

Awel y Môr Offshore Wind Farm

Category 6: Environmental Statement

Volume 4: Annex 11.1: Offshore Archaeology Desk Based Assessment

Date: April 2022

Revision: B

Application Reference: 6.4.11.1

Pursuant to: APFP Regulation 5(2)(a)



REVISION	DATE	STATUS/ REASON FOR ISSUE	AUTHOR:	CHECKED BY:	APPROVED BY:
A	August 2021	PEIR	Wessex Archaeology	RWE	RWE
B	March 2022	ES	Wessex Archaeology	RWE	RWE

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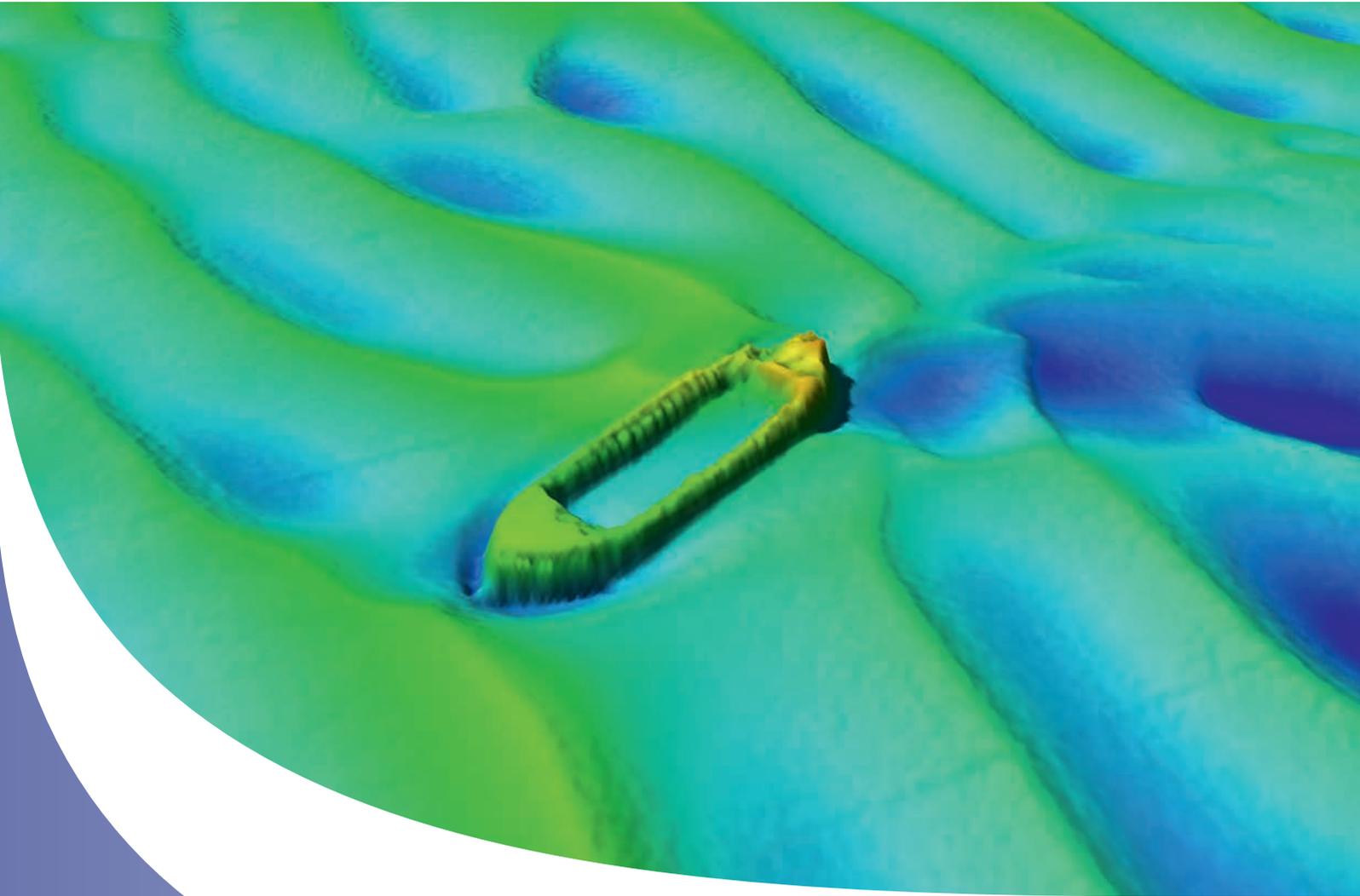
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Awel Y Môr Offshore Wind Farm

Marine archaeological technical report



Ref: 231900.01
July 2021



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Report Information

Document title	Awel Y Môr Offshore Wind Farm
Document subtitle	Marine archaeological technical report
Document reference	231900.01
Client name	GoBe Consultants on behalf of RWE Renewables UK Ltd.
Address	Suites B2 & C2, Higher Mill, Higher Mill Lane, Buckfastleigh, Devon, T Q11 0EN
Site location	Llandudno
County	Conwy
National grid reference	
Statutory designations	
Planning authority	
Planning reference	
Museum name	
Museum accession code	
WA project name	Awel y Môr Offshore Wind Farm
WA project code(s)	231900, 231902
Project management by	Euan McNeil
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Quality Assurance

Version & issue date	Status	Author	Approved by
V1 25/06/2021	Draft for Review	LR	AEM 
V2 05/07/2021	Draft for Review	LR	AEM 

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Crynodeb

Comisiynwyd Wessex Archaeology gan GoBe Consultants Ltd i baratoi Asesiad Desg mewn perthynas â'r amgylchedd archeolegol morol ar gyfer cais cynllunio arfaethedig Fferm Wynt Alltraeth Awel y Môr. Mae'r safle datblygu arfaethedig wedi ei leoli oddeutu 31 km o Rhyl oddi ar arfordir gogledd Cymru, gyda'r ardal yn gorchuddio oddeutu 88.3 km². O dan rôl ymgynghorydd archeolegol morol, mae Wessex Archaeology i baratoi Adroddiad Gwybodaeth Amgylcheddol Rhagarweiniol dilynol, wedi ei gefnogi gan gynhyrchiad yr adroddiad technegol hwn.

Nodau'r ddogfen hon oedd asesu'r adnodd archeolegol morol hysbys a phosibl yn yr ardal astudiaeth, gan gynnwys byffer 2 km o amgylch y Safle.

Mae'r asesiad hwn wedi sefydlu bod yr amgylchedd archeolegol morol yn cynnwys yr asedau canlynol:

- Potensial ar gyfer deunydd archeolegol cynhanesyddol;
- 10 cofnod o safleoedd daearol ac manau darganfyddiadau yn y parth rhynglanwol;
- 29 o longddrylliadau hysbys a man darganfyddiad sy'n ymwneud ag olion awyrennau yn ardal yr astudiaeth;
- Potensial ar gyfer darganfyddiadau pellach o safleoedd daearol nad oedd yn hysbys o'r blaen, manau darganfyddiadau, deunydd llongddrylliad o'r cyfnod Neolithig i'r cyfnod modern, a deunydd awyrennau o'r 20 fed ganrif;
- Mae cymeriad morlun hanesyddol yr ardal yn cynnwys ardaloedd o fanciau tywod sydd yn symyd yn gyson gyda dyfnderoedd cyfnewidiol; peryglon wedi eu marcio gan nifer o fwiau, goleuadau a chyrn niwl; traethau cysgodol ysgafn a rhwydwaith helaeth o fanciau tywod a fflatiau alltraeth; a defnydd milwrol hanesyddol o'r morlun yn Rhyl.

Dylid gytuno ar yr angen am, graddfa, cwmpas a natur unrhyw waith asesu a / neu archeolegol pellach trwy ymgynghori â'r awdurdodau statudol.

Arweiniodd yr asesiad o'r data geoffisegol ym mhob un o'r pedair ardal astudio (ardal yr Array, parth Seilwaith, ECC a pharth Interlink) at gyfanswm o 626 o anghysonderau â nodwyd i fod yn bosib o ddi-ddordeb archeolegol. Crynhoir y rhain fel a ganlyn:

- rhoddid sgôr archeolegol A1 i gyfanswm o 25;
- rhoddid sgôr archeolegol A2 i gyfanswm o 599; a
- rhoddid sgôr archeolegol A3 i ddau eitem; un llongddrylliad wedi ei recordio ac un rhwystr a gofnodwyd.

Nododd yr asesiad data proffiliwr is-waelod nifer o nodweddion palaeolandwedd o botensial archeolegol yn yr ardal astudiaeth. Mae Blaendal Cymhleth Sianel a nodwyd yng ngogledd a gogledd-orllewin ardal yr "Array" a pharth Seilwaith o bosibl yn cynrychioli traethlin palaeo a dyddodion deltaig cysylltiedig. Mae oedran hwn yn ansicr, a gallai fod yn Fesolithig neu'n gynharach o ran dyddiad; ar hyn o bryd mae'r dyddodion yn cael eu hystyried o botensial archeolegol posibl, ond gallent fod â photensial uchel yn dibynnu ar eu hoedran.



Nodwyd tair nodwedd sianel benodol yn torri ar draws y coridor cebl allforio, ac fe'u dehonglwyd fel "palaeochannels" wedi eu claddu, sydd yn dyddio rhwng yr Uchafswm Rhewlifol Hwyr a thramgwydd morol Holocene. O'r herwydd, ystyrir bod y rhain â photensial archeolegol uchel a gallent gynnwys arteffactau archeolegol yn y fan a'r lle a deilliedig a deunydd palaeoamgylcheddol.

Argymhellir, pe bai unrhyw samplu gwaddod (e.e. "coring" / "boreholin") yn cael ei wneud yn yr ardal astudiaeth, y dylid ddarparu unrhyw gofnodion craidd a samplau a gafwyd o fewn dyddodion o botensial archeolegol ar gyfer asesiad geoarchaeolegol gan contractwr archeolegol cymwys.

Argymhellir Parthau Gwahardd Archeolegol o amgylch pob anghysondeb â ddosberthir fel potensial archeolegol A1 neu A3. Eithrio Parthau Gwahardd Archeolegol radiws 50 m o amgylch nodweddion sydd â chyfyngiadau da, a radiws 100 m o amgylch safleoedd sydd wedi gwasgaru; llongdrylliad wedi eu recordio neu lleoliadau rhwystrau.

Mae gan yr Parthau Gwahardd Archeolegol hyn i gyd y potensial i gael eu diwygio neu eu dileu yn nes ymlaen, pe bai gwybodaeth pellach yn profi nad yw eu nodweddion cysylltiedig o botensial archeolegol neu yn cynrychioli safleoedd gwasgaredig yn ehangach.

Dylid gytuno ar yr angen am, raddfa, gwmpas a natur unrhyw waith asesu a / neu archeolegol pellach trwy ymgynghori â'r awdurdodau statudol.



Summary

Wessex Archaeology was commissioned by GoBe Consultants Ltd to provide a Desk Based Assessment (DBA) in relation to the marine archaeological environment for the proposed Awel y Môr Offshore Wind Farm (hereafter AyM) planning application. The proposed development study area (hereafter 'the study area') is located approximately 31 km from Rhyl off the north Wales coast, with the area covering approximately 88.3 km². Under the role of marine archaeological consultant, Wessex Archaeology is to prepare a subsequent Preliminary Environmental Information Report (PEIR), supported by the production of this technical report.

The aims of the document were to assess the known and potential marine archaeological resource within the study area, comprising a 2 km buffer around the study area.

This assessment has established that there are the following marine archaeological environmental assets:

- Potential for prehistoric archaeological material;
- 10 records of terrestrial sites and findspots in the intertidal zone;
- 29 known shipwrecks and a findspot relating to aircraft remains within the study area;
- Potential for further discoveries of previously unknown terrestrial sites and findspots, wreck material from the Neolithic to modern period, and 20th century aircraft material;
- The historic seascape character of the area comprises areas of constantly shifting sandbanks with changing depths; hazards marked by numerous buoys, lights and fog horns; gently shelving beaches and extensive network of offshore sandbanks and flats; and historic military use of the seascape at Rhyl.

The sub-bottom profiler data assessment identified a number of palaeolandscape features of archaeological potential within the study area. A Channel Complex Deposit identified in the north and north-west of the Array area and Infrastructure zone potentially represents a palaeo-shoreline and associated deltaic deposits. The age of this is uncertain, and could be Mesolithic or earlier in date; the deposits are currently considered of possible archaeological potential, but could be of high potential depending on their age.

Three distinct channel features were identified cutting across the Export cable corridor, and were interpreted as buried palaeochannels dating from between the Late Glacial Maximum and the Holocene marine transgression. As such, these are considered of high archaeological potential and could contain both in situ and derived archaeological artefacts and preserved palaeoenvironmental material.

It is recommended that, should any sediment sampling (e.g. coring/boreholing) be undertaken within the study area, any core records and samples acquired from within deposits of archaeological potential be made available for geoaerchaeological assessment by a suitably qualified archaeological contractor.

The assessment of the geophysical data within all four study areas (Array area, other wind farm infrastructure zone, ECC and GyM Interlink zone) resulted in a total of 626 anomalies identified as being of possible archaeological interest. These are summarised as follows:



- a total of 25 were assigned an A1 archaeological rating;
- a total of 599 were assigned an A2 archaeological rating; and
- two items, one recorded wreck and one recorded obstruction, were assigned A3 archaeological discriminations.

Archaeological Exclusion Zones (AEZs) are recommended around all anomalies classified as A1 or A3 archaeological potential. Archaeological Exclusion Zones of 50 m radius are recommended around features that are well constrained, and 100 m radius around more disperse sites; recorded wreck or obstruction locations.

These AEZs all have the potential to be amended or removed at a later date, should further information become available that proves their associated features are not of archaeological potential or represent more widely dispersed sites.

The need for, scale, scope and nature of any further assessment and/ or archaeological works should be agreed through consultation with the statutory authorities.



Acknowledgements

This project was commissioned by GoBe Consultants Ltd on behalf of RWE Renewables UK (RWE) and Wessex Archaeology is grateful to staff for their assistance.

Data was provided by the United Kingdom Hydrographic Office (UKHO), the National Record of the Historic Environment (NRHE), local Historic Environment Records (HER), and Clwyd Powys Archaeological Trust (CPAT). Wessex Archaeology is grateful to the staff of all the above organisations for their cooperation during the project.

The report was researched and compiled by Lowri Roberts BSc, MSc, Andrea Hamel BA, MA, and David Howell BSc, MSc. Wessex Archaeology's Marine Geophysics team undertook the archaeological assessment of geophysical survey data. Kitty Foster BA, MA prepared the illustrations. Euan McNeill BSc, MSc managed the project on behalf of Wessex Archaeology.



Awel y Môr Offshore Wind Farm

Marine archaeological technical report

1 INTRODUCTION

1.1 Project background

1.1.1 AyM is a proposed extension to the operational Gwynt y Môr OWF off the north east coast of Wales (Figure 1). The Gwynt y Môr OWF (hereafter GyM) has been operational since 2015 and consists of 160 wind turbine generators (WTGs), supplying approximately 400,000 households annually. The array area AyM will cover approximately 88.3 km² (not including OWIZ and GyM interlink) with a cable corridor running from the east of the array up to and including the intertidal zone. The grid connection will be made at Bodelwyddan in Denbighshire and export cables will be buried between the landfall and the grid connection. A new onshore substation will be constructed near to the National Grid's existing substation at Bodelwyddan.

1.2 Development proposal

1.2.1 The proposed AyM comprises an offshore generating station with a capacity of greater than 100 MW and therefore is a Nationally Significant Infrastructure Project (NSIP), as defined by Section 15(3) of the *Planning Act* 2008. As such, there is a requirement to submit an Application for a Development Consent Order (DCO) to the Secretary of State (SoS). There is also a requirement to obtain a marine licence under the *Marine and Coastal Access Act* (MCAA) to be granted by Welsh Government administered by Natural Resource Wales (NRW). The DCO and Marine Licence Applications will be accompanied by an Environmental Statement (ES) prepared in accordance with the Marine Works (EIA) Regulations 2007 (as amended) as relevant to the marine licence application under MCAA, the development falling under Schedule 2 of the 2017 EIA Regulations. Offshore wind farms such as AyM are helping to achieve the target set out in the *Future Wales The National Plan 2040* "for 70% of electricity consumption to be generated from renewable energy by 2030" (Welsh Government 2021a).

1.3 Scope of document

1.3.1 This assessment was requested by GoBe Consultants in order to determine, as far as is possible from existing information, the nature, extent and significance of the marine archaeological resource within the study area and its environs. This baseline will inform the impact assessment for the forthcoming Preliminary Environmental Information Report (PEIR) and the ES, as required by the Overarching *National Policy Statement for Energy* (NPS EN-1) (Department of Energy and Climate Change (DECC, 2011).

1.3.2 The marine element of the study area is considered to comprise the area offshore up to the Mean High Water Springs (MHWS). The onshore elements of the project are considered as part of a separate document.

1.3.3 *Planning Policy Wales (PPW)* (Welsh Government 2021) states that:

'the historic environment comprises all the surviving elements of previous human activity and illustrates how past generations have shaped the world around us. It is central to



Wales's culture and its character, whilst contributing to our sense of place and identity. It enhances our quality of life, adds to regional and local distinctiveness and is an important economic and social asset.'

- 1.3.4 Planning Policy Wales (Welsh Government 2021) notes that 'the historic environment is made up of individual historic features which are collectively known as historic assets' including listed buildings, historic landscapes and archaeological remains.

1.4 Aims

1.4.1 The specific aims of this assessment are to:

- Outline the known and potential marine heritage assets within the study area based on a review of existing information;
- Assess the significance of known and potential heritage assets through weighted consideration of their valued components; and
- Assess the significance of the historic seascape character of the study area.

1.5 Copyright

1.5.1 This report may contain material that is non-Wessex Archaeology copyright (e.g. Ordnance Survey, British Geological Survey, Crown Copyright), or the intellectual property of third parties, which Wessex Archaeology are able to provide for limited reproduction under the terms of our own copyright licences, but for which copyright itself is non-transferable by Wessex Archaeology. Users remain bound by the conditions of the Copyright, Designs and Patents Act 1988 with regard to multiple copying and electronic dissemination of the report.

2 LEGISLATION, GUIDANCE AND POLICY

2.1 Introduction

2.1.1 Cadw is responsible for the archaeological resource within Wales's Territorial Waters (to the 12 nautical miles (nm) limit while the main source of information on underwater heritage in Wales is the marine database of the National Monument Record compiled by the Royal Commission on Ancient and Historical Monuments in Wales (RCAHMW). NRW is responsible for licencing, regulating and planning marine activities in the seas around Wales to ensure they are carried out in a sustainable way.

2.1.2 The Welsh National Marine Plan identifies opportunities for the sustainable development of Wales's seas (Welsh Government 2019) by guiding new development and related decisions both inshore and offshore. Development plans and the Marine Plan should work together and support integrated decision making and collaboration across marine and terrestrial interfaces and boundaries (Welsh Government 2021b).

2.1.3 The following section provides a summary of the national, regional and local planning and legislative framework which governs the treatment of the marine historic environment in the planning process.

2.2 Marine legislation

2.2.1 The study area is located in the Welsh territorial sea (up to 18 nm from the coast). The following legislation applies:



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

2.3 International conventions

2.3.1 The United Nations Educational, Scientific and Cultural Organisation (UNESCO) Convention was concluded in 2001 and is a comprehensive attempt to codify the law internationally, with regards to underwater cultural heritage. The UK abstained in the vote on the final draft of the Convention, however it has stated that it has adopted the Annex of the Convention, which governs the conduct of archaeological investigations, as best practice for archaeology. Although the UK is not a signatory, the Convention entered into force on 2 January 2009, having been signed or ratified by 20 member states.

2.4 Planning Policy Wales

2.4.1 Planning Policy Wales (PPW) (Welsh Government 2021) sets out the land use planning policies of the Welsh Government. It describes the planning system as managing the use of land in the public interest, and states that the system ‘must reconcile the needs of development and conservation [...] and protecting, promoting, conserving and enhancing the built and historic environment’. The importance of the historic environment in Welsh planning policy is interwoven throughout the document.

2.4.2 The section on ‘Distinctive & Natural Places’ states that ‘The historic environment is a finite, non-renewable and shared resource and a vital and integral part of the historical and cultural identity of Wales [...] The historic environment can only be maintained as a resource for future generations if the individual historic assets are protected and conserved.’

2.4.3 The Welsh Government’s specific objectives for the historic environment include conserving archaeological remains, both for their own sake and for their role in education, leisure and the economy.

2.4.4 The Planning Policy notes that the conservation and enhancement of historic assets is most effective when considered at the earliest stage of plan preparation or when designing new proposals.

2.4.5 It also states that ‘any decisions made through the planning system must fully consider the impact on the historic environment and on the significance and heritage values of individual historic assets and their contribution to the character of place.’

2.5 Welsh National Marine Plan

2.5.1 The Welsh National Marine Plan (2019) is the first marine plan for Wales and is intended to guide the sustainable development of the marine area by setting out how proposals will be considered by decision makers.

- SOC_04 Welsh language and culture – proposals that contribute to the promotion and facilitation of the use of the Welsh language and culture are encouraged. This policy seeks to ensure that all developers consider their impact on Welsh Culture, including heritage and the historic environment;



- SOC_05: Historic assets – proposals should demonstrate how potential impacts on historic assets and their setting have been taken into consideration and should, in order of preference:
 - Avoid adverse impacts on historic assets and their settings; and/or
 - Minimise impacts where they cannot be avoided; and/or
 - Mitigate impacts where they cannot be minimised.
 - If significant adverse impacts cannot be avoided, minimised or minimised, proposals must present a clear and convincing case for proceeding.

2.6 Future Wales - The National Plan 2040

2.6.1 Future Wales – The National Plan 2040 (2021) sets out the national development framework. It provides a development plan with a strategy for addressing key national priorities through the planning system. It recognises that landscape and heritage are key motivators for people to visit Wales.

2.7 Marine policy

2.7.1 MCAA received Royal Assent on 12 November 2009. It introduced new planning and management systems for overseeing the marine environment, most notably through the requirement to obtain marine licences for works at sea (including the deposition or removal of any substance or object from the sea below Mean High Water). It created a strategic marine planning system that seeks to promote the efficient, sustainable use and protection of the marine environment, guided by the *Marine Policy Statement* and a series of Marine Plans.

2.7.2 The MCAA provides the framework for a marine licencing system, which is administered by Natural Resources Wales (NRW) in Wales, a statutory consultee within the DCO application process. The Act also amended certain provisions of the *Planning Act 2008*.

2.8 Marine guidance

2.8.1 This assessment was carried out in a manner consistent with available guidance as described below:

- *Cadw, Caring for Coastal Heritage (1999);*
- *Cadw, Caring for Military Sites of the Twentieth Century (2009);*
- *Cadw, Managing the Marine Historic Environment of Wales (2019);*
- *Cadw, Conservation Principles for the Sustainable Management of the Historic Environment in Wales (2011);*
- *JNAPC Code of Practice for Seabed Development (Joint Nautical Archaeology Policy Committee and The Crown Estate 2006);*
- *Historic Environment Guidance for Offshore Renewable Energy Sector (Wessex Archaeology 2007);*

- *Guidance for Assessment of Cumulative Impacts on the Historic Environment from Offshore Renewable Energy (Oxford Archaeology 2008);*
- *Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for Renewable Energy Sector (Fugro EMU Ltd 2011);*
- *Protocol for Archaeological Discoveries: Offshore Renewables Projects ('ORPAD') (The Crown Estate 2014);*
- *Our Seas – A shared resource: High level marine objectives (DEFRA 2009);*
- *Model Clauses for Archaeological Written Schemes of Investigations (The Crown Estate and Wessex Archaeology 2010); and*
- *Marine Geophysics Data Acquisition, Processing and Interpretation Guidance Notes (English Heritage and Bates, R., Dix, J. K., Plets, R. 2013).*
- *Managing the Marine Historic Environment of Wales (Annex B – Draft) (Natural Resources Wales in conjunction with Cadw & Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW, March 2019); and*
- *Marine Character Areas*

2.8.2 A full list of legislative, policy and guidance can be found in Appendix 2.

3 METHODOLOGY

3.1 Study area(s)

Scope

3.1.1 The study area comprised an initial 2 km buffer around the AyM array area as well as the export cable corridor, as supplied by the client. This buffer created a comprehensive search area for obtaining records from relevant archive databases, which provided not only context for the discussion and interpretation of the known and potential marine archaeological resource within the study area, but also allowed for potential inaccuracies in positional data that could be present in archival records. Once the area was refined, a buffer of 500 m was placed around the array and GyM interlink zone.

3.2 Walkover survey methodology

3.2.1 A walkover survey of the intertidal study area and foreshore took place by two terrestrial archaeologists from Wessex Archaeology during the week of the 25 of April 2021 at low tide along the landfall route in order to determine whether any archaeological features were present. Several photographs were taken from all views in order to contribute to the seascape characterisation. The survey comprised a visual inspection and identification of material and photographic record of visible features.

3.3 Archaeological desk-based assessment

Key themes

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



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

- Palaeogeography (for example, palaeochannels and other features that contain prehistoric sediment, and derived Palaeolithic artefacts e.g. handaxes), including setting;
- 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), including their settings;
- Intertidal heritage assets; and
- Historic seascape character.

Data sources

3.3.3 All existing baseline studies for marine archaeology and cultural heritage produced in support of the existing GyM OWF as well as;

- the United Kingdom Hydrographic Office (UKHO) data;
- the National Heritage List (Cadw);
- Coflein;
- Lle;
- Receiver of Wreck;
- the relevant county Historic Environment Record(s) (HER) particularly from Gwynedd Archaeological Trust and Clwyd-Powys Archaeological Trust;
- relevant mapping including Admiralty Charts, historic maps and Ordnance Survey;
- a wide range of secondary sources, including those providing an overview of the historical and archaeological resources of the waters around the coast;
- relevant documentary sources and grey literature held by Wessex Archaeology, and those available through the Archaeological Data Service and other websites;
- Welsh Research Frameworks.

Data structure

3.3.4 In order to compile the marine archaeological baseline as presented in this report, where possible, the sources were incorporated into a project Geographic Information System (GIS) using ArcGIS 10.6, enabling the data to be spatially analysed.

3.3.5 The RCAHMW and HER records have been discriminated between records for which there is known material on the seabed and 'recorded losses' (vessels and aircraft that are known to have been lost, but do not, except by chance, have material on the seabed at their recorded loss location). The records with known material on the seabed are included in the 'wrecks and obstructions' gazetteer along with data from the UKHO (Appendix 4). The

recorded losses are in a separate gazetteer and have been used to assess the potential for further discoveries (Appendix 6).

- 3.3.6 For the purposes of this report, the gazetteers are compiled and illustrated in Universal Transverse Mercator (UTM) Zone 30 north projected from the ETRS 1989 datum. Information relating to the archaeological and cultural heritage that did not include location or positional information were used to inform the marine archaeological baseline assessment where relevant.
- 3.3.7 For archaeological sites that were recorded in the UKHO, RCAHMW, Gwynedd Archaeological Trust and Clwyd-Powys Archaeological Trust datasets, the co-ordinates from the UKHO are the ones used in the gazetteer and GIS. As these relate to survey co-ordinates, they have been assessed as likely to be more accurate.

Chronology

- 3.3.8 Archaeological material is generally studied within a framework of 'periods' or 'ages' that reflect the activities and cultural changes taking place over time. All dates are referred to as BCE (Before Common Era), BP (Before Present) or AD (Anno Domini) within the text. BCE refers to calibrated radiocarbon chronology that can be considered equivalent to calendar years. BP dates are used for periods of time older than circa 10,000 years ago.
- 3.3.9 A list of the main archaeological periods in Britain referred to in the text, along with their broadly defined dates are presented in Appendix 1.

Palaeogeography

- 3.3.10 The baseline assessment for palaeogeography was based on a range of secondary sources, including academic papers, monographs, geological information (e.g. BGS mapping), and previous work undertaken by Wessex Archaeology within the Irish Sea area and the wider region. This baseline for the palaeogeographic assessment aids in producing a stratigraphy for the study area, assigning archaeological potential to identified units, and informing future sampling strategies.

Seabed features: maritime and aviation sites

- 3.3.11 The baseline summary for maritime and aviation archaeology was assessed by means of accessing any records of sites, findspots, wrecks, casualties and seabed features obtained from the UKHO, RCAHMW and HERs within the study area. The baseline assessment of maritime and aviation archaeology was further supplemented by a review of relevant primary and secondary source material in order to provide an indication on the nature of maritime and aviation activity across the region. As well as summarising the known archaeological resource, the baseline assessment underlines the potential for encountering unknown shipwreck and aircraft crash sites within the study area.

Intertidal archaeology

- 3.3.12 The baseline summary for intertidal archaeology was assessed by means of accessing any records of sites and findspots obtained from the UKHO, RCAHMW, Gwynedd Archaeological Trust and Clwyd-Powys Archaeological Trust within the study area. The baseline assessment of intertidal archaeology was further supplemented by the results of the walkover survey.

Historic seascape characterisation

- 3.3.13 The baseline summary for character of the historic seascape within the study area was assessed using the results of *National Seascape Assessment for Wales 2015*. In particular,

the assessment focussed on the Marine Character Areas for Colwyn Bay and Rhyl Flats (MCA 02), Red Wharf and Conwy Flats (MCA 03) and North Wales Open Water (MCA 04) using the report and data sheets assessing Welsh seascapes and their sensitivity to offshore developments (Natural Resources Wales 2015d).

3.4 Geophysical methodology

Geophysical study area

3.4.1 As outlined in Section 1.1, the proposed AyM is an area approximately 88.3 km² in size located off the coast of north Wales, with an associated exported cable corridor extending for the eastern end of the array area to landfall between Rhyl and Prestatyn.

3.4.2 For the purposes of the geophysical assessment, the development study area has been divided into four separate study areas; the Array area, other wind farm infrastructure zone, offshore export cable corridor (ECC), and AyM to GyM interlink (GyM Interlink area). The study area also includes a 500 m buffer zone surrounding the Array area and other wind farm Infrastructure zone. These study areas are illustrated in Figure 1.

Geophysical aims and objectives

3.4.3 The aims and objectives of the archaeological assessment of geophysical data are:

- identify any buried palaeolandscape features of possible archaeological potential;
- confirm the presence of known or previously located marine sites of archaeological potential and to comment on their apparent character;
- identify, locate and characterise hitherto unrecorded marine sites of archaeological potential;
- comment on the potential effects of dredging/development on known archaeological sites; and
- provide recommendations for archaeological mitigation.

Data sources

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

- Geophysical survey data sets acquired by Fugro GB Marine Ltd. (Fugro) in 2020, comprising sidescan sonar (SSS), multibeam echosounder (MBES), magnetometer (Mag.) and sub-bottom profiler (SBP) data sets;
- Client supplied survey reports (Fugro 2021a, 2021b);
- Recorded wreck and obstruction data acquired via the UKHO;
- Relevant background information and mapping from the area (e.g. Jackson *et al.* 1995, admiralty charts received via MarineFind);
- Previous cultural heritage and geophysical assessment results from the adjacent GyM OWF (Gifford 2005, Wessex Archaeology 2012);

3.4.5 The geophysical data acquired by Fugro in 2020 fully covers the Array area, other wind farm infrastructure zone, and ECC, but only covers the section of the GyM Interlink area



which overlaps with the ECC. The section of the GyM Interlink area which is within the existing GyM OWF area was only partially covered by geophysical data from the 2012 assessment (Wessex Archaeology 2012). The extent of this coverage is illustrated in Figure 2.

- 3.4.6 The previous cultural heritage assessment undertaken for the GyM OWF by Gifford (2005) also covers a significant portion of the AyM Array area, ECC and GyM Interlink area. However, no archaeological assessment of geophysical data was undertaken as part of this assessment, and any data sets that were consulted are now almost 20 years old (Gifford 2005). As such, the results of this assessment are not included as part of the current report.

Geophysical data - technical specifications

- 3.4.7 The geophysical data (SSS, MBES, Mag. and SBP) for the study areas were acquired by Fugro between 19 June and 30 September 2020, following mobilisation and calibrations of the *Fugro Mercator* between 10 and 18 June 2020 and the *Fugro Valkyrie* on 15 July 2020 (Fugro 2021a, 2021b).
- 3.4.8 The Array area and other wind farm infrastructure zone data were collected by the *Fugro Mercator* at a 75 m line spacing for main lines, with crosslines acquired every 500 m (Fugro 2021a). The ECC and partial GyM Interlink area data were collected at variable line spacing, between 20 and 50 m depending on water depth by the *Fugro Mercator* (offshore) and the *Fugro Valkyrie* (closer inshore) (Fugro 2021b). Further details on the equipment used is in Table 1.

Table 1 Summary of survey equipment

Survey Company	Survey Vessel	Data Type	Equipment	Data Format
Fugro	<i>Fugro Mercator</i>	SBP	Innomar SES-2000 parametric sub-bottom profiler	.sgy
		MBES	RESON SeaBat 7125 Dual Head (200kHz/400 kHz)	.xyz
		SSS	Edgetech 4200 (300-500 kHz/600-900 kHz)	.xtf
		Mag.	Geometrics G-882	.csv
	<i>Fugro Valkyrie</i>	SBP	Innomar SES-2000 parametric sub-bottom profiler	.sgy
		MBES	Teledyne RESON SeaBat® 7125-SV2 multibeam echosounder	.xyz
		SSS	EdgeTech 4125,4200 or 4205 tri-frequency side scan sonar (300/600 kHz)	.xtf
		Mag.	Geometrics G-882	.csv

- 3.4.9 The survey data were acquired in WGS84 UTM30N projected coordinates, and the results are presented in the same coordinate system (Fugro 2021a, Fugro 2021b).

Geophysical data - processing

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



Table 2 Software used for geophysical assessment

Dataset	Processing Software	Interpretation and rationalisation
SBP	CodaOctopus Survey Engine v5.11	ArcMap v10.6
MBES	QPS Fledermaus v7.8	
SSS	CodaOctopus Survey Engine v5.11	
Mag.	MagPick v3.25 and in house proprietary software	

- 3.4.11 The SBP and MBES data were used as the primary datasets for the palaeographic assessment and SSS, MBES and Mag. datasets were used for the seabed features assessment.
- 3.4.12 The SBP data were processed using CodaOctopus Survey Engine Seismic+ software. This software allows the data to be visualised with user selected filters and gain settings in order to optimise the appearance of the data for interpretation. The software then allows an interpretation to be applied to the data by identifying and selecting sedimentary boundaries and shallow geological features that might be of archaeological interest.
- 3.4.13 The SBP data were interpreted with a two-way travel time (TWTT) along the z-axis. In order to convert from TWTT to depth, the velocity of the seismic waves was estimated to be 1,600 ms⁻¹. This is a standard estimate for shallow, unconsolidated sediments.
- 3.4.14 The SBP data can also be used to identify small reflectors, which may indicate buried material such as a wreck site covered by sediment. The position and dimensions of any such objects are noted in a gazetteer, and an image acquired of each anomaly for future reference. It should be noted that anomalies of this type are rare, as the sensors must pass directly over such an object in order to detect an anomaly.
- 3.4.15 For the SBP assessment, 25% of the lines (array area and other wind farm infrastructure zone) or a central line plus two wing lines (ECC and partial GyM interlink area) were initially assessed. Where features of interest were identified, additional lines were then interpreted in order to more accurately map the extents of these features.
- 3.4.16 The MBES data were analysed to identify any unusual seabed structures that could be shipwrecks or other anthropogenic debris. The data were gridded at 0.25 m and analysed using QPS Fledermaus software, which enables a 3-D visualisation of the acquired data and geo-picking of seabed anomalies. The MBES data were also used in the palaeogeographic assessment.
- 3.4.17 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.
- 3.4.18 A mosaic of the SSS is produced during this process to assess the quality of the sonar towfish positioning. This process allows the position of anomalies to be checked between different survey lines and for the positioning to be further refined if necessary.
- 3.4.19 The form, size and/or extent of an anomaly is a guide to its potential to be an anthropogenic feature and therefore of archaeological interest. A single small but prominent anomaly may be part of a much more extensive feature that is largely buried. Similarly, a scatter of minor

anomalies may be unrelated individual features, define the edges of a buried but intact feature, or may be all that remains as a result of past impacts from, for example, dredging or fishing. Assessment is made of such groups of anomalies during data interpretation to determine which of these alternatives is the most likely.

- 3.4.20 The Mag. data were processed using a combination of Geometrics MagPick and in-house proprietary software in order to identify any discrete magnetic contacts which could represent buried metallic debris or structures such as wrecks.
- 3.4.21 The software enables both the visualisation of individual lines of data and gridding of data to produce a magnetic anomaly map. The data were first smoothed to try and eliminate any spiking. A trend was then fitted to the resulting data, and the trend values subtracted from the smoothed values. This was carried out to remove natural variations in the data (such as diurnal variation in magnetic field strength and changes in geology). The processed data were then gridded to produce a map of magnetic anomalies, and individual anomalies tagged based on the grid and individual profile lines. Images are taken in a similar process to that of the SSS data.
- 3.4.22 For the purposes of this assessment, any identified magnetic anomalies have been classified depending on their amplitude as small (5 nT to 49 nT), medium (50 nT to 99 nT), or large (>100 nT).
- 3.4.23 The results of the 2012 GyM archaeological assessment of geophysical data (Wessex Archaeology 2012) were also used as part of this assessment, and positions of anomalies identified in the 2020 geophysical data were cross-referenced with any anomalies identified during the 2012 assessment. Where appropriate, the records of previously identified anomalies were updated to reflect the results of the more recent, higher resolution data.
- 3.4.24 The previously identified anomalies from 2012 are the sole results from the section of the GyM interlink area not covered by 2020 geophysical data.

Geophysical data – data quality

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

Table 3 Criteria for assigning data quality rating

Data quality	Description
Good	Data which are clear and unaffected or only slightly affected by weather conditions, sea state, background noise or data artefacts. Seabed datasets are suitable for the interpretation of upstanding and partially buried wrecks, debris fields, and small individual anomalies. The structure of wrecks is clear, allowing assessments on wreck condition to be made. Subtle reflectors are clear within SBP data. These data provide the highest probability that anomalies of archaeological potential will be identified.
Average	Data which are moderately affected by weather conditions, sea state and noise. Seabed datasets are suitable for the identification of upstanding and partially buried wrecks, the larger elements of debris fields and dispersed sites, and larger individual anomalies. Dispersed and/or partially buried wrecks may be difficult to identify. Interpretation of continuous reflectors in SBP data is problematic. These data are not considered to be detrimentally affected to a significant degree.



Data quality	Description
Below Average	Data which are affected by weather conditions, sea state and noise to a significant degree. Seabed datasets are suitable for the identification of relatively intact, upstanding wrecks and large individual anomalies. Dispersed and/or partially buried wrecks, or small isolated anomalies may not be clearly resolved. Small palaeogeographic features, or internal structure may not be resolved in SBP data.
Variable	This category contains datasets where the individual lines range in quality. Confidence of interpretation is subsequently likely to vary within the study area.

- 3.4.2 The quality of the SBP data has been rated as 'Variable' using the above criteria. In areas containing mobile seabed sediment (i.e. sand waves and megaripples), noise was encountered at the peak of every mobile bedform that reduced the quality of the data and increased the difficulty and confidence in identifying shallow geological horizons. Outside the areas of mobile sand, the data were unaffected by noise and horizons were clearly visible. Overall, the data were considered suitable for archaeological assessment.
- 3.4.3 The MBES data were rated as 'Good' using the above criteria. The data quality and resolution of 0.25 m was found to be of a good standard and suitable for archaeological assessment of objects and debris over 0.5 m in size.
- 3.4.4 The SSS data have been rated as 'Average' using the above criteria table. Some data artefacts and stretching caused by weather conditions on site were seen, and the positioning appeared slightly affected in the mosaic. The range of 100 m per channel used for the assessment means smaller objects may not have been visible in the data. However, this is an accepted limitation of data acquired at this stage in the planning process, and the data were deemed suitable for archaeological assessment.
- 3.4.5 The Mag. data have been rated as 'Good' using the above criteria table; some minor weather effects were identified, but overall the data were clean with low background noise levels. Due to the relatively large line spacings used for the survey, particularly in the Array area and the offshore section of the ECC, smaller buried ferrous objects located between survey lines are unlikely to have been detected. As such, it cannot be guaranteed that all ferrous debris of archaeological potential have been identified. However, this is an accepted limitation of data acquired at this stage in the planning process, and the data were considered suitable for archaeological assessment.

Geophysical data - anomaly grouping and discrimination

- 3.4.6 The previous section describes the initial interpretation of all available geophysical datasets which were conducted independently of one another. This inevitably leads to the possibility of any one object being the cause of numerous anomalies in different datasets and apparently overstating the number of archaeological features in the exploration area.
- 3.4.7 To address this fact the anomalies were grouped together; allowing one ID number to be assigned to a single object for which there may be, for example, a UKHO record, a MBES anomaly, and multiple SSS anomalies.
- 3.4.8 Once all the geophysical anomalies and desk-based information have been grouped, a discrimination flag is added to the record in order to discriminate against those which are not thought to be of an archaeological concern. For anomalies located on the seabed, these flags are ascribed as follows (Table 4).

Table 4 Criteria discriminating relevance of identified features to proposed scheme

Overview classification	Discrimination	Criteria	Data type
Archaeological	P1	Feature of probable archaeological interest, either because of its palaeogeography or likelihood for producing palaeoenvironmental material	SBP, MBES
Archaeological	P2	Feature of possible archaeological interest	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.

- 3.4.9 At this stage, the results of the 2020 geophysical assessment were also grouped with the results from the 2012 GyM assessment, where appropriate.
- 3.4.10 The grouping and discrimination of information at this stage is based on all available information and is not definitive. It allows for all features of potential archaeological interest to be highlighted, while retaining all the information produced during the course of the geophysical interpretation and desk-based assessment for further evaluation should more information become available.
- 3.4.11 Any anomalies located outside of the defined study areas, either previously recorded in known databases (e.g. UKHO) or identified during this geophysical assessment, are deemed beyond the scope of the current assessment and are subsequently not included in this report.

3.5 Assessment of setting

- 3.5.1 The Planning policy Wales (2021) states that “It is important that the planning system looks to protect, conserve and enhance the significance of historic assets. This will include consideration of the setting of an historic asset which might extend beyond its curtilage. Any change that impacts on an historic asset or its setting should be managed in a sensitive and sustainable way. It is the responsibility of all those with an interest in the planning system, including planning authorities, applicants, developers and communities, to appropriately care for the historic environment in their area. The protection, conservation and enhancement of historic assets is most effective when it is considered at the earliest stage of plan preparation or when designing proposals new proposals.”
- 3.5.2 Currently, there is no specific guidance regarding the assessment of setting for offshore archaeological and cultural heritage assets. However, *Cadw’s Setting of Historic Assets in Wales* (2017) provides general guidance, largely applicable to terrestrial sites, and notes

that the importance of setting 'lies in what it contributes to the significance of a historic asset' (Cadw, 2017: 3). With regards to significance for heritage policy, the National Planning Policy Framework notes that the interest of a heritage asset 'may be archaeological, architectural, artistic or historic' (DCLG, 2012).

- 3.5.3 Cadw states that 'The setting of a historic asset includes the surroundings in which it is understood, experienced and appreciated, embracing present and past relationships to the surrounding landscape. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive, negative or neutral contribution to the significance of an asset.' (Cadw, 2017: 2).
- 3.5.4 The setting of a historic asset can include physical elements of its surroundings as well as less tangible elements. Although views to and from a historic asset are often the most obvious factors, other sensory elements can also affect setting (*ibid.*) Reference in the guidance is also made to the setting associated with buried heritage assets which may not be readily appreciated by a casual observer, but retains a presence in the landscape such as, for example, wreck sites that are periodically, partly or wholly submerged (*ibid.*: 2).
- 3.5.5 Cadw's *Managing the Marine Historic Environment of Wales* (2020) states that 'Development and use of the marine environment can, however, affect historic assets both directly and indirectly, including: loss of, or damage to, historic material; alteration to the setting of historic assets which can positively or negatively affect the ability to understand and appreciate them or through burial or exposure.'
- 3.5.6 Policy SOC_05 in the *Welsh National Marine Plan* (2019) states that "Proposals should demonstrate how potential impacts on historic assets and their settings have been taken into consideration and should, in order of preference:
- a. avoid adverse impacts on historic assets and their settings; and/or
 - b. minimise impacts where they cannot be avoided; and/or
 - c. mitigate impacts where they cannot be minimised.
- 3.5.7 In order to assess whether, how and to what degree setting makes a contribution to the significance of heritage assets, the following must be considered: the physical surroundings of the asset including its relationship with other heritage assets; the way the asset is appreciated, and the asset's associations and patterns of use.
- 3.5.8 The assessment of setting in this document follows the guidance discussed in the paragraphs above, is based on the baseline assessment of the palaeogeography, terrestrial, maritime and aviation assets, and is described using the following two factors;
- Physical surroundings and Views – which includes the physical presence of the asset on the seabed, its surroundings, and relationship with other assets and navigational hazards in the immediate area. Views to and from the asset, and how the asset is experienced in its immediate physical surroundings are also considered; and;
 - Non-visual factors – including the way the asset is appreciated in a broader historical, artistic and intellectual capacity, and the asset's associations.
- 3.5.9 It should be noted that for heritage assets offshore, sites are generally only experienced by divers, remotely operated vehicle (ROV), or by geophysical survey, and the views to the

asset are often very limited due to reduced visibility in the water column. In addition, unlike many terrestrial sites, the position of the asset on the seabed has not been deliberately chosen, and although some sites may have reached their position through military action (e.g. wartime losses and losses from mine-laying activity)(Natural Resources Wales 2015c) or have been lost due to a particular navigational hazard (e.g. hitting a harbour wall like that of Rhyl or being stranded on a particular sandbank for instance in Cefn Sidan near Llanenlli), many positions are entirely arbitrary, and even with military sinking events, an attack on the surface could lead to a wreck being deposited on the seabed miles from where the event took place. Non-visual factors may include associations with particular battles, wars, minefields, and other historic events, as well as how the wreck can be appreciated in its wider context, for example through well-known trade routes, collisions or local industry. Association between the asset and the local social history is another important aspect of an asset's non-visual importance, including rescue attempts or losses occurring within modern memory.

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

3.6 Determining value and sensitivity

- 3.6.1 This report will ultimately inform an EIA for the study area that will be presented within the ES. In order to assess the potential impacts of a development upon the marine environment, EIAs typically adopt the conceptual approach known as the 'source-pathway-receptor' model. This approach is based on the identification of the source (i.e. the origin of a potential impact), the pathway (i.e. the means by which the effect of the activity could impact a receptor) and the receptor that may be impacted (e.g. known/ potential heritage assets). In order for the significance of any given impact to be fully understood, the sensitivity of any receptors that may be impacted need to be considered. This section outlines the means by which the sensitivity of marine heritage assets is ascertained.

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

- Adaptability – the degree to which a receptor can avoid or adapt to an effect;
- Tolerance – the ability of a receptor to accommodate temporary or permanent change without significant adverse impact;
- Recoverability – the temporal scale over and extent to which a receptor will recover following an effect; and
- Value – a measure of the receptor's importance, rarity and worth.

3.7 Assumptions and limitations

Archaeological data

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

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

Geophysical data

- 3.7.3 The individual geophysical data sets were assessed and rated for quality, and the quality assessment is presented in Section 3.4.1 to Section 3.4.5.
- 3.7.4 The geophysical survey and assessment undertaken in 2012 does not cover the entirety of the GyM interlink area outside the array area and ECC (Figure 2). As such, it cannot be guaranteed that all features of archaeological potential have been identified within the GyM interlink area. Additionally, no palaeolandscapes assessment was undertaken during the 2012 GyM assessment. As such, a palaeolandscape assessment of the GyM interlink area outside the array area and ECC is not possible.

4 MARINE ARCHAEOLOGICAL ASSESSMENT: PALAEOGEOGRAPHY

4.1 Geological baseline and archaeological potential

- 4.1.1 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 within the Irish Sea area and the wider region. This serves as a baseline for the palaeogeographic assessment, and aids in producing a stratigraphy for the study area, assigning archaeological potential to identified units, and informing future sampling strategies.
- 4.1.2 The study area is located between Anglesey and Liverpool Bay, offshore North Wales, in the Welsh Platform area of the Irish Sea. The basement geology of this area of the Irish Sea comprises sandstones and mudstones dating from the Permian through to the Triassic, with some potential Carboniferous deposits in the nearshore, all which are extensively folded and faulted. (Jackson *et al.* 1995, Mellett *et al.* 2015).
- 4.1.3 The upper surface of the bedrock represents a significant unconformity, and the bedrock units are directly overlain by Quaternary sediments within the study area (Jackson *et al.* 1995, Mellett *et al.* 2015). The Quaternary history of the Irish Sea, as with most of the UK, is complex and has been dominated by recent glacial/interglacial cycles, which have been recorded within the regional geology.

Pre-Anglian to Ipswichian (>478 ka – 115 ka; >Marine Isotope Stage (MIS) 12 – 5e)

- 4.1.4 As a shallow shelf area at a relatively high latitude, the eastern Irish Sea has experienced at least three glacial advances and retreats since the Anglian period. These advances and retreats are recorded as repeated phases of major incisions, lodgement/ablation tills, and associated interglacial deposits identified at different levels within the Irish Sea stratigraphy (Jackson *et al.* 1995, Mellett *et al.* 2015).
- 4.1.5 The periodic formation and ablation of ice sheets affected local (and global) relative sea levels, fluctuations in which likely resulted in the eastern Irish Sea being periodically sub-aerially exposed. Although the region was directly covered by ice during multiple glacial

advances, periods of time may have existed between marine regression and glacial advance (and *vice versa*) where the landscape was free of both water and ice.

- 4.1.6 From an archaeological perspective, evidence for human occupation in excess of 700,000 years has previously been recorded at sites around the UK, particularly in the East Anglia region (Parfitt *et al.* 2005, Parfitt *et al.* 2010). Periods of sub-aerial exposure of the shallow shelf areas around the UK will have permitted the movement of Pleistocene animals, and may have facilitated occupation and exploitation of this landscape by early hominins. Direct evidence of hominin occupation of the shallow shelf areas of the UK has previously been identified off the coast of Suffolk, when numerous lithic artefacts dating from the Early Middle Palaeolithic (c. 350 ka – 180 ka BP) were recovered from the seabed during aggregate dredging (Wessex Archaeology 2011d, Tizzard *et al.* 2014).
- 4.1.7 The presence of Palaeolithic cave sites along the North Wales coast indicate that similar occupation of the Irish Sea during times of low relative sea level may have been possible. In particular, early Neanderthal remains discovered in Pontnewydd Cave near St Asaph, Denbighshire, dating from c. 225 ka before present (BP), indicate hominin presence in the area during the Early Middle Palaeolithic, prior to the late glacial maximum (LGM) (Lynch *et al.* 2000, Flemming 2005). However, the area will have been uninhabitable during the heights of the Anglian and Saalian glaciations and so will have been abandoned during these periods. As such, any habitation in the area was potentially sporadic and punctuated by extended periods of absence.
- 4.1.8 Due to the highly erosive effect glaciations have upon the underlying landscape, subsequent glaciations tend to remove most evidence of the preceding pre-glacial/interglacial landscapes. Similarly, any archaeological material deposited offshore during earlier ice-free periods is likely to have been removed by subsequent glaciations, with the exception of some coastal cave sites (Flemming 2005).

Devensian to LGM (c. 115 ka – 18 ka; MIS 5d -2)

- 4.1.9 The Devensian glacial advance was the last, although not the most extensive, glacial advance experienced by the UK, during which the Irish Sea was again likely to have been entirely covered by ice. Relict terrestrial features still visible on the seabed, such as drumlins, moraines, eskers, and periglacial patterned ground, are all evidence of the advance and retreat of the Devensian ice sheet and its effect on the underlying landscape (Jackson *et al.* 1995, Van Landeghem *et al.* 2009, Van Landeghem and Chiverrell 2011, Mellett. *et al.* 2015).
- 4.1.10 Archaeologically, it is known that Wales was occupied at least during the earlier Devensian, with Neanderthal finds dating from 50 ka BP identified from Coygan Cave near Tenby, and modern human remains dating from 26 ka BP discovered in Paviland Cave on the Gower Peninsular, both in South Wales (Lynch *et al.* 2000, Flemming 2005).
- 4.1.11 Within the Irish Sea, palaeoenvironmental analysis of borehole samples acquired for the Walney OWF recovered pollen sequences relating to the Upper Palaeolithic (ca. 34 ka BP), suggesting isolated pockets of material from the earlier, pre-glacial advance of the Devensian period may have survived further offshore (Wessex Archaeology 2010a). However, as with the previous glacial advances, the area would again have been uninhabitable and abandoned by the Last Glacial Maximum.

Post-LGM and early Holocene (18,000 – 6,000 BP; MIS 2-1)

- 4.1.12 The history of the Irish Sea since the LGM is unclear, and the relative sea level curve for the region is complicated due to complex interactions between global sea level rise and

isostatic readjustment (Flemming 2005, Shennan *et al.* 2011). The long standing view suggests that, as climate conditions warmed and the ice front retreated northwards, relative sea level values remained low throughout the whole Irish Sea, exposing the area as a terrestrial environment for a significant period of time (Jackson *et al.* 1995, Coles 1998). This was followed by a gradual inundation, with approximate modern day sea levels reached by around 5,000 BP (Figure 5).

- 4.1.13 This is also supported by work undertaken as part of the West Coast Palaeolandscapes Survey (WCPS), where potential Holocene features such as coastlines, fluvial channels (e.g. the offshore extension of the river Mersey across Liverpool Bay) and deltaic features were identified and mapped from geophysical data sets (Fitch *et al.* 2011). Potential Holocene terrestrial features were also identified during the assessments of the Irish Sea Round 3 Zone and Rhiannon OWF (Wessex Archaeology 2011d, 2014).
- 4.1.14 However, more recent studies undertaken in the area suggest a marine termination of the retreating ice sheet with no, or a very limited, period of sub-aerial exposure between LGM and marine transgression (Van Landeghem *et al.* 2009, Van Landeghem and Chiverrell 2011, Mellett. *et al.* 2015). This is based in part due to the presence of interpreted iceberg plough marks cut into the now submerged relict glacial landforms on the seabed of the Irish Sea, suggesting direct iceberg calving into water from the foot of the retreating ice sheet (Van Landeghem *et al.* 2009, Van Landeghem and Chiverrell 2011).
- 4.1.15 Flemming (2005, p. 16-17) proposes a third model for glacial retreat – one with an extensive proglacial lake which initially partially covered the present day Irish Sea area, before retreating northwards with the ice front to expose a terrestrial landscape, followed by final inundation sometime after 7,000 BP. This model would explain iceberg calving into a large lake, whilst still providing a terrestrial environment within which features such as those identified by Fitch *et al.* (2011) could develop.
- 4.1.16 The correct model of glacial retreat has significant consequences for the post-LGM archaeological potential of the Irish Sea; a fully inundated landscape has low potential for the deposition of artefacts, and vice versa. However, the discovery of Late Upper Palaeolithic material dating from around 10 ka BP in Kendrick's Cave on the Great Orme Peninsular (Flemming 2005, Lynch *et al.* 2000), just south of the study area, indicates that, were the Irish Sea a terrestrial environment post-LGM, then it is likely that human communities had a presence within the landscape.
- 4.1.17 Assuming a terrestrial followed by transgression model, gradual sea level rise would have probably placed much of the Irish Sea either on the coastline or just offshore by the Mesolithic period (c. 10 ka – 6 ka BP) (Shennan and Horton 2002). Past identification of submerged peat deposits and drowned forests around the Welsh coastline and the edges of the Irish Sea suggests coastlines in the area were stable for periods of time during marine transgression (Steers 1948, Flemming 2005, Wessex Archaeology 2009). Such peat deposits are known to be present in the intertidal area of the AyM ECC, and have been identified during surveys associated with the current assessment (Fugro 2021c).
- 4.1.18 The Mesolithic record of the British Isles suggests a strong relationship between human activity and coasts, wetlands, rivers and streams, and evidence of human occupation of the river Mersey, which drains into the eastern Irish Sea, has previously been discovered (Cowell and Innes 1994). These areas provide rich sources of food and resources for these hunter/gatherer groups, as well as important transport routes inland or between islands. Any surviving sedimentary deposits from this period could potentially contain both *in-situ*

and derived artefacts from a time when these coastal and littoral landscapes, now submerged by the sea, were utilised intensively by human populations.

- 4.1.19 There is evidence of early prehistoric activity within Route Section D, with areas of Mesolithic activity identified within the landscape being situated near to the River Clwyd near Rhuddlan. The river would have provided the natural resources which would have made this landscape attractive for early prehistoric populations. During this period this area would have been 10 km inland of the former Mesolithic coastline. As a result of rising sea levels, an estuary formed at the mouth of the Clwyd between Abergele and Rhyl. Finds from the Rhuddlan area include worked flint, hazelnut shells and other charred plant remains some of which came from small pits (Volume 3, Chapter 8: Onshore Archaeology and Cult Heritage).
- 4.1.20 In addition to these submerged coastal landscapes, the Mesolithic archaeological record potentially contains examples of coastal or sea going craft made from dugout logs or hide covered wooden frames as well as worked flint and chert artefacts.
- 4.1.21 By the end of the Mesolithic, the Irish Sea would have been completely submerged, with coastlines approximately close to their present day positions, and archaeological evidence from the Neolithic onwards will be of an increasingly maritime nature. However, continued use of the intertidal zone surrounding the Irish Sea has been found in the form of preserved human footprints on the foreshore at Formby Point, Merseyside, dating from the Neolithic/Bronze Age (Roberts *et al.* 1996). Further offshore, any artefacts from this period not related to maritime activity are likely to be derived and re-deposited after introduction to the area by fluvial processes or coastal erosion.
- 4.1.22 The onshore cable connection for Burbo Bank Offshore Wind Farm Extension, which at landfall is located approximately 50 m to the east of the proposed AyM onshore ECC, found Bronze Age remains in the northernmost part of the route near the shore at Rhyl which comprised mainly boundary ditches and scatters or groups of pits and postholes. It was suggested that domestic structures could be in the vicinity. The gullies were identified as being agricultural in nature and may be an indication of former Bronze Age field boundaries. Many of the pits contained evidence of burning and therefore could be associated with domestic activity. The Bronze Age activity extended across a 2 km section of the Burbo Bank Offshore Wind Farm Extension cable route suggesting that the activity extended over a large area just in from the present shoreline (Oxford Archaeology 2006) and therefore could extend to the AyM study area.
- 4.1.23 Post the Holocene marine transgression, the archaeological potential of the study area shifts to the maritime history of the UK, which is presented in Section 5.

4.2 Palaeolandscapes assessment

Introduction

- 4.2.1 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 3, and illustrated in Figures 6 – 11.
- 4.2.2 During assessment of the SBP data, the identified geology within the study area was divided into 6 separate units, as described below:

Table 5 Interpreted shallow stratigraphy of the study area

Unit	Unit name	Geophysical Characteristics ⁽¹⁾	Interpreted Sediment Type ⁽²⁾	Archaeological Potential
6	Holocene Seabed Sediments – Post-transgression (Holocene, MIS 1)	Observed as either a veneer or deposit of mobile sediment a few metres thick. Contains cross bedded reflectors in areas sand waves.	Sand and gravelly sand with shell fragments.	Considered of low potential in itself, but possibly contains reworked artefacts and can cover wreck sites and other cultural heritage.
5	Holocene Sediments – Pre-transgression (Early Holocene, MIS 2 – 1)	Generally identified as channel features with either chaotic or layered fills Also includes internal high amplitude reflectors.	Possible fluvial/terrestrial sediments, including potential layers of organic clay.	Potential to contain <i>in situ</i> and derived archaeological material, and palaeoenvironmental material.
4	Channel Complex Deposits (Late Devensian/Early Holocene, MIS 2 – 1)	Extensive layer of cross-cutting channel features. Well defined basal reflectors with acoustically transparent fills.	Potential delta-top or braid-plain, comprising sandy channels and possible associated fine grained deposits.	Potential depends on the age of the deposit – may be too glacial proximal for human habitation, but if later may contain both <i>in situ</i> and derived artefacts.
3	Western Irish Sea Formation – Prograded facies (Late Devensian, MIS 2 – 1)	Variable geophysical characteristics, ranging from chaotic to internal dipping reflectors. Generally a strong basal reflector.	Potential delta front deposit comprising muddy sands.	Likely a glacial proximal deposit, and so low potential for <i>in situ</i> archaeological material, but may contain derived material depending on age.
2	Western Irish Sea Formation – Chaotic facies (Late Devensian, MIS 2 – 1)	Homogenous, acoustically transparent unit.	Potentially glaciomarine /glaciolacustrine sands and gravels.	Likely a glacial proximal deposit, and so low potential for archaeological material.
1	Cardigan Bay Formation – Upper Till (Devensian, MIS 5d – 2)	Thick unit identified across most of the study area. Irregular upper reflector, basal reflector not identified. Generally characterised as acoustically chaotic.	Stiff to hard glacial till.	Unlikely to contain archaeological material.
⁽¹⁾ Based on geophysical data				
⁽²⁾ Based on geophysical characteristics, Jackson <i>et al.</i> (1995), and Mellett <i>et al.</i> (2015)				

4.2.3 The potential sediment types described in Table 5 are based on previous research in the wider region (e.g. Jackson *et al.*) and the geophysical characteristics of the units. No ground truthing data (e.g. core logs) has been acquired from within the study area at this time, and such sampling would be required in order to confirm (or otherwise) the sedimentary interpretation provided in this report.



- 4.2.4 Unit 1 was identified across most of the study area, and represents the oldest unit visible within the SBP data. This is the Upper Till member of the Cardigan Bay Formation; an extensive deposit of hard, overconsolidated glacial tills deposited during the Devensian glaciation. The unit is characterised by an irregular upper reflector, suggesting an eroded surface, and a relatively homogenous, acoustically chaotic appearance within the SBP data.
- 4.2.5 As a glacial deposit, Unit 1 will have been laid down during a period of human absence in the area, when the Irish Sea was covered by ice sheets. As such, unit 1 is not considered to be of archaeological potential. However, its upper surface, particularly close to the coast, may have provided a land surface post-LGM upon which archaeological material could be deposited.
- 4.2.6 Units 2 and 3 are interpreted as recording the melting and retreat of the Devensian ice sheet immediately post-LGM. Both are thicker with better developed internal features offshore and thin towards the coast, where they potentially pinch out before landfall (although the SBP data does not cover the intertidal area).
- 4.2.7 Unit 2 is a homogenous, acoustically transparent unit, present across much (although not all) of the study area, directly overlying Unit 1. The unit is particularly thick in areas where the top of Unit 1 is relatively deep and can be absent where it is shallow, suggesting the deposition of Unit 2 was topographically controlled.
- 4.2.8 This is interpreted as a glaciomarine or glaciolacustrine deposit, potentially sands and gravels, laid down immediately post-LGM as the Devensian ice sheet retreated north across the Irish Sea. Due to the interpreted glacial proximal (and aquatic) depositional environment of Unit 2, the surrounding landscape is likely to have been uninhabitable at the time of deposition, and so Unit 2 is not considered to be of archaeological potential.
- 4.2.9 Unit 3 has also been identified across most of the study area, directly overlying Unit 2 where it is present, and Unit 1 where Unit 2 is absent. This unit is acoustically highly variable, ranging from relatively chaotic to containing numerous internal features and dipping reflectors. The base of Unit 3 is similarly variable, and can be characterised by a strong, sub-horizontal reflector, suggesting a significant erosion surface and/or deposits with an increased organic content, or by a poorly defined reflector difficult to distinguish from the underlying Unit 2. The reflector separating units 2 and 3 is particularly distinct in the region around Unit 4 (described below) and towards the coastline.
- 4.2.10 Unit 3 has been interpreted as a possible delta front deposit, and potentially comprises muddy sands. This suggests a gradual filling and/or draining of the body of water responsible for the deposition of Unit 2, and an introduction of more fluvial-derived sediments into the area. The mud fraction of Unit 3 potentially increases as the unit thins towards the coast, inferred from a gradual transition from chaotic and dipping acoustic characteristics to more sub-horizontal internal reflectors.
- 4.2.11 Unit 3 is still interpreted as a water-lain deposit, and so the potential for *in situ* archaeological artefacts is considered to be low. However, since the unit is interpreted to have been deposited in an increasingly glacial distal environment, there is the potential for Unit 3 to contain derived archaeological material delivered to the area via fluvial systems and redeposited in a secondary context.
- 4.2.12 These lower three units are present across most of the study area, and are of relatively low archaeological potential. However, the distribution and potential of the overlying units varies between the Array area and the ECC. As such, these shall now be discussed by area.

Array area and Infrastructure zone

- 4.2.13 The distribution of palaeogeographic features of archaeological potential identified within the Array area and Infrastructure zone is illustrated in Figure 6, and the individual features described in Appendix 3.
- 4.2.14 Unit 4 has been identified restricted to the north and north-west of the Array area and Infrastructure zone. This unit is mainly represented by features **71000 – 71005**, and is characterised by a complex array of small, cross-cutting channel features with relatively well defined basal reflectors and acoustically transparent fills (Fig. 7). These individual channel features cannot be traced between survey lines with any degree of confidence, and so the unit has been classified as a Channel Complex Deposit.
- 4.2.15 The channel features are cut into the underlying Unit 3, and individual channels generally only cut as far down as the Unit 2/Unit 3 boundary reflector, which is relatively prominent in this part of the study area, suggesting it may be a significant erosion surface/hard ground in this area (Fig. 7). Overall, Unit 4 is thicker and better developed in the west (**71000**) where the upper glacial till (Unit 1) reflector is deeper, and becomes more fragmented before disappearing entirely in the east (**71003 – 71005**) where the upper till reflector is shallow. This suggests that, as with Unit 2, the deposition of Unit 4 is topographically constrained.
- 4.2.16 Unit 4 also contains a number of areas of acoustically more structured deposits, which are present between the individual channel features (Fig. 8). These have been classified as areas of possible fine grained deposits, and can variably be cut by or overlay the channel features, suggesting they are an integral part of the Unit 4. These features (**71006 – 71013**) may represent overbank sediments associated with the individual channels. However, sampling would be required to confirm this.
- 4.2.17 Unit 4 itself is interpreted as a delta top or braid plain deposit, created in a terrestrial environment following the filling and/or draining of the body of water within which Unit 2 and Unit 3 were deposited. As a terrestrial deposit it is possibly of high archaeological potential, as it would have the potential to contain both *in situ* and derived archaeological artefacts and palaeoenvironmental material. However, the age of the unit is currently unclear, and it may be that it was deposited in an environment still too cold/glacial proximal for human habitation. As such, it is currently classified as possible archaeological potential; further work would be needed to determine the age and therefore the potential of the unit.
- 4.2.18 Within the Array area and Infrastructure zone, Unit 5 is represented by a number of sporadically distributed features with no clear association or alignments (Fig. 6). These features (**71013 – 71029**) are all interpreted as cut and fills, and are cut into Unit 1, Unit 2, or Unit 3. They are generally characterised by relatively poorly defined basal reflectors, and comprise either a single or multiple phases of chaotic or layered fills.
- 4.2.19 These potentially represent the remains of partially eroded fluvial channels created during the period of sub-aerial exposure of the study area between the LGM and the Holocene marine transgression; as such, Unit 5 is classified as pre-transgression Holocene sediments. However, the features identified within the Array area and Infrastructure zone are relatively poorly defined compared with those identified along the ECC (described below), and may also represent internal features within Unit 1 or Unit 3. As such, they are classified as of possible archaeological potential.

Offshore ECC

- 4.2.20 The distribution of palaeogeographic features of archaeological potential identified within the ECC is illustrated in Figure 9, and the individual features described in Appendix 3.

- 4.2.21 As with the Area array and Infrastructure zone, Units 1 to 3 have all been identified within the ECC. Unit 4 is restricted to the north and north-west section of the Array area and Infrastructure zone, and is not present within the ECC.
- 4.2.22 Unit 5 is represented within the ECC by larger, more significant features than those visible within the Array area and Infrastructure zone. Three distinct channel features, **71031**, **71033**, and **71040**, cut across the width of the ECC, approximately in a NNE-SSW orientation, at the section of the ECC just to the west of Rhyl Flats OWF (Fig. 9).
- 4.2.23 Of these features, **71033** is the largest and most distinct. This channel is characterised by a relatively distinct basal reflector, and at least two (probably more) phases of fill. The edges of the channel are often very steep, abruptly truncating the reflectors of underlying units, and the basal reflector often extends to beyond the limits of penetration of the SBP. This suggests the feature may have originally been created through glacial process, but infilled with later sediment.
- 4.2.24 The earliest phase of fill is generally acoustically unstructured, although does contain faint parallel reflectors in some places. It also contains two areas of high amplitude reflectors towards the upper layers of the fill (**71034**, plus one outside the study area) (Fig. 10). This high amplitude reflector is sub-horizontal and relatively irregular, and is interpreted to represent an internal erosion surface or possible deposit with an increased organic content (e.g. an organic clay). However, based on its acoustic character, it does not appear to be a fully organic deposit, such as a buried peat.
- 4.2.25 The second phase of fill within **71033** is represented by a number of separate cut and fills which are characterised by poorly defined basal reflectors and steeply dipping internal reflectors (**71035** - **71039**) (Fig. 11). This second phase potentially represents later reactivation of the channel as a fluvial feature following initial complete infilling with sediment.
- 4.2.26 The two other channel features, **71031** and **71040**, are smaller and shallower than **71033**, and are generally characterised by a well-defined basal reflector and single phase of layered fill (although the south-west section of **71040** has two fills, separated by a distinct internal reflector).
- 4.2.27 These channel features are all interpreted as potentially part of the same fluvial system, created in a terrestrial environment between the LGM and Holocene marine transgression. As such, they are considered of high archaeological potential, and could contain both *in situ* and derived archaeological artefacts and preserved palaeoenvironmental material. The river system would have provided the natural resources which would have made this landscape attractive for early prehistoric populations and channels provide a focus for passing through the landscape and accessing raw materials and prey species. The site in Route Section D is indicative of the type of Mesolithic archaeology that may be present associated with the channel system with Late Upper Palaeolithic archaeology also a possibility. Establishing the age of these deposits and the timing of inundation of the array area and the shoreward transgression over the ECR would refine this interpretation.
- 4.2.28 A small number of other, smaller cut and fill features (see Appendix 3 for full list) are also present within the ECC, and are also attributed to Unit 5. As with similar features identified within the Array area and Infrastructure zone, these are smaller, less certain features, and could either represent pre-transgression Holocene deposits or be internal features of the underlying units. As such, these are classified as of possible archaeological potential as discussed above.

- 4.2.29 It is known that peat deposits have been identified in the intertidal area of the ECC during surveys associated with this proposed development (Fugro 2021c). However, the SBP data coverage does not extend as far towards the coast as the intertidal zone, and no definite indications of such deposits extending further offshore have been identified.
- 4.2.30 Unit 6, the Holocene seabed sediment, is present across both the Array area and Infrastructure zone and the ECC. It ranges from a thin veneer over the underlying Quaternary deposits (mainly in the ECC) to relatively thick areas of mega-ripples and sand waves (mainly in the Array area).
- 4.2.31 As post-transgression (modern) sedimentary deposit, Unit 6 is not considered of archaeological potential in itself, but it has the potential to bury archaeological sites (e.g. shipwrecks) in areas where the sediment is sufficiently thick and mobile.
- 4.2.32 Additionally, it is known that the composition of the seabed sediment within the Irish Sea partially includes reworked underlying sediments, particularly from Unit 3 (Jackson *et al.* 2005). As such, the potential remains for chance isolated finds in a secondary context to be present within Unit 6.

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

5.1 Introduction

- 5.1.1 The following assessment of the maritime and aviation marine archaeological baseline resource is based on records of known shipwrecks, aircraft crash sites and obstructions.

5.2 Designated Maritime and Aviation Sites

- 5.2.1 *Resurgam* (2012) is a protected wreck located in the wider buffer of the site. *Resurgam* is a British submersible that was launched in 1879, designed by the Reverend George Garrett and built by Cochran & company, Birkenhead with 2-cylinder compound engine, single shaft. The vessel left Birkenhead for Portsmouth 10 December 1879 and lost a propeller outside Rhyl. The submersible was fitted with a new propeller and sailed from Rhyl 25 February 1880 under tow from escort yacht Elphin who developed engine trouble in a severe gale. The 3-man crew aboard *Resurgam* went to assist and the tow line snapped, sinking the submersible. Several searches for the vessel were unsuccessful until 1996 when diver Keith Hurley was asked to remove snagged fishing nets from a seabed obstruction. The vessel was recorded as still having some of original wood cladding in place, the hatch missing, and conning tower dented. The vessel was designated as a historic wreck in 1997 and a restricted radius of 300 m put in place. In 1999, the wreck was moved during night of 9 June 1999 some 140 m south south west from its charted position and relocated by police divers. In 2019, the wreck was lying in a general depth of 9 m, upright on the seabed and measured 12.2 m long and 2.5 m wide (<https://www.coflein.gov.uk/en/site/405760/details/resurgam> accessed December 2020).

- 5.2.2 There are no designated aviation sites within the study area.

5.3 Known Maritime Sites

- 5.3.1 A search of records in the UKHO, RCAHMW and HER datasets revealed 29 sites (Appendix 4) (Figure 3). The search area for known maritime sites was wider than that of the geophysical assessment as it consisted of the initial study area with four cable routes as well as a 2 km buffer. Sites that were visible in the geophysical survey data are discussed

further in Section 5.5 below with a description of what can currently be identified on the seabed.

- 5.3.2 *Glory* (2005) is a wooden sailing vessel which was carrying roofing slates from Bangor to Liverpool under the command of J Garner. The vessel sank off Little Ormes Head in early October 1821, but the crew and passengers were saved. This wreck, believed to be the *Glory*, lies with its keel orientated 000/180 degrees. The remains of the hull are pinned under the cargo of cut roofing slates. The site extends for some 20 m x 8 m and the mound has a height 2 m above the seabed. There is a debris trail extending some 35 m to the south. The wreck is located in the wider buffer of the study area.
- 5.3.3 *Ocean Monarch* (2008) was a wooden sailing vessel built in 1843 by Donald McKay, USA that sank on 25 August 1848 while on passage from Liverpool to Boston with a general cargo and passengers. The vessel sank at anchor following a fire, reported to have been started by one of the passengers with a loss of 178 lives. A 1993 survey recorded very little of wooden hull remains with evidence of copper sheathing and the cargo concreted although many stacks of broken plates were visible. The wreck was worked on to salvage the cargo by Joseph McCormack of Liverpool in 1987 (https://www.joc.com/maritime-news/ship-sank-1848-begins-yield-its-treasure_19870225.html accessed December 2020). The wreck is located in the wider buffer of the study area.
- 5.3.4 The Pensarn wreck (2010) is the partially submerged remains of a wooden vessel. A preliminary survey of the site was conducted by CPAT during evening low tide on 1 August 2019. The lower elements of the stern, port and starboard futtocks and possible bowsprit are visible (CPAT 2019). The vessel has been tentatively identified as the *Endeavour*, a wooden sloop lost in 1854. The wreck is located in the wider buffer of the study area.
- 5.3.5 *Chacabuco* (Possibly) (70293) is an iron-hulled full-rigged ship built by Gourlay Brothers & Co, Dundee, in 1869. The vessel had a length of 62 m and 10.3 m in breadth with 1 bulkhead and 2 decks. The vessel sank 15 miles from Ormes Head following a collision with SS *Torch* in 1873 (Michael 2008). SS *Torch* is also thought to have sunk 6 miles from this wreck. The vessel was dived in 1989 and was found to be a lot of collapsed steel wreckage including a fair amount of sail rigging, partially buried in a sand wave. in a general depth of 37 m, with the wreck standing upright with bows west. The wreck was examined in 2020 in a general depth of 27 m and was recorded as being broken up and degraded. The wreck is known to have been dived along with SS *Torch* (Holden 2008). The wreck is located within the array area.
- 5.3.6 *Vine* (Possibly) (2028) was a wooden sailing vessel built in 1788 in Norwich. The vessel was on passage from Dinorwig to Liverpool in 1877 when it sprang a leak in a south-west force 9 wind while carrying 105 tons of roofing slates and sank. The wreck was dived in September 2000 and was confirmed as a sailing vessel with cut slated while the wooden hull protrudes from beneath the cargo. The vessel was recorded as lying 180 degrees with a length of 20 m, a width of 8 m, and a height of 2 m by divers' estimation. While archaeological investigations have been carried out on several wrecks and there is information on recorded losses to a certain degree, an assessment of the overall maritime archaeology of the industry appears to be lacking (Wessex Archaeology 2009a) therefore slate carrying wrecks could be of more significant archaeological value. The wreck is located in the wider buffer of the study area.
- 5.3.7 *Nydia* (Probably) (2007) is a British sailing vessel built in 1853 by P Vailin, Quebeck and owned at time of loss by J P Evans, Liverpool. The vessel was on a passage from Liverpool for Tiree and sank following a collision with British SS *Albanian* in clear weather on 18

November 1877. The vessel was dived in 1991 and was reported as the remains of a fairly large sailing vessel with a copper sheathed hull and the bow facing north-west. The vessel is upright and intact except where damaged by trawls. In 1992, the wreck was thought to be confirmed as *Nydia* from the construction details. The wreck is located in the wider buffer of the study area.

- 5.3.8 SS *Albanian* (70326) is a British steam ship built in 1870 by T Royden & Sons, Liverpool. The vessel was on a passage from Liverpool for Genoa & Leghorn and sank following a collision with British sailing vessel *Nydia* in clear weather on 18 November 1877. SS *Albanian* maintained course with *Nydia* close to the wind and was struck by *Nydia* port side, aft of the bridge. Third officer Penny was held to be wholly responsible for the collision through holding course. The vessel was confirmed to be SS *Albanian* in 1992 and was reported to be in three pieces following a salvage by the *Petrel* of the pipework in 1993. In 2014, the forward part of the vessel had collapsed, the midships were upright, the stern was broken, and lies to the starboard. The wreck has a dive trail with a map highlighting the most interesting section of the wreck to visit as well as some background information about the vessel and the sinking and the cargo it carried (https://divernet.com/wp-content/uploads/2018/01/wrecktour_179_albania.pdf accessed December 2020). The wreck is located within the array area.
- 5.3.9 *Dublin* (70019) is a British steam ship built in Dublin by Walpole and Webb in 1866 with a 350 hp engine. The vessel left the river Mersey on 26 October 1888, bound from Garston for Dublin with general cargo and passengers and was struck amidships by the paddle steamer *Longford* and sank almost immediately. The crew and passengers made their escape in the boats. In 1989, a bell inscribed '*Dublin*' was recovered from the wreck which stands upright, about 7 m high, and with a trawl net over its stern. In 1992, the central hub of the helm was recovered from the wreck inscribed '*Dublin* 1866' and a steering pedestal with 'Dublin 1866' stamped on it in 1994. The wreck was examined in 2020 in a general depth of 28 m and was recorded as having a length of 55.9 m, a width of 8.9 m and a height of 10.14 m. The wreck has previously been dived by the Flintshire Sub-Aqua club (<https://www.flintsac.co.uk/coastal%20dive%20site.htm> accessed December 2020). The wreck is located within the 500 m buffer of the array area.
- 5.3.10 *Penrhos* (Probably) (2009) is a British steam ship built in 1904 by W J Yarwood, Northwich at the Stanley (yard number 31). The vessel was sold on in 1939 to the Straits SS Co Ltd, Liverpool, and renamed '*Penrhos*'. The vessel sailed from Penmaenmawr, North Wales, to Liverpool on 1 January 1942 when it struck a mine and sank with a loss of four crew. In 1989, a bell was recovered from the wreck inscribed 'Island Queen' although it has not been possible to substantiate the claim that the bell came from this wreck. In 1993, it was said the wreck was upright and complete with wheelhouse near the stern and has a single iron propeller entangled with netting. The wreck was examined in 2020 in a general depth of 12 m and was recorded as being upright and intact with a length of 31.7 m, a width of 6.9 m and a height of 3.15 m. The wreck is still known to be dived by Merseyside Sub Aqua Club - Branch 5 and Chorley British Sub Aqua Club (BSAC) (<https://www.chorleybsac.org.uk/forum/viewtopic.php?f=4&t=2022> accessed December 2020). The wreck is located in the wider buffer of the study area.
- 5.3.11 *Penstone* (2011) was a steam ship built in 1926 by Manchester dry dock Co. and sank on 31 July 1948 following collision with Norwegian MV *Villanger* while on passage from Penmaenmawr to Preston. A survey in 1984 positively identified the wreck from photographs and plans lying in a general depth of 32 m. A survey in 2013 observed a general depth of 29.4 m and the wreck was recorded as being upright, intact and with bow facing east-north-east. The wreck has previously been dived by the Flintshire Sub-Aqua

club (<https://www.flintsac.co.uk/coastal%20dive%20site.htm> accessed December 2020). The wreck is located in the wider buffer of the study area.

- 5.3.12 *Calcium* (Possibly) (2001) is a British steam ship mined and sank 2 December 1940. A wreck thought to be *Calcium* was confirmed to be in this position in 1991 although the wreck was not located during a survey in 1997, 1999 or 2000 and amended to 'Dead' by the UKHO. The wreck has previously been dived by the Flintshire Sub-Aqua club (<https://www.flintsac.co.uk/coastal%20dive%20site.htm> accessed December 2020). The wreck is located in the wider buffer of the study area. *Strathrye* (2014) is a British trawler built of wood with one boiler, triple expansion engine and single shaft. The vessel was on a return passage from Fleetwood after fishing and was mined on 12 January 1941. The vessel was recorded as being 37.3 m in length and with a beam of 8.2 m in 1988 and a large hole was observed in the port side consistent with having struck a mine. The vessel was dived in 1997 in a general depth of 37 m, with the wreck standing upright with bows west. The wreck is located in the wider buffer of the study area.
- 5.3.13 *Rhos Anna* (2013) is a fishing vessel that sank 13 July 1992 and marked by unlit conical buoy. The wreck was recorded as being 11 m long and in 3.3 m of water. The wreck was removed on 25 August 1992 and the buoy discontinued. The vessel was later refitted and is used for Angling trips. The wreck is located in the wider buffer of the study area.
- 5.3.14 *Horizon* (Possibly) (2006) is a British fishing vessel that sank 16 November 1996 with a crew of two saved. In 2020, the wreck was recorded as being in a general depth of 20 m with a length of 11.6 m and a width of 5.7 m and a height of 1.32 m. It is thought that the wreck is intact and buried in a sand wave. The wreck is located in the wider buffer of the study area.
- 5.3.15 The possible wreck of *Susie Mo II* (2015) located in April 2019 and recorded as having similarities with a missing fishing vessel, located in a general depth of 6 m with a length of 7 m and a width of 3.7 m. The vessel is possibly that of a fishing vessel harboured in Conwy harbour that never returned from a fishing trip in 2015 (<https://www.dailypost.co.uk/news/north-wales-news/missing-conwy-boast-susie-mo-9665753> accessed December 2020). The wreck is located in the wider buffer of the study area.
- 5.3.16 An unknown wreck (2016) recorded as a dangerous wreck in a general depth of 12 m. The confirmation of a wreck was made in July 2020 with a length of approximately 20 m and a width of 4 m. The vessel was recorded as a small unknown wreck with some planks running across the sea bed overlain with bricks and tiles (possibly ballast, or cargo), with the highest point being a collection of half a dozen stacked metal tubes which may be pipes and likely cargo. The wreck is located in the wider buffer of the study area.
- 5.3.17 An unknown wreck (2017) recorded as a non-dangerous wreck with a length of 4.5 m in a general depth of 3 m. The wreck was seen from aerial photography in 1989 and appeared to be the stern end of a sailing yacht, with 5 m visible with the stern breaking the surface at time of photography. The wreck is located in the wider buffer of the study area.
- 5.3.18 A possible wreck (2018) located in February 2019 and recorded as a degraded wreck on the seabed with some structures which could be propellers or an engine. In September 2019, the wreck was recorded as being in a general depth of 3 m with a length of 17.3 m, a width of 5.7 m and a height of 0.6 m. The date and circumstance of loss is unknown. The wreck is located in the wider buffer of the study area.

- 5.3.19 A possible wreck (2019) located in February 2019 and recorded as a degraded wreck or wreck shaped pile on the seabed. In September 2019, the wreck was recorded as being in a general depth of 2 m with a length of 11.2 m, a width of 4.2 m and a height of 0.7 m. The date and circumstance of loss is unknown. The wreck is located in the wider buffer of the study area.
- 5.3.20 A possible wreck (2020) located in February 2019 and recorded as a degraded wreck or wreck shaped pile on seabed. In September 2019, the wreck was recorded as being in a general depth of 3 m with a length of 11 m, a width of 4.2 m and a height of 0.7 m. The date and circumstance of loss is unknown. The wreck is located within the East A cable route.
- 5.3.21 An unknown wreck (70042) located in January 2020 and recorded as a dangerous wreck. The wreck was recorded as being upright and intact in a general depth of 17 m during an examination in August 2020. The wreck was measured as having a length of 12.71 m, a width of 7.5 m and a height of 3.9 m. The date and circumstance of loss is unknown. The wreck is located within the array area.
- 5.3.22 An unknown wreck (2022) located in January 2020 and recorded as a non-dangerous wreck. The wreck was recorded as being a possible degraded wreck in a general depth of 35 m during an examination in August 2020. The wreck was measured as having a length of 12 m, a width of 31.1 m and a height of 2.5 m. The date and circumstance of loss is unknown. The wreck is located in the wider buffer of the study area.
- 5.3.23 An unknown wreck (2023) located in August 2020 and recorded as a dangerous wreck. The wreck was recorded in a general depth of 12 m while the wreck was measured as having a length of 6.8 m, a width of 3.4 m and a height of 0.67 m. The date and circumstance of loss is unknown. The wreck is located in the wider buffer of the study area.
- 5.3.24 An unknown wreck (2024) located in August 2020 and recorded as a dangerous wreck. The wreck was recorded in a general depth of 14 m while the wreck was measured as having a length of 13.4 m, a width of 2.8 m and a height of 0.45 m. The date and circumstance of loss is unknown. The wreck is located in the wider buffer of the study area.
- 5.3.25 An unknown wreck (2025) located in August 2020 and recorded as a dangerous wreck. The wreck was recorded in a general depth of 17 m while the wreck was measured as having a length of 12.71 m, a width of 6.54 m and a height of 1.68 m. The date and circumstance of loss is unknown. The wreck is located in the wider buffer of the study area.
- 5.3.26 An unknown wreck (70180) located in August 2020 and recorded in a general depth of 29 m while the wreck was measured as having a length of 3 m, a width of 3 m and a height of 1.8 m. The date and circumstance of loss is unknown. The wreck is located within the array area.
- 5.3.27 An unknown wreck (70252) recorded in 1939 as being 8.5 m off Great Ormes Head and recorded in a general depth of 15 m. The date and circumstance of loss is unknown. The wreck is located within the array area.

Value

- 5.3.28 The present assessment of the value of known and potential archaeology within the study areas is based on data from the UKHO, NRHE and HER and the archaeological assessment of geophysical survey data. This assessment is based on the criteria for assessing archaeological value, as set out in table 1, and based on available guidance (Cadw 2020; Wessex Archaeology 2011a, b, c).



- 5.3.29 Each wreck should be assessed on a case-by-case basis, in order to take into account the full range of criteria for assessing value (such as period, rarity, documentation, group value, survival/ condition, potential, build, use, loss, and investigation), however, it is also possible to provide a broad assessment of the sites, based on date categories defined by the Marine Class Description and principles of selection (Wessex Archaeology, 2008e).
- 5.3.30 Of the wrecks that have been identified and named, the oldest wreck is the *Glory* (2005), which sank in 1821. No information was found on the date the vessel was built. Most of the other known wrecks were built between this date and 1904 (including; 70326, 70293, 70019, 2007, 2008, 2009, 2010, 2012 and 70252). 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. It is likely that most of these vessels are considered to be of medium value with the exception of *Resurgam* (2012) which is considered to be high in value as it is already a protected wreck due to being an example of an early submersible.
- 5.3.31 *Glory* (2005) and *Vine* (Possibly) (2028) could also be considered to have a higher value as they were both carrying roofing slates from north Wales to Liverpool. The extraction of slate can be seen as a consistent exploitation of an available resource throughout Wales' entire historic period. It preserved communities and sustained their populations while many rural areas throughout the rest of the UK were being abandoned in favour of cities (Wessex Archaeology 2009a). Due to these wrecks representing an important part of Wales' heritage, it is believed they have a high value.
- 5.3.32 There are three wrecks related to the period of the two World Wars. Individual examples could be considered of increased value, based on individual histories, associations and particularly if either build or loss is attributable to military action. Three vessels *Penrhos* (Probably) (2009), *Calcium* (Possibly) (2001) and *Strathrye* (2014) were all mined and sank in 1942, 1940 and 1941 respectively during the Second World War whilst on passage. None of the vessels were lost during the First World War. In general, it is likely that these vessels would be of medium value however, they could be considered to have increased group value, due to their association with international events. The loss of life on board *Penrhos* (Probably) (2009) could raise it to being of higher value.
- 5.3.33 Wrecks dating post-1945 (such as 2006, 2011, 2013, and 2015) are less likely to be of archaeological interest, and the wrecks of this date in the study area are thought to be of low archaeological value.
- 5.3.34 For the wrecks and possible wrecks that have not been named and that are of unknown date, their value is presently unknown, but should be considered as high until proven otherwise.
- 5.3.35 The sites that are dived (70326, 2001, 70293, 70019, 2007, 2009, 2011, 2012, 2014, 70252) are seen as having a higher value and setting, especially those who have dive trails (70326 and 70293) as they are local value to the community and have a recreational value.
- 5.3.36 Additionally, the value of any wrecks discovered during pre-construction or construction activities for AyM OWF would also be unknown and would need to be evaluated on a case-by-case basis.



5.4 Known Aviation Sites

5.4.1 The fuselage of an Avro Anson Bomber aircraft (2004) was located in 1993 near Rhyl Buoy (Figure 4). The engines were thought to have already been removed. The date and circumstance of loss is unknown. A survey in 2000 did not locate any more aircraft wreckage and the record was amended to 'dead'. The findspot is located within the cable route.

Receiver of wreck

5.4.2 The Receiver of wreck was contacted in order to conduct a search within the four corners of the buffer. They found nothing on the co-ordinates alone, however they searched by geographical features in the area and found one droit which may be within the co-ordinates provided. One aeroplane propeller - single blade and the remains of a flight level instrument (droit number A/3970) was reported on 30 March 2001 alongside the North Rhyl Buoy. It is assumed that the propeller was recovered and therefore constitutes a findspot, rather than a site, but may indicate further wreckage in the area.

Value

5.4.3 As it is currently unknown whether the remains of a whole aircraft are in the area, it is unknown whether the aircraft crashed while in military service, and therefore is automatically protected under the *Protection of Military Remains Act 1986*, however, given the aircraft type this should be assumed to be the case. It is known that Rhyl was used by the military during the Second World War, therefore, based on the criteria used to establish value in table 1, it is assumed this site could be of high value.

5.4.4 Any further aircraft material discovered would have to be assessed on a case-by-case basis, but it should be treated as of very high value until proven otherwise.

5.5 Seabed features assessment

Introduction

5.5.1 The geophysical data were assessed to identify features of archaeological potential relating to maritime and aviation activity. The results of this assessment are collated in gazetteer format detailed in Appendix 5, and illustrated in Figures 12a – 16 and Sheets 1 to 5.

5.5.2 For ease of discussion, the results are presented by area; Array area (including buffer), other wind farm infrastructure zone (including buffer), ECC, and GyM Interlink area. Some of the areas do overlap (e.g. the GyM Interlink zone overlaps the offshore end of the ECC); in these cases, the anomalies within these overlap areas are repeated within each appropriate gazetteer (and associated provided shapefiles), but each anomaly is only discussed in detail once in the report, as necessary. This ensures the results of each study area can be viewed in isolation if required.

5.5.3 In the gazetteers (Appendix 5), all geophysical anomalies identified within the 2020 data set are assigned a 70xxx series ID number. Any anomalies previously identified within the 2012 GyM assessment retain their original 7xxx series ID number.

5.5.4 A total of 626 features have been identified as being of possible archaeological potential across all four study areas, and are discriminated as shown in Table 6. As some of these anomalies are present in more than one study area, the sum of anomalies across the site may appear greater than the true total.

Table 6 Anomalies of archaeological potential within the study area

	Quantity	Interpretation
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Archaeological discrimination	Array area	Other wind farm infrastructure zone	ECC	GyM Interlink zone	
A1	20	1	4	0	Anthropogenic origin of archaeological interest
A2	445	30	127	20	Uncertain origin of possible archaeological interest
A3	1	0	1	0	Historic record of possible archaeological interest with no corresponding geophysical anomaly
Total	466	31	132	20	

5.5.5 Furthermore, these anomalies can be classified by probable type, which can further aid in assigning archaeological potential and importance (Table 7).

Table 7 Types of anomaly identified

Anomaly classification	Definition	Number of anomalies			
		Array area	Other wind farm infrastructure zone	ECC	GyM Interlink zone
Wreck	Areas of coherent structure including wrecks of ships, submarines and some aircraft (where coherent structure survives)	5	0	0	0
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	11	2	1	0
Debris	Distinct objects on the seabed, generally exhibiting height or with evidence of structure, that are potentially anthropogenic in origin	17	0	23	6
Seabed disturbance	An area of disturbance without individual, distinct objects. Potentially indicates wreck debris or other anthropogenic features buried just below the seabed.	6	0	3	1
Rope/chain	Curvilinear dark reflectors, often with a small amount of height, indicating rope or chain (if ferrous)	11	0	19	4



Anomaly classification	Definition	Number of anomalies			
		Array area	Other wind farm infrastructure zone	ECC	GyM Interlink zone
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	2	1	1	0
Dark reflector	Individual objects or areas of high reflectivity, displaying some anthropogenic characteristics. Precise nature is uncertain	46	10	51	6
Mound	A mounded feature with height not considered to be natural. Mounds may form over wreck sites or other debris.	7	0	3	0
Depression	An area of disturbed seabed with depth. Potentially indicates scour around a buried feature or where a feature has been cleared.	0	1	0	0
Magnetic	No associated seabed surface expression, and have the potential to represent possible buried ferrous debris or buried wreck sites	360	17	30	3
Recorded Wreck	Position of a recorded wreck at which previous surveys have identified definite seabed anomalies, but for which no associated feature has been identified within the current data set.	1	0	0	0
Recorded obstruction	Position of a recorded obstruction (e.g. foul ground, fisherman's fastener recorded by the UKHO), but for which no associated feature has been identified within the current data set	0	0	1	0
Total	-	466	31	132	20

Array area

- 5.5.6 A total of 466 anomalies of archaeological potential have been identified within the Array area, the distribution of which is illustrated in Figures 12a and 12b.
- 5.5.7 Five wrecks have been identified within the Array area; wrecks **70019** and **70326**, which also have associated debris, and **70042**, **70180** and **70293**, which have no visible associated debris.
- 5.5.8 Wreck **70019** corresponds with the UKHO record 7693, and is illustrated in Sheet 1. In the SSS data this is visible as the clear outline of an upright, intact wreck measuring 58.3 x 13.2 x 5.5 m and orientated approximately north-east to south-west. A very large, clear shadow

is visible, which is roughly in two parts and has a very tall, narrow section which may represent a standing mast. Some complex internal features are visible. In the MBES dataset this is seen as a large intact wreck with visible internal structure, oriented approximately north-east to south-west. There is a slight depression on the western edge and some sediment build up visible on the southern edge. There is a very large (2015 nT) associated magnetic anomaly, suggesting at least partial ferrous construction.

- 5.5.9 This wreck is recorded in the UKHO database as the wreck of the *Dublin*, a steamship built in Dublin by Walpole and Webb in 1866. The wreck was lost in October 1866 on transit between Garston and Dublin after a collision with the paddle steamer *Longford*. The UKHO record indicates the wreck is fairly intact but badly corroded, which correlates with the current geophysical results. The wreck is situated within an area of mobile seabed sediment, and so is potentially buried periodically.
- 5.5.10 Wreck **70019** is surrounded by a number of debris fields (**70018** and **70021**,) and debris items (**70016** and **70023**), all of which have been assigned an A1 archaeological potential rating. The two debris fields are both visible on the SSS data as complex areas of anomalies, with **70018** measuring 37.0 x 5.3 x 0.1 m and **70021** measuring 36.9 x 13.5 m. The items of debris are both dark reflectors without associated shadows; **70016** measures 4.5 x 2.5 m and **70023** measures 3.5 x 2.0 m. No definite associated magnetic anomalies are present, but proximity to the wreck **70019** would likely obscure any possible small anomalies.
- 5.5.11 Wreck **70042** corresponds with the UKHO record 93229, and is illustrated in Sheet 2. In the SSS dataset this is visible as a small wreck orientated east-west, appearing upright and intact and measuring 29.0 x 8.6 x 3.7 m. An irregular shadow is present, higher at the eastern end, although the shadow extent may be partly due to sedimentary features. The hull outline is clear, and a central rectangular depression seen, but no other internal features are visible. No visible debris spread is noted around the vessel. Shallow scour is seen in the MBES data at the eastern point. No associated magnetic anomaly is present, but as the wreck is located between two Mag. survey lines, any ferrous material present may not have been detected.
- 5.5.12 This wreck is listed by the UKHO as an unknown wreck, first identified by Clinton Marine during a Civil Hydrography Programme survey in 2020. As such, no additional details or survey history are available.
- 5.5.13 Anomaly **70180** is currently charted as an obstruction by the UKHO (94513), but here is interpreted as a potential wreck (Sheet 3). In the SSS dataset this is visible as an irregular seabed disturbance measuring 21.8 x 10.4 x 3.2 m, containing a square dark reflector with a large, straight shadow at the south-western end, which may be an intact boiler. No other recognisable intact vessel structure is visible. In the MBES dataset, the main section of the potential wreck appears as a low, elongate mound, trending north-east to south-west. The potential boiler is visible at the south-western end of the main section as a distinct, taller mound with multiple peaks. If the anomaly is a wreck, it appears severely degraded and/or mostly buried. This is associated with a very large magnetic anomaly of 2225 nT, indicating significant amount of ferrous material. The location of the potential wreck within an area of mobile seabed sediment suggests it is periodically buried.
- 5.5.14 Anomaly **70180** is recorded by the UKHO as an obstruction, first identified by Clinton Marine during a Civil Hydrography Programme survey in 2020. As such, no additional details or survey history are available.

- 5.5.15 Wreck **70293** corresponds with the UKHO record 7620, and is illustrated in Sheet 4. In the SSS data this is visible as an area of irregular incoherent dark reflectors with shadow measuring 70.3 x 37.1 x 2.2 m. The wreck is highly degraded and potentially partially buried in mobile seabed sediment, although a series of parallel dark reflectors with shadows identified at the east end could indicate intact vessel frame. No visible debris spread is noted around the vessel. In the MBES data this is seen as a large area of angular elongate objects ranging from 3.5 m to 28.5 m in length, orientated north-west to south-east. A very large magnetic anomaly (1616 nT) indicates the presence of significant amounts of ferrous material.
- 5.5.16 This is recorded in the UKHO database as possibly the wreck of the sailing vessel *Chacabuco* which is reported to have sank following a collision with the *SS Torch*. It is reported as being a highly broken-up sailing vessel, partially buried in a sand wave, and with a significant amount of collapsed steel wreckage, which correlates with the geophysical anomalies observed during this assessment. Its location within an area of mobile seabed sediment suggests it is likely to be buried periodically.
- 5.5.17 Wreck **70326** corresponds with the UKHO record 8124, and is illustrated in Sheet 5. In the SSS dataset this is visible as a distinct wreck with some elements relatively intact and recognisable as vessel structure. The wreck has dimensions of approximately 88.7 x 27.4 x 3.8 m, and is surrounded by a number of small debris fields and individual pieces of debris (described below). The wreck appears to be in two sections, with the central area between appearing very distorted, possibly degraded, and/or partially buried. The exposed northern section is extant and well defined, with a series of regular elongate dark reflectors indicating some coherent internal structure. The southern end of the vessel appears less distinct and may indicate a higher level of degradation in this area; however, some possible internal structure can still be seen. In the MBES dataset the vessel is visible as oriented approximately north to south. There is some sedimentation at the southern end, however the exposed northern section is proud of the seabed and relatively intact. There is scour visible predominantly at intervals along the eastern side, with the largest at the northern end extending approximately 160 m to the east with a depth of up to 6.0 m. There is a very large associated magnetic anomaly (4727 nT), suggesting significant ferrous content.
- 5.5.18 This corresponds with the UKHO record for the wreck of the *SS Albanian*, a steamship built in 1870 by T Royden & Sons of Liverpool. It was lost in 1877 after being struck by a wooden barque. The record indicates the wreck was already well broken up during initial surveys, and has degraded further as a result of salvaging efforts. This correlates with the degraded state of the central area of the wreck, and the surrounding debris fields, as visible in the geophysical data.
- 5.5.19 Wreck **70326** has six possible related debris fields (**70327**, **70328**, **70330**, **70331**, **70332** and **70333**), two possible related items of debris (**70329** and **70336**), and one possible related length of rope or chain (**70334**). These have all been assigned an A1 archaeological potential rating due to their interpretation as possible wreck debris. The debris fields are all areas containing dark reflectors which cast shadows, and range in size between 67.7 x 9.1 x 0.2 m (**70332**) and 7.8 x 3.7 x 0.6 m (**70331**). The items of debris are both dark reflectors which cast small shadows; **70329** measures 4.8 x 0.3 x 0.1 m, while **70336** measures 3.1 x 0.7 x 0.2 m. Anomaly **70334** appears in the SSS data as a distinct linear bright reflector, measuring 29.7 x 0.4 x 0.1 m, running parallel to wreck **70326**. A possible object may be present at the southern end, but this is unclear. No associated magnetic anomalies are present, but proximity to the wreck **70326** would likely obscure any possible anomalies.

- 5.5.20 One additional debris field in the Array area (**70416**), has been assigned an A1 archaeological potential rating, although it is not directly related to a wreck. This was newly identified in the current phase of assessment, and is visible in the SSS data as several distinct dark reflectors which appear to form an angular outline that tapers in at one end, measuring 14.0 x 10.0 x 0.6 m (Figure 13). No associated magnetic anomaly is present however, the anomaly is located between Mag. survey lines and any ferrous material present may not have been detected. This is potentially an area of debris of unknown origin, but could be the partially buried remains of a structure such as a wreck.
- 5.5.21 One item of debris in the Array area (**70415**), also not directly related to a wreck, has been classified as being of an A1 archaeological potential rating. Newly identified in the current phase of assessment, anomaly **70415** is located 4.0 m from the A1 debris field **70416**, and has also been classified as A1 due to its potential association. This was identified in the SSS data as a dark reflector measuring 2.2 x 1.3 x 0.4 m. No associated magnetic anomaly is present, but the anomaly is located between Mag. survey lines and any ferrous material present may not have been detected.
- 5.5.22 Of the remaining 446 anomalies, 445 have been ascribed an archaeological potential rating of A2. As the anomalies are currently unidentified, but considered as of possible archaeological interest, it is not possible to assess their value at this time.
- 5.5.23 Of these, two anomalies have been classed as debris fields. Anomaly **70036** is visible in the SSS data as an area of dark reflectors measuring 53.9 x 5.3 x 0.3 m with an associated small magnetic anomaly of 19 nT, and so is potentially ferrous debris. Anomaly **70094** is seen in the SSS data as a small area of dark reflectors measuring 12.6 x 6.1 x 0.3 m, including an elongate dark reflector, and has no associated magnetic anomaly, suggesting non-ferrous debris.
- 5.5.24 A total of 12 anomalies have been classified as items of debris and ascribed an A2 archaeological potential rating. The anomalies are primarily mounds, with some dark reflectors present and one instance of what may be a coiled rope (**70366**). These range in size between 15.0 x 0.9 x 0.1 m (**70218**) and 1.1 x 0.3 x 0.1 m (**70282**). Two anomalies (**70049** and **70055**) have small associated magnetic anomalies, suggesting they are at least partially ferrous.
- 5.5.25 In total, six seabed disturbances have been identified within the Array area. These are varied in shape, measuring between 45.9 x 7.1 x 0.1 m (**70062**) and 2.2 x 1.1 x 0.3 m (**70449**), and all except one have height (**70223**). No associated magnetic anomalies are present, suggesting these features are either natural seabed features or represent non-ferrous debris buried just below the seabed.
- 5.5.26 Of the anomalies within the Array area, ten have been classified as possible lengths of rope or chain. These measure between 262.0 x 0.6 x 0.1 m (**70011**) and 9.9 x 0.7 x 0.1 m (**70106**). Of these, only one (**70031**) has an associated magnetic anomaly, measuring 201 nT in amplitude, suggesting the feature is either potentially a length of chain rather than rope or is attached to a ferrous object (e.g. an anchor).
- 5.5.27 Two bright reflectors are present in the Array area, one elongate (**70374**) measuring 2.8 x 0.7m and one 'C' shaped (**70380**) measuring 2.1 x 1.2 m, neither of which have associated shadows. These anomalies potentially represent pieces of debris that absorb rather than reflect acoustic waves, such as waterlogged wood or synthetic material, or seabed scars.

- 5.5.28 A total of 46 dark reflectors were noted in the Array area. Of these, two have associated magnetic anomalies: **70398** has an amplitude of 53 nT and **70411** an amplitude of 34 nT. These features are likely to have a ferrous component. Other identified dark reflectors were present in the areas between magnetometer survey lines, and therefore the possibility of some of the other dark reflectors containing ferrous material remains. The dark reflectors ranged in size between 0.7 x 0.1 x 0.2 m (**70335**) and 27.5 x 1.0 m (**70398**) and 42 of the 46 anomalies had height. Dark reflectors could either be individual pieces of debris or natural features; ground truthing would be needed to further determine their archaeological potential.
- 5.5.29 In total, seven anomalies have been classified as mounds. These vary in size between 1.4 x 1.1 x 0.4 m (**70005**) and 3.0 x 2.4 x 0.2 m (**70074**). The mounds are of uncertain origin, and could represent debris covered by seabed sediment or be natural features. As no magnetic anomalies were associated with any of the mounds, any debris present is likely to be non-ferrous, or the anomalies in question were located between Mag. survey lines.
- 5.5.30 A total of 360 magnetic anomalies have been noted in the Array area, all of which are without associated SSS or MBES anomalies. These range from 5 nT (**70155, 70201, 70217, 70260, 70312, 70317, 70360** and **70471**) to 274 nT (**70386**). These indicate potential ferrous debris that is either buried or without surface expression.
- 5.5.31 One existing record within the Array area has been ascribed an archaeological potential rating of A3. This is UKHO record 7671, a recorded wreck location for which no remains were visible in the geophysical data. This position is for an unidentified wreck first observed in 1939. It has not been located by subsequent surveys, and was marked for deletion from the record in 1988. The position is within area of numerous Mag. anomalies, but no definite associated geophysical anomaly has been noted. Any wreck at this location is likely well dispersed and/or buried; additionally, the record may be inaccurately positioned and the wreck may be located elsewhere.

Other wind farm infrastructure zone

- 5.5.32 A total of 31 anomalies of archaeological potential have been identified within the other wind farm infrastructure zone, the distribution of which is illustrated in Figure 12a.
- 5.5.33 One feature in the other wind farm infrastructure zone has been ascribed an A1 archaeological potential rating; debris field **70480**. This is a dispersed area of dark reflectors measuring 37.3 x 15.4 x 0.6 m with an associated medium magnetic anomaly of 57 nT (Figure 13). This may represent partially ferrous debris of currently unknown origin, or could be a dispersed and partially buried wreck site.
- 5.5.34 No definite wreck sites or recorded wrecks or obstructions have been identified within this zone.
- 5.5.35 The remaining 30 anomalies in the other wind farm infrastructure zone have been ascribed an archaeological potential rating of A2.
- 5.5.36 Of these, one feature (**70489**) has been classified as a debris field. This is an area of irregular dark reflectors measuring 10.9 x 5.2 x 0.4 m. No associated magnetic anomaly is present, indicating the feature likely comprises non-ferrous material.
- 5.5.37 One anomaly has been classified as a bright reflector (**70494**). This is elongate in shape, measuring 2.2 x 0.7 m and has no visible shadow. Bright reflectors potentially represent pieces of debris that absorb rather than reflect acoustic waves, such as waterlogged wood

or synthetic material, or seabed scars. No magnetic anomaly is associated with **70494**, indicating the feature is likely non-ferrous.

- 5.5.38 In total, ten anomalies classified as dark reflectors are present within the other wind farm infrastructure zone. The anomalies vary in size from 4.1 x 1.7 x 0.5 m (**70447**) to 1.2 x 0.9 x 0.2 m (**70483**), and all have visible height. As no associated magnetic anomalies are present, the dark reflectors are likely to be non-ferrous, or the anomalies in question were located between Mag. survey lines. These anomalies are of uncertain origin, and could be individual pieces of debris or natural features.
- 5.5.39 One depression has been noted in the other wind farm infrastructure zone, **70484**, measuring 2.7 x 1.5 x 0.2 m. This has been interpreted as a possible area of scour associated with a dark reflector (**70483**). No magnetic anomaly is associated, and so the feature is likely to be non-ferrous.
- 5.5.40 In total 17 magnetic anomalies have been identified within the other wind farm infrastructure zone, all of which are without associated SSS or MBES anomalies. These vary in amplitude from 6 nT (**70478** and **70493**) to 113 nT (**70342**) and indicate potential ferrous debris that is either buried or without surface expression.

Offshore ECC

- 5.5.41 A total of 132 anomalies of archaeological potential have been identified within the ECC, the distribution of which is illustrated in Figures 14a and 14b.
- 5.5.42 One debris field (**70511**) has been assigned an A1 archaeological potential rating in the ECC. This is an elongate area of dark and bright reflectors with well-defined boundaries and some potential structure (Figure 15). This measures 12.4 x 5.0 x 0.5 m and has a small associated magnetic anomaly of 24 nT, indicating at least partial ferrous composition. The anomaly may be partially ferrous debris of currently unknown origin, or may represent a badly degraded and partially buried structure such as a wreck.
- 5.5.43 Two anomalies classified as items of debris have been assigned an A1 archaeological potential rating. Anomaly **70510** represents two parallel elongate dark reflectors measuring 10.4 x 1.1 x 0.2 m, while **70512** is an elongate dark reflector measuring 2.5 x 0.9 x 0.1 m (Figure 15). Neither piece of interpreted debris has an associated magnetic anomaly, indicating that the debris is likely to be non-ferrous. Both **70510** and **70512** are located in the vicinity of **70511** (14 m north-west and 35 m east, respectively), and have been assigned an A1 archaeological potential rating due to their likely association.
- 5.5.44 One mound (**7070**) in the ECC has been ascribed an A1 archaeological potential rating. This is a distinct and discrete elongate mound with an irregular surface, which was identified during the Gwyny y Môr assessment (Wessex Archaeology 2012) as well as within the 2020 datasets (Figure 15). The feature measures 14.5 x 11.8 x 1.2 m and has a medium associated magnetic anomaly of 66 nT, suggesting ferrous material. The magnetic anomaly was not identified during the previous assessment, potentially due to its location between Mag. survey lines.
- 5.5.45 The appearance of this anomaly has remained consistent between two surveys a decade apart, suggesting it is a relatively stable, long-lived feature on the seabed. It is a unique feature within the wider study area, and so is unlikely to be natural. This anomaly potentially represents a mound or debris, potentially a ballast mound from a shipwreck, the surrounding remains of which have decayed away. However, this can only be confirmed by visual inspection.



- 5.5.46 No definite wreck sites were identified in the ECC.
- 5.5.47 Of the remaining 128 anomalies within the ECC, 127 have been ascribed an archaeological potential rating of A2. As these sites are currently unidentified, it is not possible to assess their value.
- 5.5.48 In total 21 anomalies have been classified as items of debris. These have all been identified from the SSS data and are dark reflectors which range between 12.8 x 5.6 x 0.1 m (**70590**) and 1.0 x 1.0 x 0.3 m (**70620**) in size. Eight of these pieces of debris (70520 – 70527) are closely spaced along the same alignment, and potentially represent intermittent exposures of the same partially buried feature. Three of the identified pieces of debris have associated magnetic anomalies; **70613** a large magnetic amplitude of 111 nT, **70502** a small amplitude of 17 nT, and **70621** a small amplitude of 13 nT, indicating the presence of varying degrees of ferrous material. The debris items without associated magnetic anomalies may be non-ferrous in nature, or located between the Mag. survey lines.
- 5.5.49 A total of three anomalies classified as seabed disturbances have been noted in the ECC area. Of these, two were identified on the SSS data as areas of small dark reflectors, measuring 18.7 x 5.2 m (**70573**) and 17.1 x 15.2 x 0.2 m (**70346**). The other was identified in the MBES data and measures 2.2 x 1.1 x 0.3 (**70449**). No associated magnetic anomalies are present, indicating the features may comprise non-ferrous material, or be located between the Mag. survey lines. These may represent collections of partially buried, non-ferrous debris; however, they may also be natural in origin.
- 5.5.50 A further 19 of the A2 anomalies have been classified as ropes or chains. These range in dimensions between 210.0 x 2.6 x 0.4 m (**70546**) and 7.4 x 0.2 x 0.1 m (**70503**). Of the 19 anomalies, 18 do not have an associated magnetic amplitude, indicating that the features are either likely to be non-ferrous, or were located between the Mag. survey lines. One of the anomalies (**70610**) has a small associated magnetic anomaly of 15 nT; in the SSS data this was visible as a linear dark reflector with a wider central section, interpreted as a possible chain or rope with attached ferrous object, such as an anchor.
- 5.5.51 One anomaly has been classified as a bright reflector. The feature **70534** was noted in the SSS data as a long and narrow curvilinear anomaly measuring 131.9 x 0.9 m, with a possibly related dark reflector (**70535**) at the eastern end. This is interpreted as a possible length of rope or chain, or a seabed scar. No magnetic anomaly is associated, indicating the feature is non-ferrous.
- 5.5.52 A total of 51 dark reflectors were identified in the ECC. These anomalies range in size between 7.3 x 1.2 m (**70598**) and 0.5 x 0.1 m (**70540**). Five anomalies do not have visible height, while anomaly **70559** is the tallest at 1.1 m. Only one anomaly has a small associated magnetic amplitude, **70411** at 34 nT, indicating the presence of some ferrous material. The other 50 anomalies are likely to be non-ferrous in composition, or located between Mag. survey lines. These anomalies are of uncertain origin, and could be individual pieces of debris or natural features.
- 5.5.53 Two anomalies were classified as mounds, both of which were visible in the MBES data only. Anomaly **70562** measures 2.7 x 2.5 x 0.6 m, and anomaly **70550** measures 1.8 x 1.6 x 0.4 m. Neither has an associated magnetic anomaly, indicating any debris present is likely to be non-ferrous. Both mounds are of uncertain origin, and may represent debris covered by seabed sediment, or be natural features.

- 5.5.54 A total of 30 magnetic anomalies were noted in the ECC, all of which are without associated SSS or MBES anomalies. These range from 9 nT (**70599**) to 220 nT (**70608**) in amplitude and indicate potential ferrous debris that is either buried or without surface expression. Additionally, one very large magnetic anomaly (7209 nT, **70603**) was also identified. This anomaly has been retained as a precaution, but may be the result of external factors occurring during data collection, e.g. another vessel passing close to the magnetometer.
- 5.5.55 One existing record within the ECC, **70593**, has been ascribed an archaeological potential rating of A3. This is UKHO record 8270, a recorded obstruction for which no anomalies were visible in the geophysical data. This is currently recorded as an area of foul ground, which was previously reported as the wreck of an Avro Anson Bomber. The UKHO report states the engines were removed, indicating other elements of the wreck should remain on the seabed. A survey undertaken in 2000 failed to detect the wreck, and it was amended to dead. No anomalies have been identified at this location using the 2020 geophysical data. The UKHO record indicates this is located "near N Rhyl buoy", but the nearest marker buoy is over 2 km away from the chartered position, so the position may be inaccurate.

GyM Interlink area

- 5.5.56 A total of 20 anomalies of archaeological potential have been identified within the GyM Interlink area, the distribution of which is illustrated in Figure 16.
- 5.5.57 No wreck material or recorded wrecks or obstructions were identified in the GyM Interlink area, and all 20 anomalies have been ascribed an archaeological potential rating of A2.
- 5.5.58 A total of six anomalies were classified as debris. All were identified in the SSS data; four from the results of the GyM assessment (**7079**, **7080**, **7090** and **7106**) (Wessex Archaeology 2012), and two from the 2020 dataset (**70347** and **70508**). These range in size between 17.5 x 12.5 m (**7106**) and 3.7 x 3.2 x 1.2 m (**7079**). None of the possible items of debris have associated magnetic anomalies, indicating they are likely non-ferrous in nature.
- 5.5.59 One seabed disturbance (**70346**) has been identified in the GyM Interlink area. This is an elongate area of small dark reflectors measuring 15.4 x 13.5 x 0.1 m, identified in the 2020 dataset. As no associated magnetic anomaly is present, the feature is likely composed of non-ferrous material. The feature may represent a collection of partially buried, non-ferrous debris, but may also be natural in origin.
- 5.5.60 In total, four anomalies have been classified as rope or chain features. These are all dark reflectors measuring between 12.5 x 0.6 x 0.2 m (**70505**) and 7.4 x 0.2 x 0.1 m (**70503**), and all are located along the same alignment, suggesting they are exposed sections of the same partially buried feature. None are associated with magnetic anomalies, indicating the features are likely non-ferrous in composition.
- 5.5.61 Of the remaining anomalies, six are classified as dark reflectors. These range in size between 5.2 x 0.8 x 0.3 m (**70411**) and 1.3 x 1.2 x 0.1 m (**70348**). In total, five of the dark reflectors had no associated magnetic anomalies and are therefore likely to be non-ferrous; although some features may have been present in the areas between Mag. survey lines. One anomaly (**70411**) has a small associated magnetic anomaly of 34 nT, indicating the presence of ferrous material. Dark reflectors could either be individual pieces of debris or natural features; ground truthing would be needed to further determine their archaeological potential.
- 5.5.62 The remaining three anomalies in the GyM Interlink area have been classified as magnetic, all are without associated SSS or MBES anomalies. Two are newly identified in the 2020

dataset (**70217** and **70270**), and one was identified from the 2010 data (**7100**). The anomalies are between 68 nT (**70270**) and 5 nT (**70217**) in amplitude. These indicate potential ferrous debris that is either buried or without surface expression.

- 5.5.63 As previously noted, the Interink area is only partially covered by a combination of current and previous archaeological assessments of geophysical data. The potential remains for anomalies of archaeological potential to be present in the areas not covered by previous geophysical assessment as illustrated in Figure 2.

5.6 Maritime and Aviation potential

- 5.6.1 It is possible that many of the features assigned A2 archaeological discrimination discussed above could relate to maritime and aviation features. In addition, there remains potential for buried features not yet identified.

5.7 Maritime archaeological potential

- 5.7.1 Many vessels were lost without a record being made, and sometimes even the records that were created have since been lost (Cant 2013). Examining the recorded losses discussed above provides an indication to the potential for further discoveries, as do the factors discussed below.
- 5.7.2 The exploitation of the marine environment is thought to have begun in the Mesolithic, at the earliest time of inundation of the coast, when people would have started to use boats to access the available resources and maintain links with other communities. It is thought that during the Mesolithic period major transgressions inundated the low-lying area between Rhyl and Prestatyn, but that areas of elevated boulder clay remained above sea level and were occupied as the most seaward habitable land. This may account for the distribution of shell beds and Mesolithic finds reported around Rhyl (Davidson 2002). An antler mattock was also discovered in Rhyl dated to 6560 +/- 80 BP (OxA-1009) (Bonsall and Smith 1990).
- 5.7.3 Maritime traffic was being undertaken during the Neolithic, with the importation of domesticated animals and other goods from the Continent. The remains of an ancient submerged forest in Rhyl and Abergele (<http://www.dyfedarchaeology.org.uk/lostlandscapes/submergedforests.html> accessed December 2020) is a reminder of a landscape that was once utilised by human and animals that has the potential to yield archaeological remains.
- 5.7.4 There has been relatively little direct study of aspects of maritime and coastal activity from the later prehistoric periods in Wales. Studies of long-distance trade and exchange of cultures traditionally focus on stone and flint tools and their geological provenance, rather than maritime networks. Evidence for seafaring is usually inferred from the identification of Mesolithic sites on islands, which must have required some form of craft to complete the sea crossing. Skinboats may have been used, but logboats are certainly known from mainland Europe during this period. As some of the intertidal finds recorded within the study area date to the prehistoric period, it may represent an area where seafaring was taking place.
- 5.7.5 Continuing into the Bronze and Iron Ages, there is a long period which is marked only by a few significant maritime/coastal artefact and boat finds, whilst dramatic changes in society, technology and economy are well attested in terrestrial monuments and material culture. An assemblage of over 70 artefacts mostly of Neolithic and Bronze Age date were recovered from the peat shelf at Rhyl and include polished stone axes (Manley 1989). Finds from peat deposits, such as the two bronze axes and a bronze dagger from the peat shelf

off Llandudno, Conwy, and a bronze spearhead and a bronze axe found on the peat shelf at Rhyl, Denbighshire, are more likely to be an indication of Bronze Age exploitation of coastal environments which were later inundated (Manley 1989). The mines within the Great Orme in Llandudno are thought to be the earliest metal workings in the UK and are nationally important Bronze Age copper workings (National Resources Wales 2015b).

- 5.7.6 The Roman occupation of Britain was by necessity accomplished by ‘maritime’ means, with the *classis Britannica* operating both for exploration and like a state haulage company in the first centuries of occupation. Apart from the Barland’s Farm boat, no other vessels from the Roman period have been discovered in Wales, even though an inscribed stone found to the west of Chester apparently confirms the age old navigation dangers of the Dee estuary - ‘OPTONIS AD SPEM ORDINUS C LVCILI INGENVI QVI NAVFRAGIO PERIT S E’ or ‘Optio in the century of Lucilius Inegneus, awaiting promotion to centurion, who died in a shipwreck, is buried’ (Wynne-Jones, 2001, 9). The results of recent geophysical survey work and excavation at Caerlon have reinforced the importance of the Roman port supporting the Roman legion and its network. The Dee Estuary is just to the east of the study area with the South Hoyle Channel and Inner Passage provided the approaches to Roman port of Chester. Nearby, a small, stone built rectangular, apsidal-ended building located in Llwydyaen in the Conwy valley close to the study area has produced a C14 date securely within the middle Roman period for an internal partition thought to be a temple. A Roman era industrial site was also discovered near Flint and surveyed by Cadw and the Clwyd Powys Archaeological Trust (<https://www.walesonline.co.uk/news/local-news/praise-builders-roman-finds-unearthed-2506416> accessed December 2020).
- 5.7.7 The Great Orme, Llandudno was named by the Vikings who passed it on their seafaring voyages as the Scandinavian word “örmr” means snake (RCAHMW 2019, 94) in reference to the headland protruding out of the water like a monster. In 1165, Henry II hired a Viking squadron from Dublin to raid the coasts of Gwynedd after recognising Wales’s vulnerability to naval blockade (RCAHMW 2019, 101). Therefore, it is possible for the remains of ships dating to the Viking period being in the vicinity.
- 5.7.8 Into the early medieval period, there is much more evidence for coastal settlement where maritime communities shared cultural contact around the Irish Sea basin, and into the Western Approaches with contact with continental Europe. From the 6th-7th century onwards, it has been suggested that proto-harbours began to emerge from sheltered beaches along with specialist seafaring traders – often associated with princely strongholds such as Dinas Powys, Hen Gastell, Deganwy (which is very close to the study area) and Tenby (Rees et al 2017).
- 5.7.9 The recently published volume ‘Maritime Wales in the Middle Ages: 1039- 1542’ (Gruffydd 2016) highlights that the maritime medieval archaeological record is sparse – including only the twelfth century logboat of Llyn Padarn, the thirteenth century clinker-built vessel carrying iron ore from Magor Pill, and the fifteenth century Newport Ship. The 12th Century Conwy Castle (World Heritage Sites) is close to the study area. In the early thirteenth century, the medieval port of Llan-faes at the northern entrance of the Menai Strait conducted significant trade in ale, wine, wool, and hides, and maintained a herring fishery, before its Welsh population was moved by Edward I to Newborough on the other side of the island (as a result of the construction of the new castle at Beaumaris). Many other settlements such as Chepstow and Newport sought and received borough charter status during this period, with enterprising merchants alert to the benefits of access to water transportation.
- 5.7.10 Post-medieval and modern wrecks, as they were generally made of more substantial material, are more likely to have been discovered through surveys undertaken by the UKHO

and others, and thus recorded in the archaeological record. However, there is still potential for discovery of previously unrecorded wreck sites, particularly of wooden wrecks, broken up wrecks or partially buried wrecks that are more difficult to detect through geophysical survey.

- 5.7.11 The range of seafaring and seascape related research topics expands exponentially from the medieval period into the modern day. Much of the presently available research is related to the expansion in trade in various Welsh commodities such as copper, coal, slate and other stone trades, and associated port developments. The Welsh slate industry, while having a mainly 19th and 20th century focus, has a history which stretches back as far as the Roman period at least. The extraction of slate can be seen as a consistent exploitation of an available resource throughout Wales' entire historic period. The impacts of the industry highlight its importance to the cultural heritage of Wales. It changed the landscape of North Wales, resulting in its development and a marked change in its demographics in the 19th century. It preserved communities in that area sustaining their populations while many rural areas throughout the rest of the UK were being abandoned in favour of cities (Wessex Archaeology 2009a).
- 5.7.12 The two World Wars provide two historical periods when the sea lanes became theatres of war. The relationships between defence of the sea lanes and Welsh airfields provides another potential research area.
- 5.7.13 There is also potential for 20th century aircraft, particularly in relation to the Second World War. Aircraft crash sites are also difficult to identify through archaeological assessments of geophysical survey, although past experience indicates material from the study area, such as engines or other material may be recorded as small obstructions or anomalies.

Table 8 Summary of maritime potential by period

Period	Summary
Pre - 1508	Potential for material associated with prehistoric maritime activities, including coastal travel, fishing and the exploitation of other marine and coastal resources. Vessels of this period include rafts, hide covered watercraft and log boats. The discovery of small finds in the intertidal zone highlights the potential for early maritime activity.
	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. Early Neolithic house structures have previously been excavated in North Wales and therefore, maritime activity could have been taking place during this period.
	The study area is very close to the major settlement and trading port of Chester, which remained important until the eighteenth century. An inscribed stone found to the west of Chester apparently confirms the age old navigation dangers of the Dee estuary, therefore, there is particular potential for discoveries. In addition, there is considerable 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. The port only went in to decline when it failed to compete with Liverpool, therefore there is potential for several types of watercraft to be in the vicinity.
	In addition, there is potential for material associated with coastal and seafaring activity in the 'Dark Ages', associated with the renewed expansion of trade



	<p>routes and Germanic and Norse invasion and migration. Vessels of this period may be representative of new shipbuilding traditions including changes in technique.</p> <p>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. The Dee Estuary was navigable until the eighteenth century.</p>
1509 to 1815	<p>Vessels of this period continued to variously represent both the clinker techniques and construction utilising the flush-laid strakes technique. There is increasing potential for post-medieval shipwrecks associated with the expansion of transoceanic communications and the opening up of the New World. There is increasing potential for post-medieval shipwrecks associated with continuing local trade and marine exploitation. The Welsh slate industry has a history which stretches back as far as the Roman period. The extraction of slate can be seen as a consistent exploitation of an available resource throughout Wales' entire historic period. The impacts of the industry highlight its importance to the cultural heritage of Wales (Wessex Archaeology 2009a).</p>
1816 to 1913	<p>Increasing 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. Potential for the discovery of shipwrecks demonstrating a diverse array of vernacular boat types evolved for use in specific environments. Potential for wrecks associated with large scale worldwide trade, the fishing industry or coastal maritime activity including marine exploitation. Also, potential for vessels associated with leisure activities and travel to seaside resorts as Rhyl was a famous British seaside destination.</p>
1914 to 1945	<p>Potential for the discovery of shipwrecks associated with the First and Second 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>

5.8 Aviation potential

- 5.8.1 The seascapes of Rhyl were used by the military during the Second World War with the coastal flats associated with several forced landings and crashes, such as Boulton Paul Defiant which belly-landed on the beach in 1941. During the same period the area provided the last coastal fix for aircraft operating out of Hawarden and Sealand which means that there is potential for aircraft remains (Natural Resources Wales 2015a).

Navigational hazards

- 5.8.2 The navigation chart for the area shows no real navigational hazards. Two obstructions are labelled on the chart; one in the intertidal zone and the modern obstruction of GyM OWF is in the area (Figure 17). There are also constantly shifting sandbanks recorded as being in the area with changing depths (Natural Resources Wales 2015a). The hazards are marked by numerous buoys, lights and fog horns, however these could have posed a serious threats in earlier times.

Seabed (or Potential for Preservation)

- 5.8.3 From the perspective of potential for preservation, key variables which need to be taken into account include seabed mobility, type and the depth of sediments mapped by the British Geological Survey (BGS) (Merrit et al., 2007). The study area is mostly bedrock and slightly gravelly sand meaning preservation will be less than it would be if the seabed was thick mud.

Recorded losses

- 5.8.4 The UKHO, RCAHMW and HER datasets have 48 records of recorded losses. These are records for which although a vessel (or vessels) is known to have been lost in the general area, no material has been encountered on the seabed at the recorded location. No 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 reflect the fact that record keeping, and the maintaining of those records, had improved significantly.

Table 9 Recorded Losses – summary by date

Date	Number of records of ships	Number of records of aircraft
Post-medieval	29	N/A
Modern	10	5
Unknown	4	N/A
Total	43	5

Ship Recorded losses

- 5.8.5 The recorded losses all date from the post-medieval or modern period and cover a wide range of vessel types. Some provide information about the causes of loss.
- 5.8.6 Of the 43 records of vessels that were lost, 36 have a recorded vessel type. These include: a fishing vessel, ketch, Mersey flat, sailing ketch or fishing vessel, sailing vessel, schooner, sloop, steamship, wooden barque, wooden brig, wooden brigantine, wooden flat built, wooden ketch, smack and wooden yawl. The types of vessels highlight the wide range of maritime activities in the study area over time. Some of the vessels

Table 10 Recorded loses cargoes and journeys

Cargo	Journey
Coal	Unknown
Limestone	From Preston to Ardrossan
Bottled beer, empty beer cases and limestone	From Dublin to Ayr
Pit woode	From Mandal to Connah's Quay
Rice and sugar	From Montserrat to Liverpool



Coal	From Runcorn to Port Galmon (Porth Colman?)
Limestone	From Llandulas to Widnes
Coal	From Garston to Kinsale
Cast iron ingots	From Glasgow to Saltney
105 tons of roofing slate	From Port Dinorwic to Liverpool
Gravel	From Conwy to Liverpool
Manure	From Garston to Beaumaris
Limestone	From Llandulas to Widnes

5.8.7 Although now in serious decline, the coal industry was fundamental in shaping the development of modern Wales, particularly in the south. For a brief period of time in the late 19th and early 20th centuries it was arguably also Britain's greatest single export and Welsh 'steam coal' powered the industrial and transport revolutions taking place across the world. The coal industry bestrode Wales like a behemoth. Most of the coal was exported and therefore the coal trade was by necessity largely a maritime trade (Wessex Archaeology 2009b) therefore any leads on the location of the remains of coal carrying vessel could be of significant archaeological value.

Aircraft Recorded losses

5.8.8 There are five aircraft recorded losses within the search area.

5.8.9 A Supermarine Spitfire I X4425 (prn 130299) was one of 500 delivered between July 1940 and February 1941. It was assigned to 19/92 squadrons and 57 OTU/61 OTU. The aircraft flew into sand and crashed at Llandulas, Denbighshire, on 4 April 1943.

5.8.10 A Boulton Paul Defiant I N1770 (prn 130258) was one of 202 delivered to the RAF by Boulton Paul, Wolverhampton, to contract 751867/38 between June and October 1940. Its service life included assignments to 255/256 Squadrons. The aircraft's engine cut out and it crash landed on the beach.

5.8.11 An Armstrong Whitworth Whitley V BD204 (prn 130240) was one of 157 delivered to the RAF by AWA, Baginton, between February and July 1942. It was assigned to 24 OTU. The aircraft's engine cut out and it belly-landed on mudflats at Rhyl on 17 May 1943.

5.8.12 A De Havilland Mosquito VI HX863 (prn 130290) was one of 130 delivered to the RAF by De Havilland between July and October 1943. Its service life included assignments to 29/307 squadrons and 60 OTU. It spun into the sea and blew up off Rhyl on 14 February 1944.

5.8.13 Miles Master I N7937 (prn 130268) was one of 500 delivered to the RAF by Philip & Powis, Woodley, to contract 779602/38 between July 1939 and September 1940. It was assigned to 5 FTS. The aircraft crashed whilst low flying at Dyserth Road, Rhyl, on 5 October 1940.

6 MARINE ARCHAEOLOGICAL ASSESSMENT: INTERTIDAL HERITAGE ASSETS

6.1 Data assessment

6.1.1 The data for the intertidal zone came exclusively from the HERs and can be seen in Appendix 7 and Figure 4.

- 6.1.2 A perforated antler mattock (1003) was found near Splash Point, Rhyl. The mattock dated to 6560 +/- 80 BP (OxA-1009) therefore it is Mesolithic (Davidson 2002). The findspot is located in the wider buffer of the study area.
- 6.1.3 Various Neolithic objects (1000) were found on a submerged land surface in this area in the early 20th century including three Graig Lwyd axes and two polished stone axes. Also, a pebble mace head and two polished stone axes, pebble mace head, bronze chisel and a bronze socketed spearhead. The finds also included post-medieval bronze objects. The site is located in the wider buffer of the study area.
- 6.1.4 A bronze socketed spearhead (1001) 4.4 inches long was found on the Rhyl beach. Now lost. The findspot is located in the wider buffer of the study area.
- 6.1.5 Bronze chisel found in 1913 on a peat bed. The blade is 2.5 inches long and 1.25 inches wide (prn 1002). The findspot is located in the wider buffer of the study area.
- 6.1.6 An anvil stone (prn 1004) made of a large granite pebble with a ground out circular hollow on one face was found on an old ground surface on the beach at Abergele. The findspot is located in the wider buffer of the study area.
- 6.1.7 A stretch of stones is visible at low tide, which may be a possible causeway measuring approximately 5-8 m (prn 1005). composed of angular stones (max. size about 30-40cms). The site is located in the wider buffer of the study area.
- 6.1.8 A series of wooden posts (prn 1006) are also visible in the intertidal zone, set in roughly parallel short trenches filled with stone. They are thought to be the remains older groynes. The site is located in the wider buffer of the study area.
- 6.1.9 Rhyl Pier (1007) was built in 1867. It has since been demolished and no trace remains although foundation materials could remain. The site is located in the wider buffer of the study area.
- 6.1.10 An unidentified object of possible modern date (1008) was also discovered in the intertidal zone. The object consists of a curved sub-oval piece of wood, one edge of which has been covered in copper alloy. The wood is cracked and frayed due to drying out and the copper alloy encrusted and corroded. Seven circular rivets attach the copper alloy to the wood. The object is possibly nautical, though its size suggests perhaps from a smaller vessel rather than ship. Possibly the copper/bronze tipping of an oar blade, a fitting off a cutter or lifeboat. Although found within a blue clay layer the rivets suggest a more modern date. The findspot is located in the wider buffer of the study area.
- 6.1.11 A local volunteer force rifle range (1009) was recorded during Dee Estuary Historic Landscape Survey. The site is located in the wider buffer of the study area.
- 6.1.12 The results of the walkover survey captured in photographs revealed an additional historic site comprising of concrete blocks and rubble in the intertidal zone. Further research on the local area revealed this to be the remains of 'Salem bungalow' which fell into the sea due to coastal erosion in 1944. Salem Bungalow was built by Alfred Dickinson an early pioneer of electric tram technology (<https://mikehardisty.wordpress.com/2019/08/18/the-house-that-fell-into-the-sea/> accessed May 2021).



Value

- 6.1.13 Of the records of terrestrial sites in the intertidal zone, six relate to findspots (1000-1004, 1008). The value of these finds will not be affected as they have been removed from their locations and will not be impacted by the development. Rhyl pier (1007) has also been removed and therefore its value will not be affected.
- 6.1.14 The main two intertidal sites are the possible causeway (1005) and wooden posts (1006). The wooden posts are thought to be the remains of groynes and therefore are thought to be modern. The possible causeway is undated. At the most basic level, these take the form of primitive rutways down to the seashore, such as the causeway near Laugharne, Carmarthenshire on which carts were led from the lime quarries (Davidson 2002).

6.2 Potential for heritage assets within the intertidal zone

- 6.2.1 Structural remains other than watercraft, including such elements as fish traps, piers, tidal gates or sea defences, may be found within the intertidal zone (between MHWS and MLWS). The intertidal area is thought to have been in use since the Mesolithic. It is thought that during the Mesolithic period major transgressions inundated the low-lying area between Rhyl and Prestatyn, but that areas of elevated boulder clay remained above sea level and were occupied as the most seaward habitable land. This may account for the distribution of shell beds and Mesolithic finds reported around Rhyl (Davidson 2002). Finds dated to this period have also been discovered within the intertidal zone and there could be potential for further finds of this date.
- 6.2.2 The mines within the Great Orme in Llandudno, which overlooks the study area are thought to be the earliest metal workings in the UK and are nationally important Bronze Age copper workings (National Resources Wales 2015b). Some of the metal work discovered in the intertidal zone could be related to this trade and there could be potential for further metal working related maritime traffic.
- 6.2.3 Depending on the date of the causeway recorded within the intertidal zone, artefacts related to its use may also be discovered.
- 6.2.4 The bays are sheltered by Anglesey with Great Orme headland being the only area exposed to the full force of the sea, especially in northerly wind conditions (Natural Resources Wales 2015b), which means the area will have been a safe haven for vessels for centuries. Some of the sheltering vessels may have been blown towards the land and lost in the intertidal zone therefore there is potential for material relating to maritime vessels and their cargo.
- 6.2.5 In addition, there are five aircraft recorded losses within the intertidal zone, and it is possible that material from these crash sites could still be found. The seascapes of Rhyl were used by the military during the Second World War with the coastal flats associated with several forced landing and crashes therefore there is potential for further remains to be discovered.

7 ASSESSMENT OF HISTORIC SEASCAPE CHARACTER

7.1 Introduction

- 7.1.1 Working on behalf of the Welsh Government, Natural Resources Wales carried out a study to identify the character of Wales's seascapes at a broad scale (Natural Resources Wales 2015a,b,c). Seascapes, like landscapes, reflect the relationship between people and place; marine character areas highlight the key natural, cultural and perceptual influences that make the character of each seascape distinct and unique. Seascapes are about linking people and their cultures, and places and their natural resources. This is important as it

allows us to understand and appreciate sense of place and local distinctiveness. There are 29 marine character areas in Welsh territorial waters and there is spatial information and a description for each of them. This forms part of the information underpinning the Welsh National Marine Plan. Marine character areas and the effects of development on them should be considered when drawing up and assessing project proposals (Cadw 2020).

7.2 Historic Seascape Characterisation

7.2.1 The Study Area spans across Marine Character Areas 02: Colwyn Bay and Rhyl flats (Natural Resources Wales 2015a) Marine Character Areas 03: Red Wharf and Conwy Bays (Natural Resources Wales 2015b) and Marine Character Areas 04: North Wales Open Waters (Natural Resources Wales 2015c). The below information highlights sandbanks. Sandbanks can provide archaeological potential as there could be buried material in the sandbanks that can't be detected by geophysical survey. The great changes that have occurred in the configuration of navigation channels at the mouth the estuaries of the Conway, Dee and the Burry inlet are also noteworthy (RCAHMW 2019, 62).

7.2.2 Marine Character Areas 02 Key Characteristics

Low-lying coastline backed by coastal levels associated with the broad mouth of the Vale of Clwyd to the eastern half of the area.
High, exposed, rocky limestone hills and open headlands with intermediate developed bays to the western half of the area. Little Orme and Great Orme headlands form dramatic rugged landmarks.
Long sandy beaches and shingle storm beaches. All the soft coastline is protected by various coastal defences including groynes, rock armour, beach recharging, walls and traditional promenades.
Shallow waters (<20m) with gently shelving beaches and extensive network of offshore sandbank and flats.
Significant peat exposures off Rhyl and at Rhos on Sea attesting to inundated land surfaces dating to the end of the last Ice Age.
Extensive marine sediments of sand and gravel extending from the neighbouring Dee Estuary MCA and forming long, linear sandbanks running roughly parallel to the shore.
Constantly shifting sandbanks with changing depths; hazards marked by numerous buoys, lights and fog horns.
South Hoyle Channel and Inner Passage provided the approaches to Roman port of Chester. The present-day navigation channels are maintained regularly by dredging.
The flats, sand banks, bays and rocky shores are important for biodiversity, extensively designated including SPA, SAC and SSSI.
Wave exposure generally low closer to shore, increasing in more open waters where the sheltering effect of Great Orme's Head (in MCA 03) diminishes.
Developed coastline with many seaside resort towns, notably Llandudno (and pier), Colwyn Bay (and pier), Rhyl and Prestatyn, the latter having many caravan and chalet parks on their fringe. The coast serves as a traditional holiday destination.



Recreational activity includes water sports such as jet skiing and speed boating. Tourist pleasure trips run from the pier at Llandudno, usually heading westwards around Great Orme's Head.
Wales Coast Path and a popular cycleway run the length of the coastline. Collectively, the A55, A548 and main Holyhead to Chester railway line follow close to the coastline.
Concentrations of documented shipwrecks in the approaches to Rhyl and Foryd harbours, also in locations where they were blown ashore from traditional anchorages.
Both Colwyn Bay and Rhyl are popular shore and boat angling areas. Rhyl includes the main harbour along this stretch of coast.
Historic military use of the seascape at Rhyl providing the last coastal fix for aircraft operating out of Hawarden and Sealand.
Rhyl Flats Offshore Wind Farm forms a dominating offshore feature. The moving turbines are supplemented by further turbines beyond (in MCA 29).
Limestone hills form a backdrop, in the east linking to the adjacent slopes of the Clwydian Range AONB. From further out to sea, views reach beyond to the mountains of Snowdonia National Park.

7.2.3 Marine Character Areas 03 Key Characteristics

Comprises Conwy, Red Wharf and Dulas Bays, characterised by broad sand flats and low-lying sandy beaches, punctuated by rugged cliffs and prominent limestone headlands.
Offshore waters deepening to a maximum of 30 m. There is an extensive intertidal area around the mouth of the Conwy Estuary, extending westwards and including Lavan Sands.
North-easterly aspect of the bays in the west is unusual for Wales, with Great Orme's Head prominent in many land-to-sea views.
Varied coastal geology of cliffs and rocky or sandy beaches giving rise to diverse nationally and internationally important habitats within a relatively small area, including valued maritime grasslands and limestone heath.
A mosaic of seabed types found in the north of the MCA with algae and fauna covered bedrock and boulders amongst sand and mixed sediments.
Partly within the Menai Strait and Conway Bay SAC, recognised for its unusual and varied coastal and intertidal habitats and the associated reef communities.
The bays are sheltered by Anglesey with Great Orme headland being the only area exposed to the full force of the sea, especially in northerly wind conditions.
Rich evidence for a long history of human occupation, with large sections of the adjacent coast designated as Landscapes of Outstanding Historic Interest.
The 12th Century Conwy and Beaumaris Castles (World Heritage Sites) overlook the MCA.
Nationally important Bronze Age copper workings on Great Orme are thought to be the earliest metal workings in the UK.

A number of shipwrecks, including the tragic loss of the <i>Royal Charter</i> in 1859 and the planned sinking of the <i>Ghambira</i> . The wreck of the <i>Flying Foam</i> is visible in the intertidal area on the eastern side of the Conwy Bay.
Popular tourist destination evidenced by several coastal settlements. Activities include swimming, angling and diving, jet-skiing and pleasure trips. There are a number of recreational dive sites along the coast.
The Wales Coast Path follows much of the coastline in this MCA. Most of the adjacent Anglesey coastline is AONB-designated, reflecting its nationally important scenic qualities. Snowdonia National Park rises up dramatically to the south.
Puffin island a key feature of the seascape setting in views north, with Great Orme being a distinctive feature to the east; forming gateway features into Conwy Bay.
Two distinctive bridges built by Telford and Stephenson cross the river at Conwy and mirror those found in the Menai Strait.

7.3 Capacity to Accommodate Change

- 7.3.1 GyM OWF on the Rhyl flats forms a dominating offshore feature, with the moving turbines supplemented by further turbines beyond (Natural Resources Wales 2015a). As there is already an active wind farm in the seascape character, the seascape character in the area has already been impacted as houses on the east coast on Anglesey are able to see the wind farm. The addition of AyM OWF would mean that the wind farm would be visible from further afield.

8 CONCLUSIONS AND RECOMMENDATIONS

Palaeolandscape features

- 8.1.1 A number of palaeolandscape features of archaeological potential have been identified within the study area. Within the Array area and Infrastructure zone, an extensive area of Channel Complex Deposits (Unit 4) were identified in the north and north-west, suggesting the study area was located within a terrestrial environment between the LGM and the Holocene marine transgression.
- 8.1.2 These features correlate with a potential palaeo-coastline and associated deltaic features identified during the WCPS (Fitch *et al.* 2011). This, combined with the iceberg plough marks identified during previous work in the Irish Sea (Van Landeghem *et al.* 2009), supports the post-LGM landscape theory proposed by Flemming (2005) of an initial glacial lake, followed by sub-aerial expose, and then a marine transgression, rather than a constant maritime environment.
- 8.1.3 However, Fitch *et al.* (2011) suggest these coastal and deltaic features were relatively ephemeral, so it may be that the Holocene marine transgression was relatively rapid across the Irish Sea. As such, any post-LGM/pre-transgression deposits are likely to be relatively underdeveloped, especially compared with similar deposits within the southern North Sea.
- 8.1.4 The features identified during the WCPS (Fitch *et al.* 2011) were interpreted as representing a Mesolithic shoreline; if this is the case, then the deposits would be considered of high archaeological potential. However, no direct dating evidence is available for these features at present, and they could potentially represent features created earlier in the Holocene

prior to human re-occupation of the region. As such, they are currently considered of possible archaeological potential.

- 8.1.5 It is recommended that, should any sediment sampling (e.g. coring/boreholing) be undertaken within the study area, any core records and samples acquired from within these Unit 4 features be made available for geoarchaeological assessment by a suitably qualified archaeological contractor. This should aid in determining the nature and age, and therefore archaeological potential, of these deposits.
- 8.1.6 Within the ECC, three major channel features were identified; also potentially dating from between the LGM and the Holocene marine transgression. Although they may have originally been cut by glacial processes, it is likely that they were later reactivated and filled as fluvial features.
- 8.1.7 As terrestrial features of potential Holocene age, these channels are interpreted as of high archaeological potential. As with the Unit 5 deposits, it is recommended that, should any sediment sampling (e.g. coring/boreholing) be undertaken within the study area, any core records and samples acquired from within these Unit 4 features be made available for geoarchaeological assessment by a suitably qualified archaeological contractor.

Seabed features

- 8.1.8 Archaeological Exclusion Zones (AEZs) are recommended around 26 anomalies classified as A1 and A3 archaeological potential, situated across three of the study areas (Array area, other wind farm infrastructure zone, and ECC). AEZs of 50 m radius are recommended around features that are well constrained, with distinct outlines and which do not appear to be highly degraded or dispersed. AEZs of 100 m radius are recommended around more disperse sites where the extents are less certain, and debris could be present beyond the extents visible in the geophysical data. AEZs of 100 m radius are also recommended around recorded wreck or obstruction positions, due to the uncertainty of the positioning of these locations.
- 8.1.9 These AEZs all have the potential to be reduced or removed at a later date, should further information become available that proves their associated features are not of archaeological potential. The recommended AEZs are summarised in Table 11.

Table 11 Recommended AEZs within the study area

ID	Classification	Archaeological discrimination	Position (WGS84 UTM31N)		Study area	Recommended AEZ
			Easting	Northing		
70016	Debris	A1	457940	5927366	Array area	50m AEZ around position
70018	Debris field	A1	457903	5927351	Array area	50m AEZ around visible debris field extents
70019	Wreck	A1	457899	5927359	Array area	50m AEZ around boundary of wreck
70021	Debris field	A1	457892	5927373	Array area	50m AEZ around visible debris field extents
70023	Debris	A1	457852	5927361	Array area	50m AEZ around position
70042	Wreck	A1	456278	5926972	Array area	50m AEZ around boundary of wreck
70180	Wreck	A1	453786	5923243	Array area	100m AEZ around visible wreck extents



ID	Classification	Archaeological discrimination	Position (WGS84 UTM31N)		Study area	Recommended AEZ
			Easting	Northing		
70252	Recorded wreck	A3	443624	5926402	Array area	100m AEZ around recorded position
70293	Wreck	A1	447402	5923866	Array area	100m AEZ around visible wreck extents
70326	Wreck	A1	440517	5926285	Array area	100m AEZ around visible wreck extents
70327	Debris field	A1	440519	5926240	Array area	50m AEZ around visible debris field extents
70328	Debris field	A1	440554	5926258	Array area	50m AEZ around visible debris field extents
70329	Debris	A1	440528	5926261	Array area	50m AEZ around position
70330	Debris field	A1	440501	5926303	Array area	50m AEZ around visible debris field extents
70331	Debris field	A1	440535	5926294	Array area	50m AEZ around visible debris field extents
70332	Debris field	A1	440559	5926325	Array area	50m AEZ around visible debris field extents
70333	Debris field	A1	440503	5926332	Array area	50m AEZ around visible debris field extents
70336	Debris	A1	440587	5926260	Array area	50m AEZ around position
70415	Debris	A1	450313	5921074	Array area	50m AEZ around position
70416	Debris field	A1	450312	5921083	Array area	100m AEZ around visible debris field extents
70480	Debris field	A1	440688	5922857	other wind farm infrastructure zone	100m AEZ around visible debris field extents
7070	Mound	A1	460302	5916795	ECC	100m buffer around visible extents of feature
70510	Debris	A1	452648	5918774	ECC	50m buffer around position
70511	Debris field	A1	452658	5918763	ECC	100m buffer around visible extents of debris
70512	Debris	A1	452693	5918757	ECC	50m buffer around position
70593	Recorded obstruction	A3	461991	5913704	ECC	100m buffer around recorded position

8.1.10 For features assigned A2 archaeological discrimination rating, no AEZs are recommended at this time. However, avoidance of these features by micro-siting is recommended if they are proposed to be directly impacted by development in the future. If micro-siting is not possible, then further assessment to ascertain the nature of the features may be required.

8.1.11 It is recommended that if any objects of possible archaeological interest are recovered during any future groundwork operations, that they should be reported using the established Protocol for Archaeological Discoveries: Offshore Renewables Projects (The Crown Estate,



2014). This will establish whether the recovered objects are of archaeological interest and recommend appropriate mitigation measures.



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APPENDICES

Appendix 1: Terminology Glossary

AD	Anno Domini
ALSF	Aggregate Levy Sustainability Fund
BCE	Before Common Era
BGS	British Geological Survey
BH	Borehole
BP	Before Present
BULSI	Build, Use, Loss, Survival and Investigation
CifA	Chartered Institute for Archaeologists
DECC	Department of Energy and Climate Change
DEFRA	Department for Environment, Food and Rural Affairs
DCLG	Department for Communities and Local Government
ECC	Export Cable Corridor
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
ES	Environmental Statement
GIS	Geographic Information System
HER	Historic Environment Record
HSC	Historic Seascape Characterisation
JNAPC	Joint Nautical Archaeology Policy Committee
LGM	Last Glacial Maximum
MCAA	Marine and Coastal Access Act 2009
MHWS	Mean High Water Springs
MPS	Marine Policy Statement
N/A	Not applicable (not included in dataset)
NM	Nautical Miles
NRHE	National Record of the Historic Environment
NRW	Natural Resources Wales
PEIR	Preliminary Environmental Information Report
UKHO	United Kingdom Hydrographic Office
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UTM	Universal Transverse Mercator



Chronology

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

Prehistoric	
Palaeolithic	970,000 – 9500 BCE
Lower Palaeolithic	970,000 – 300,000 BCE
Pre-Anglian to Ipswichian	>478 ka – 115 ka; >Marine Isotope Stage (MIS) 12 – 5e
Middle Palaeolithic	300,000 – 40,000 BCE
Devensian to LGM	c. 115 ka – 18 ka; MIS 5d -2
Upper Palaeolithic	40,000 – 10,000 BCE
Post-LGM and early Holocene	18,000 – 6,000 BP; MIS 2-1
Late Upper Palaeolithic	12,000 – 9500 BCE
Early Post-glacial	9500 – 8500 BCE
Mesolithic	8500 – 4000 BCE
Neolithic	4000 – 2400 BCE
Bronze Age	2400 – 700 BCE
Iron Age	700 BCE – AD 43

Historic	
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



Appendix 2: Legislative, policy and guidance

Designation	Associated Legislation or Policy	Overview
	<i>Marine and Coastal Areas Act 2009 - Marine Policy Statement (MPS), 2011</i>	Marine licensing and marine planning made the responsibility of the MMO. England's inshore and offshore waters have been divided into 11 plan areas.
Protected Wreck Sites	<i>Protection of Wrecks Act 1973</i>	The <i>Protection of Wrecks Act 1973</i> allows the Secretary of State to designate a restricted area around a wreck to prevent uncontrolled interference. These statutorily protected areas are likely to contain the remains of a vessel, or its contents, which are of historical, artistic or archaeological importance.
Protected Places and Controlled Sites	<i>Protection of Military Remains Act 1986</i>	The <i>Protection of Military Remains Act 1986</i> provides protection for designated military vessels and for all aircraft that crashed while in military service. The Act provides two types of protection: Protected Places (wrecks designated by name and can be designated even if the location of the site is not known) and Controlled Sites (sites designated by location – covers wrecks within the last 200 years). It is illegal to disturb sites or remove anything from sites. Protected Places can be visited by divers, but the rule is look but don't touch. For Controlled Sites it is illegal to conduct any operations (including diving or excavation) within the Controlled Site unless licensed to do so by the Ministry of Defence.
	<i>Merchant Shipping Act 1995</i>	This Act sets out the procedures for determining the ownership of underwater finds that turn out to be 'wreck', defined as any flotsam, jetsam, derelict and lagan found in or on the shores of the sea or any tidal water. It includes ship, aircraft, hovercraft, parts of these, their cargo or equipment. If any such finds are brought ashore, the salvor is required to give notice to the Receiver of Wreck. This Act is administered by the Maritime and Coastguard Agency.
	<i>Marine and Coastal Areas Act 2009 (Marine Policy Statement 2011)</i>	Marine licensing and marine planning made the responsibility of the Marine Management Organisation (MMO). England's inshore and offshore waters have been divided into 11 plan areas, for which marine plans are being produced by the MMO.
	<i>Revised Draft National Policy Statement for Energy (EN-1) DECC 2010)</i>	This National Policy Statement (NPS) sets out the national policy for energy infrastructure, and the importance of archaeological assessment in the development process.



Designation	Associated Legislation or Policy	Overview
	<i>Revised Draft National Policy Statement for Renewable Energy (EN-3) DECC 2010)</i>	This NPS, taken together with EN-1, provides the primary basis for the decisions by the Planning Inspectorate on renewable energy infrastructure development applications. It sets out the importance of the historic environment and the ways it can be impacted by development, outlines guidance for application assessments, Planning Inspectorate decision making, and mitigation measures.
	<i>UNESCO Convention on the Protection of the Underwater Cultural Heritage</i>	The UNESCO Convention was concluded in 2001, and is a comprehensive attempt to codify the law internationally, with regards to underwater cultural heritage. The UK abstained in the vote on the final draft of the Convention, however it has stated that it has adopted the Annex of the Convention, which governs the conduct of archaeological investigations, as best practice for archaeology. Although the UK is not a signatory, the Convention entered into force on 2nd January 2009, having been signed or ratified by 20 member states.



Appendix 3: Palaeogeographic features of archaeological potential

Array area and Infrastructure zone

ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Unit	Interpreted Age	Dataset	Section
			From	To					
71000	Channel complex	P2	0.4	5.7	An extensive area of channel complex deposits, cutting into the underlying Western Irish Sea Formation (chaotic and prograded facies). Characterised by numerous small, cross-cutting cut and fill features, that generally have a relatively well defined basal reflector and acoustically transparent/unstructured fill (although the characteristics of these features can vary). Often, the cut and fills penetrate only as far BSB as an underlying erosion surface, which is potentially relatively hard and more resistant to erosion than the sediment surrounding the cuts. The cut and fill features are also so numerous that individual features cannot be traced between survey lines with any degree of certainty. The deposits are generally thicker and better developed towards the west and thinner, less defined towards the east, possibly due to the increasing depth BSB of the top of the underlying Cardigan Bay Formation (till) towards the north and west. As the deposits thin towards the east, the extents become increasingly difficult to define and the unit becomes fragmented. Potentially associated areas of layered deposits, interpreted as possible fine grained deposits, are located within the same stratigraphic levels as the cut and fills, and have been mapped separately (71006 - 71012). Possible remnants of a delta top or sandur plain deposit of Late Devensian age.	4	Late Devensian/ Early Holocene	2020 Array	Array, Array buffer, Infrastructure zone, Infrastructure zone buffer
71001	Channel complex	P2	0.5	1.4	A small, simple cut and fill feature cut into the underlying Western Irish Sea Formation prograded facies, only identified on one survey line. Characterised by a generally well-defined basal reflector with a single phase of unstructured fill. Appears similar to features within channel complex 71000, and is probably an outlier of the same complex.	4	Late Devensian/ Early Holocene	2020 Array	Array buffer



ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Unit	Interpreted Age	Dataset	Section
			From	To					
71002	Channel complex	P2	0.4	2.5	An area containing a number of small, cross-cutting cut and fill features, cut into the underlying Western Irish Sea Formation prograded facies. Generally characterised by well-defined basal reflectors and acoustically transparent/unstructured fill. Located to the east of channel complex 71000, and likely an outlier of the same complex as it becomes fragmented due to shallowing till depth BSB.	4	Late Devensian/ Early Holocene	2020 Array	Array, Array buffer
71003	Channel complex	P2	0.4	3.2	An area containing a number of cross-cutting cut and fill features, cut into the underlying Western Irish Sea Formation prograded facies. The features are generally relatively poorly defined, with irregular basal reflectors and acoustically transparent/unstructured fill. Located to the east of channel complex 71000, and likely a continuation of the same complex as it becomes fragmented due to shallowing till depth BSB. The exact edges are difficult to define, and the feature may extend further than the identified boundaries.	4	Late Devensian/ Early Holocene	2020 Array	Array, Array buffer
71004	Channel complex	P2	0.5	2.5	An area containing a number of cross-cutting cut and fill features, cut into the underlying Western Irish Sea Formation prograded facies. Generally characterised by well-defined basal reflectors and acoustically transparent/unstructured fill. Located to the east of channel complex 71000, and likely a continuation of the same complex as it becomes fragmented due to shallowing till depth BSB. The exact edges are difficult to define, and the feature may extend further than the identified boundaries.	4	Late Devensian/ Early Holocene	2020 Array	Array
71005	Channel complex	P2	0.4	2.9	An area containing a number of cross-cutting cut and fill features, cut into the underlying Western Irish Sea Formation prograded facies. Generally characterised by well-defined basal reflectors and acoustically transparent/unstructured fill. Located to the east of channel complex 71000, and likely a continuation of the same complex as it becomes fragmented due to shallowing till depth BSB. The exact edges are difficult to define, and the feature may extend further than the identified boundaries.	4	Late Devensian/ Early Holocene	2020 Array	Array, Array buffer



ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Unit	Interpreted Age	Dataset	Section
			From	To					
71006	Fine grained deposit	P2	0.6	3.7	A shallow, tabular deposit characterised by a generally unstructured but consistent seismic response, sometimes with layered horizons at its base. Appears at times to be potential seabed sediment, but is located within the extents of channel complex 71000 , and both cuts and is cut by internal features within the channel complex. Interpreted as possible fine-grained deposits within the channel complex, potentially overbank sediments. One of a number of similar features (71006 - 71012) associated with the channel complex.	4	Late Devensian/ Early Holocene	2020 Array	Array, Infrastructure zone, Infrastructure zone buffer
71007	Fine grained deposit	P2	0.5	4.7	A shallow, tabular deposit characterised by a generally unstructured but consistent seismic response, sometimes with layered horizons at its base. Appears at times to be potential seabed sediment, but is generally located within the extents of channel complex 71000 (although extends beyond its south-eastern boundary), and both cuts and is cut by internal features within the channel complex. Interpreted as possible fine-grained deposits within the channel complex, potentially overbank sediments. One of a number of similar features (71006 - 71012) associated with the channel complex.	4	Late Devensian/ Early Holocene	2020 Array	Array
71008	Fine grained deposit	P2	0.5	1.5	A shallow feature identified on one survey line only, identified overlying the channel complex deposits. The feature is characterised by a relatively well-defined basal reflector, and potentially dipping internal reflectors. Interpreted as possible fine-grained deposits within the channel complex, potentially overbank sediments. One of a number of similar features (71006 - 71012) associated with the channel complex.	4	Late Devensian/ Early Holocene	2020 Array	Array, Array buffer
71009	Fine grained deposit	P2	0.6	2.0	A shallow feature identified on one survey line only, identified overlying the channel complex deposits. The feature is characterised by a poorly defined basal reflector, and an acoustically unstructured but consistent fill. Interpreted as possible fine-grained deposits within the channel complex, potentially overbank sediments. One of a number of similar features (71006 - 71012) associated with the channel complex.	4	Late Devensian/ Early Holocene	2020 Array	Array buffer



ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Unit	Interpreted Age	Dataset	Section
			From	To					
71010	Fine grained deposit	P2	0.5	3.6	A shallow, tabular deposit characterised by a generally unstructured but consistent seismic response, sometimes with layered horizons at its base. Appears at times to be potential seabed sediment, but is generally located within the extents of channel complex 71000 (although occasionally extends beyond its boundary), and both cuts and is cut by internal features within the channel complex. Interpreted as possible fine-grained deposits within the channel complex, potentially overbank sediments. One of a number of similar features (71006 - 71012) associated with the channel complex.	4	Late Devensian/ Early Holocene	2020 Array	Array, Array buffer
71011	Fine grained deposit	P2	0.5	1.7	A shallow feature identified on one survey line only, identified overlying the channel complex deposits. The feature is characterised by a poorly defined basal reflector, and an acoustically unstructured but consistent fill. Interpreted as possible fine-grained deposits within the channel complex, potentially overbank sediments. One of a number of similar features (71006 - 71012) associated with the channel complex.	4	Late Devensian/ Early Holocene	2020 Array	Array, Array buffer
71012	Fine grained deposit	P2	0.9	2.0	A shallow feature identified on one survey line only, identified overlying the channel complex deposits. The feature is characterised by a poorly defined basal reflector, and an acoustically unstructured but consistent fill. Interpreted as possible fine-grained deposits within the channel complex, potentially overbank sediments. One of a number of similar features (71006 - 71012) associated with the channel complex.	4	Late Devensian/ Early Holocene	2020 Array	Array
71013	Simple cut and fill	P2	0.5	4.2	Possible cut and fill feature cut into Western Irish Sea Formation chaotic facies, characterised by a poorly defined basal reflector and a single phase of fill with poorly developed dipping reflectors. Only identified on one survey line. Located close to channel complex deposits, but is different in appearance (channel complex features are generally well defined with transparent fill) and likely to be an unrelated feature. Possible remnants of an eroded fluvial system, or an internal feature.	5	Early Holocene	2020 Array	Array



ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Unit	Interpreted Age	Dataset	Section
			From	To					
71014	Complex cut and fill	P2	0.5	4.2	A complex cut and fill feature cut into the Western Irish Sea Formation prograded facies, only identified on one survey line. Characterised by a poorly defined undulating basal reflector, with numerous phases of overlying fill. The earlier phases (towards the north-west) appear relatively chaotic, whilst the later phases (towards the south-east) comprise parallel internal reflectors. The south-eastern extent terminates beneath a large sand wave. Possible remnant of a fluvial channel, but could be an internal feature. Potentially related to similar nearby feature 71015 .	5	Early Holocene	2020 Array	Array, Infrastructure zone
71015	Complex cut and fill	P2	0.9	3.5	A complex cut and fill feature cut into the Western Irish Sea Formation prograded facies, only identified on one survey line. Characterised by a poorly defined undulating basal reflector, with numerous phases of chaotic fill. Located beneath the edge of a large sand wave. Possible remnant of a fluvial channel, but could be an internal feature. Potentially related to similar nearby feature 71014 .	5	Early Holocene	2020 Array	Array
71016	Simple cut and fill	P2	0.5	2.8	Possible small cut and fill feature identified cutting into the underlying Western Irish Sea Formation chaotic facies. Characterised by a well-defined basal reflector and a single phase of acoustically transparent fill. Possible remnant of a fluvial system, but could be an internal feature of the prograded facies.	5	Early Holocene	2020 Array	Array
71017	Simple cut and fill	P2	0.5	2.9	Possible small cut and fill feature cutting into the underlying Western Irish Sea Formation chaotic facies, identified on a number of survey lines. Generally characterised by a relatively well defined basal reflector and a single phase of acoustically transparent fill. Possible remnant of an eroded fluvial system, but could be an internal feature.	5	Early Holocene	2020 Array	Array
71018	Simple cut and fill	P2	0.6	2.5	Possible small cut and fill feature cut into the underlying Western Irish Sea Formation prograded facies. Characterised by a relatively poorly defined basal reflector and a single phase of acoustically chaotic fill, and only identified on one survey line. Possible remnants of a fluvial channel, but could be an internal feature.	5	Early Holocene	2020 Array	Array



ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Unit	Interpreted Age	Dataset	Section
			From	To					
71019	Simple cut and fill	P2	0.5	2.8	Possible small cut and fill feature cut into the underlying Western Irish Sea Formation prograded facies. Characterised by a relatively poorly defined basal reflector and a single phase of acoustically unstructured fill, and only identified on one survey line. Possible remnants of a fluvial channel, but could be an internal feature.	5	Early Holocene	2020 Array	Array
71020	Simple cut and fill	P2	1.1	3.0	Possible small cut and fill feature cut into the underlying Western Irish Sea Formation prograded facies. Characterised by a relatively poorly defined basal reflector and a single phase of poorly developed layered fill, and only identified on one survey line. Possible remnants of a fluvial channel, but could be an internal feature.	5	Early Holocene	2020 Array	Array
71021	Complex cut and fill	P2	0.6	3.9	A broad, distinct cut and fill feature cut into the underlying Western Irish Sea formation prograded facies. Characterised by a relatively poorly defined, undulating basal reflector, and a number of distinct fills; parallel dipping and hummocky reflectors in the north-west, and an acoustically unstructured unit in the south-east. Appears different in character to the nearby channel complex deposits. Possible remnant of an eroded fluvial system, but could be an internal prograded facies feature.	5	Early Holocene	2020 Array	Array
71022	Simple cut and fill	P2	0.6	2.7	Possible small cut and fill feature cut into the underlying Western Irish Sea Formation prograded facies. Characterised by a relatively poorly defined basal reflector and a single phase of acoustically unstructured fill, and only identified on one survey line. Possible remnants of a fluvial channel, but could be an internal feature.	5	Early Holocene	2020 Array	Array
71023	Simple cut and fill	P2	0.5	2.6	Possible small cut and fill feature cut into the underlying Western Irish Sea Formation chaotic facies and overlain by mobile seabed sediment. Characterised by a well-defined basal reflector and a single phase of acoustically transparent fill, and only identified on one survey line. Possible remnants of a fluvial channel, but could be a seabed depression filled with reworked modern sediment.	5	Early Holocene	2020 Array	Array



ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Unit	Interpreted Age	Dataset	Section
			From	To					
71024	Complex cut and fill	P2	2.0	5.5	Distinct, complex cut and fill feature cut into the underlying Western Irish Sea Formation chaotic facies and overlain by mobile seabed sediment. Characterised by a relatively poorly defined basal reflector and multiple phases of fill comprising dipping parallel reflectors. Possible remnants of an eroded fluvial system, but could be an internal feature.	5	Early Holocene	2020 Array	Array
71025	Complex cut and fill	P2	0.6	3.9	Relatively poorly defined cut and fill feature cut through a layered Western Irish Sea Formation deposit into the underlying Cardigan Bay Formation till. Poorly defined basal reflector, with possible multiple phases of fill characterised by faint dipping reflectors. Only identified on one survey line. Possible remnants of an eroded fluvial system, but could be an internal feature.	5	Early Holocene	2020 Array	Array
71026	Simple cut and fill	P2	1.4	2.6	Possible small cut and fill feature cut into the underlying Western Irish Sea Formation prograded facies and overlain by mobile seabed sediment. Characterised by a poorly defined basal reflector and a single phase of acoustically layered fill, and only identified on one survey line. Possible remnants of a fluvial channel, but could be an internal feature.	5	Early Holocene	2020 Array	Array
71027	Simple cut and fill	P2	1.2	6.7	Relatively extensive, distinct cut and fill feature cut into the underlying Western Irish Sea Formation prograded facies and overlain by mobile seabed sediment. Characterised by a well-defined basal reflector truncating the underlying dipping reflectors, and a single phase of acoustically transparent fill. Possible remnants of an eroded fluvial system, but could be an internal feature.	5	Early Holocene	2020 Array	Array
71028	Simple cut and fill	P2	1.1	3.2	Possible cut and fill feature cut into the underlying Western Irish Sea Formation prograded facies and overlain by mobile seabed sediment. Characterised by a poorly defined basal reflector and a single phase of acoustically layered fill. Possible remnants of a fluvial channel, but could be an internal feature.	5	Early Holocene	2020 Array	Array, Array buffer



ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Unit	Interpreted Age	Dataset	Section
			From	To					
71029	Simple cut and fill	P2	1.9	5.0	Distinct cut and fill feature cut into the underlying Western Irish Sea Formation prograded facies and overlain by mobile seabed sediment. Characterised by a poorly defined basal reflector but with a single phase of well layered fill. Probable remnants of an eroded fluvial feature, but only identified on one survey line.	5	Early Holocene	2020 Array	Array buffer, ECC, AyM-GyM interlink

Offshore ECC

ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Unit	Interpreted Age	Dataset	Section
			From	To					
71029	Simple cut and fill	P2	1.9	5.0	Distinct cut and fill feature cut into the underlying Western Irish Sea Formation prograded facies and overlain by mobile seabed sediment. Characterised by a poorly defined basal reflector but with a single phase of well layered fill. Probable remnants of an eroded fluvial feature, but only identified on one survey line.	5	Early Holocene	2020 Array	Array buffer, ECC, AyM-GyM interlink
71030	Simple cut and fill	P2	0.3	2.4	Possible cut and fill feature cut into the underlying Cardigan Bay Formation till, only identified on one survey line. Characterised by a relatively well defined basal reflector and a single phase of unstructured fill. Could be the eroded remnants of a fluvial system, or an internal till feature.	5	Early Holocene	2020 ECC	ECC
71031	Channel	P1	0.4	3.9	Distinct cut and fill feature identified on a number of survey lines, cuts into the underlying Cardigan Bay Formation till. Generally well defined basal reflector, although it may be obscured in places by acoustic blanking (but this is unclear in the data), with a single phases of acoustically layered fill. Possible fluvial channel.	5	Early Holocene	2020 ECC	ECC



ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Unit	Interpreted Age	Dataset	Section
			From	To					
71032	Simple cut and fill	P2	0.3	2.7	Distinct, shallow cut and fill feature cut into the underlying Cardigan Bay Formation till. Characterised by a well-defined basal reflector and a single phase of acoustically transparent/unstructured fill. The basal reflector is relatively thick, possibly suggesting different sediment at the base relative to the rest of the feature. Possible remnants of an eroded fluvial feature. Very similar, and adjacent, to large channel feature 71033 , and probably related.	5	Early Holocene	2020 ECC	ECC
71033	Channel	P1	0.2	11.0	Large, distinct, NNE-SSW trending channel feature cut into the underlying Cardigan Bay Formation till. Characterised by a relatively distinct basal reflector, and at least two (probably more) phases of fill. The edges of the channel are often very steep, abruptly truncating the reflectors of underlying units, and the basal reflector often extends to beyond the limits of penetration of the parametric sonar, and so the depths provided should be considered a minimum value. The earliest phase of fill is generally acoustically unstructured, although does contain faint parallel reflectors in some places. It also contains two areas of high amplitude reflectors towards the upper layers of the fill (71034 , plus one outside the study area). A second stage of fill is identified as a number of separate cut and fills which are characterised by poorly defined basal reflectors and steeply dipping internal reflectors (71035 - 71039). Probable channel system, may be fluvial in origin but the steep sides suggest it could also be a late glacial feature filled with later sediment.	5	Early Holocene	2020 ECC	ECC
71034	High amplitude reflector	P1	1.0	4.0	Irregular, sub-horizontal high amplitude reflector within, and towards the top of, the first phase of fill of channel 71033 . Identified on the eastern edge of the southern part of the channel, and is cut by second phase of fill 71039 . Possible erosion surface or layer relatively high in organic content, e.g. organic clay, but does not suggest a fully organic layer such as peat.	5	Early Holocene	2020 ECC	ECC



ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Unit	Interpreted Age	Dataset	Section
			From	To					
71035	Simple cut and fill	P1	0.5	10.1	Cut and fill feature orientated approximately NNE-SSW, completely within the extents of channel 71033 and forming part of the second phase of fill of the channel. No clearly identifiable basal reflector, but the feature is distinguished by the abrupt truncation of earlier features and a fill comprising steeply dipping internal reflectors. Possibly indicates later reactivation of channel 71033 as a fluvial feature.	5	Early Holocene	2020 ECC	ECC
71036	Simple cut and fill	P1	0.5	4.2	Small cut and fill feature cut into channel 71033 , mostly located outside of the current study area. No clearly identifiable basal reflector, but the feature is distinguished by the abrupt truncation of earlier features and a fill comprising steeply dipping internal reflectors. Possibly indicates later reactivation of channel 71033 as a fluvial feature.	5	Early Holocene	2020 ECC	ECC
71037	Simple cut and fill	P2	0.6	3.4	Small cut and fill feature cut into channel 71033 , only identified on one survey line. No clearly identifiable basal reflector, but the feature is distinguished by the abrupt truncation of earlier features and a fill comprising steeply dipping internal reflectors. Possibly indicates later reactivation of channel 71033 as a fluvial feature.	5	Early Holocene	2020 ECC	ECC
71038	Simple cut and fill	P2	0.7	1.7	Small cut and fill feature cut into channel 71033 , only identified on one survey line. No clearly identifiable basal reflector, but the feature is distinguished by the abrupt truncation of earlier features and a fill comprising steeply dipping internal reflectors. Possibly indicates later reactivation of channel 71033 as a fluvial feature.	5	Early Holocene	2020 ECC	ECC
71039	Simple cut and fill	P2	0.8	5.8	Small cut and fill feature cut into channel 71033 , only identified on one survey line. No clearly identifiable basal reflector, but the feature is distinguished by the abrupt truncation of earlier features (including high amplitude reflector 71034) and an acoustically transparent fill. Possibly indicates later reactivation of channel 71033 as a fluvial feature.	5	Early Holocene	2020 ECC	ECC



ID	Classification	Archaeological Discrimination	Depth Range (mBSB)		Description	Unit	Interpreted Age	Dataset	Section
			From	To					
71040	Channel	P1	0.4	7.6	Distinct north-east to south-west trending channel feature cut into the Western Irish Sea Formation. Characterised by a well-defined basal reflector, and two phases of fill - a lower unstructured fill (at the south-west end only), and an upper fill comprising faint parallel internal reflectors. The two fills are divided by a distinct irregular reflector, potentially an internal erosion surface. The feature is situated roughly parallel with channel 71033, and is possibly a related fluvial channel.	5	Early Holocene	2020 ECC	ECC
71041	Simple cut and fill	P2	1.0	2.0	Small possible cut and fill feature cut into the Western Irish Sea Formation, only identified on one survey line. Well defined basal reflector, with a single phase of acoustically layered fill. Potentially related to nearby similar features 71042, 71043 and 71044, but this is uncertain. Possible remnants of an eroded fluvial system, or could be an internal feature.	5	Early Holocene	2020 ECC	ECC
71042	Simple cut and fill	P2	0.5	1.9	Small possible cut and fill feature cut into the Cardigan Bay Formation till, only identified on one survey line. Well defined basal reflector, with a single phase of acoustically unstructured fill. Potentially related to nearby similar features 71041, 71043 and 71044, but this is uncertain. Possible remnants of an eroded fluvial system, or could be an internal feature.	5	Early Holocene	2020 ECC	ECC
71043	Simple cut and fill	P2	0.6	1.8	Small possible cut and fill feature cut into the Cardigan Bay Formation till, only identified on one survey line. Well defined basal reflector, with a single phase of acoustically unstructured fill. Potentially related to nearby similar features 71041, 71042 and 71044, but this is uncertain. Possible remnants of an eroded fluvial system, or could be an internal feature.	5	Early Holocene	2020 ECC	ECC
71044	Simple cut and fill	P2	0.4	1.9	Small possible cut and fill feature cut into the Cardigan Bay Formation till, only identified on one survey line. Well defined basal reflector, with a single phase of acoustically unstructured fill. Potentially related to nearby similar features 71041, 71042 and 71043, but this is uncertain. Possible remnants of an eroded fluvial system, or could be an internal feature.	5	Early Holocene	2020 ECC	ECC



Appendix 4: Known Shipwrecks, Aircraft Crash Sites, Obstructions and findspots within the study area

WA ID	UKHO ID	RCAHMW ID	HER ID	Name	Latitude	Longitude	UTM30N_X	UTM30N_Y	Type
70326	8124	271774		Albanian	53.48247	-3.8968	440489	5926317	Wreck
2001	7538			Calcium (Possibly)	53.41692	-3.75125	450071	5918914	Wreck
70293	7620	271443		Chacabuco (Possibly)	53.4613	-3.79255	447381	5923881	Wreck
70019	7693	271169		Dublin	53.49352	-3.63453	457904	5927360	Wreck
2004	8270		130190	Fuselage of Avro Anson Bomber	53.37108	-3.57128	461991	5913704	Findspot
2005		240100		Glory	53.36053	-3.74209	450614	5912634	Wreck
2006	8318			Horizon (Possibly)	53.40902	-3.78083	448095	5918056	Wreck
2007	8140	271604		Nydia (Probably)	53.50273	-3.87568	441918	5928555	Wreck
2008	8237	271692		Ocean Monarch	53.4225	-3.593	460593	5919436	Wreck
2009	7514	271003		Penrhos (Probably)	53.38393	-3.69667	453663	5915207	Wreck
2010			164090	Pensarn wreck (possibly Endeavour)	53.29584	-3.59124	60967	5925466	Wreck
2011	7701	271172		Penstone	53.49833	-3.6251	458534	5927890	Wreck
2012	8119	405760	34881	Resurgam	53.39538	-3.55558	463056	5916399	Wreck
2013	8266			Rhos Anna	53.32957	-3.51225	465885	5909055	Wreck
2014	7711	271773		Strathrye	53.49857	-3.83653	444509	5928060	Wreck
2015	91489			? Susie Mo li	53.32648	-3.66507	455705	5908796	Wreck
2016	94490			Unkown	53.42057	-3.5894	460831	5919219	Wreck
2017	7504		64176	Unkown	53.32903	-3.51332	465814	5908997	Wreck
2018	91160			Unkown	53.33385	-3.50152	466603	5909527	Wreck
2019	91161			Unkown	53.31652	-3.55595	462964	5907625	Wreck
2020	91162			Unkown	53.31735	-3.56618	462283	5907723	Wreck
70042	93229			Unkown	53.4899	-3.6588	456290	5926972	Wreck
2022	93231			Unkown	53.45005	-3.9628	436061	5922768	Wreck



2023	94491			Unkown	53.39063	-3.67928	454826	5915942	Wreck
2024	94494			Unkown	53.40782	-3.68277	454613	5917855	Wreck
2025	94512			Unkown	53.42722	-3.64172	457361	5919988	Wreck
70180	94513			Unkown	53.45617	-3.696	453785	5923243	Wreck
70252	7671			Unkown	53.48357	-3.84958	443624	5926401	Wreck
2028	8238			Vine (Possibly)	53.36053	-3.74208	450615	5912635	Wreck

Appendix 5: Seabed geophysical anomalies of archaeological potential

Array area

ID	Classification	Easting	Northing	Archaeological discrimination	L (m)	W (m)	H (m)	Depth below seabed (m)	Least Depth (m LAT)	Magnetic amplitude (nT)	Description	Anomaly type	Dataset	Section	External references
70000	Magnetic	459543	5927049	A2	-	-	-	-	-	125	Identified in the 2020 Mag. dataset as a large, broad asymmetric dipole with peak and trough over two profile lines. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70001	Magnetic	459579	5927309	A2	-	-	-	-	-	14	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70002	Magnetic	459449	5927356	A2	-	-	-	-	-	23	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70003	Magnetic	459375	5927370	A2	-	-	-	-	-	18	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70004	Magnetic	459309	5926703	A2	-	-	-	-	-	12	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70005	Mound	459240	5927202	A2	1.4	1.1	0.4	-	-	-	Identified in the 2020 MBES dataset as a small elongate subrounded mound, with steeper slope on north-west side than south-east. The feature is proximal to metre-scale sand waves and is distinct from surrounding seabed. No corresponding SSS or Mag. contacts. Could be non-ferrous debris or a natural feature.	MBES	2020 Array	Array buffer	-
70006	Magnetic	459142	5926835	A2	-	-	-	-	-	30	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70007	Magnetic	458909	5927164	A2	-	-	-	-	-	27	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70008	Rope/chain	458711	5926706	A2	120.6	1.2	0.2	-	-	-	Identified in the 2020 SSS dataset as a slightly curved linear dark reflector which appears intermittent and possibly partially buried within an area of mobile sediment. A very short shadow is visible in places. There is possibly an additional rounded dark reflector on the eastern end. Visible in the MBES dataset as a long, curvilinear mound. No corresponding Mag. contacts. Interpreted as a rope or chain feature.	SSS	2020 Array	Array	-
70009	Magnetic	458386	5926942	A2	-	-	-	-	-	13	Identified in the 2020 Mag. dataset as a small negative monopole with peak and trough on one profile line. Visible on the MBES dataset as a small mound with scour. No corresponding SSS contacts. Interpreted as a possible natural feature or may be possible ferrous debris.	Mag.	2020 Array	Array	-
70010	Magnetic	458487	5926283	A2	-	-	-	-	-	127	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70011	Rope/chain	458289	5926691	A2	262.0	0.6	0.1	-	-	-	Identified in the 2020 SSS dataset as a long, straight, linear dark reflector which appears intermittent and possibly partially buried within an area of mobile sediment. A very short shadow is visible in places. Visible in the MBES dataset as a very long, straight linear mound within an area of mobile sand. This feature exhibits a similar orientation as 70008 and may be a continuation of the same feature. No corresponding Mag. contacts. Interpreted as a possible rope or chain.	SSS	2020 Array	Array	-



ID	Classification	Easting	Northing	Archaeological discrimination	L (m)	W (m)	H (m)	Depth below seabed (m)	Least Depth (m LAT)	Magnetic amplitude (nT)	Description	Anomaly type	Dataset	Section	External references
70012	Magnetic	458140	5926725	A2	-	-	-	-	-	31	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70013	Magnetic	458152	5926722	A2	-	-	-	-	-	32	Identified in the 2020 Mag. dataset as a small asymmetric dipole with peak and trough on one profile line. This is complex feature with two troughs and as such may represent multiple objects. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70014	Dark reflector	458161	5926743	A2	5.6	0.3	0.1	-	-	-	Identified in the 2020 SSS dataset as an elongate dark reflector with a short rounded shadow. This feature is possibly related to 70008 approximately 50 m away. No corresponding MBES or Mag. contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Array	-
70015	Magnetic	458096	5927456	A2	-	-	-	-	-	28	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70016	Debris	457940	5927366	A1	4.5	2.5	0.0	-	-	-	Identified in the 2020 SSS dataset as a small, sub-rounded dark reflector with no clear shadow. No corresponding MBES or Mag. contacts. This feature is approximately 15 m from wreck 70019 and is interpreted to be possibly associated debris.	SSS	2020 Array	Array buffer	-
70017	Magnetic	457937	5926721	A2	-	-	-	-	-	11	Identified in the 2020 Mag. dataset as a small, broad asymmetric dipole with peak and trough over two profile lines. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70018	Debris field	457903	5927351	A1	37.0	5.3	0.1	-	-	-	Identified in the 2020 SSS dataset as an area of complex linear and angular dark reflectors adjacent to wreck 70019. Small angular shadows are visible in places. No corresponding MBES or Mag. contacts. This feature is adjacent to wreck 70019 and is interpreted to be possibly associated debris.	SSS	2020 Array	Array buffer	-
70019	Wreck	457899	5927359	A1	58.3	13.2	5.5	-	-	2015	Identified in the 2020 SSS dataset as a clear outline of upright, intact wreck, orientated approximately north-east to south-west. A very large, clear shadow is visible, which is roughly in two sections and has a very tall, narrow section which may represent a standing mast. Some complex internal features are visible. Visible in the MBES dataset as a large intact wreck with visible internal structure, oriented approximately north-east to south-west. There is a slight depression on the western edge. Located in an area of metre-scale sand waves with some sediment build up visible on the southern edge. Associated with a very large, sharp asymmetric dipole with peak and trough on one profile line on the mag dataset, suggesting ferrous construction or the presence of ferrous material. Surrounded by a number of debris items (70016, 70018, 70021, and 70023). Listed by the UKHO as the wreck of the <i>Dublin</i> , a steamship built in Dublin by Walpole and Webb in 1866.	MBES, SSS, Mag.	2020 Array	Array buffer	UKHO 7693
70020	Magnetic	457907	5926662	A2	-	-	-	-	-	16	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70021	Debris field	457892	5927373	A1	36.9	13.5	0.0	-	-	-	Identified in the 2020 SSS dataset as an area of complex reflectivity and some small angular dark reflectors. No corresponding MBES or Mag. contacts. Interpreted as a possible area of sediment build-up adjacent to wreck 70019 which may contain buried debris.	SSS	2020 Array	Array buffer	-
70022	Magnetic	457915	5926491	A2	-	-	-	-	-	40	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70023	Debris	457852	5927361	A1	3.5	2.0	0.0	-	-	-	Identified in the 2020 SSS dataset as an indistinct, round dark reflector with a very small shadow. No corresponding MBES or Mag. contacts. This feature is approximately 30 m from wreck 70019 and is interpreted to be possible associated debris.	SSS	2020 Array	Array buffer	-



ID	Classification	Easting	Northing	Archaeological discrimination	L (m)	W (m)	H (m)	Depth below seabed (m)	Least Depth (m LAT)	Magnetic amplitude (nT)	Description	Anomaly type	Dataset	Section	External references
70024	Magnetic	457954	5926325	A2	-	-	-	-	-	38	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70025	Magnetic	457606	5927299	A2	-	-	-	-	-	33	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70026	Magnetic	457705	5926267	A2	-	-	-	-	-	9	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70027	Mound	457717	5925777	A2	1.9	1.3	0.3	-	-	-	Identified in the 2020 MBES dataset as a small subrounded mound, slightly ovoid in shape and with a steeper slope on the north-west side than the south-east side. Proximal to metre-scale sand waves and is distinct from surrounding seabed. Visible in the SSS dataset as a small round dark reflector with a short tapered shadow. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible debris.	MBES	2020 Array	Array buffer	-
70028	Magnetic	457548	5925847	A2	-	-	-	-	-	11	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70029	Magnetic	457266	5927124	A2	-	-	-	-	-	14	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70030	Magnetic	457245	5926970	A2	-	-	-	-	-	14	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70031	Rope/chain	457258	5927407	A2	57.7	1.2	0.2	-	-	201	Identified in the 2020 SSS dataset as a long, curved, intermittent dark reflector or series of smaller reflectors, some with tapered shadows. This feature is located within an area of sand waves and may be partially buried. Associated with a large negative monopole with peak and trough on one profile line in the Mag. dataset. No corresponding MBES contacts. Interpreted as a possible rope or chain feature.	SSS, Mag.	2020 Array	Array buffer	-
70032	Magnetic	457216	5927446	A2	-	-	-	-	-	7	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70033	Magnetic	457334	5926084	A2	-	-	-	-	-	21	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70034	Magnetic	457114	5926480	A2	-	-	-	-	-	17	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70035	Rope/chain	457074	5926134	A2	31.8	0.7	0.1	-	-	-	Identified in the 2020 SSS dataset as a long, linear dark reflector lying in an approximately spiral shape. A short shadow is visible along its length. No corresponding MBES or Mag. contacts. Interpreted as a possible rope or chain feature.	SSS	2020 Array	Array	-
70036	Debris field	456859	5926865	A2	53.9	5.3	0.3	-	-	19	Identified in the 2020 SSS dataset as a series of intermittent linear dark reflectors with very clear irregular shadows. Some additional broader reflectors at the western edge but these may be sediment build-up. Associated with multiple distinct small magnetic anomalies, which may indicate dispersed ferrous objects. No corresponding MBES contacts. Possibly two partially buried ropes or chains roughly parallel, but could be a mostly buried structure.	SSS, Mag.	2020 Array	Array	-



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70037	Magnetic	456775	5927377	A2	-	-	-	-	-	19	Identified in the 2020 Mag. dataset as a small asymmetric dipole with peak and trough over two profile lines. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70038	Magnetic	456840	5926024	A2	-	-	-	-	-	35	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70039	Magnetic	456645	5927502	A2	-	-	-	-	-	10	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70040	Magnetic	456553	5926684	A2	-	-	-	-	-	9	Identified in the 2020 Mag. dataset as a small, broad asymmetric dipole with peak and trough on one profile line and also visible on other profile lines. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70041	Rope/chain	456445	5926475	A2	25.2	0.5	0.1	-	-	-	Identified in the 2020 SSS dataset as a short, curvilinear dark reflector with a short shadow which is located amongst large-scale sedimentary bedforms. No corresponding MBES or Mag. contacts. Interpreted as a possible rope or chain feature.	SSS	2020 Array	Array	-
70042	Wreck	456278	5926972	A1	29.0	8.6	3.7	-	-	-	Identified in the 2020 SSS dataset as a small wreck orientated east-west, appearing upright and intact, with no visible debris spread. An irregular shadow is present, higher at the eastern end, although the extent may be partly sedimentary features. Hull outline is clear but no internal features visible, apart from a central rectangular depression. Shallow scour is visible in the MBES data at the eastern point, and the wreck is situated within metre-scale sand waves. Listed by the UKHO (93229) as an unknown wreck, first identified during a Civil Hydrography Programme survey in 2020.	MBES, SSS	2020 Array	Array	UKHO 93229
70043	Magnetic	456084	5927155	A2	-	-	-	-	-	11	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70044	Seabed disturbance	456028	5926472	A2	12.9	6.7	0.1	-	-	-	Identified in the 2020 SSS dataset as a curved linear dark reflector in a rough circle, with a short shadow. Located within an area of mobile sediments. No corresponding MBES or Mag. contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Array	-
70045	Magnetic	455855	5926380	A2	-	-	-	-	-	10	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70046	Magnetic	455829	5926323	A2	-	-	-	-	-	11	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70047	Magnetic	455300	5927439	A2	-	-	-	-	-	22	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70048	Magnetic	455233	5927076	A2	-	-	-	-	-	36	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70049	Debris	454996	5926855	A2	5.0	3.3	0.1	-	-	14	Identified in the 2020 Mag. dataset as a small, broad symmetric dipole with peak and trough on one profile line. Visible in the MBES dataset as a very small, broad mound. No corresponding SSS contacts. Interpreted as possible ferrous debris.	Mag.	2020 Array	Array	-
70050	Magnetic	454751	5926855	A2	-	-	-	-	-	12	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-



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70051	Magnetic	454710	5927468	A2	-	-	-	-	-	8	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70052	Magnetic	454646	5926818	A2	-	-	-	-	-	25	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70053	Magnetic	454352	5927000	A2	-	-	-	-	-	56	Identified in the 2020 Mag. dataset as a medium, sharp asymmetric dipole with peak and trough on one profile line and also visible on other profile lines. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70054	Magnetic	454273	5927109	A2	-	-	-	-	-	19	Identified in the 2020 Mag. dataset as a small symmetric dipole with peak and trough over two profile lines. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70055	Debris	454252	5926826	A2	4.0	2.5	0.9	-	-	36	Identified in the 2020 SSS dataset as a rounded dark reflector with a short, rounded shadow. Associated with small, broad asymmetric dipole with peak and trough on one profile line on the Mag. dataset. Visible on the MBES dataset as a small round mound in scour. Interpreted as possible ferrous debris.	SSS, Mag.	2020 Array	Array	-
70056	Magnetic	453884	5927092	A2	-	-	-	-	-	16	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70057	Magnetic	453113	5927390	A2	-	-	-	-	-	17	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70058	Magnetic	457214	5925264	A2	-	-	-	-	-	147	Identified in the 2020 Mag. dataset as a large, sharp asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70059	Magnetic	457089	5925554	A2	-	-	-	-	-	11	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70060	Magnetic	457055	5925571	A2	-	-	-	-	-	32	Identified in the 2020 Mag. dataset as a small asymmetric dipole with peak and trough over two profile lines and also visible on other profile lines. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70061	Magnetic	456419	5925553	A2	-	-	-	-	-	9	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70062	Seabed disturbance	456601	5925780	A2	45.9	7.1	0.1	-	-	-	Identified in the 2020 SSS dataset as a series of linear dark reflectors with shadows protruding from a sand wave crest. No corresponding Mag. or MBES contacts. Interpreted as a possible seabed scar or may be possible debris.	SSS	2020 Array	Array	-
70063	Magnetic	456230	5925464	A2	-	-	-	-	-	10	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70064	Magnetic	456019	5925546	A2	-	-	-	-	-	26	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-



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70065	Magnetic	456086	5925753	A2	-	-	-	-	-	8	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70066	Dark reflector	455283	5925482	A2	5.2	1.0	0.3	-	-	-	Identified in the 2020 SSS dataset as a small, slightly angular dark reflector with a short tapered shadow at one end and some minor surrounding sediment disturbance. One of a line of four similar objects approximately 45 m long separated equidistantly along with 70067 , 70068 and 70069 . Visible on the MBES dataset as a small mound in scour. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Array	-
70067	Dark reflector	455281	5925499	A2	3.4	1.1	0.3	-	-	-	Identified in the 2020 SSS dataset as a small, slightly angular dark reflector with a short tapered shadow at one end and some minor surrounding sediment disturbance. One of a line of four similar objects approximately 45 m long separated equidistantly along with 70066 , 70068 and 70069 . Visible on the MBES dataset as a small mound in scour. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Array	-
70068	Dark reflector	455280	5925514	A2	3.0	0.9	0.1	-	-	-	Identified in the 2020 SSS dataset as a small, slightly angular dark reflector with a short tapered shadow at one end and some minor surrounding sediment disturbance. One of a line of four similar objects approximately 45 m long separated equidistantly along with 70066 , 70067 and 70069 . No corresponding MBES or Mag. contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Array	-
70069	Dark reflector	455268	5925527	A2	3.2	1.1	0.2	-	-	-	Identified in the 2020 SSS dataset as a small, slightly angular dark reflector with a short tapered shadow at one end, a small area of scour and some minor surrounding sediment disturbance. One of a line of four similar objects approximately 45 m long separated equidistantly along with 70066 , 70067 and 70068 . Visible on the MBES dataset as a small mound in scour. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Array	-
70070	Magnetic	455173	5925621	A2	-	-	-	-	-	23	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70071	Magnetic	455137	5925638	A2	-	-	-	-	-	18	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70072	Mound	455104	5925660	A2	2.2	1.1	0.3	-	-	-	Identified in the 2020 MBES dataset as a small rounded mound within a slight depression and distinct from surrounding seabed. Visible in the SSS dataset as a small dark reflector with a very indistinct tapered shadow and situated within scour. No corresponding Mag. contacts. One of a cluster of anomalies with 70073 and 70074 . Interpreted as a possible natural feature or may be possible debris.	MBES, SSS	2020 Array	Array	-
70073	Mound	455072	5925640	A2	1.4	1.2	0.3	-	-	-	Identified in the 2020 MBES dataset as a small, slightly ovoid mound within a slight depression. Visible in the SSS dataset as a small dark reflector with a tapered shadow and situated within scour. One of a cluster of anomalies with 70072 and 70074 . No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible debris.	MBES, SSS	2020 Array	Array	-
70074	Mound	455046	5925667	A2	3.0	2.4	0.2	-	-	-	Identified in the 2020 MBES dataset as a small, slightly ovoid mound within slight depression. Visible in the SSS dataset as a small dark reflector with a tapered shadow and situated within scour. No corresponding Mag. contacts. One of a cluster of anomalies with 70072 and 70073 . Interpreted as a possible natural feature or may be possible debris.	MBES, SSS	2020 Array	Array	-
70075	Magnetic	455099	5926274	A2	-	-	-	-	-	18	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-



ID	Classification	Easting	Northing	Archaeological discrimination	L (m)	W (m)	H (m)	Depth below seabed (m)	Least Depth (m LAT)	Magnetic amplitude (nT)	Description	Anomaly type	Dataset	Section	External references
70076	Magnetic	455053	5926282	A2	-	-	-	-	-	8	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70077	Magnetic	454419	5925963	A2	-	-	-	-	-	16	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70078	Dark reflector	454360	5926063	A2	6.4	2.9	0.4	-	-	-	Identified in the 2020 SSS dataset as an indistinct, elongate dark reflector with possibly a very indistinct shadow, although may just be surrounding scour or disturbance. Also visible in the MBES dataset as a distinct mound. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris.	SSS	2020 Array	Array	-
70079	Magnetic	454294	5926318	A2	-	-	-	-	-	15	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70080	Magnetic	454027	5926574	A2	-	-	-	-	-	8	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70081	Magnetic	453716	5925980	A2	-	-	-	-	-	10	Identified in the 2020 Mag. dataset as a small, broad asymmetric dipole with peak and trough over two profile lines. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70082	Magnetic	453026	5926775	A2	-	-	-	-	-	14	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70083	Magnetic	452621	5926686	A2	-	-	-	-	-	9	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70084	Magnetic	452381	5926395	A2	-	-	-	-	-	19	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70085	Magnetic	452641	5927160	A2	-	-	-	-	-	11	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70086	Magnetic	452341	5926478	A2	-	-	-	-	-	10	Identified in the 2020 Mag. dataset as a small, broad asymmetric dipole with peak and trough on one profile line. There is a small depression visible in the MBES dataset that may be associated. No corresponding SSS contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70087	Magnetic	452063	5926577	A2	-	-	-	-	-	12	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70088	Magnetic	452060	5927283	A2	-	-	-	-	-	165	Identified in the 2020 Mag. dataset as a large, sharp asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70089	Magnetic	451791	5927466	A2	-	-	-	-	-	10	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-



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70090	Magnetic	451463	5927149	A2	-	-	-	-	-	29	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70091	Magnetic	451425	5927350	A2	-	-	-	-	-	13	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70092	Magnetic	450714	5926921	A2	-	-	-	-	-	31	Identified in the 2020 Mag. dataset as a small positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70093	Magnetic	449853	5927308	A2	-	-	-	-	-	152	Identified in the 2020 Mag. dataset as a large, sharp asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70094	Debris field	455998	5924470	A2	12.6	6.1	0.3	-	-	-	Identified in the 2020 SSS dataset as an elongate, slightly irregular dark reflector with a short shadow. No corresponding Mag. or MBES contacts. Interpreted as a possible modern wind farm infrastructure or may be possible debris. Retained as a precaution.	SSS	2020 Array	Array buffer	-
70095	Magnetic	455485	5924963	A2	-	-	-	-	-	120	Identified in the 2020 Mag. dataset as a large negative monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70096	Dark reflector	455559	5925013	A2	3.4	0.7	0.1	-	-	-	Identified in the 2020 SSS dataset as a very small, short linear dark reflector with a small rounded shadow, one of a cluster of three similar anomalies. No corresponding Mag. or MBES contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris.	SSS	2020 Array	Array	-
70097	Debris	455541	5925031	A2	3.2	1.2	0.4	-	-	-	Identified in the 2020 SSS dataset as a small, slightly angular dark reflector with a short tapered shadow, one of a cluster of three similar anomalies. Visible in the MBES dataset as a small, ovoid mound within depression, distinct from surrounding seabed. No corresponding Mag. contacts. Interpreted as possible debris.	SSS, MBES	2020 Array	Array	-
70098	Dark reflector	455512	5925024	A2	4.6	2.3	0.3	-	-	-	Identified in the 2020 SSS dataset as a small, irregular dark reflector with a short tapered shadow, one of a cluster of three similar anomalies. Visible on the MBES dataset as a small round mound. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Array	-
70099	Debris	455085	5924946	A2	7.5	6.3	1.7	-	-	-	Identified in the 2020 SSS dataset as a large, rounded dark reflector with a bright, tall shadow and some scour and disturbed seabed visible. Visible on the MBES dataset as a large mound with scour. No corresponding Mag. contacts. Interpreted as possible debris.	SSS, MBES	2020 Array	Array	-
70100	Dark reflector	455030	5924982	A2	2.6	2.5	0.6	-	-	-	Identified in the 2020 SSS dataset as a small angular dark reflector with a short tapered shadow. Visible in the MBES dataset as a small sub-rounded mound within depression. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible debris and possibly related to nearby feature 70099 .	SSS, MBES	2020 Array	Array	-
70101	Dark reflector	455004	5924945	A2	3.3	1.0	0.2	-	-	-	Identified in the 2020 SSS dataset as a small angular dark reflector with a short tapered shadow. This object is possibly related to the nearby debris field 70099. No corresponding Mag. or MBES contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Array	-
70102	Magnetic	454549	5925065	A2	-	-	-	-	-	24	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70103	Magnetic	454404	5924641	A2	-	-	-	-	-	102	Identified in the 2020 Mag. dataset as a large, sharp asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-



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70104	Magnetic	454282	5925005	A2	-	-	-	-	-	39	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70105	Magnetic	454216	5925184	A2	-	-	-	-	-	62	Identified in the 2020 Mag. dataset as a medium, sharp asymmetric dipole with peak and trough over two profile lines. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70106	Rope/chain	454127	5924869	A2	9.9	0.7	0.1	-	-	-	Identified in the 2020 SSS dataset as a short, slightly curvilinear dark reflector with a short shadow consistent along its length. This feature is perpendicular to the orientation of surrounding sedimentary bedforms. No corresponding Mag. or MBES contacts. Interpreted as a possible rope or chain feature.	SSS	2020 Array	Array	-
70107	Magnetic	453763	5925029	A2	-	-	-	-	-	35	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70108	Magnetic	452789	5925456	A2	-	-	-	-	-	22	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70109	Magnetic	452713	5925483	A2	-	-	-	-	-	10	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70110	Magnetic	452816	5925996	A2	-	-	-	-	-	22	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70111	Magnetic	452304	5926189	A2	-	-	-	-	-	50	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70112	Magnetic	452018	5926361	A2	-	-	-	-	-	8	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70113	Magnetic	451773	5925823	A2	-	-	-	-	-	13	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70114	Magnetic	451947	5926387	A2	-	-	-	-	-	33	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70115	Magnetic	451888	5926260	A2	-	-	-	-	-	22	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70116	Magnetic	451759	5926221	A2	-	-	-	-	-	19	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70117	Magnetic	451678	5926104	A2	-	-	-	-	-	25	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-



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70118	Magnetic	451743	5926390	A2	-	-	-	-	-	15	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70119	Magnetic	450998	5926180	A2	-	-	-	-	-	55	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70120	Magnetic	450516	5926038	A2	-	-	-	-	-	9	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70121	Magnetic	450506	5926140	A2	-	-	-	-	-	16	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70122	Magnetic	450481	5926050	A2	-	-	-	-	-	32	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70123	Magnetic	450520	5926586	A2	-	-	-	-	-	36	Identified in the 2020 Mag. dataset as a small positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70124	Magnetic	450283	5926357	A2	-	-	-	-	-	8	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70125	Magnetic	450367	5926887	A2	-	-	-	-	-	12	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70126	Magnetic	450359	5926973	A2	-	-	-	-	-	24	Identified in the 2020 Mag. dataset as a small asymmetric dipole with peak and trough over two profile lines. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70127	Magnetic	449675	5926475	A2	-	-	-	-	-	17	Identified in the 2020 Mag. dataset as a small asymmetric dipole with peak and trough over two profile lines. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70128	Magnetic	449579	5927092	A2	-	-	-	-	-	26	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70129	Magnetic	448957	5926996	A2	-	-	-	-	-	15	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70130	Magnetic	448586	5927132	A2	-	-	-	-	-	14	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70131	Magnetic	448011	5927180	A2	-	-	-	-	-	14	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70132	Magnetic	447292	5927220	A2	-	-	-	-	-	88	Identified in the 2020 Mag. dataset as a medium, sharp asymmetric dipole with peak and trough over two profile lines. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-



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70133	Dark reflector	454697	5923721	A2	3.8	0.9	0.2	-	-	-	Identified in the 2020 SSS data as a small, angular dark reflector which is wider at one end with a sloping shadow. Isolated within an area of mobile sediments. No corresponding MBES contact. Possible non-ferrous debris or a natural feature.	SSS	2020 Array	Array buffer, AyM-GyM interlink	-
70134	Magnetic	454375	5923958	A2	-	-	-	-	-	61	Identified in the 2020 Mag. data as a medium asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array buffer	-
70135	Magnetic	452946	5924315	A2	-	-	-	-	-	10	Identified in the 2020 Mag. data as a small, broad symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70136	Magnetic	453131	5924634	A2	-	-	-	-	-	61	Identified in the 2020 Mag. data as a medium negative monopole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array	-
70137	Mound	452920	5924466	A2	1.8	1.6	0.4	-	-	-	Identified in the 2020 MBES data as a small elongate mound directly adjacent to sand waves, with slight scour on the northern and southern edges. No corresponding SSS or Mag. contact. Possible non-ferrous debris or a natural feature.	MBES	2020 Array	Array	-
70138	Magnetic	452636	5924504	A2	-	-	-	-	-	12	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70139	Dark reflector	452279	5924536	A2	4.4	0.3	0.0	-	-	-	Identified in the 2020 SSS data as a slightly elongate dark reflector with a short, sloping shadow. No corresponding MBES or Mag. contact. Possible non-ferrous debris or a natural feature.	SSS	2020 Array	Array	-
70140	Magnetic	452287	5924947	A2	-	-	-	-	-	37	Identified in the 2020 Mag. data as a small negative monopole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array	-
70141	Magnetic	450997	5925232	A2	-	-	-	-	-	64	Identified in the 2020 Mag. data as a medium asymmetric dipole with peak and trough on one profile line. Also visible on other profile lines. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array	-
70142	Magnetic	450894	5925213	A2	-	-	-	-	-	170	Identified in the 2020 Mag. data as a large, sharp asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array	-
70143	Magnetic	451055	5925372	A2	-	-	-	-	-	154	Identified in the 2020 Mag. data as a large, sharp positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array	-
70144	Magnetic	451249	5925546	A2	-	-	-	-	-	26	Identified in the 2020 Mag. data as a small positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70145	Magnetic	450843	5925297	A2	-	-	-	-	-	99	Identified in the 2020 Mag. data as a medium, sharp asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array	-
70146	Magnetic	450892	5925597	A2	-	-	-	-	-	45	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array	-
70147	Magnetic	450765	5925811	A2	-	-	-	-	-	10	Identified in the 2020 Mag. data as a small, broad symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70148	Magnetic	449953	5925677	A2	-	-	-	-	-	14	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. Also visible on other profile lines. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70149	Magnetic	450101	5926144	A2	-	-	-	-	-	8	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-



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70150	Magnetic	449838	5925977	A2	-	-	-	-	-	20	Identified in the 2020 Mag. data as a small, broad positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70151	Magnetic	449680	5925794	A2	-	-	-	-	-	8	Identified in the 2020 Mag. data as a small, broad symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70152	Magnetic	449432	5925693	A2	-	-	-	-	-	7	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70153	Magnetic	449422	5925809	A2	-	-	-	-	-	12	Identified in the 2020 Mag. data as a small, broad symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70154	Magnetic	449503	5925940	A2	-	-	-	-	-	24	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough over two profile lines. Visible on adjacent profile lines. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70155	Magnetic	448927	5925926	A2	-	-	-	-	-	5	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. Small but distinct from rest of line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70156	Magnetic	448708	5925758	A2	-	-	-	-	-	19	Identified in the 2020 Mag. data as a small symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70157	Magnetic	449116	5926473	A2	-	-	-	-	-	10	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70158	Magnetic	448745	5926605	A2	-	-	-	-	-	19	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70159	Magnetic	448572	5926432	A2	-	-	-	-	-	30	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array	-
70160	Seabed disturbance	448593	5926572	A2	14.2	11.8	0.5	-	-	-	Identified in the 2020 SSS data as an irregular area of angular dark reflectors which cast a broad shadow. Visible in the MBES data as a sub-angular mound, with a curved ridge on the northern side and a slight peak in the centre. The feature has a scour extending 10 m to the east. No corresponding Mag. contact. Possible non-ferrous debris or a natural feature.	SSS, MBES	2020 Array	Array	-
70161	Magnetic	447901	5926841	A2	-	-	-	-	-	12	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70162	Dark reflector	447501	5926564	A2	8.4	1.5	0.2	-	-	-	Identified in the 2020 SSS data as a curved linear dark reflector with a short shadow and a relatively long area of scour to the southeast. Distinct in an otherwise featureless area of seabed. No definite corresponding MBES or Mag. contact, but a small possible mound seen on the MBES data may be related. Possible non-ferrous debris or a natural feature.	SSS	2020 Array	Array	-
70163	Dark reflector	447675	5926872	A2	2.3	1.2	0.4	-	-	-	Identified in the 2020 SSS data as an elongate, rounded dark reflector with a short rounded shadow and an irregular area of scour. No definite corresponding MBES or Mag. contact, but a small possible mound seen on the MBES data may be related. Possible non-ferrous debris or a natural feature.	SSS	2020 Array	Array	-



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70164	Magnetic	447682	5926953	A2	-	-	-	-	-	15	Identified in the 2020 Mag. data as a small, broad symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70165	Magnetic	447126	5926721	A2	-	-	-	-	-	10	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70166	Magnetic	446604	5926521	A2	-	-	-	-	-	13	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70167	Magnetic	446588	5926834	A2	-	-	-	-	-	23	Identified in the 2020 Mag. data as a small symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array buffer	-
70168	Magnetic	446708	5927041	A2	-	-	-	-	-	19	Identified in the 2020 Mag. data as a small symmetric dipole with peak and trough over two profile lines. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70169	Magnetic	446815	5927237	A2	-	-	-	-	-	81	Identified in the 2020 Mag. data as a medium, sharp symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array	-
70170	Magnetic	446261	5926800	A2	-	-	-	-	-	19	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array buffer	-
70171	Magnetic	446120	5927004	A2	-	-	-	-	-	47	Identified in the 2020 Mag. data as a small positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array buffer	-
70172	Magnetic	446049	5927110	A2	-	-	-	-	-	12	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70173	Magnetic	445766	5926817	A2	-	-	-	-	-	12	Identified in the 2020 Mag. data as a small negative monopole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70174	Magnetic	445799	5926882	A2	-	-	-	-	-	36	Identified in the 2020 Mag. data as a small positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array buffer	-
70175	Magnetic	445663	5927037	A2	-	-	-	-	-	25	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array buffer	-
70176	Magnetic	445709	5927087	A2	-	-	-	-	-	23	Identified in the 2020 Mag. data as a small, broad positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70177	Magnetic	445576	5927354	A2	-	-	-	-	-	7	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array buffer	-
70178	Magnetic	444869	5927390	A2	-	-	-	-	-	16	Identified in the 2020 Mag. data as a small, broad positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array buffer	-



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70179	Dark reflector	454106	5923573	A2	6.4	0.7	0.1	-	-	-	Identified in the 2020 SSS dataset as a linear, slightly curved dark reflector with a short shadow. Located in an area of mobile sediment. Also visible in the MBES dataset as a short curved mound with some surrounding scour. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris.	SSS	2020 Array	Array	-
70180	Wreck	453786	5923243	A1	21.8	10.4	3.2	-	-	2225	Identified in the 2020 SSS dataset as an unidentified wreck first observed in this dataset. In the SSS dataset this is visible as an irregular seabed disturbance measuring 21.8 x 10.4 x 3.2 m, containing a square dark reflector with a large, straight shadow at the south-western end, which may be an intact boiler. No other recognisable intact vessel structure is visible. In the MBES dataset, the main section of the potential wreck appears as a low, elongate mound, trending north-east to south-west. The potential boiler is visible at the south-western end of the main section as a distinct, taller mound with multiple peaks. If the anomaly is a wreck, it appears severely degraded and/or mostly buried. This is associated with a very large magnetic anomaly of 2225 nT, indicating significant amount of ferrous material. Recorded by the UKHO as an obstruction (94513) first identified during a Civil Hydrography Programme survey in 2020.	SSS, MBES, Mag.	2020 Array	Array	UKHO 94513
70181	Magnetic	453738	5923025	A2	-	-	-	-	-	129	Identified in the 2020 Mag. dataset as a large, sharp asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70182	Magnetic	453295	5923250	A2	-	-	-	-	-	41	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70183	Magnetic	453087	5923806	A2	-	-	-	-	-	13	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70184	Magnetic	452358	5923670	A2	-	-	-	-	-	12	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70185	Magnetic	452095	5924161	A2	-	-	-	-	-	21	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70186	Magnetic	451003	5924390	A2	-	-	-	-	-	28	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70187	Magnetic	450737	5924337	A2	-	-	-	-	-	17	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70188	Magnetic	450713	5924751	A2	-	-	-	-	-	51	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70189	Magnetic	450167	5924619	A2	-	-	-	-	-	42	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70190	Magnetic	449583	5924981	A2	-	-	-	-	-	16	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-



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70191	Magnetic	449670	5925254	A2	-	-	-	-	-	7	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70192	Magnetic	449431	5925276	A2	-	-	-	-	-	13	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70193	Magnetic	448723	5924907	A2	-	-	-	-	-	26	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70194	Magnetic	448827	5925420	A2	-	-	-	-	-	18	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70195	Magnetic	448308	5925434	A2	-	-	-	-	-	34	Identified in the 2020 Mag. dataset as a small asymmetric dipole with peak and trough over two profile lines. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70196	Magnetic	448211	5925866	A2	-	-	-	-	-	27	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70197	Magnetic	447825	5925386	A2	-	-	-	-	-	10	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70198	Magnetic	447739	5925567	A2	-	-	-	-	-	16	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70199	Magnetic	447318	5925651	A2	-	-	-	-	-	7	Identified in the 2020 Mag. dataset as a small, broad asymmetric dipole with peak and trough over two profile lines. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70200	Magnetic	446917	5926039	A2	-	-	-	-	-	27	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70201	Magnetic	446865	5926117	A2	-	-	-	-	-	5	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70202	Magnetic	446693	5926105	A2	-	-	-	-	-	12	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70203	Magnetic	446401	5926063	A2	-	-	-	-	-	6	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70204	Magnetic	446319	5926395	A2	-	-	-	-	-	14	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70205	Magnetic	445894	5925933	A2	-	-	-	-	-	7	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-



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70206	Magnetic	446075	5926484	A2	-	-	-	-	-	63	Identified in the 2020 Mag. dataset as a medium, sharp symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70207	Magnetic	445853	5925964	A2	-	-	-	-	-	198	Identified in the 2020 Mag. dataset as a large, sharp asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70208	Magnetic	445674	5926389	A2	-	-	-	-	-	52	Identified in the 2020 Mag. dataset as a medium symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70209	Magnetic	445688	5926542	A2	-	-	-	-	-	7	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70210	Magnetic	445026	5926680	A2	-	-	-	-	-	15	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70211	Magnetic	444637	5927073	A2	-	-	-	-	-	209	Identified in the 2020 Mag. dataset as a large, sharp positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70212	Magnetic	444133	5926785	A2	-	-	-	-	-	11	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70213	Magnetic	444029	5926666	A2	-	-	-	-	-	11	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70214	Magnetic	443775	5927075	A2	-	-	-	-	-	45	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70215	Magnetic	443365	5927224	A2	-	-	-	-	-	14	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70216	Magnetic	442154	5927184	A2	-	-	-	-	-	20	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70217	Magnetic	454664	5922136	A2	-	-	-	-	-	5	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer, AyM-GyM interlink	-
70218	Debris	453508	5922965	A2	15.0	0.9	0.1	-	-	-	Identified in the 2020 SSS dataset as a distinct elongate dark reflector with some scour to the north-east. Visible in the MBES dataset as a very indistinct elongate mound. One of a group of three anomalies with 70219 and 70220 in a NE-SW orientated line extending approximately 60 m. No corresponding Mag. contacts. Interpreted as possible debris.	SSS	2020 Array	Array	-
70219	Debris	453488	5922978	A2	2.5	1.1	0.2	-	-	-	Identified in the 2020 SSS dataset as a distinct, rounded dark reflector with no clear shadow, located in an area of sand ripples. Visible in the MBES dataset as a very small round mound. One of a group of three anomalies with 70218 and 70220 in a NE-SW orientated line extending approximately 60 m. No corresponding Mag. contacts. Interpreted as possible debris.	SSS	2020 Array	Array	-



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70220	Debris	453450	5923001	A2	2.4	0.6	0.4	-	-	-	Identified in the 2020 SSS dataset as a distinct dark reflector with no discernible shadow and some possible scour to the north and south. Visible in the MBES dataset as a very small round mound. One of a group of three anomalies with 70218 and 70219 in a NE-SW orientated line extending approximately 60 m. No corresponding Mag. contacts. Interpreted as possible debris.	SSS	2020 Array	Array	-
70221	Magnetic	453229	5922724	A2	-	-	-	-	-	9	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70222	Magnetic	452873	5923171	A2	-	-	-	-	-	13	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70223	Seabed disturbance	452591	5923171	A2	2.7	2.3	0.0	-	-	-	Identified in the 2020 SSS dataset as a distinct subrounded seabed disturbance in an area of sand ripples. A small additional dark reflector is visible to the south-east. No corresponding MBES or Mag. contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Array	-
70224	Magnetic	452111	5922985	A2	-	-	-	-	-	6	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70225	Magnetic	451547	5923028	A2	-	-	-	-	-	130	Identified in the 2020 Mag. dataset as a large, sharp asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70226	Magnetic	450185	5923355	A2	-	-	-	-	-	10	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70227	Magnetic	449500	5923602	A2	-	-	-	-	-	16	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70228	Magnetic	449020	5924110	A2	-	-	-	-	-	20	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70229	Magnetic	448558	5924644	A2	-	-	-	-	-	28	Identified in the 2020 Mag. dataset as a small positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70230	Magnetic	446632	5924881	A2	-	-	-	-	-	11	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70231	Magnetic	446615	5924969	A2	-	-	-	-	-	40	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70232	Magnetic	446200	5925260	A2	-	-	-	-	-	94	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70233	Magnetic	445970	5925670	A2	-	-	-	-	-	38	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-



ID	Classification	Easting	Northing	Archaeological discrimination	L (m)	W (m)	H (m)	Depth below seabed (m)	Least Depth (m LAT)	Magnetic amplitude (nT)	Description	Anomaly type	Dataset	Section	External references
70234	Magnetic	445579	5925019	A2	-	-	-	-	-	21	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70235	Magnetic	445705	5925766	A2	-	-	-	-	-	74	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70236	Magnetic	445523	5925900	A2	-	-	-	-	-	6	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70237	Magnetic	445137	5925179	A2	-	-	-	-	-	7	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70238	Magnetic	445110	5925654	A2	-	-	-	-	-	44	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70239	Magnetic	444872	5925430	A2	-	-	-	-	-	43	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70240	Magnetic	444921	5925814	A2	-	-	-	-	-	16	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70241	Magnetic	444789	5925768	A2	-	-	-	-	-	6	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70242	Magnetic	444358	5925851	A2	-	-	-	-	-	34	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70243	Magnetic	444516	5926261	A2	-	-	-	-	-	30	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70244	Magnetic	444316	5926168	A2	-	-	-	-	-	8	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70245	Magnetic	443726	5926152	A2	-	-	-	-	-	15	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70246	Magnetic	443728	5926243	A2	-	-	-	-	-	10	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70247	Magnetic	443530	5926004	A2	-	-	-	-	-	254	Identified in the 2020 Mag. dataset as a large, sharp asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70248	Magnetic	443619	5926283	A2	-	-	-	-	-	36	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-



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70249	Magnetic	443453	5925941	A2	-	-	-	-	-	14	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70250	Magnetic	443355	5925908	A2	-	-	-	-	-	37	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70251	Magnetic	443525	5926386	A2	-	-	-	-	-	25	Identified in the 2020 Mag. dataset as a small positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70252	Recorded wreck	443624	5926402	A3	-	-	-	-	-	-	Recorded position of an unidentified wreck first observed in 1939. Not located by subsequent surveys, and marked for deletion from the record in 1988. No associated geophysical anomaly, although the position is within an area of numerous Mag. anomalies. Any wreck at this location is likely well dispersed and/or buried, or the record is inaccurately positioned and the associated wreck is located elsewhere. Position retained as a precaution.	-	-	Array	UKHO 7671
70253	Magnetic	443294	5925932	A2	-	-	-	-	-	7	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70254	Magnetic	443264	5925944	A2	-	-	-	-	-	120	Identified in the 2020 Mag. dataset as a large, sharp asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70255	Magnetic	443224	5926023	A2	-	-	-	-	-	12	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70256	Magnetic	443374	5926442	A2	-	-	-	-	-	49	Identified in the 2020 Mag. dataset as a small asymmetric dipole with peak and trough over two profile lines and visible on other profile lines. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70257	Magnetic	443343	5926382	A2	-	-	-	-	-	22	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70258	Magnetic	443098	5926005	A2	-	-	-	-	-	14	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70259	Magnetic	443067	5925926	A2	-	-	-	-	-	25	Identified in the 2020 Mag. dataset as a small positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70260	Magnetic	443000	5926038	A2	-	-	-	-	-	5	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70261	Magnetic	442362	5926176	A2	-	-	-	-	-	9	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70262	Magnetic	442618	5926911	A2	-	-	-	-	-	17	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-



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70263	Magnetic	442164	5926637	A2	-	-	-	-	-	42	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70264	Magnetic	442062	5926844	A2	-	-	-	-	-	33	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70265	Magnetic	441535	5926475	A2	-	-	-	-	-	25	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70266	Magnetic	441508	5927111	A2	-	-	-	-	-	12	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70267	Magnetic	441319	5926645	A2	-	-	-	-	-	10	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70268	Magnetic	440381	5926910	A2	-	-	-	-	-	18	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70270	Magnetic	453848	5921567	A2	-	-	-	-	-	68	Identified in the 2020 Mag. dataset as a medium positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer, ECC, AyM-GyM interlink	-
70271	Magnetic	450758	5922211	A2	-	-	-	-	-	18	Identified in the 2020 Mag. dataset as a small, broad positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70272	Magnetic	450884	5922633	A2	-	-	-	-	-	10	Identified in the 2020 Mag. dataset as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70273	Magnetic	450788	5922526	A2	-	-	-	-	-	10	Identified in the 2020 Mag. dataset as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70274	Magnetic	450769	5922675	A2	-	-	-	-	-	26	Identified in the 2020 Mag. dataset as a small asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70275	Magnetic	450511	5922539	A2	-	-	-	-	-	33	Identified in the 2020 Mag. dataset as a small symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70276	Magnetic	450179	5922501	A2	-	-	-	-	-	22	Identified in the 2020 Mag. dataset as a small symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70277	Magnetic	450157	5922992	A2	-	-	-	-	-	33	Identified in the 2020 Mag. dataset as a small symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-



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70278	Dark reflector	450088	5922976	A2	2.7	0.8	0.1	-	-	-	Identified in the 2020 SSS dataset as a distinct elongate dark reflector with a bright shadow, located in an area of mobile seabed sediment. Appears on an acute angle to local bedforms. No corresponding MBES or Mag. contact. Possible debris or a natural feature.	SSS	2020 Array	Array	-
70279	Magnetic	449737	5922813	A2	-	-	-	-	-	74	Identified in the 2020 Mag. dataset as a medium dipole visible on one profile line. No corresponding SSS or MBES contacts. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70280	Magnetic	449698	5922827	A2	-	-	-	-	-	47	Identified in the 2020 Mag. dataset as a small positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70281	Debris	449619	5922837	A2	3.2	0.4	0.1	-	-	-	Identified in SSS data as a distinct elongate dark reflector with a bright shadow, located in an area of mobile seabed sediment. No corresponding MBES or Mag. contact. Likely related to 70282 located 2m north-east. Possible item of debris.	SSS	2020 Array	Array	-
70282	Debris	449620	5922840	A2	1.1	0.3	0.1	-	-	-	Identified in SSS data as a distinct elongate dark reflector with a bright shadow, located in an area of mobile seabed sediment. No corresponding MBES or Mag. contact. Likely related to 70281 located 2m south-west. Possible item of debris.	SSS	2020 Array	Array	-
70283	Dark reflector	449513	5923490	A2	1.7	1.2	0.1	-	-	-	Identified in the 2020 SSS dataset as an indistinct rounded dark reflector with a bright shadow, located in an area of mobile seabed sediment. No corresponding MBES or Mag. contact. Possible debris or a natural feature.	SSS	2020 Array	Array	-
70284	Dark reflector	449190	5922979	A2	3.6	0.2	0.3	-	-	-	Identified in the 2020 SSS dataset as a distinct elongate dark reflector with a bright shadow. The shadow appears curved possibly indicating a second facet or a separate secondary anomaly. No corresponding MBES or Mag. contact. Possible debris or a natural feature.	SSS	2020 Array	Array	-
70285	Magnetic	449250	5923224	A2	-	-	-	-	-	9	Identified in the 2020 Mag. dataset as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70286	Debris	449219	5923481	A2	4.3	0.5	0.2	-	-	-	Identified in the 2020 SSS dataset as a distinct curvilinear dark reflector with a shadow, located in an area of mobile seabed sediment. No corresponding MBES or Mag. contact. Possible item of debris.	SSS	2020 Array	Array	-
70287	Magnetic	448688	5923336	A2	-	-	-	-	-	9	Identified in the 2020 Mag. dataset as a small, broad symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. May represent a natural feature or may represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70288	Magnetic	448698	5923423	A2	-	-	-	-	-	6	Identified in the 2020 Mag. dataset as a small, broad positive monopole with peak and trough on one profile line. No corresponding SSS contact but a slight seabed disturbance is visible with two angular mounds measuring 9.5 x 2.2 x 0.1 m maximum. Retained as a precaution. May represent a natural feature or may represent possible ferrous debris with little surface expression.	Mag.	2020 Array	Array	-
70289	Magnetic	448242	5923537	A2	-	-	-	-	-	17	Identified in the 2020 Mag. dataset as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. May represent a natural feature or may represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70290	Magnetic	448311	5923876	A2	-	-	-	-	-	7	Identified in the 2020 Mag. dataset as a small negative monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. May represent a natural feature or may represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70291	Magnetic	448160	5923777	A2	-	-	-	-	-	41	Identified in the 2020 Mag. dataset as a small asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70292	Magnetic	447864	5923646	A2	-	-	-	-	-	42	Identified in the 2020 Mag. dataset as a small, broad, positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. May represent a natural feature or may represent possible ferrous debris that is either buried or with no surface expression. Retained as a precaution.	Mag.	2020 Array	Array	-



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70293	Wreck	447402	5923866	A1	70.3	37.1	2.2	-	-26.0	1616	An area of irregular incoherent dark reflectors with significant shadow identified in the 2020 SSS data, interpreted as a wreck. The wreck is highly degraded and potentially partially buried in mobile seabed sediment, although a series of parallel dark reflectors with shadows identified at the east end could indicate intact vessel frame. Observed in the MBES data as a large area of angular elongate objects ranging from 3.5 m to 28.5 m in length, orientated north-west to south-east. A very large anomaly identified in the Mag. data indicates the presence of significant amounts of ferrous material. Corresponds with UKHO record 7620, and is possibly the wreck of the sailing vessel <i>Chacabuco</i> which is reported to have sunk following a collision with the SS Torch. It is reported as being a highly broken-up sailing vessel, partially buried in a sandwave, and with a significant amount of collapsed steel wreckage, which correlates with the geophysical anomalies observed during this assessment.	SSS, MBES, Mag.	2020 Array	Array	UKHO 7620
70294	Magnetic	447208	5923503	A2	-	-	-	-	-	33	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70295	Magnetic	447161	5923520	A2	-	-	-	-	-	8	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70296	Magnetic	447041	5923880	A2	-	-	-	-	-	13	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70297	Magnetic	446803	5923997	A2	-	-	-	-	-	15	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70298	Magnetic	446005	5924253	A2	-	-	-	-	-	19	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70299	Magnetic	445203	5924292	A2	-	-	-	-	-	19	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70300	Magnetic	445354	5924704	A2	-	-	-	-	-	29	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70301	Magnetic	445068	5924275	A2	-	-	-	-	-	8	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70302	Magnetic	444989	5924755	A2	-	-	-	-	-	33	Identified in the 2020 Mag. dataset as a small, broad symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. May represent a natural feature or may represent possible ferrous debris that is either buried or with no surface expression. Retained as a precaution.	Mag.	2020 Array	Array	-
70303	Dark reflector	444733	5924468	A2	3.0	0.1	0.1	-	-	-	Identified in the 2020 SSS dataset as a distinct elongate dark reflector with a bright shadow, located in an area of mobile seabed sediment. Lies perpendicular to surrounding seabed formations. No corresponding MBES or Mag. contact. Interpreted as a possible natural feature or possible debris.	SSS	2020 Array	Array	-
70304	Magnetic	444872	5924964	A2	-	-	-	-	-	16	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-



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70305	Magnetic	444160	5924669	A2	-	-	-	-	-	68	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70306	Magnetic	443881	5924852	A2	-	-	-	-	-	56	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70307	Magnetic	444015	5924973	A2	-	-	-	-	-	37	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70308	Magnetic	444288	5925327	A2	-	-	-	-	-	7	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70309	Magnetic	443756	5925132	A2	-	-	-	-	-	42	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70310	Magnetic	443584	5925032	A2	-	-	-	-	-	85	Identified in the 2020 Mag. dataset as a medium, sharp symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70311	Magnetic	443667	5925164	A2	-	-	-	-	-	22	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70312	Magnetic	443681	5925546	A2	-	-	-	-	-	5	Identified in the 2020 Mag. dataset as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Retained as a precaution. May represent a natural feature or may represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70313	Magnetic	443408	5925491	A2	-	-	-	-	-	8	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70314	Magnetic	443250	5925703	A2	-	-	-	-	-	35	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70315	Magnetic	443052	5925405	A2	-	-	-	-	-	31	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70316	Magnetic	442584	5925172	A2	-	-	-	-	-	13	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70317	Magnetic	442946	5925736	A2	-	-	-	-	-	5	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70318	Magnetic	442141	5925481	A2	-	-	-	-	-	66	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-



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70319	Magnetic	442128	5925868	A2	-	-	-	-	-	21	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70320	Magnetic	441661	5925963	A2	-	-	-	-	-	26	Identified in the 2020 Mag. dataset as a small, broad asymmetric dipole with peak and trough over two profile lines. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70321	Magnetic	441568	5926070	A2	-	-	-	-	-	7	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70322	Magnetic	441426	5926042	A2	-	-	-	-	-	16	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70323	Magnetic	441591	5926302	A2	-	-	-	-	-	19	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70324	Magnetic	441038	5926263	A2	-	-	-	-	-	6	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70325	Dark reflector	440461	5926118	A2	2.7	1.2	0.2	-	-34.9	-	Identified in the 2020 SSS dataset as an irregularly shaped dark reflector with a bright shadow. Located in an area of clear seabed. Observed in the MBES dataset as an indistinct low mound with no clear scour. No corresponding Mag. anomaly. Possible debris or a natural feature.	SSS	2020 Array	Array	-
70326	Wreck	440517	5926285	A1	88.7	27.4	3.8	-	-28.6	4727	Identified in the 2020 SSS dataset as a distinct wreck with clear sections relatively intact and recognisable as vessel structure, observed in the MBES dataset as oriented approximately north to south. The wreck appears in two sections, as the central section appears very distorted and difficult to identify individual objects, suggesting it is degraded and/or partially buried. The exposed northern section is an extant, well defined wreck, and a series of regular elongate dark reflectors indicate some coherent internal structure. The south end of the vessel appears less distinctive and may indicate higher level of degradation in this area, however some possible internal structure can still be seen. There is some sedimentation at the southern end, however the exposed section is proud of the seabed and is relatively intact. There is scour visible predominantly at intervals along the eastern side, with the largest at the northern end extending approximately 160 m to the east with a depth of up to 6.0 m. There is a very large, sharp symmetric dipole with peak and trough on one profile line at this location in the 2020 Mag. dataset, suggesting significant ferrous content. Corresponds with the location of the wreck of the SS <i>Albanian</i> (UKHO 8124), a steamship built in 1870 by T Royden & Sons of Liverpool. It was lost in 1877 after being struck by a wooden barque. The record indicates it has been partially salvaged, which possibly accounts for the degraded central section observed in the geophysical data.	SSS, MBES, Mag.	2020 Array	Array	UKHO 8124
70327	Debris field	440519	5926240	A1	43.0	16.9	0.6	-	-37.9	-	Identified in the 2020 SSS dataset as an area of indistinct irregular dark reflectors with some shadow visible. Observed in the MBES dataset as an area of scour with an irregular base and at least one distinct mound measuring 2.8 x 2.6 x 0.5 m. There is no definite corresponding Mag. contact, however as it is located so close to 70326 any possible amplitude is likely to be obscured. Located to the immediate south of wreck 70326, and interpreted as a possible related debris field.	SSS	2020 Array	Array	-



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70328	Debris field	440554	5926258	A1	16.5	12.3	0.1	-	-	-	Identified in the 2020 SSS dataset as an area of indistinct irregularly shaped dark reflectors with some small shadow. The largest and most distinct dark reflector measures 1.2 x 0.4 x 0.1 m. No definite corresponding MBES contact. There is no corresponding Mag. contact, however as it is located so close to 70326 any possible amplitude is likely to be obscured. Located approximately 20 m west of wreck 70326 and interpreted as a possible related debris field.	SSS	2020 Array	Array	-
70329	Debris	440528	5926261	A1	4.8	0.3	0.1	-	-	-	Identified in the 2020 SSS dataset as a curvilinear dark reflector with a small shadow. No corresponding MBES contact. There is no definite corresponding Mag. contact, however as it is located so close to 70326 any possible amplitude is likely to be obscured. Located 5 m south-east of wreck 70326 , and interpreted as a possible related item of debris.	SSS	2020 Array	Array	-
70330	Debris field	440501	5926303	A1	36.7	23.3	0.1	-	-	-	Identified in the 2020 SSS dataset as an area of indistinct irregular dark reflectors and rounded dark reflectors with shadow. The most distinct elongate dark reflector with shadow measures 1.4 x 0.2 x 0.4 m. There is some seabed disturbance visible which could indicate partial burial. Located approximately 10.0 m west of 70326 and likely related. No corresponding MBES contact. There is no definite corresponding Mag. contact, however as it is located so close to 70326 any possible amplitude is likely to be obscured. Located approximately 10.0 m west of wreck 70326 , and interpreted as a possible related debris field.	SSS	2020 Array	Array	-
70331	Debris field	440535	5926294	A1	7.8	3.7	0.6	-	-	-	Identified in the 2020 SSS dataset as an area of distinct rounded dark reflectors with shadow. The largest measures 2.5 x 1.6 x 0.6 m. No corresponding MBES contact. There is no definite corresponding Mag. contact, however as it is located so close to 70326 any possible amplitude is likely to be obscured. Located approximately 5 m east of wreck 70326 , and interpreted as a possible related debris field.	SSS	2020 Array	Array	-
70332	Debris field	440559	5926325	A1	67.7	9.1	0.2	-	-	-	Identified in the 2020 SSS dataset as an area of small rounded dark reflectors of varying intensity. The most distinct measures 1.5 x 0.6 x 0.2 m. No corresponding MBES contact. There is no definite corresponding Mag. contact, however as it is located so close to 70326 any possible amplitude is likely to be obscured. Located within a large scour approximately 50 m north-east of wreck 70326 , and interpreted as a possible related debris field.	SSS	2020 Array	Array	-
70333	Debris field	440503	5926332	A1	18.1	16.7	0.6	-	-36.4	-	Identified in the 2020 SSS dataset as an area of irregular dark reflectors with some shadow visible. The most distinct dark reflector measures 3.5 x 0.9 x 0.2 m. Located at the north end of 70326 and likely related. Observed in the MBES dataset as an area of distinctive irregular mounds that extend primarily to the north-west of 70326 for 16.0 m. Some encircling scour, however this is obscured by a larger area of scour to the north-east. There is no definite corresponding Mag. contact, however as it is located so close to 70326 any possible amplitude is likely to be obscured. Located at the northern end of wreck 70326 , and interpreted as a possible related debris field.	SSS	2020 Array	Array	-
70334	Rope/chain	440531	5926310	A1	29.7	0.4	0.1	-	-38.4	-	Identified in the 2020 SSS dataset as a distinct linear bright reflector, parallel to wreck 70326 . A possible object is visible at the south end, but this is unclear from this dataset. Observed in the MBES dataset as a linear mound with little surface expression, with a more distinct rounded mound visible at the south end measuring 2.7 x 1.4 x 0.1 m. There is no definite corresponding Mag. contact, however as it is located so close to 70326 any possible amplitude is likely to be obscured. Located approximately 8 m to the east of wreck 70326 , and interpreted as a possible related length of rope or chain, however may be a linear item of debris.	SSS	2020 Array	Array	-
70335	Dark reflector	440472	5926280	A2	0.7	0.1	0.2	-	-	-	Identified in the 2020 SSS dataset as a distinct rounded dark reflector with shadow. No definite corresponding MBES contact. There is no definite corresponding Mag. contact, however as it is located so close to 70326 any possible amplitude is likely to be obscured. Located approximately 40 m west of wreck 70326 , and could be related debris or a natural feature.	SSS	2020 Array	Array	-



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70336	Debris	440587	5926260	A1	3.1	0.7	0.2	-	-	-	Identified in the 2020 SSS dataset as an irregularly shaped dark reflector with a slight shadow that is slightly rounded at one end. Located 55.0 m south-east of 70326 and may be related debris. No corresponding MBES contact. There is no definite corresponding Mag. contact, however as it is located so close to 70326 any possible amplitude is likely to be obscured. Located approximately 55.0 m south-east of wreck 70326 , and interpreted as a possible related item of debris.	SSS	2020 Array	Array	-
70337	Magnetic	440766	5926353	A2	-	-	-	-	-35.6	7	Identified in the 2020 Mag. dataset as a small, broad asymmetric dipole with peak and trough on one profile line. Observed in the MBES dataset as a slight seabed disturbance measuring 5.1 x 4.8 x 0.1 m. No corresponding SSS contact. Located 240 m north-east of wreck 70326 and may be related, but this is too large a distance to be certain. Interpreted as possible ferrous debris that is either partially buried or with little surface expression.	Mag.	2020 Array	Array	-
70338	Magnetic	440729	5926358	A2	-	-	-	-	-	80	Identified in the 2020 Mag. dataset as a medium, sharp asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Located 210 m north-east of wreck 70326 and may be related, but this is too large a distance to be certain. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70339	Magnetic	440675	5926396	A2	-	-	-	-	-	28	Identified in the 2020 Mag. dataset as a small negative monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Located 180 m NNE of 70326 and may be related, but this is too large a distance to be certain. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70340	Magnetic	440664	5926555	A2	-	-	-	-	-	21	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70346	Seabed disturbance	452954	5920543	A2	17.1	15.2	0.2	-	-	-	Identified in the 2020 SSS data as an elongate area of small dark reflectors, which cast small shadows. Present in an area of sand waves. No definite corresponding MBES or Mag. contact, but a possible mound visible in the MBES close to this location may be associated. Possible debris or a natural feature.	SSS	2020 Array	Array buffer, ECC, AyM-GyM interlink	-
70347	Debris	453493	5921084	A2	5.1	3.2	0.0	-	-	-	Identified in the 2020 SSS data as a distinct angular dark reflector with no visible shadow. Located in an area of sand waves. No corresponding MBES or Mag. contact. Possible item of non-ferrous debris.	SSS	2020 Array	Array buffer, ECC, AyM-GyM interlink	-
70348	Dark reflector	452737	5920727	A2	1.3	1.2	0.1	-	-	-	Identified in the 2020 SSS data as an elongate sub-angular dark reflector which appears to curve round at one end. This casts a faint 'D' shaped shadow. No corresponding MBES or Mag. contact. Possible item of non-ferrous debris or a natural feature.	SSS	2020 Array	Array buffer, ECC, AyM-GyM interlink	-
70349	Dark reflector	452878	5921174	A2	5.0	1.0	0.2	-	-	-	Identified in the 2020 SSS data as a sub-angular slightly elongate dark reflector, with short rounded shadow. Situated within an area of sand waves. No definite corresponding MBES contact, but a small depression visible in the MBES close to this location may be associated. Possible item of debris, or a natural feature.	SSS	2020 Array	Array	-
70350	Dark reflector	452725	5921345	A2	4.2	1.0	0.0	-	-	-	Identified in the 2020 SSS data as an elongate dark reflector which does not appear to cast a shadow. Situated within an area of sand waves. No corresponding MBES or Mag. contact. Possible item of non-ferrous debris, or a natural feature.	SSS	2020 Array	Array	-
70351	Rope/chain	452238	5921107	A2	62.0	1.4	0.2	-	-	-	Identified in the 2020 SSS data as a narrow curvilinear dark reflector which casts a small, bright shadow along its length. Oriented in opposition to surrounding sand waves. No definite corresponding MBES or Mag. contact, but a low linear mound visible in the MBES close to this location may be associated. Possible length of rope or chain.	SSS	2020 Array	Array	-
70352	Dark reflector	452165	5921132	A2	3.4	1.4	0.0	-	-	-	Identified in the 2020 SSS data as a rounded dark reflector, possibly slightly 'C' shaped which casts a bright shadow. A small associated scour is visible. This is located in an area of mobile sediment. No corresponding MBES or Mag. contact. Possible item of non-ferrous debris, or a natural feature.	SSS	2020 Array	Array	-



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70353	Magnetic	452321	5921497	A2	-	-	-	-	-	18	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough over two profile lines. No corresponding SSS or MBES contact. Possibly related to anomaly 70354. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70354	Magnetic	452310	5921535	A2	-	-	-	-	-	19	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possibly related to anomaly 70353. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70355	Dark reflector	451632	5920844	A2	4.0	0.3	0.1	-	-	-	Identified in the 2020 SSS data as short curvilinear dark reflector with short rounded shadow along its length. No corresponding MBES contact. Possible item of debris, or a natural feature.	SSS	2020 Array	Array	-
70356	Magnetic	451646	5921348	A2	-	-	-	-	-	100	Identified in the 2020 Mag. data as a large negative monopole with peak and trough on one profile line. Visible on two directly adjacent lines of data. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array	-
70357	Mound	451677	5921456	A2	1.7	1.5	0.2	-	-	-	Identified in the 2020 MBES data as a sub-angular mound with a small depression on the northern side. This is situated within an area of sand waves. The associated depression measures 0.9 x 0.7 x 0.2 m. No corresponding SSS contact. Possible item of debris, or a natural feature.	MBES	2020 Array	Array	-
70358	Dark reflector	451461	5921694	A2	1.7	2.8	0.2	-	-	-	Identified in the 2020 SSS data as a distinct dark reflector, appearing circular, possibly with a clear space within. No corresponding MBES contact. Possible item of debris, or a natural feature.	SSS	2020 Array	Array	-
70359	Magnetic	450950	5921834	A2	-	-	-	-	-	17	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70360	Magnetic	450587	5921195	A2	-	-	-	-	-	5	Identified in the 2020 Mag. data as a small, broad positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70361	Magnetic	450229	5921796	A2	-	-	-	-	-	15	Identified in the 2020 Mag. data as a small negative monopole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70362	Magnetic	449843	5921463	A2	-	-	-	-	-	155	Identified in the 2020 Mag. data as a large, sharp positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible significant ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array	-
70363	Dark reflector	449811	5922442	A2	3.0	0.6	0.1	-	-	-	Identified in the 2020 SSS data as an elongate dark reflector with long rounded shadow which appears detached at one end, indicating the object may be protruding into the water column. Located in an area of sand waves. No corresponding MBES contact. Possible item of debris, or a natural feature.	SSS	2020 Array	Array	-
70364	Magnetic	449734	5922505	A2	-	-	-	-	-	7	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70365	Dark reflector	449156	5922408	A2	2.6	0.4	0.3	-	-	-	Identified in the 2020 SSS data as a narrow elongate dark reflector which casts a bright shadow with one longer section. This is situated within an area of sand waves. No corresponding MBES or Mag. contact. Possible item of non-ferrous debris, or a natural feature.	SSS	2020 Array	Array	-
70366	Debris	449014	5922696	A2	8.0	5.0	0.2	-	-	-	Identified in the 2020 SSS data as a discrete area of overlapping curvilinear dark reflectors which cast bright shadows along their lengths. Located in an area of sand waves. No corresponding MBES or Mag. contact. Possible item of non-ferrous debris, possibly a coiled rope.	SSS	2020 Array	Array	-
70367	Magnetic	448702	5922104	A2	-	-	-	-	-	8	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-



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70368	Magnetic	448289	5922046	A2	-	-	-	-	-	23	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough on one profile line. Visible on closely adjacent line of data. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array	-
70369	Magnetic	448390	5922362	A2	-	-	-	-	-	6	Identified in the 2020 Mag. data as a small, broad positive monopole with peak and trough on one profile line. No associated SSS or MBES contacts. Possible ferrous debris that is either buried or without surface expression, or could be a natural feature.	Mag.	2020 Array	Array	-
70370	Magnetic	448421	5922502	A2	-	-	-	-	-	22	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough on one profile line. Visible on adjacent lines. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array	-
70371	Magnetic	448021	5923130	A2	-	-	-	-	-	8	Identified in the 2020 Mag. data as a small, broad symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70372	Magnetic	447354	5923372	A2	-	-	-	-	-	17	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70373	Magnetic	446980	5922973	A2	-	-	-	-	-	27	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array	-
70374	Bright reflector	446567	5922923	A2	2.8	0.7	0.0	-	-	-	Identified in the 2020 SSS data as an elongate bright reflector. No definite corresponding MBES contact, but a small depression visible in the MBES close to this location may be associated. Possible item of debris, or a natural feature.	SSS	2020 Array	Array	-
70375	Magnetic	445998	5923106	A2	-	-	-	-	-	12	Identified in the 2020 Mag. data as a small, sharp asymmetric dipole with peak and trough over two profile lines. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70376	Magnetic	446032	5923221	A2	-	-	-	-	-	8	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70377	Magnetic	446076	5923364	A2	-	-	-	-	-	9	Identified in the 2020 Mag. data as a small, broad symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70378	Magnetic	445860	5922899	A2	-	-	-	-	-	11	Identified in the 2020 Mag. data as a small negative monopole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70379	Magnetic	445770	5922931	A2	-	-	-	-	-	16	Identified in the 2020 Mag. data as a small symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70380	Bright reflector	445901	5923785	A2	2.1	1.2	0.0	-	-	-	Identified in the 2020 SSS data as a 'C' shaped bright reflector. No definite corresponding MBES contact, but a small depression visible in the MBES close to this location may be associated. Possible item of debris, or a natural feature.	SSS	2020 Array	Array	-
70381	Magnetic	445812	5923522	A2	-	-	-	-	-	32	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array	-
70382	Magnetic	445499	5923501	A2	-	-	-	-	-	16	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-



ID	Classification	Easting	Northing	Archaeological discrimination	L (m)	W (m)	H (m)	Depth below seabed (m)	Least Depth (m LAT)	Magnetic amplitude (nT)	Description	Anomaly type	Dataset	Section	External references
70383	Magnetic	445310	5923167	A2	-	-	-	-	-	13	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough over two profile lines. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70384	Magnetic	445236	5923354	A2	-	-	-	-	-	11	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70385	Magnetic	445337	5923696	A2	-	-	-	-	-	18	Identified in the 2020 Mag. data as a small, broad positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70386	Magnetic	445190	5924146	A2	-	-	-	-	-	274	Identified in the 2020 Mag. data as a large negative monopole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible significant ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array	-
70387	Dark reflector	445047	5923909	A2	3.2	2.1	0.1	-	-	-	Identified in the 2020 SSS data as a curved 'C' shaped dark reflector with a rounded shadow. Appears to be within a slight depression, possibly indicating associated scour. Visible on the MBES data as a sub-angular mound within a slight depression. No corresponding Mag. contact. Possible item of non-ferrous debris, or a natural feature.	SSS, MBES	2020 Array	Array	-
70388	Magnetic	444328	5923987	A2	-	-	-	-	-	18	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70389	Magnetic	443897	5924083	A2	-	-	-	-	-	46	Identified in the 2020 Mag. data as a small symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array	-
70390	Magnetic	443465	5924067	A2	-	-	-	-	-	13	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70391	Magnetic	443446	5924143	A2	-	-	-	-	-	17	Identified in the 2020 Mag. data as a small negative monopole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70392	Magnetic	443146	5924026	A2	-	-	-	-	-	16	Identified in the 2020 Mag. data as a small negative monopole with peak and trough on one profile line. Seen as a dipole on a perpendicular line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70393	Magnetic	443144	5924031	A2	-	-	-	-	-	19	Identified in the 2020 Mag. data as a small, broad dipole with peak and trough on one profile line. Visible on a perpendicular line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70394	Magnetic	443037	5923988	A2	-	-	-	-	-	31	Identified in the 2020 Mag. data as a small symmetric dipole with peak and trough on one profile line. Seen on multiple lines of data. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array	-
70395	Dark reflector	443096	5924233	A2	3.0	1.9	0.3	-	-	-	Identified in the 2020 SSS data as an angular and slightly elongated dark reflector with a bright tapered shadow that flares to one side. Some slight associated scour is present. Visible in the MBES data as a sub-angular mound within scour that extends 30 m to the east, and is up to 0.2 m deep. Possible item of debris, or a natural feature.	SSS, MBES	2020 Array	Array	-
70396	Magnetic	442574	5924084	A2	-	-	-	-	-	23	Identified in the 2020 Mag. data as a small symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-



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70397	Magnetic	442539	5924171	A2	-	-	-	-	-	27	Identified in the 2020 Mag. data as a small positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70398	Dark reflector	442631	5924700	A2	27.5	1.0	0.0	-	-	53	Identified in the 2020 SSS data as a narrow linear dark reflector with occasional slight, intermittent shadows. The orientation of this feature is perpendicular to surrounding natural formations. Visible in the Mag. data as a medium positive monopole with peak and trough on one profile line. No definite corresponding MBES contact, but a small linear mound visible in the MBES close to this location may be associated. Possible ferrous debris or modern anthropogenic.	SSS, Mag.	2020 Array	Array	-
70399	Magnetic	442342	5924643	A2	-	-	-	-	-	76	Identified in the 2020 Mag. data as a medium, sharp symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array	-
70400	Magnetic	442255	5924737	A2	-	-	-	-	-	22	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough over two profile lines. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array	-
70401	Magnetic	442277	5924895	A2	-	-	-	-	-	9	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70402	Magnetic	441883	5925104	A2	-	-	-	-	-	11	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70403	Magnetic	441369	5924748	A2	-	-	-	-	-	11	Identified in the 2020 Mag. data as a small, broad symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70404	Magnetic	441274	5924741	A2	-	-	-	-	-	10	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70405	Magnetic	440960	5925414	A2	-	-	-	-	-	59	Identified in the 2020 Mag. data as a medium, sharp symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression.	Mag.	2020 Array	Array	-
70406	Magnetic	441003	5925550	A2	-	-	-	-	-	6	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70407	Magnetic	440848	5925414	A2	-	-	-	-	-	6	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70408	Magnetic	440713	5925760	A2	-	-	-	-	-	18	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70409	Magnetic	440440	5925430	A2	-	-	-	-	-	7	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Array	-
70411	Dark reflector	452133	5920464	A2	5.2	0.8	0.3	-	-	34	Identified in the 2020 SSS data as a distinct dark reflector with a slightly indistinct flared shadow. Set within a depression or associated scour. Present in an area of sand ripples. Visible in the Mag. data as a small negative monopole with peak and trough on one profile line. No corresponding MBES contact, but position amended to match a small, indistinct mound seen in the MBES. Possible natural feature containing a high percentage of ferrous minerals, or a natural feature.	SSS, Mag.	2020 Array	Array buffer, ECC, AyM-GyM interlink	-



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70412	Magnetic	450323	5920172	A2	-	-	-	-	-	9	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70413	Magnetic	450913	5920916	A2	-	-	-	-	-	27	Identified in the 2020 Mag. data as a small, broad and very asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70414	Dark reflector	450600	5920749	A2	1.6	1.0	0.3	-	-	-	Identified in the 2020 SSS data as a distinct dark reflector which casts a bright shadow with a tapered end. A small amount of scour is present. Visible in the MBES data as a prominent mound, located at the lowest point between megaripples. Possible debris or a natural feature.	SSS, MBES	2020 Array	Array	-
70415	Debris	450313	5921074	A1	2.2	1.3	0.4	-	-	-	Identified in the 2020 SSS data as a distinct dark reflector with a somewhat indistinct shadow, located 4 m southwest of debris field 70416 . No corresponding MBES contact, but the MBES shows this to be located at the end of a sand wave crest. Possible item of debris, potentially related to 70416 .	SSS	2020 Array	Array	-
70416	Debris field	450312	5921083	A1	14.0	10.0	0.6	-	-	-	Identified in the 2020 SSS data as several distinct dark reflectors which appear to form an angular outline that tapers in at one end. Oriented northeast-southwest. No clear internal structure is seen, but this is present in an area of mobile sediments and is likely partially buried. Possible related item of debris seen 4 m to the south (70415). No corresponding MBES contact, but a disturbed area of variable height is visible on the MBES data. Possible non-ferrous wreck or items of debris.	SSS	2020 Array	Array	-
70417	Magnetic	449110	5921349	A2	-	-	-	-	-	8	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70418	Magnetic	449062	5921347	A2	-	-	-	-	-	15	Identified in the 2020 Mag. data as a small negative monopole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70419	Magnetic	448958	5921007	A2	-	-	-	-	-	33	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70420	Magnetic	448707	5920771	A2	-	-	-	-	-	11	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70421	Magnetic	448032	5921242	A2	-	-	-	-	-	23	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70422	Magnetic	447187	5921789	A2	-	-	-	-	-	6	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70423	Magnetic	446445	5922132	A2	-	-	-	-	-	16	Identified in the 2020 Mag. data as a small negative monopole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70424	Magnetic	445576	5922605	A2	-	-	-	-	-	12	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-



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70425	Magnetic	444500	5922613	A2	-	-	-	-	-	190	Identified in the 2020 Mag. data as a large, sharp asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact, but a small, slightly irregular and curved possible mound is present at this location, between sand waves. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70426	Magnetic	444667	5922858	A2	-	-	-	-	-	14	Identified in the 2020 Mag. data as a small, broad positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70427	Magnetic	444175	5922734	A2	-	-	-	-	-	42	Identified in the 2020 Mag. data as a small, sharp asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70428	Magnetic	444044	5922689	A2	-	-	-	-	-	7	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70429	Dark reflector	444426	5923316	A2	2.3	0.8	0.3	-	-	-	Identified in the 2020 SSS data as a distinct sub-angular dark reflector, this casts a bright shadow with fairly straight sides and a slanted end shape. Present in an area of sand ripples. No definite corresponding MBES contact, but a small possible mound is seen in the MBES data. Possible debris or a natural feature.	SSS	2020 Array	Array	-
70430	Magnetic	443994	5923014	A2	-	-	-	-	-	8	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70431	Magnetic	443679	5922913	A2	-	-	-	-	-	24	Identified in the 2020 Mag. data as a small symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70432	Magnetic	443936	5923223	A2	-	-	-	-	-	11	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70433	Magnetic	443935	5923355	A2	-	-	-	-	-	14	Identified in the 2020 Mag. data as a small negative monopole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70434	Magnetic	443479	5922816	A2	-	-	-	-	-	48	Identified in the 2020 Mag. data as a small positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contact, but position is seen to be at crest of a sand wave. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70435	Magnetic	442855	5922880	A2	-	-	-	-	-	7	Identified in the 2020 Mag. data as a small, broad symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70436	Magnetic	442827	5922891	A2	-	-	-	-	-	17	Identified in the 2020 Mag. data as a small symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70437	Magnetic	442855	5923111	A2	-	-	-	-	-	6	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70438	Magnetic	442904	5923267	A2	-	-	-	-	-	6	Identified in the 2020 Mag. data as a small, broad symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-



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70439	Magnetic	442774	5923538	A2	-	-	-	-	-	18	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. No corresponding SSS or MBES contact. Probably natural in origin.	Mag.	2020 Array	Array	-
70440	Magnetic	442681	5923490	A2	-	-	-	-	-	38	Identified in the 2020 Mag. data as a small, sharp symmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70441	Magnetic	442523	5923547	A2	-	-	-	-	-	6	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70442	Magnetic	442215	5923738	A2	-	-	-	-	-	39	Identified in the 2020 Mag. data as a small positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70443	Magnetic	441798	5923890	A2	-	-	-	-	-	25	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70444	Magnetic	440969	5924578	A2	-	-	-	-	-	12	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70446	Magnetic	440434	5924770	A2	-	-	-	-	-	12	Identified in the 2020 Mag. data as a small, broad positive monopole with peak and trough on one profile line. Seen also on a nearly overlapping adjacent line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70448	Dark reflector	450727	5919166	A2	2.1	0.3	0.2	-	-	-	Identified in the 2020 SSS dataset as curved dark reflector which casts a two-ended shadow. This is present in an area of seabed with mobile sediment. No corresponding Mag. or MBES contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Array buffer	-
70449	Seabed disturbance	451005	5919392	A2	2.2	1.1	0.3	-	-	-	Identified in the 2020 MBES dataset as a small disturbed area composed of three small mounds located on the side of a megaripple. Unusual and distinct. No corresponding SSS or Mag. contacts. Interpreted as a possible natural feature or may be possible debris.	MBES	2020 Array	Array	-
70450	Dark reflector	451214	5919422	A2	2.3	0.2	0.1	-	-	-	Identified in the 2020 SSS dataset as a narrow curvilinear dark reflector which casts a small shadow. Located in an area of megaripples and may be an associated sedimentary feature, but is distinct and anomalous. Visible in the MBES dataset as a very low mound. No corresponding Mag. or MBES contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Array buffer, ECC	-
70451	Dark reflector	451070	5919700	A2	1.8	0.8	0.2	-	-	-	Identified in the 2020 SSS dataset as a small rounded dark reflector which casts a rounded shadow. This appears to have a small associated scour and is present in an area of mobile sediment. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Array buffer, ECC, AyM-GyM interlink	-
70452	Magnetic	450095	5919422	A2	-	-	-	-	-	131	Identified in the 2020 Mag. dataset as a large negative monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70453	Rope/chain	449743	5919899	A2	12.1	1.0	0.3	-	-	-	Identified in the 2020 SSS dataset as a distinct, narrow linear dark reflector. Appears similar to surrounding megaripples, but is distinct. No corresponding Mag. or MBES contacts. Interpreted as a possible length of rope or chain which may be part of a larger, partially broken up feature with 70454 and 70455 .	SSS	2020 Array	Array	-
70454	Rope/chain	449753	5919920	A2	14.8	1.0	0.1	-	-	-	Identified in the 2020 SSS dataset as a distinct, narrow linear dark reflector which casts a small shadow. Possibly associated with the surrounding megaripples, but appears very distinct. No corresponding Mag. or MBES contacts. Interpreted as a possible length of rope or chain which may be part of a larger, partially broken up feature with 70453 and 70455 .	SSS	2020 Array	Array	-



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70455	Rope/chain	449736	5919917	A2	25.3	1.3	0.2	-	-	-	Identified in the 2020 SSS dataset as a distinct, narrow curvilinear dark reflector which casts a small, bright shadow. In an area of megaripples. Appears anomalous and distinct. No corresponding Mag. or MBES contacts. Interpreted as a possible length of rope or chain which may be part of a larger, partially broken up feature with 70453 and 70454 .	SSS	2020 Array	Array	-
70456	Magnetic	449279	5920183	A2	-	-	-	-	-	16	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70457	Magnetic	449156	5920459	A2	-	-	-	-	-	69	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70458	Magnetic	447919	5920126	A2	-	-	-	-	-	8	Identified in the 2020 Mag. dataset as a small, broad positive monopole with peak and trough over two profile lines. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70459	Dark reflector	447233	5920076	A2	1.0	0.8	0.2	-	-	-	Identified in the 2020 SSS dataset as a circular dark reflector which may have a central depression, and casts a bright tapered shadow. This feature appears distinct and is located in an area of mobile sediment. No corresponding Mag. or MBES contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Array buffer	-
70460	Dark reflector	447096	5920370	A2	2.5	1.3	0.5	-	-	-	Identified in the 2020 SSS dataset as a small distinct dark reflector which casts a long, narrow shadow that is fairly long. Visible in the MBES dataset as a mound, small with an angular top and slightly more distinct than natural seabed variations seen in the wider area. This is present in an area of mobile sediment between megaripples and is proximal to 70461 and 70462 . No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible debris.	SSS, MBES	2020 Array	Array buffer	-
70461	Dark reflector	447077	5920378	A2	1.3	0.3	0.2	-	-	-	Identified in the 2020 SSS dataset as a small sub-angular dark reflector which casts a bright tapering shadow and may have a central depression. This is located proximal to 70462 and 70460 and is present in an area of mobile sediment. No corresponding Mag. or MBES contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Array buffer	-
70462	Dark reflector	447076	5920377	A2	5.4	0.3	0.1	-	-	-	Identified in the 2020 SSS dataset as a short, narrow linear dark reflector, slightly curved at each end, and which casts a short bright shadow. This is located close to 70461 and 70460 and is present in an area of mobile sediment. No corresponding Mag. or MBES contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Array buffer	-
70463	Magnetic	447084	5920818	A2	-	-	-	-	-	26	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70464	Magnetic	446184	5921530	A2	-	-	-	-	-	45	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70465	Magnetic	445296	5921382	A2	-	-	-	-	-	6	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70466	Dark reflector	444693	5922125	A2	3.1	0.1	0.2	-	-	-	Identified in the 2020 SSS dataset as small, slightly elongate dark reflector which casts a rounded shadow. This is present in an area of mobile sediment. No corresponding Mag. or MBES contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Array	-
70467	Magnetic	443568	5922046	A2	-	-	-	-	-	8	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-



ID	Classification	Easting	Northing	Archaeological discrimination	L (m)	W (m)	H (m)	Depth below seabed (m)	Least Depth (m LAT)	Magnetic amplitude (nT)	Description	Anomaly type	Dataset	Section	External references
70468	Dark reflector	443427	5922494	A2	1.3	0.7	0.2	-	-	-	Identified in the 2020 SSS dataset as a rounded dark reflector which casts a bright and straight sided shadow with a rounded top. This is present in a small and bright associated scour. No corresponding Mag. or MBES contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Array	-
70469	Magnetic	443042	5921805	A2	-	-	-	-	-	10	Identified in the 2020 Mag. dataset as a small, broad symmetric dipole with peak and trough on one profile line. Located close to a pipeline, but appears distinct. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer	-
70470	Magnetic	442892	5922483	A2	-	-	-	-	-	7	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70471	Magnetic	442678	5922791	A2	-	-	-	-	-	5	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70472	Dark reflector	442117	5922812	A2	1.0	0.4	0.1	-	-	-	Identified in the 2020 SSS dataset as curved elongate dark reflector which casts a bright tapering shadow. This is distinct and anomalous. Present at the edge of an area of mobile sediment. No corresponding Mag. or MBES contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Array	-
70473	Magnetic	442121	5922916	A2	-	-	-	-	-	20	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array	-
70474	Dark reflector	441841	5922905	A2	4.5	0.2	0.2	-	-	-	Identified in the 2020 SSS dataset as short, linear dark reflector which casts a bright shadow. This feature appears distinct in an area of seabed with few small features and broad mobile sedimentary features. No corresponding Mag. or MBES contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Array	-

Other wind farm infrastructure zone

ID	Classification	Easting	Northing	Archaeological discrimination	L (m)	W (m)	H (m)	Depth below seabed (m)	Least Depth (m LAT)	Magnetic amplitude (nT)	Description	Anomaly type	Dataset	Section	External references
70269	Magnetic	440332	5927066	A2	-	-	-	-	-	18	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Infrastructure zone buffer	-
70341	Magnetic	440245	5926081	A2	-	-	-	-	-	9	Identified in the 2020 Mag. dataset as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Retained as a precaution. May represent a natural feature or may represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Infrastructure zone	-
70342	Magnetic	440146	5926167	A2	-	-	-	-	-	113	Identified in the 2020 Mag. dataset as a large negative monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Infrastructure zone	-
70343	Magnetic	439957	5926120	A2	-	-	-	-	-	34	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Infrastructure zone	-



ID	Classification	Easting	Northing	Archaeological discrimination	L (m)	W (m)	H (m)	Depth below seabed (m)	Least Depth (m LAT)	Magnetic amplitude (nT)	Description	Anomaly type	Dataset	Section	External references
70344	Magnetic	439869	5926217	A2	-	-	-	-	-	11	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Infrastructure zone	-
70345	Magnetic	439865	5926473	A2	-	-	-	-	-	21	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Infrastructure zone	-
70410	Magnetic	440041	5925227	A2	-	-	-	-	-	14	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. Possible ferrous debris that is buried or without surface expression, or a natural feature.	Mag.	2020 Array	Infrastructure zone	-
70447	Dark reflector	440044	5924470	A2	4.1	1.7	0.5	-	-	-	Identified in the 2020 SSS data as a distinct dark reflector which casts a shadow. Feature appears to be within a slight depression, likely associated scour. Visible in the MBES data as a small subangular mound within a scour which extends approx. 3 m to the east, and is deeper on the western edge approx. 0.4 m below seabed. Possible debris or a natural feature.	SSS, MBES	2020 Array	Infrastructure zone	-
70445	Magnetic	440570	5923708	A2	-	-	-	-	-	9	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Infrastructure zone	-
70475	Dark reflector	440964	5922803	A2	1.8	0.7	0.1	-	-	-	Identified in the 2020 SSS dataset as a small dark reflector which casts a bright shadow. No corresponding Mag. or MBES contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Infrastructure zone	-
70476	Dark reflector	440886	5922676	A2	3.6	1.4	0.1	-	-	-	Identified in the 2020 SSS dataset as angular dark reflector which casts a tapered and bright shadow. This appears unusual between megaripples in an area of mobile sediment. No corresponding Mag. or MBES contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Infrastructure zone	-
70477	Dark reflector	440814	5922764	A2	1.4	0.5	0.1	-	-	-	Identified in the 2020 SSS dataset as a very slightly elongate dark reflector, distinct and casts a bright shadow. Associated scour is present. Located close to 70479 at the edge of an area of mobile sediment. No corresponding MBES contact but may be associated with magnetic anomaly 70478 , but this is uncertain as magnetometer data does not directly cover the position. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Infrastructure zone	-
70478	Magnetic	440816	5922776	A2	-	-	-	-	-	6	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Infrastructure zone buffer	-
70479	Dark reflector	440810	5922767	A2	2.3	0.6	0.1	-	-	-	Identified in the 2020 SSS dataset as Sub-angular dark reflector, distinct and casts a bright, tapered shadow. Associated scour is present. Located close to 70477 at the edge of an area of mobile sediment. No corresponding MBES contact but may be associated with magnetic anomaly 70478 , but this is uncertain as magnetometer data does not directly cover the position. Interpreted as natural.	SSS	2020 Array	Infrastructure zone buffer	-
70480	Debris field	440688	5922857	A1	37.3	15.4	0.6	-	-	57	Identified in the 2020 SSS dataset as a slightly dispersed area of small dark reflectors which cast bright shadows, many of which have small associated scours. Such features are unusual in the wider area, and especially so in concentration. Located in an area of mobile sediment. Associated with a slightly broad, medium negative monopole with peak and trough on one profile line. No corresponding MBES contact. Interpreted as a possible ferrous debris field, potentially a dispersed and mostly buried wreck site.	SSS, Mag.	2020 Array	Infrastructure zone buffer	-
70481	Magnetic	440736	5923030	A2	-	-	-	-	-	15	Identified in the 2020 Mag. dataset as a small asymmetric dipole with peak and trough on one profile line. Visible on adjacent lines. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Infrastructure zone	-



ID	Classification	Easting	Northing	Archaeological discrimination	L (m)	W (m)	H (m)	Depth below seabed (m)	Least Depth (m LAT)	Magnetic amplitude (nT)	Description	Anomaly type	Dataset	Section	External references
70482	Magnetic	440732	5923107	A2	-	-	-	-	-	12	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Infrastructure zone	-
70483	Dark reflector	440728	5923216	A2	1.2	0.9	0.2	-	-	-	Identified in the 2020 SSS dataset as small angular dark reflector which casts a slightly indistinct shadow. Present in a relatively featureless area of seabed, although few features are seen in the wider area. No corresponding Mag. or MBES contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Infrastructure zone	-
70484	Depression	440730	5923227	A2	2.7	1.5	0.2	-	-	-	Identified in the 2020 SSS dataset as a distinct depression with a bright shadow and angular shape. Unusual and distinct, and present in a fairly featureless area of seabed. Visible in the MBES dataset as a very small depression. No corresponding Mag. contacts. Interpreted as a possible area of scour associated with 70483.	SSS	2020 Array	Infrastructure zone	-
70485	Magnetic	440625	5923065	A2	-	-	-	-	-	16	Identified in the 2020 Mag. dataset as a small asymmetric dipole with peak and trough on one profile line. Slightly visible on directly adjacent line of data. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Infrastructure zone	-
70486	Dark reflector	440723	5923303	A2	1.8	0.3	0.1	-	-	-	Identified in the 2020 SSS dataset as small, distinct dark reflector which casts a large bright shadow. Some associated scour is present. No corresponding Mag. or MBES contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Infrastructure zone	-
70487	Dark reflector	440626	5923371	A2	3.4	0.2	0.0	-	-	-	Identified in the 2020 SSS dataset as an irregular, slightly elongate dark reflector which casts a small shadow. Oriented differently to adjacent megaripple so likely a non-sedimentary feature. No corresponding Mag. or MBES contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Infrastructure zone	-
70489	Debris field	439404	5927097	A2	10.9	5.2	0.4	-	-37.0	-	Identified in the 2020 SSS dataset as an area of irregular dark reflectors with some shadow and some scour or depression. The most distinct dark reflector is central and measures 5.5 x 1.8 x 0.1 m. Located in an area of clear seabed. Observed in the MBES dataset as a distinct large mound with some encircling scour extending for 2.4 m. An area of further scour or depression extends east with an uneven base possibly indicating further anomalies. No corresponding Mag. anomaly. Interpreted as a possible non-ferrous debris field.	SSS	2020 Array	Infrastructure zone buffer	-
70490	Dark reflector	439420	5927055	A2	3.1	0.7	0.1	-	-	-	Identified in the 2020 SSS dataset as an indistinct elongate dark reflector with a bright shadow. Located in an area of clear seabed. No corresponding MBES contact. Possibly related to nearby debris field 70489, located 40m to the NNE. Interpreted as a possible natural feature or possible debris.	SSS	2020 Array	Infrastructure zone buffer	-
70491	Magnetic	439341	5926931	A2	-	-	-	-	-	73	Identified in the 2020 Mag. dataset as a medium, sharp positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Infrastructure zone buffer	-
70492	Magnetic	439236	5926581	A2	-	-	-	-	-	21	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Infrastructure zone buffer	-
70493	Magnetic	439551	5926330	A2	-	-	-	-	-	6	Identified in the 2020 Mag. dataset as a small, broad asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. May represent a natural feature or may represent possible ferrous debris that is either buried or with no surface expression. Retained as a precaution.	Mag.	2020 Array	Infrastructure zone	-
70494	Bright reflector	439142	5926034	A2	2.2	0.7	0.0	-	-	-	Identified in the 2020 SSS data as an elongate bright reflector. No corresponding MBES or Mag. contact. Possible item of non-ferrous debris, or a natural feature.	SSS	2020 Array	Infrastructure zone buffer	-
70495	Dark reflector	439516	5925985	A2	1.8	0.3	1.1	-	-	-	Identified in the 2020 SSS data as a slightly elongate dark reflector with long narrow shadow. No corresponding MBES contact. Possible item of debris, or a natural feature.	SSS	2020 Array	Infrastructure zone buffer	-



ID	Classification	Easting	Northing	Archaeological discrimination	L (m)	W (m)	H (m)	Depth below seabed (m)	Least Depth (m LAT)	Magnetic amplitude (nT)	Description	Anomaly type	Dataset	Section	External references
70496	Magnetic	440032	5923594	A2	-	-	-	-	-	29	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Infrastructure zone	-
70497	Magnetic	439384	5923592	A2	-	-	-	-	-	7	Identified in the 2020 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 that is either buried or with no surface expression. Outside the study area.	Mag.	2020 Array	Infrastructure zone buffer	-

ECC

ID	Classification	Easting	Northing	Archaeological discrimination	L (m)	W (m)	H (m)	Depth below seabed (m)	Least Depth (m LAT)	Magnetic amplitude (nT)	Description	Anomaly type	Dataset	Section	External references
70270	Magnetic	453848	5921567	A2	-	-	-	-	-	68	Identified in the 2020 Mag. dataset as a medium positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer, ECC, AyM-GyM interlink	-
70346	Seabed disturbance	452954	5920543	A2	17.1	15.2	0.2	-	-	-	Identified in the 2020 SSS data as an elongate area of small dark reflectors, which cast small shadows. Present in an area of sand waves. No definite corresponding MBES or Mag. contact, but a possible mound visible in the MBES close to this location may be associated. Possible debris or a natural feature.	SSS	2020 Array, 2020 ECR	Array buffer, ECC, AyM-GyM interlink	-
70347	Debris	453495	5921083	A2	5.1	3.2	0.0	-	-	-	Identified in the 2020 SSS data as a distinct angular dark reflector with no visible shadow. Located in an area of sand waves. No corresponding MBES or Mag. contact. Possible item of non-ferrous debris.	SSS	2020 Array, 2020 ECR	Array buffer, ECC, AyM-GyM interlink	-
70348	Dark reflector	452737	5920727	A2	1.3	1.2	0.1	-	-	-	Identified in the 2020 SSS data as an elongate sub-angular dark reflector which appears to curve round at one end. This casts a faint 'D' shaped shadow. No corresponding MBES or Mag. contact. Possible item of non-ferrous debris or a natural feature.	SSS	2020 Array	Array buffer, ECC, AyM-GyM interlink	-
70411	Dark reflector	452133	5920464	A2	5.2	0.8	0.3	-	-	34	Identified in the 2020 SSS data as a distinct dark reflector with a slightly indistinct flared shadow. Set within a depression or associated scour. Present in an area of sand ripples. Visible in the Mag. data as a small negative monopole with peak and trough on one profile line. No corresponding MBES contact, but position amended to match a small, indistinct mound seen in the MBES. Possible natural feature containing a high percentage of ferrous minerals, or a natural feature.	SSS, Mag.	2020 Array	Array buffer, ECC, AyM-GyM interlink	-
70449	Seabed disturbance	451005	5919392	A2	2.2	1.1	0.3	-	-	-	Identified in the 2020 MBES dataset as a small disturbed area composed of three small mounds located on the side of a megaripple. Unusual and distinct. No corresponding SSS or Mag. contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris.	MBES	2020 Array	Array buffer, ECC	-
70450	Dark reflector	451214	5919422	A2	2.3	0.2	0.1	-	-	-	Identified in the 2020 SSS dataset as a narrow curvilinear dark reflector which casts a small shadow. Located in an area of megaripples and may be an associated sedimentary feature, but is distinct and anomalous. Visible in the MBES dataset as a very low mound. No corresponding Mag. or MBES contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris.	SSS	2020 Array	Array buffer, ECC	-
70451	Dark reflector	451070	5919700	A2	1.8	0.8	0.2	-	-	-	Identified in the 2020 SSS dataset as a small rounded dark reflector which casts a rounded shadow. This appears to have a small associated scour and is present in an area of mobile sediment. No corresponding MBES or Mag. contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris.	SSS	2020 Array	Array buffer, ECC, AyM-GyM interlink	-



ID	Classification	Easting	Northing	Archaeological discrimination	L (m)	W (m)	H (m)	Depth below seabed (m)	Least Depth (m LAT)	Magnetic amplitude (nT)	Description	Anomaly type	Dataset	Section	External references
70500	Magnetic	452197	5919567	A2	-	-	-	-	-	13	Identified in the 2020 Mag. data as a small, broad symmetric dipole with peak and trough on one profile line. No associated SSS or MBES contacts. Possible ferrous debris that is either buried or without surface expression, or a natural feature.	Mag.	2020 ECR	ECC	-
70501	Dark reflector	453384	5920424	A2	3.6	0.7	0.1	-	-	-	Identified in the 2020 SSS data as a narrow elongate dark reflector, which is straight and casts a curved shadow. Located in an area of megaripples. No associated Mag. or MBES contacts. Possible non-ferrous debris or a natural feature.	SSS	2020 ECR	ECC, AyM-GyM interlink	-
70502	Debris	452461	5919353	A2	5.9	0.6	0.2	-	-	17	Identified in the 2020 SSS data as an elongate dark reflector with a small shadow located within an area of mobile seabed sediment. Associated with a small, broad asymmetric dipole with peak and trough on one profile line. No definite associated MBES contact, but a small area of disturbance at this location may be related. Possible ferrous debris.	SSS, Mag.	2020 ECR	ECC	-
70503	Rope/chain	454608	5921512	A2	7.4	0.2	0.1	-	-	-	Identified in the 2020 SSS dataset as a distinct linear dark reflector with a bright shadow. No corresponding MBES or Mag. contact. The linear appears partially buried by the surrounding sand waves and continues as 70504 , 70505 , and 70506 . Possible partially buried rope or chain.	SSS	2020 Array, 2020 ECR	ECC, AyM-GyM interlink	-
70504	Rope/chain	454633	5921511	A2	9.7	0.5	0.2	-	-	-	Identified in the 2020 SSS dataset as a distinct linear dark reflector with a bright shadow. No corresponding MBES or Mag. contact. The linear appears partially buried by the surrounding sand waves and continues as 70503 , 70505 , and 70506 . Possible partially buried rope or chain.	SSS	2020 Array, 2020 ECR	ECC, AyM-GyM interlink	-
70505	Rope/chain	454648	5921510	A2	12.5	0.6	0.2	-	-	-	Identified in the 2020 SSS dataset as a distinct linear dark reflector with a bright shadow. Observed in the MBES dataset as an indistinct linear mound on an east to west alignment. No corresponding Mag. anomaly. The linear appears partially buried by the surrounding sand waves and continues as 70503 , 70504 , and 70506 . Possible partially buried rope or chain.	SSS	2020 Array, 2020 ECR	ECC, AyM-GyM interlink	-
70506	Rope/chain	454677	5921509	A2	11.5	0.9	0.2	-	21.2	-	Identified in the 2020 SSS dataset as a distinct linear dark reflector with a bright shadow. Observed in the MBES dataset as an indistinct linear mound on an east to west alignment. No corresponding Mag. anomaly. The linear appears partially buried by the surrounding sand waves and continues as 70503 , 70504 , and 70505 . Possible partially buried rope or chain.	SSS	2020 Array, 2020 ECR	ECC, AyM-GyM interlink	-
70507	Dark reflector	454316	5920926	A2	2.3	0.7	0.2	-	-	-	Identified in the 2020 SSS data as a small elongate subangular dark reflector with slightly flared shadow, distinct from the surrounding sand waves. No definite associated MBES or Mag. contact, but a small possible disturbance in the MBES may be related. Possible non-ferrous debris or a natural feature.	SSS	2020 ECR	ECC, AyM-GyM interlink	-
70508	Debris	453880	5920377	A2	5.3	0.2	0.1	-	-	-	Identified in the 2020 SSS data as a small elongate dark reflector with rounded shadow, oriented approx. east to west, distinct from the surrounding megaripples. No associated MBES or Mag. contacts. Possible non-ferrous debris.	SSS	2020 ECR	ECC, AyM-GyM interlink	-
70509	Debris	452575	5919017	A2	3.4	1.9	0.6	-	-	-	Identified in the 2020 SSS data as an elongate dark reflector with large rounded shadow, orthogonal to adjacent sand ripple and distinct from surrounding seabed. No associated Mag. anomaly, but visible in the MBES data as an elongate ridge potentially partially buried by mobile sand. Possible non-ferrous debris.	SSS	2020 ECR	ECC	-
70510	Debris	452648	5918774	A1	10.4	1.1	0.2	-	-	-	Identified in the 2020 SSS data as two parallel, adjacent elongate dark reflectors which cast bright, irregular shadows. Located in an area of megaripples. No definite corresponding MBES or mag. contacts, but an irregular area of seabed visible in the MBES close to this location may be associated. Located 14 m north-west of debris field 70511 , and is probably associated debris.	SSS	2020 ECR	ECC	-



ID	Classification	Easting	Northing	Archaeological discrimination	L (m)	W (m)	H (m)	Depth below seabed (m)	Least Depth (m LAT)	Magnetic amplitude (nT)	Description	Anomaly type	Dataset	Section	External references
70511	Debris field	452658	5918763	A1	12.4	5.0	0.5	-	-	24	Identified in the 2020 SSS data as an elongate area of dark and bright reflectors located within an area of megaripples. The area has a sharp boundary on WNW edge, and some potential structure is visible. Visible in the MBES data as a low, elongate, irregular mound. Identified in the Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line, suggesting at least partial ferrous composition. This is located 35 m west and 14 m south-east of debris features 70512 and 70510 respectively, and is likely associated. Additional buried debris may be present in the vicinity due to the mobile nature of the seabed sediment at this location. Probable area of ferrous debris, potentially a badly degraded structure such as a wreck.	SSS, Mag.	2020 ECR	ECC	-
70512	Debris	452693	5918757	A1	2.5	0.9	0.1	-	-	-	Identified in the 2020 SSS data as a small elongate dark reflector with a long narrow shadow, located in an area of megaripples. No definite Mag. anomaly, but visible as a small, low mound in the MBES data. Located 35 m east of debris field 70511 and possibly associated debris.	SSS	2020 ECR	ECC	-
70513	Magnetic	453957	5919637	A2	-	-	-	-	-	24	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough on one profile line. No associated MBES or Mag. anomalies. Possible ferrous debris that is either buried or without surface expression.	Mag.	2020 ECR	ECC	-
70514	Debris	454510	5920164	A2	3.6	2.0	0.2	-	-	-	Identified in the 2020 SSS data as a small irregular area of small subangular dark reflectors with long shadows, located in an area of megaripples. Tentatively visible in the MBES data as a small, low mound. Possible debris.	SSS	2020 ECR	ECC	-
70515	Rope/chain	454808	5920448	A2	192.4	0.8	0.2	-	-	-	Identified in the 2020 SSS data as a curvilinear dark reflector with small shadow, located in an area of sand waves. Part of an intermittent east-west alignment of 5 similar features, approximately 650 m long. Identified in the MBES data as a thin curvilinear ridge. No associated Mag. anomaly. Possibly a section of a long length of rope or chain that is periodically buried by sand waves. Retained as a precaution.	SSS	2020 ECR	ECC	-
70516	Rope/chain	454999	5920441	A2	88.7	0.5	0.1	-	-	-	Identified in the 2020 SSS data as a curvilinear dark reflector with small shadow, located in an area of sand waves. Part of an intermittent east-west alignment of 5 similar features, approximately 650 m long. Identified in the MBES data as a thin curvilinear ridge. No associated Mag. anomaly. Possibly a section of a long length of rope or chain that is periodically buried by sand waves. Retained as a precaution.	SSS	2020 ECR	ECC	-
70517	Rope/chain	455165	5920438	A2	111.5	0.5	0.1	-	-	-	Identified in the 2020 SSS data as a curvilinear dark reflector with small shadow, located in an area of sand waves. Part of an intermittent east-west alignment of 5 similar features, approximately 650 m long. Identified in the MBES data as a thin curvilinear ridge. No associated Mag. anomaly. Possibly a section of a long length of rope or chain that is periodically buried by sand waves. Retained as a precaution.	SSS	2020 ECR	ECC	-
70518	Rope/chain	455242	5920438	A2	10.7	0.2	0.1	-	-	-	Identified in the 2020 SSS data as a curvilinear dark reflector with small shadow, located in an area of sand waves. Part of an intermittent east-west alignment of 5 similar features, approximately 650 m long. Identified in the MBES data as a thin curvilinear ridge. No associated Mag. anomaly. Possibly a section of a long length of rope or chain that is periodically buried by sand waves. Retained as a precaution.	SSS	2020 ECR	ECC	-
70519	Rope/chain	455351	5920438	A2	27.7	0.7	0.1	-	-	-	Identified in the 2020 SSS data as a curvilinear dark reflector with small shadow, located in an area of sand waves. Part of an intermittent east-west alignment of 5 similar features, approximately 650 m long. Identified in the MBES data as a thin curvilinear ridge. No associated Mag. anomaly. Possibly a section of a long length of rope or chain that is periodically buried by sand waves. Retained as a precaution.	SSS	2020 ECR	ECC	-
70520	Debris	453286	5918668	A2	4.8	0.2	0.1	-	-	-	Identified in the 2020 SSS data as an elongate dark reflector with small shadow, located within the trough of a sand megaripple. No associated MBES or Mag. contacts. Part of a linear alignment of 8 similar features, approximately 300 m long, trending approximately east-west. All features are within the troughs of megaripples, and are spaced approximately 35 to 50 m apart. Could be a scar or potentially debris; maybe a section of a long length of rope or chain that has become mostly buried. Retained as a precaution.	SSS	2020 ECR	ECC	-



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70521	Debris	453322	5918675	A2	5.2	0.6	0.1	-	-	-	Identified in the 2020 SSS data as an elongate dark reflector with small shadow, located within the trough of a sand megaripple. No associated MBES or Mag. contacts. Part of a linear alignment of 8 similar features, approximately 300 m long, trending approximately east-west. All features are within the troughs of megaripples, and are spaced approximately 35 to 50 m apart. Could be a scar or potentially debris; maybe a section of a long length of rope or chain that has become mostly buried. Retained as a precaution.	SSS	2020 ECR	ECC	-
70522	Debris	453361	5918676	A2	9.6	0.5	0.1	-	-	-	Identified in the 2020 SSS data as an elongate dark reflector with small shadow, located within the trough of a sand megaripple. No associated MBES or Mag. contacts. Part of a linear alignment of 8 similar features, approximately 300 m long, trending approximately east-west. All features are within the troughs of megaripples, and are spaced approximately 35 to 50 m apart. Could be a scar or potentially debris; maybe a section of a long length of rope or chain that has become mostly buried. Retained as a precaution.	SSS	2020 ECR	ECC	-
70523	Debris	453403	5918676	A2	5.0	0.3	0.1	-	-	-	Identified in the 2020 SSS data as an elongate dark reflector with small shadow, located within the trough of a sand megaripple. No associated MBES or Mag. contacts. Part of a linear alignment of 8 similar features, approximately 300 m long, trending approximately east-west. All features are within the troughs of megaripples, and are spaced approximately 35 to 50 m apart. Could be a scar or potentially debris; maybe a section of a long length of rope or chain that has become mostly buried. Retained as a precaution.	SSS	2020 ECR	ECC	-
70524	Debris	453438	5918678	A2	11.6	0.2	0.1	-	-	-	Identified in the 2020 SSS data as an elongate dark reflector with small shadow, located within the trough of a sand megaripple. No associated MBES or Mag. contacts. Part of a linear alignment of 8 similar features, approximately 300 m long, trending approximately east-west. All features are within the troughs of megaripples, and are spaced approximately 35 to 50 m apart. Could be a scar or potentially debris; maybe a section of a long length of rope or chain that has become mostly buried. Retained as a precaution.	SSS	2020 ECR	ECC	-
70525	Debris	453490	5918676	A2	2.9	0.2	0.1	-	-	-	Identified in the 2020 SSS data as an elongate dark reflector with small shadow, located within the trough of a sand megaripple. No associated MBES or Mag. contacts. Part of a linear alignment of 8 similar features, approximately 300 m long, trending approximately east-west. All features are within the troughs of megaripples, and are spaced approximately 35 to 50 m apart. Could be a scar or potentially debris; maybe a section of a long length of rope or chain that has become mostly buried. Retained as a precaution.	SSS	2020 ECR	ECC	-
70526	Debris	453547	5918673	A2	3.1	0.2	0.1	-	-	-	Identified in the 2020 SSS data as an elongate dark reflector with small shadow, located within the trough of a sand megaripple. No associated MBES or Mag. contacts. Part of a linear alignment of 8 similar features, approximately 300 m long, trending approximately east-west. All features are within the troughs of megaripples, and are spaced approximately 35 to 50 m apart. Could be a scar or potentially debris; maybe a section of a long length of rope or chain that has become mostly buried. Retained as a precaution.	SSS	2020 ECR	ECC	-
70527	Debris	453587	5918672	A2	3.7	0.6	0.1	-	-	-	Identified in the 2020 SSS data as an elongate dark reflector with small shadow, located within the trough of a sand megaripple. No associated MBES or Mag. contacts. Part of a linear alignment of 8 similar features, approximately 300 m long, trending approximately east-west. All features are within the troughs of megaripples, and are spaced approximately 35 to 50 m apart. Could be a scar or potentially debris; maybe a section of a long length of rope or chain that has become mostly buried. Retained as a precaution.	SSS	2020 ECR	ECC	-
70528	Dark reflector	454955	5919840	A2	1.9	1.4	0.0	-	-	-	Identified in the 2020 SSS data as a small elongate dark reflector with potential scour on the north-west side but no apparent shadow. Somewhat distinct from the surrounding megaripples. No associated MBES or Mag. contacts. Possible non-ferrous debris or a natural feature.	SSS	2020 ECR	ECC	-



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70529	Dark reflector	454429	5919226	A2	2.7	0.7	0.1	-	-	-	Identified in the 2020 SSS data as an elongate dark reflector with short rounded shadow, located in an area of megaripples but distinct from surrounding seabed. No associated Mag. anomaly, but visible in the MBES data as a small, elongate mound within a depression. Could be non-ferrous debris or a natural feature. Retained as a precaution.	SSS	2020 ECR	ECC	-
70530	Dark reflector	454403	5919074	A2	2.6	1.9	0.1	-	-	-	Identified in the 2020 SSS data as two immediately adjacent small subangular dark reflectors with short shadows and possible small scour. Located in an area of megaripples. No associated MBES contact. Could be debris or natural features. Retained as a precaution.	SSS	2020 ECR	ECC	-
70531	Dark reflector	454158	5918797	A2	4.7	1.2	0.3	-	-	-	Identified in the 2020 SSS data as a small irregular subangular dark reflector with a flared shadow. Some associated scour is visible. No definite corresponding MBES or Mag. contact, but a small possible mound visible in the MBES close to this location may be associated. Possible item of non-ferrous debris, or a natural feature.	SSS	2020 ECR	ECC	-
70532	Rope/chain	454568	5919157	A2	29.5	0.2	0.1	-	-	-	Identified in the 2020 SSS data as a narrow, discontinuous curvilinear dark reflector with an irregular shadow. This is oriented north-west to south-east and cuts across the surrounding sand ripples. No corresponding MBES or Mag. contact. Possible partially buried length of rope or chain.	SSS	2020 ECR	ECC	-
70533	Magnetic	454237	5918737	A2	-	-	-	-	-	38	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contact. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 ECR	ECC	-
70534	Bright reflector	454674	5919128	A2	131.9	0.9	0.0	-	-	-	Identified in the 2020 SSS data as a long narrow curvilinear bright reflector oriented approx. east-west, running along the edge of an area of megaripples. No associated Mag. anomaly. Dark reflector 70535 is located at the eastern end, and may be related. Could be a length of rope or chain or a seabed scar.	SSS	2020 ECR	ECC	-
70535	Dark reflector	454730	5919118	A2	4.1	3.2	0.2	-	-	-	Identified in the 2020 SSS data as a sub-angular dark reflector which casts a fairly bright, short, tapering shadow, and appears larger than natural rocks in the area. Located at the edge of an area of megaripples, and at the end of linear bright reflector 70534 . Identified in the MBES data as a somewhat distinct irregular/slightly elongate mound on the boundary between featureless seabed and an area of megaripples. No associated Mag. anomaly. Possible non-ferrous debris or a natural feature.	SSS, MBES	2020 ECR	ECC	-
70536	Dark reflector	455329	5919736	A2	1.2	0.9	0.0	-	-	-	Identified in the 2020 SSS data as a small rounded dark reflector with shadow in the centre, possibly hollow. Associated scour is seen. No corresponding MBES or Mag. contact. Possible item of non-ferrous debris, or a natural feature.	SSS	2020 ECR	ECC	-
70537	Dark reflector	455137	5919510	A2	4.4	2.7	0.6	-	19.7	-	Identified in the 2020 SSS data as a small irregular subangular dark reflector with rounded shadow. This has an associated scour. Visible in the 2020 MBES data as a distinct subangular mound. Situated in a depression with wide, shallow scour extending approx. 9 m to the ESE. Possible item of debris, or a natural feature.	SSS, MBES	2020 ECR	ECC	-
70538	Dark reflector	455002	5919312	A2	1.1	0.5	0.1	-	-	-	Identified in the 2020 SSS data as a small subangular dark reflector with rounded shadow. No corresponding MBES or Mag. contact. Possible item of non-ferrous debris, or a natural feature.	SSS	2020 ECR	ECC	-
70539	Dark reflector	454393	5918685	A2	0.9	0.1	0.0	-	-	-	Identified in the 2020 SSS data as a small elongate dark reflector with a short rounded shadow. Located 1 m south-west of similar anomaly 70540 . No corresponding MBES contact. Possible item of debris, or a natural feature.	SSS	2020 ECR	ECC	-
70540	Dark reflector	454394	5918686	A2	0.5	0.1	0.0	-	-	-	Identified in the 2020 SSS data as a small elongate dark reflector with a short rounded shadow. Located approximately 1 m north-east of 70539 and may be associated. No corresponding MBES contact. Possible item of debris, or a natural feature.	SSS	2020 ECR	ECC	-
70541	Dark reflector	454378	5918602	A2	2.0	1.6	0.7	-	17.1	-	Identified in the 2020 SSS data as a small subangular dark reflector which casts a straight-sided shadow. Some associated scour is present. Visible in the MBES data as a subangular mound. This is located directly adjacent to anomaly 70542 and these are present within the same scour or depression. No corresponding Mag. contact. Possible item of non-ferrous debris, or a natural feature.	SSS, MBES	2020 ECR	ECC	-



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70542	Dark reflector	454380	5918601	A2	2.8	2.6	0.4	-	17.3	-	Identified in the 2020 SSS data as a small subangular dark reflector which casts a straight-sided shadow. Some associated scour is present. Visible in the MBES data as a subangular mound. This is located directly adjacent to anomaly 70541 and these are present within the same scour or depression. No corresponding Mag. contact. Possible item of non-ferrous debris, or a natural feature.	SSS, MBES	2020 ECR	ECC	-
70543	Dark reflector	454314	5918297	A2	3.1	0.6	0.3	-	-	-	Identified in the 2020 SSS data as a curved dark reflector with asymmetrically tapering shadow. No definite corresponding MBES or Mag. contact, but a small possible mound visible in the MBES close to this location may be associated. Possible item of debris, or a natural feature.	SSS	2020 ECR	ECC	-
70544	Dark reflector	455661	5919339	A2	2.2	0.3	0.2	-	-	-	Identified in the 2020 SSS data as a curved dark reflector with a slightly irregular shadow. No definite corresponding MBES or Mag. contact, but a small possible mound visible in the MBES close to this location may be associated. Possible item of non-ferrous debris, or a natural feature.	SSS	2020 ECR	ECC	-
70545	Debris	454611	5918068	A2	3.2	1.0	0.3	-	-	-	Identified in the 2020 SSS data as a small elongate dark reflector with short rounded shadow, located at the eastern end of rope or chain feature 70546. Possibly associated with a small, broad magnetic anomaly, but is situated within an area of increased background signal variability and so this is uncertain. Possible anchor or mooring point.	SSS	2020 ECR	ECC	-
70546	Rope/chain	454687	5918031	A2	210.0	2.6	0.4	-	14.3	-	Identified in the 2020 SSS data as a long, distinct, curvilinear dark reflector with small shadow. Identified in the MBES data as a distinct curved ridge, generally on a north-east to south-west alignment. A distinct separate anomaly at the eastern end may represent an anchor (70545). No associated Mag. anomaly. Possible length of rope or chain.	SSS, MBES	2020 ECR	ECC	-
70547	Dark reflector	454869	5918104	A2	2.4	1.4	0.8	-	-	-	Identified in the 2020 SSS data as a small elongate dark reflector with broad rounded shadow, distinct from surrounding seabed. Visible in the MBES data as a distinct elongate mound. Could be debris or a natural feature.	SSS	2020 ECR	ECC	-
70548	Magnetic	454808	5918789	A2	-	-	-	-	-	46	Identified in the 2020 Mag. data as a medium asymmetric dipole with peak and trough on one profile line. No associated SSS or MBES contacts. Possible ferrous debris that is either buried or without surface expression.	Mag.	2020 ECR	ECC	-
70549	Magnetic	455332	5919104	A2	-	-	-	-	-	31	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough on one profile line. Potentially associated with a small mound visible within the MBES data, but this is unclear. Possible ferrous debris with little surface expression.	Mag.	2020 ECR	ECC	-
70550	Mound	455841	5919573	A2	1.8	1.6	0.4	-	18.2	-	Identified in the 2020 MBES data as a distinct rounded mound in an area of sand ripples. Situated within a scour or depression. No associated SSS or Mag. contacts. Could be non-ferrous debris or a natural feature.	MBES	2020 ECR	ECC	-
70551	Dark reflector	455593	5918600	A2	1.9	1.2	0.5	-	-	-	Identified in the 2020 SSS data as a sub-angular dark reflector which casts a bright shadow with straight sides. Possible internal structure, but this is unclear. Visible in the MBES data as a small mound. Could be debris or a natural feature.	SSS	2020 ECR	ECC	-
70552	Magnetic	456116	5917627	A2	-	-	-	-	-	30	Identified in the 2020 Mag. data as a medium negative monopole with peak and trough on one profile line. No associated MBES or SSS contacts. Possible ferrous debris that is either buried or without surface expression.	Mag.	2020 ECR	ECC	-
70553	Magnetic	456052	5918548	A2	-	-	-	-	-	47	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough on one profile line. No associated SSS or MBES contacts. Possible ferrous debris that is either buried or without surface expression.	Mag.	2020 ECR	ECC	-
70554	Dark reflector	456541	5918174	A2	2.5	0.6	0.2	-	-	-	Identified in the 2020 SSS data as a slightly indistinct elongated dark reflector with a bright, irregular shadow. No associated MBES contact. Could be debris or a natural feature.	SSS	2020 ECR	ECC	-
70555	Magnetic	456412	5918592	A2	-	-	-	-	-	20	Identified in the 2020 Mag. data as a small, broad positive monopole with peak and trough on one profile line. No associated MBES or SSS contacts. Possible ferrous debris that is either buried or without surface expression.	Mag.	2020 ECR	ECC	-
70556	Dark reflector	457550	5917605	A2	2.0	1.3	0.9	-	-	-	Identified in the 2020 SSS data as a distinct sub-angular dark reflector which casts a bright tapering shadow and has associated scour. Visible in the MBES data as an elongate mound within a depression. Could be debris or a natural feature.	SSS	2020 ECR	ECC	-
70557	Dark reflector	457464	5917468	A2	2.6	0.8	0.4	-	-	-	Identified in the 2020 SSS data as a small elongate dark reflector with broad asymmetrically tapered shadow. Identified in the MBES data as a small elongate mound within a depression. Could be debris or a natural feature.	SSS	2020 ECR	ECC	-



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70558	Dark reflector	457380	5917220	A2	2.7	1.6	0.2	-	-	-	Identified in the 2020 SSS data as a small irregular subangular dark reflector with rounded shadow, and possible internal structure. Visible in the MBES data as a small mound. Could be debris or a natural feature.	SSS	2020 ECR	ECC	-
70559	Dark reflector	457373	5917071	A2	3.7	3.5	1.1	-	12.4	-	Identified in the 2020 SSS data as a distinct subangular dark reflector with broad tapered shadow, distinct from surrounding seabed, situated within a distinct scour. Identified in the MBES data as a distinct, large mound in an area of clear seabed, with a 1.6 m wide scour extending from the north-west to the north-east side. Possible debris or a natural feature.	SSS	2020 ECR	ECC	-
70560	Dark reflector	457598	5918550	A2	2.4	2.1	0.7	-	14.0	-	Identified in the 2020 SSS data as a small irregular, subangular dark reflector with long broad tapered shadow and rounded scour. A second possible object with height also visible within shadow. Identified in the MBES data as a distinct, tall mound in an area of relatively clear seabed, set within broad depression or scour 5.1 m across. Could be debris or a natural feature.	SSS, MBES	2020 ECR	ECC	-
70561	Magnetic	457696	5918420	A2	-	-	-	-	-	19	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No associated SSS or MBES contacts. Possible ferrous debris that is either buried or without surface expression, or a natural feature.	Mag.	2020 ECR	ECC	-
70562	Mound	458083	5918311	A2	2.7	2.5	0.6	-	13.4	-	Identified in the 2020 MBES data as a distinct subrounded mound in an area of relatively clear seabed. Set within encircling scour or broad depression 5.8 m wide. Some sedimentation on the north-eastern side. No associated SSS or Mag. anomalies. Could be non-ferrous debris or a natural feature. Retained as a precaution.	MBES	2020 ECR	ECC	-
70563	Dark reflector	458055	5917428	A2	2.8	0.7	0.8	-	-	-	Identified in the 2020 SSS data as a distinct dark reflector with large shadow and possible scour. Visible in the MBES data as a distinct mound within a depression. Could be debris or a natural feature.	SSS	2020 ECR	ECC	-
70564	Rope/chain	458552	5917856	A2	43.9	1.1	0.1	-	-	-	Identified in the 2020 SSS data as a straight, linear dark reflector with small shadow. The longer of two adjacent, very similar anomalies (the other being 70565). No associated MBES anomaly. Possible length of rope or chain, although the two anomalies together may be the edges of a distinct seabed scar. Retained as a precaution.	SSS	2020 ECR	ECC	-
70565	Rope/chain	458552	5917855	A2	16.3	0.8	0.1	-	-	-	Identified in the 2020 SSS data as a straight, linear dark reflector with small shadow. The shorter of two adjacent, very similar anomalies (the other being 70564). No associated MBES anomaly. Possible length of rope or chain, although the two anomalies together may be the edges of a distinct seabed scar. Retained as a precaution.	SSS	2020 ECR	ECC	-
70566	Magnetic	459041	5916656	A2	-	-	-	-	-	11	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one profile line. No associated SSS or MBES contacts. Possible ferrous debris that is either buried or without surface expression, or a natural feature.	Mag.	2020 ECR	ECC	-
70567	Debris	459432	5917103	A2	3.0	1.7	1.0	-	-	-	Identified in the 2020 SSS data as a distinct, elongate dark reflector with distinct shadow and associated scour. Visible in the MBES data as an elongate mound in a depression. Possible debris.	SSS	2020 ECR	ECC	-
70568	Dark reflector	459499	5916958	A2	1.8	1.7	0.5	-	-	-	Identified in the 2020 SSS data as a distinct rounded dark reflector which casts a bright tapered shadow with a flared side, possibly due to associated scour. Visible in the MBES data as a small mound. Could be debris or a natural feature.	SSS	2020 ECR	ECC	-
70569	Dark reflector	459652	5916662	A2	3.1	0.6	0.5	-	-	-	Identified in the 2020 SSS data as a 'C' shaped dark reflector which casts an irregularly shaped shadow and has associated scour. Unusual for the area and larger than surrounding natural features. Visible in the MBES data as a small, irregular mound. No associated Mag. anomaly. Possible non-ferrous debris or a natural feature.	SSS	2020 ECR	ECC	-
70570	Magnetic	459898	5916569	A2	-	-	-	-	-	27	Identified in the 2020 Mag. data as a small asymmetric magnetic dipole with peak and trough on one survey line. No associated SSS or MBES contacts. Possible ferrous debris that is either buried or without surface expression.	Mag.	2020 ECR	ECC	-



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7070	Mound	460302	5916795	A1	14.5	11.8	1.2	-	10.3	66	Previously identified in the 2010 SSS as a rounded object with irregular surface, located in a boulder field. Identified in the 2020 SSS data as a distinct, elongate mound with an irregular surface. In the MBES data, it is found to be orientated approximately north-south, with a long, shallow scour extending to the ESE. Associated with a medium negative magnetic monopole, suggesting the presence of ferrous material. No other similar anomalies present in the area, potential debris; possibly a ballast mound, but this cannot be determined without further investigation.	SSS, MBES, Mag.	2020 ECR, 2010 GyM	ECC	-
70571	Dark reflector	460063	5917130	A2	2.6	1.2	0.3	-	-	-	Identified in the 2020 SSS data as a distinct, elongate dark reflector with shadow and small scour, located in a generally featureless area of seabed. Visible in the MBES data as a small mound within a depression. Could be debris or a natural feature.	SSS	2020 ECR	ECC	-
70572	Dark reflector	460150	5917240	A2	1.8	1.4	0.8	-	11.9	-	Identified in the 2020 SSS data as a distinct subangular dark reflector with two-lobed rounded scour and long tapered broad shadow. Identified in the MBES data as a distinct mound within a depression. Could be debris or a natural feature.	SSS, MBES	2020 ECR	ECC	-
70573	Seabed disturbance	460335	5916887	A2	18.7	5.2	0.0	-	-	-	Identified in the 2020 SSS data as an area of small subrounded dark reflectors, potentially with very short shadows or associated scours, somewhat distinct from surrounding seabed. Visible in the MBES data as an elongate area of irregular seabed. Possible debris buried just below the seabed, or a natural feature.	SSS	2020 ECR	ECC	-
70574	Dark reflector	460002	5915446	A2	4.3	1.2	0.3	-	-	-	Identified in the 2020 SSS data as an elongate dark reflector with shadow and associated scour in an area of featureless seabed. Visible in the MBES data as a small mound. Could be debris or a natural feature.	SSS	2020 ECR	ECC	-
70575	Magnetic	461321	5914816	A2	-	-	-	-	-	28	Identified in the 2020 Mag. data as a small asymmetric dipole with peak and trough on one profile line. No associated SSS or MBES contacts. Possible ferrous debris that is either buried or without surface expression.	Mag.	2020 ECR	ECC	-
70576	Rope/chain	461620	5914738	A2	91.0	1.3	0.2	-	9.9	-	Identified in the 2020 SSS data as a long, straight, linear dark reflector with small shadow in an area with relatively small irregular seabed features. Visible in the MBES data as a long, linear ridge within a small depression. No associated Mag. anomaly. Does not correlate with any charted cables, possible length of rope or chain.	SSS, MBES	2020 ECR	ECC	-
70577	Magnetic	459724	5915005	A2	-	-	-	-	-	121	Identified in the 2020 Mag. dataset as a large, sharp asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible significant ferrous debris that is either buried or with no surface expression. Possibly related to a nearby marker buoy, but this is unclear. Retained as a precaution.	Mag.	2020 ECR	ECC	-
70578	Rope/Chain	459867	5914924	A2	18.0	1.1	0.3	-	-	-	Identified in the 2020 SSS dataset as a distinct curvilinear dark reflector with shadow located in an area with other similar features and dark reflectors, and possibly attached to adjacent dark reflector 70579. In an area of variable reflectivity seabed and apparent mobile sediments. Interpreted as a possible modern feature or may be possible rope or chain.	SSS	2020 ECR	ECC	-
70579	Dark reflector	459857	5914926	A2	6.5	2.1	0.8	-	-	-	Identified in the 2020 SSS dataset as a distinct, subrounded, irregular dark reflector with a bright asymmetric shadow. Located immediately adjacent to rope/chain 70578 and may be attached. Located in an area of variable reflectivity seabed. Visible on the MBES dataset as a very low mound. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 ECR	ECC	-
70580	Dark reflector	459933	5914822	A2	3.7	2.2	0.6	-	-	-	Identified in the 2020 SSS dataset as an irregular dark reflector with a bright asymmetric shadow, possible comprising two objects - one elongate and linear, one subrounded and irregular. Located in an area of variable reflectivity seabed, some mobile sediments and situated within an area of scour. Visible on the MBES dataset as a small mound. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris. Could be related to the nearby marker buoy, but this can only be confirmed by visual inspection.	SSS	2020 ECR	ECC	-



ID	Classification	Easting	Northing	Archaeological discrimination	L (m)	W (m)	H (m)	Depth below seabed (m)	Least Depth (m LAT)	Magnetic amplitude (nT)	Description	Anomaly type	Dataset	Section	External references
70581	Dark reflector	461005	5914730	A2	3.2	1.4	0.6	-	-	-	Identified in the 2020 SSS dataset as a distinct elongate dark reflector with a bright shadow. Located in an area of variable reflectivity seabed, with smaller natural features visible in the area. Visible on the MBES dataset as a prominent mound set within scour. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris.	SSS	2020 ECR	ECC	-
70582	Magnetic	461321	5914816	A2	-	-	-	-	-	28	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 ECR	ECC	-
70583	Dark reflector	461316	5914870	A2	2.6	1.6	0.3	-	-	-	Identified in the 2020 SSS dataset as a distinct subrounded to elongate dark reflector with a bright shadow. Scour is visible to the south-west. Located in an area of variable reflectivity seabed. Visible on the MBES dataset as a small mound. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris.	SSS	2020 ECR	ECC	-
70584	Dark reflector	461183	5914906	A2	3.0	0.6	0.3	-	-	-	Identified in the 2020 SSS dataset as a distinct large subrounded, elongate dark reflector with a bright shadow. Set in a wide depression or scour and located in an area of variable reflectivity seabed. Some smaller, probably natural features are visible nearby. Visible on the MBES dataset as a small mound set within scour. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris.	SSS	2020 ECR	ECC	-
70585	Dark reflector	461421	5914829	A2	4.1	1.4	0.5	-	-	-	Identified in the 2020 SSS dataset as a distinct irregular dark reflector with a bright, asymmetric shadow which obscures part of the dark reflector itself. Set within scour to the south-west. Visible on the MBES dataset as a rounded mound set within scour. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris.	SSS	2020 ECR	ECC	-
70586	Dark reflector	461433	5914695	A2	1.5	1.5	0.1	-	-	-	Identified in the 2020 SSS dataset as a distinct dark reflector. Isolated and located in an area of variable reflectivity seabed. Visible on the MBES dataset as a low mound. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris.	SSS	2020 ECR	ECC	-
70587	Dark reflector	461548	5914757	A2	4.3	1.3	0.7	-	-	-	Identified in the 2020 SSS dataset as a distinct subrounded to elongate dark reflector with a bright shadow. Located in an area of variable reflectivity seabed. Visible on the MBES dataset as a tall, prominent mound. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris.	SSS	2020 ECR	ECC	-
70588	Magnetic	462149	5914318	A2	-	-	-	-	-	124	Identified in the 2020 Mag. dataset as a large, sharp asymmetric dipole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 ECR	ECC	-
70589	Dark reflector	461637	5913557	A2	1.2	0.7	0.1	-	-	-	Identified in the 2020 SSS dataset as a fairly distinct dark reflector with an indistinct shadow. Located in an area of variable reflectivity seabed and approximately 7 m to the north-west of 70590, and may be related. Visible on the MBES dataset as a small mound. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris.	SSS	2020 ECR	ECC	-
70590	Debris	461648	5913550	A2	12.8	5.6	0.1	-	-	-	Identified in the 2020 SSS dataset as a distinct irregular dark reflector comprising a single contiguous feature with two elongate dark reflectors forming an 'L' shape, which casts a bright shadow. Isolated in an area of seabed with some mobile sediments. Visible in the MBES dataset as a curvilinear mound. No corresponding Mag. contacts. Interpreted as possible non-ferrous debris.	SSS	2020 ECR	ECC	-
70591	Debris	461636	5913624	A2	5.4	1.1	0.1	-	-	-	Identified in the 2020 SSS dataset as a distinct elongate dark reflector with a short shadow, isolated in an area of variable reflectivity seabed and some mobile sediments. Visible in the MBES dataset as an elongate mound. No corresponding Mag. contacts. Interpreted as possible non-ferrous debris.	SSS	2020 ECR	ECC	-
70592	Magnetic	462076	5913719	A2	-	-	-	-	-	36	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 ECR	ECC	-



ID	Classification	Easting	Northing	Archaeological discrimination	L (m)	W (m)	H (m)	Depth below seabed (m)	Least Depth (m LAT)	Magnetic amplitude (nT)	Description	Anomaly type	Dataset	Section	External references
70593	Recorded obstruction	461991	5913704	A3	-	-	-	-	-	-	Recorded by the UKHO as an area of foul ground, previously reported as the wreck of an Avro Anson Bomber. The report indicates the engines have been previously removed, indicating the other remains are supposed to still be on the seabed. However, subsequent survey in 2000 failed to detect the wreck, and it was amended to dead. No anomalies have been identified at this location using the 2020 geophysical data. The UKHO record indicates this is located "near N Rhyl buoy", but the nearest marker buoy is over 2 km away from the chartered position, so the position may be inaccurate.	-	2020 ECR	ECC	UKHO 8270
70594	Magnetic	461996	5913856	A2	-	-	-	-	-	80	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 ECR	ECC	-
70595	Dark reflector	462806	5913562	A2	4.5	1.7	0.4	-	-	-	Identified in the 2020 SSS dataset as a distinct, irregular, elongate dark reflector with multiple areas of shadow, suggesting up to three distinct features. Located in an area of variable reflectivity seabed and mobile sediments. Visible in the MBES dataset as an elongate mound. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris.	SSS	2020 ECR	ECC	-
70596	Magnetic	462475	5913090	A2	-	-	-	-	-	16	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 ECR	ECC	-
70597	Magnetic	462403	5913099	A2	-	-	-	-	-	38	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 ECR	ECC	-
70598	Dark reflector	463186	5912782	A2	7.3	1.2	0.0	-	-	-	Identified in the 2020 SSS dataset as a distinct linear dark reflector with no visible shadow in an area of variable reflectivity seabed. No corresponding Mag. or MBES contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris.	SSS	2020 ECR	ECC	-
70599	Magnetic	463502	5912887	A2	-	-	-	-	-	9	Identified in the 2020 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 that is either buried or with no surface expression, or a natural feature.	Mag.	2020 ECR	ECC	-
70600	Rope/chain	463021	5912318	A2	23.7	0.8	0.0	-	-	-	Identified in the 2020 SSS dataset as a distinct, curvilinear dark reflector, isolated in an area of variable reflectivity seabed. Faintly visible on the MBES dataset as a very indistinct linear mound. No corresponding Mag. contacts. Interpreted as a possible length of rope or chain, but may be a modern feature.	SSS	2020 ECR	ECC	-
70601	Magnetic	463124	5912230	A2	-	-	-	-	-	21	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 ECR	ECC	-
70602	Magnetic	462991	5912212	A2	-	-	-	-	-	29	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 ECR	ECC	-
70603	Magnetic	464923	5911781	A2	-	-	-	-	-	7209	Identified in the 2020 Mag. dataset as a very large, sharp positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. Interpreted as possible ferrous debris that is either buried or with no surface expression. Not identified on any other survey lines, which is unusual for an anomaly of this size. May be due to another effect (e.g. another vessel passing close during survey), but retained as a precaution.	Mag.	2020 ECR	ECC	-
70604	Magnetic	465694	5910800	A2	-	-	-	-	-	65	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 ECR	ECC	-



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70605	Magnetic	465526	5911469	A2	-	-	-	-	-	32	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 ECR	ECC	-
70606	Magnetic	465828	5911177	A2	-	-	-	-	-	14	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 ECR	ECC	-
70607	Magnetic	466985	5910899	A2	-	-	-	-	-	11	Identified in the 2020 Mag. data as a small, broad asymmetric dipole with peak and trough on one survey line. No associated SSS or MBES contacts. Possible ferrous debris that is either buried or without surface expression, or a natural feature.	Mag.	2020 ECR	ECC	-
70608	Magnetic	468455	5910439	A2	-	-	-	-	-	220	Identified in the 2020 Mag. data as a large, distinct, magnetic monopole with peak and trough on one survey line. No associated SSS or MBES contacts. Possible significant ferrous debris, that is either buried or without surface expression. Probably related to nearby features 70613 and 70612 .	Mag.	2020 ECR	ECC	-
70609	Debris	467748	5911072	A2	3.3	2.2	0.7	-	3.9	-	Identified in the 2020 SSS dataset as a slightly rounded, elongate dark reflector with a short shadow and some surrounding disturbed seabed. Visible in the MBES dataset as a distinct, subrounded mound set within encircling scour 1.2-1.6 m wide. No corresponding Mag. contacts. Interpreted as possible non-ferrous debris.	MBES, SSS	2020 ECR	ECC	-
70610	Rope/chain	468114	5910065	A2	110.0	2.5	0.5	-	-	15	Identified in the 2020 SSS dataset as a long, slightly curved linear dark reflector with a clear tapered shadow in the central section, associated with a widening of the feature which may indicate an attached object. Adjacent and possibly attached to dark reflector 70611 . Associated with a small, broad positive monopole with peak and trough on one profile line visible in the Mag. dataset. Visible in the MBES dataset as a curvilinear mound. Interpreted as a possible chain or rope with attached ferrous object.	SSS, Mag.	2020 ECR	ECC	-
70611	Dark reflector	468078	5910054	A2	4.2	2.9	0.2	-	2.4	-	Identified in the 2020 SSS dataset as a large, irregular dark reflector with a broader tapered shadow. Visible in the MBES dataset as an irregular, elongate mound in an area of clear seabed. Adjacent and possibly attached to rope or chain feature 70610 . No corresponding Mag. contacts. Interpreted as a possible debris or anchor.	MBES, SSS	2020 ECR	ECC	-
70612	Dark reflector	468460	5910485	A2	4.4	0.3	0.1	-	-	-	Identified in the 2020 SSS dataset as an indistinct but irregular elongate dark reflector with a possible short shadow. Approximately 25 m from 62018 and possibly associated. Visible in the MBES dataset as a small mound in scour. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris.	SSS	2020 ECR	ECC	-
70613	Debris	468474	5910472	A2	3.4	3.0	0.7	-	-	111	Identified in the 2020 SSS dataset as a small, slightly angular and sharply defined dark reflector with a narrow, tapered shadow. Visible in the MBES dataset as a small mound in scour. Associated with a large, sharp asymmetric dipole with peak and trough on one profile line visible in the Mag. dataset. Interpreted as possible ferrous debris.	SSS, Mag.	2020 ECR	ECC	-
70614	Dark reflector	468271	5910043	A2	3.0	0.3	0.2	-	-	-	Identified in the 2020 SSS dataset as a small, elongate dark reflector with a short tapered shadow. No corresponding MBES or Mag. contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris.	SSS	2020 ECR	ECC	-
70615	Rope/chain	468546	5910413	A2	33.5	2.1	0.0	-	-	-	Identified in the 2020 SSS dataset as a long, narrow linear dark reflector with no visible shadow. Visible in the MBES dataset as a long, straight, linear mound. No corresponding Mag. contacts. Interpreted as a possible rope or chain.	SSS	2020 ECR	ECC	-
70616	Magnetic	468693	5910552	A2	-	-	-	-	-	145	Identified in the 2020 Mag. dataset as a large, sharp asymmetric dipole with peak and trough on one profile line and in an area with a number of magnetic responses. No corresponding SSS or MBES contacts. Interpreted as possible significant ferrous debris that is either buried or with no surface expression.	Mag.	2020 ECR	ECC	-



ID	Classification	Easting	Northing	Archaeological discrimination	L (m)	W (m)	H (m)	Depth below seabed (m)	Least Depth (m LAT)	Magnetic amplitude (nT)	Description	Anomaly type	Dataset	Section	External references
70617	Rope/chain	469444	5910327	A2	200.7	2.4	0.0	-	-	-	Identified in the 2020 SSS dataset as a very long, curvilinear dark reflector with no clear shadow, appearing highly sinuous in places. Some spurs off the main feature are visible, as well as possible indistinct, very short shadows. No corresponding MBES or Mag. contacts. Interpreted as a possible rope or chain.	SSS	2020 ECR	ECC	-
70618	Dark reflector	468780	5909970	A2	6.3	1.4	0.6	-	1.8	-	Identified in the 2020 SSS dataset as a highly reflective, angular dark reflector with a tapered, double-peaked shadow, which appears isolated and anomalous. Visible on the MBES dataset as a distinct subrounded mound in an area of textured seabed. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris.	MBES, SSS	2020 ECR	ECC	-
70619	Dark reflector	468794	5909614	A2	6.0	0.8	0.5	-	-	-	Identified in the 2020 SSS dataset as a D-shaped, rounded dark reflector with a slightly broad tapered shadow, which appears isolated and anomalous. Visible on the MBES dataset as a prominent mound. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible non-ferrous debris.	SSS	2020 ECR	ECC	-
70620	Debris	468992	5909824	A2	1.0	1.0	0.3	-	-	-	Identified in the 2020 SSS dataset as a large, rounded but slightly indistinct dark reflector with a large tapered shadow. Visible in the MBES dataset as a rounded mound, and associated with a medium magnetic dipole with peak and trough on one line. Possible ferrous debris.	SSS	2020 ECR	ECC	-
70621	Debris	469299	5909574	A2	2.0	2.0	0.3	-	-	13	Identified in the 2020 SSS dataset as an elongate dark reflector with a tapered shadow. Potentially associated with a small, broad asymmetric dipole with peak and trough on one profile line visible on the Mag. dataset, although this is tentative. Visible on the MBES dataset as a small, subangular mound. Interpreted as possible ferrous debris.	SSS, Mag.	2020 ECR	ECC	-
70622	Dark reflector	469459	5909832	A2	2.0	0.5	0.1	-	-	-	Identified in the 2020 SSS dataset as a small, lozenge-shaped dark reflector with a short tapered shadow and a possible central depression. 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.	SSS	2020 ECR	ECC	-

Interlink area

ID	Classification	Easting	Northing	Archaeological discrimination	L (m)	W (m)	H (m)	Depth below seabed (m)	Least Depth (m LAT)	Magnetic amplitude (nT)	Description	Anomaly type	Dataset	Section	External references
7079	Debris	458075	5920549	A2	3.7	3.2	1.2	-	-	-	Previously identified in the 2010 SSS data as an object located within a depression in an area of sand ripples. No associated Mag. anomaly. Interpreted as possible debris.	SSS	2010 GyM array	AyM-GyM interlink	-
7080	Debris	458036	5920499	A2	4.5	0.7	0.6	-	-	-	Previously identified in the 2010 SSS data as an elongated object located within an area of sand ripples. No associated Mag. anomaly. Interpreted as possible debris.	SSS	2010 GyM array	AyM-GyM interlink	-
7090	Debris	457796	5920700	A2	4.5	1.3	0.7	-	-	-	Previously identified in the 2010 SSS data as an elongated object located within an area of sand ripples. No associated Mag. anomaly. Interpreted as possible debris.	SSS	2010 GyM array	AyM-GyM interlink	-
7100	Magnetic	456654	5920610	A2	-	-	-	-	-	7	Previously identified in the 2010 Mag. data as a small magnetic anomaly without associated SSS or MBES contacts. Possible ferrous debris that is either buried or without surface expression, or a natural feature.	Mag.	2010 GyM array	AyM-GyM interlink	-
7106	Debris	456377	5921291	A2	17.5	12.5	0.0	-	-	-	Previously identified in the 2010 SSS data as an elongated object orientated 348 degrees. Located in an area of sand ripples with scour extending 87 m to the east. No associated Mag. anomaly. Interpreted as possible debris.	SSS	2010 GyM array	AyM-GyM interlink	-
70133	Dark reflector	454697	5923721	A2	3.8	0.9	0.2	-	-	-	Identified in the 2020 SSS data as a small, angular dark reflector which is wider at one end with a sloping shadow. Isolated within an area of mobile sediments. No corresponding MBES contact. Possible non-ferrous debris or a natural feature.	SSS	2020 Array	Array buffer, AyM-GyM interlink	-



ID	Classification	Easting	Northing	Archaeological discrimination	L (m)	W (m)	H (m)	Depth below seabed (m)	Least Depth (m LAT)	Magnetic amplitude (nT)	Description	Anomaly type	Dataset	Section	External references
70217	Magnetic	454664	5922136	A2	-	-	-	-	-	5	Identified in the 2020 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 that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer, AyM-GyM interlink	-
70270	Magnetic	453848	5921567	A2	-	-	-	-	-	68	Identified in the 2020 Mag. dataset as a medium positive monopole with peak and trough on one profile line. No corresponding SSS or MBES contacts. May represent possible ferrous debris that is either buried or with no surface expression.	Mag.	2020 Array	Array buffer, ECC, AyM-GyM interlink	-
70346	Seabed disturbance	452954	5920543	A2	15.4	13.5	0.1	-	-	-	Identified in the 2020 SSS data as an elongate area of small dark reflectors, which cast small shadows. Present in an area of sand waves. No definite corresponding MBES or Mag. contact, but a possible mound visible in the MBES close to this location may be associated. Possible debris or a natural feature.	SSS	2020 Array	Array buffer, ECC, AyM-GyM interlink	-
70347	Debris	453493	5921084	A2	4.9	3.2	0.0	-	-	-	Identified in the 2020 SSS data as a distinct angular dark reflector with no visible shadow. Located in an area of sand waves. No corresponding MBES or Mag. contact. Possible item of non-ferrous debris.	SSS	2020 Array	Array buffer, ECC, AyM-GyM interlink	-
70348	Dark reflector	452737	5920727	A2	1.3	1.2	0.1	-	-	-	Identified in the 2020 SSS data as an elongate sub-angular dark reflector which appears to curve round at one end. This casts a faint 'D' shaped shadow. No corresponding MBES or Mag. contact. Possible item of non-ferrous debris or a natural feature.	SSS	2020 Array	Array buffer, ECC, AyM-GyM interlink	-
70411	Dark reflector	452133	5920464	A2	5.2	0.8	0.3	-	-	34	Identified in the 2020 SSS data as a distinct dark reflector with a slightly indistinct flared shadow. Set within a depression or associated scour. Present in an area of sand ripples. Visible in the Mag. data as a small negative monopole with peak and trough on one profile line. No corresponding MBES contact, but position amended to match a small, indistinct mound seen in the MBES. Possible natural feature containing a high percentage of ferrous minerals, or a natural feature.	SSS, Mag.	2020 Array	Array buffer, ECC, AyM-GyM interlink	-
70451	Dark reflector	451070	5919700	A2	1.8	0.8	0.2	-	-	-	Identified in the 2020 SSS dataset as a small rounded dark reflector which casts a rounded shadow. This appears to have a small associated scour and is present in an area of mobile sediment. No corresponding Mag. contacts. Interpreted as a possible natural feature or may be possible debris.	SSS	2020 Array	Array buffer, ECC, AyM-GyM interlink	-
70501	Dark reflector	453384	5920424	A2	3.6	0.7	0.1	-	-	-	Identified in the 2020 SSS data as a narrow elongate dark reflector, which is straight and casts a curved shadow. Located in an area of megaripples. No associated Mag. or MBES contacts. Possible non-ferrous debris or a natural feature.	SSS	2020 ECR	ECC, AyM-GyM interlink	-
70503	Rope/chain	454608	5921512	A2	7.4	0.2	0.1	-	-	-	Identified in the 2020 SSS dataset as a distinct linear dark reflector with a bright shadow. No corresponding MBES or Mag. contact. The linear appears partially buried by the surrounding sand waves and continues as 70504 , 70505 , and 70506 . Possible partially buried rope or chain.	SSS	2020 Array, 2020 ECR	ECC, AyM-GyM interlink	-
70504	Rope/chain	454633	5921511	A2	9.7	0.5	0.2	-	-	-	Identified in the 2020 SSS dataset as a distinct linear dark reflector with a bright shadow. No corresponding MBES or Mag. contact. The linear appears partially buried by the surrounding sand waves and continues as 70503 , 70505 , and 70506 . Possible partially buried rope or chain.	SSS	2020 Array, 2020 ECR	ECC, AyM-GyM interlink	-
70505	Rope/chain	454648	5921510	A2	12.5	0.6	0.2	-	-	-	Identified in the 2020 SSS dataset as a distinct linear dark reflector with a bright shadow. Observed in the MBES dataset as an indistinct linear mound on an east to west alignment. No corresponding Mag. anomaly. The linear appears partially buried by the surrounding sand waves and continues as 70503 , 70504 , and 70506 . Possible partially buried rope or chain.	SSS	2020 Array, 2020 ECR	ECC, AyM-GyM interlink	-
70506	Rope/chain	454677	5921509	A2	11.5	0.9	0.2	-	21.2	-	Identified in the 2020 SSS dataset as a distinct linear dark reflector with a bright shadow. Observed in the MBES dataset as an indistinct linear mound on an east to west alignment. No corresponding Mag. anomaly. The linear appears partially buried by the surrounding sand waves and continues as 70503 , 70504 , and 70505 . Possible partially buried rope or chain.	SSS	2020 Array, 2020 ECR	ECC, AyM-GyM interlink	-



ID	Classification	Easting	Northing	Archaeological discrimination	L (m)	W (m)	H (m)	Depth below seabed (m)	Least Depth (m LAT)	Magnetic amplitude (nT)	Description	Anomaly type	Dataset	Section	External references
70507	Dark reflector	454316	5920926	A2	2.3	0.7	0.2	-	-	-	Identified in the 2020 SSS data as a small elongate subangular dark reflector with slightly flared shadow, distinct from the surrounding sand waves. No definite associated MBES or Mag. contact, but a small possible disturbance in the MBES may be related. Possible non-ferrous debris or a natural feature.	SSS	2020 ECR	ECC, AyM-GyM interlink	-
70508	Debris	453880	5920377	A2	5.3	0.2	0.1	-	-	-	Identified in the 2020 SSS data as a small elongate dark reflector with rounded shadow, oriented approx. east to west, distinct from the surrounding megaripples. No associated MBES or Mag. contacts. Possible non-ferrous debris.	SSS	2020 ECR	ECC, AyM-GyM interlink	-

1. Co-ordinates are in WGS84 UTM30N
2. Positional accuracy estimated ± 10 m



Appendix 6: Maritime and aviation recorded losses

UKHO ID	RCAHMW ID	HER ID	Name	Date	Type
	271369		Ann	Post Medieval	Schooner
		130240	Armstrong Whitworth Whitley V BD204	Modern	Aircraft
7342	272084		Benholm	Post Medieval	Steamship
8174			Blanch Hebe	Modern	Unkown
		130258	Boulton Paul Defiant I N1770	Modern	Aircraft
	271454		City Of Verviers	Modern	Steamship
	271450		Conway's Pride	Post Medieval	Wooden Ketch
	271537		Curlew	Post Medieval	Wooden Smack
	240961		Cyrus	Post Medieval	Wooden Barque
		130290	De Havilland Mosquito VI HX863	Modern	Aircraft
	240578		Dido C	Post Medieval	Ketch
	271453		Doon	Modern	Steamship
	240576		Eagle	Post Medieval	Wooden Sloop
	525143		Eagle	Post Medieval	Wooden Sloop
	271368		Endeavour	Post Medieval	Wooden Sloop
	271386		Fearless	Modern	Steamship
	274877		Ferdinande	Post Medieval	Wooden Brigantine
7510	506952	64179	Four Brothers (Possibly)	Modern	Schooner
7506	271317, 506953		Guardian Angel	Modern	Wooden Barque
	519089		Hecla	Post Medieval	Sailing Vessel
	240570		Jane	Post Medieval	Sloop
	240573		Jane And Mary	Post Medieval	Wooden Sloop
	271451		Llysfaen	Modern	Steamship
	271737		Margaret	Post Medieval	Wooden Sailing Vessel



	525228		Mayflower	Post Medieval	Wooden Sloop
		130268	Miles Master I N7937	Modern	Aircraft
	271731		No.4 Pilot Boat	Post Medieval	Wooden Sloop
	271434		Pat John Nugent	Post Medieval	Wooden Sloop
	271455		Progress	Modern	Wooden Schooner
	271527		Raven	Post Medieval	Wooden Sloop
	271629		Rose	Post Medieval	Wooden Yawl
	271558		Saint Olaf	Post Medieval	Wooden Brig
	271644		Samuel	Modern	Wooden Smack
	525214		Sarah	Post Medieval	Mersey Flat
		130299	Supermarine Spitfire I X4425	Modern	Aircraft
	271568		Temple	Post Medieval	Wooden Flat Built
	271590		Thomas	Post Medieval	Wooden Sailing Vessel
8142			Unkown	Unkown	Unkown
8141			Unkown	Unkown	Unkown
7710			Unkown	Unkown	Unkown
8143			Unkown	Unkown	Unkown
	506954		Unnamed Wreck	Post Medieval	Unkown
	506873		Unnamed Wreck	Post Medieval	Unkown
57247			Viking (Probably)	Modern	Fishing Vessel
	271446		Vine	Post Medieval	Wooden Sloop
	271598		William	Post Medieval	Wooden Schooner
	271374		William Henry	Post Medieval	Wooden Mersey Flat (Or Jigger)
	271354		Young Walker	Modern	Sailing Ketch Or Fishing Vessel

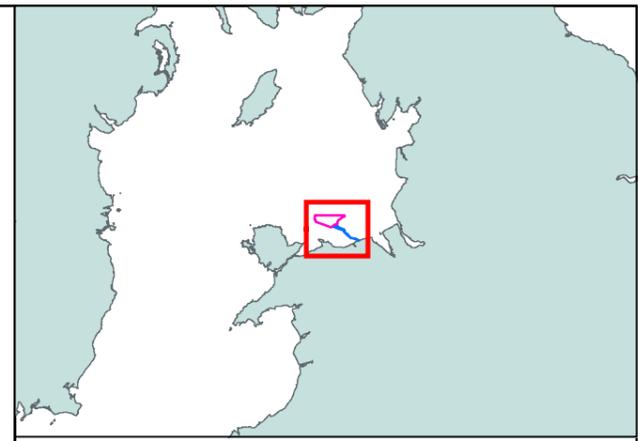
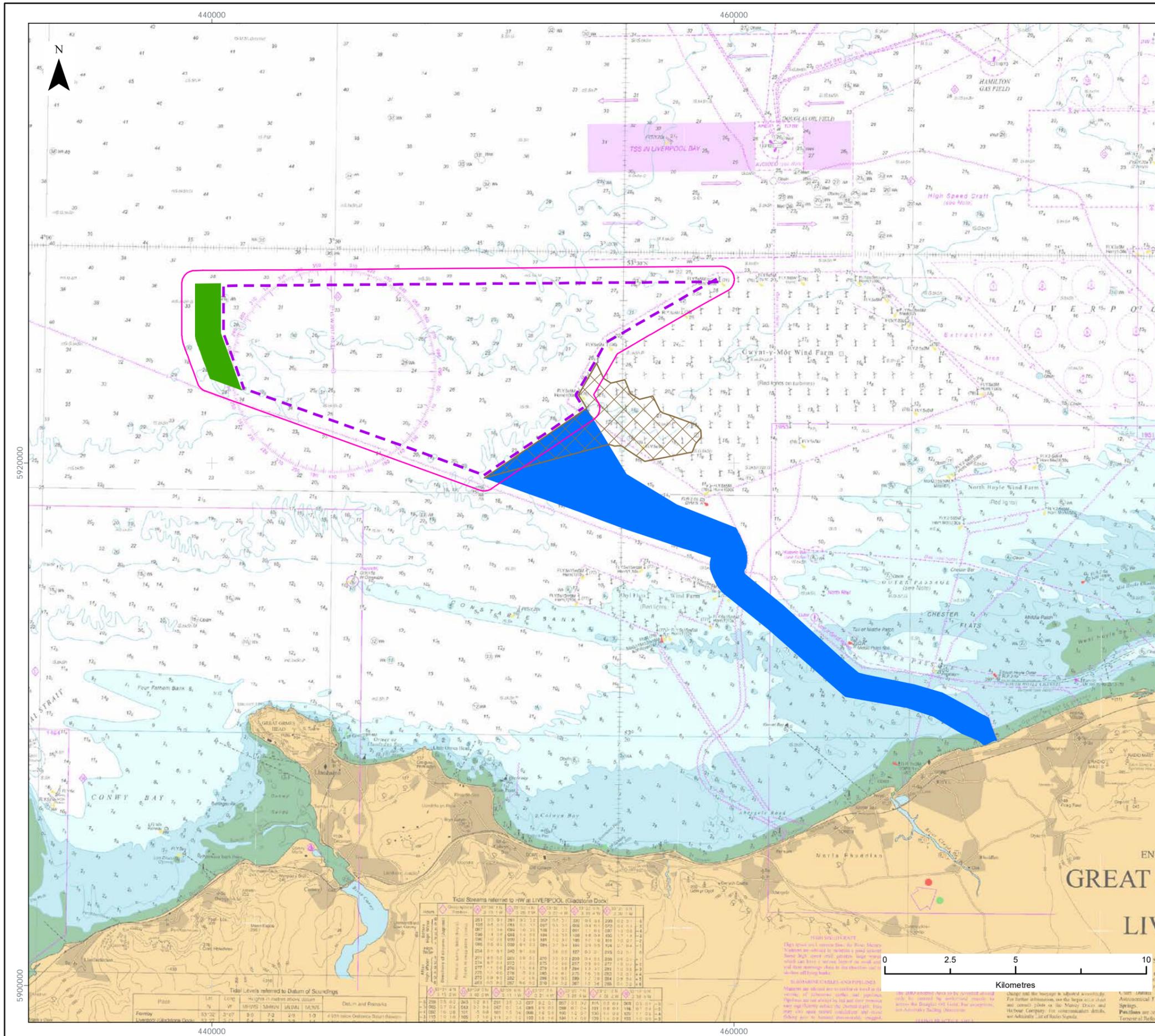


Appendix 7: Intertidal heritage assets

WA ID	HER ID	Description	Latitude	Longitude	UTM30N X	UTM30N Y	Type
1000	prn 101936	Various Neolithic objects found on submerged land surface in this area in the early 20th century including three Graig Lwyd axes and two polished stone axes.	53.33013	-3.46729	468880	5909098	Findspot
1001	prn 101903	Bronze socketed spearhead 4.4 inches long found on the Rhyl beach. Now lost.	53.32754	-3.48041	468004	5908815	Findspot
1002	prn 101937	Bronze chisel found 1913 on peat bed. The blade is 2.5 inches long and 1.25 inches wide	53.33013	-3.46729	468880	5909098	Findspot
1003	prn 33099	Perforated antler mattock	53.33032	-3.47300	468500	5909121	Findspot
1004	prn 100485	Anvil stone of large granite pebble with a ground out circular hollow on one face.	53.29625	-3.58512	461002	5905386	Findspot
1005	prn 106402	Stretch of stones visible at low tide, which may be a possible causeway approximately 5-8 m across.	53.33031	-3.47450	468400	5909120	Site
1006	prn 123322	A series of wooden posts set in roughly parallel short trenches filled with stone. May be the remains older groynes.	53.33006	-3.47224	468550	5909092	Findspot
1007	prn 34208	Rhyl Pier	53.32423	-3.49306	467159	5908453	Site
1008	prn 141424	An unidentified object of possible modern date. The object consists of a curved sub-oval piece of wood, one edge of which has been covered in copper alloy.	53.33132	-3.46553	468998	5909229	Findspot
1009	prn 37700	Local volunteer force rifle range recorded during Dee Estuary Historic Landscape Survey.	53.33118	-3.46120	469286	5909212	Site



Appendix 8: OASIS record form



- LEGEND**
- Array Area
 - Other Wind Farm Infrastructure Zone
 - Array area/Infrastructure zone buffer
 - AyM to GyM interlink
 - Offshore Export Cable Corridor

Data Source:
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 Licence No. EK001-0582-MF0050.

PROJECT TITLE:
AWEL Y MÔR OFFSHORE WINDFARM

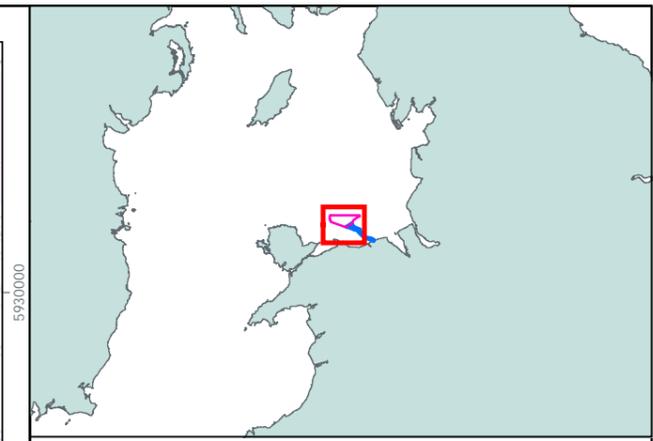
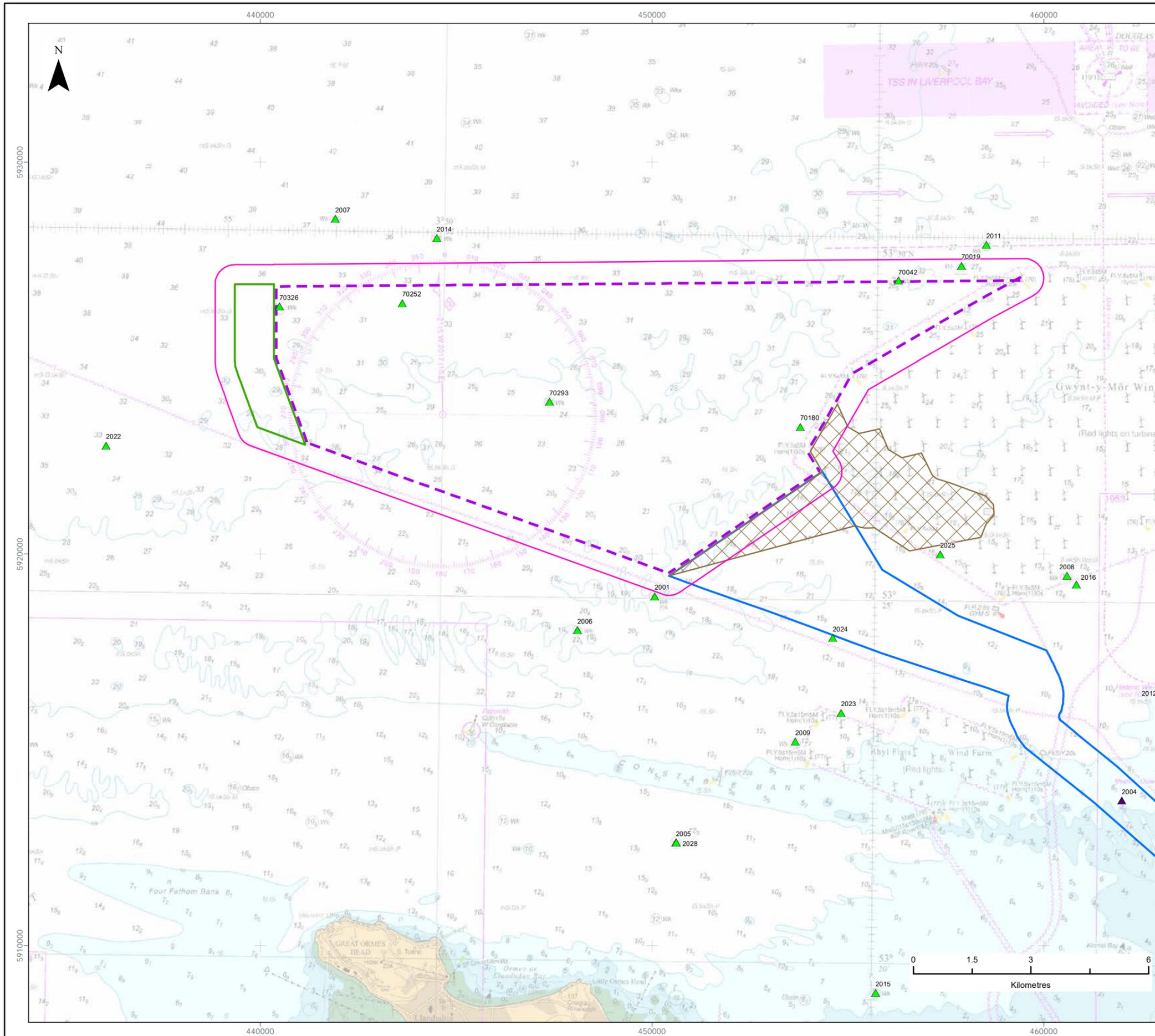
FIGURE TITLE:
Study Area

VER	DATE	REMARKS	Drawn	Checked
1	19/07/2021	For Issue	KJF	LR

FIGURE NUMBER:
Figure 1

SCALE: 1:150,000	PLOT SIZE: A3	DATUM: WGS84	PROJECTION: UTM30N
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LEGEND

- Array Area
- Other Wind Farm Infrastructure Zone
- Array area/Infrastructure zone buffer
- AyM to GyM interlink
- Offshore Export Cable Corridor

Known Maritime and Aviation Sites

- ▲ Findspot
- ▲ Wreck

Data Source:
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PROJECT TITLE:
AWEL Y MÔR OFFSHORE WINDFARM

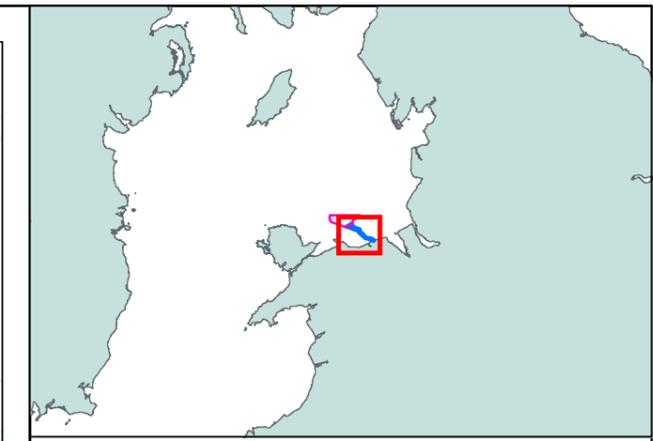
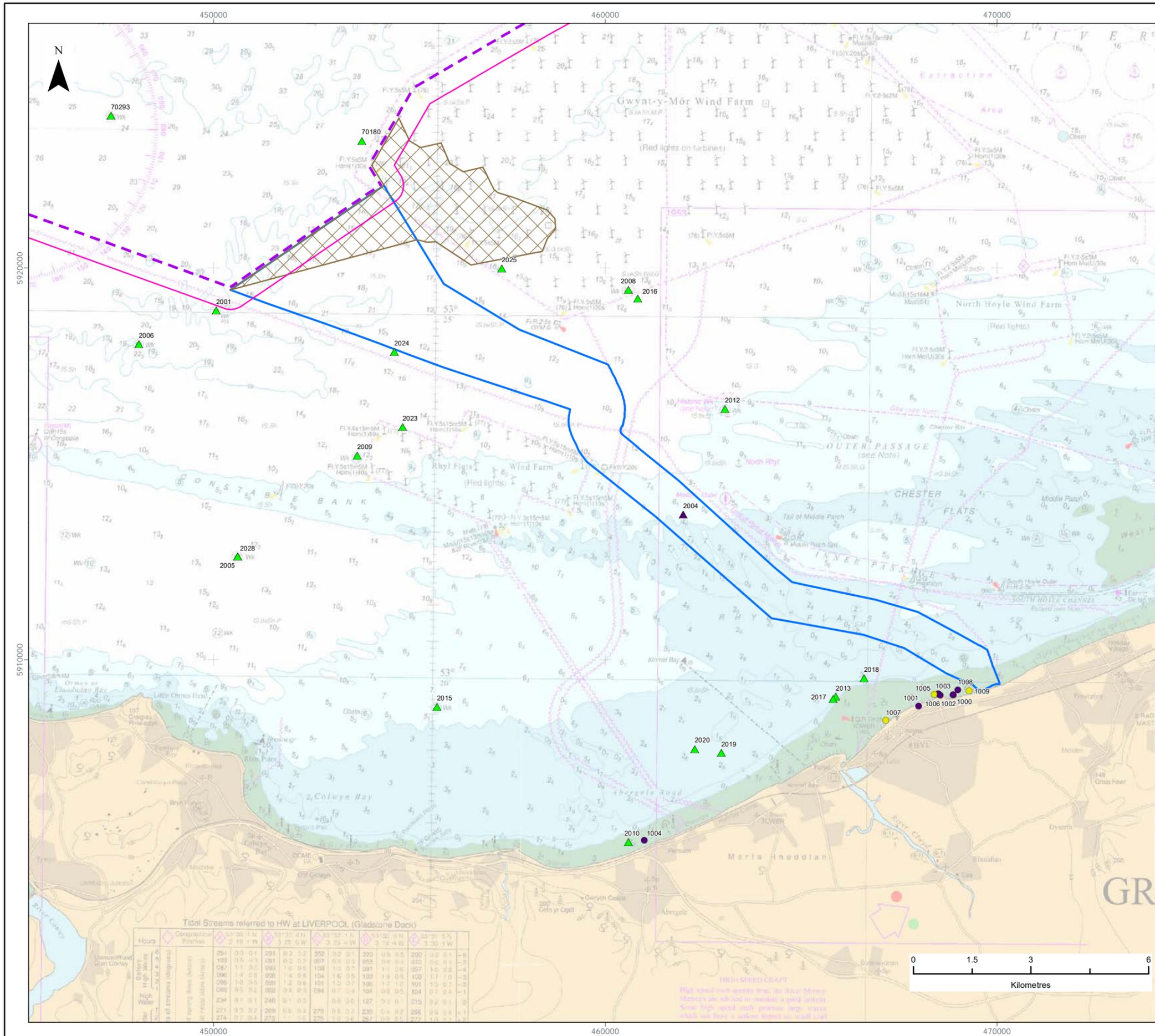
FIGURE TITLE:
Offshore Wind Farm Study Area

VER	DATE	REMARKS	Drawn	Checked
1	20/07/2021	For Issue	KJF	LR

FIGURE NUMBER:
Figure 3

SCALE: 1:100,000	PLOT SIZE: A3	DATUM: WGS84	PROJECTION: UTM30N
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LEGEND

- Array Area
- Array area/Infrastructure zone buffer
- AyM to GyM interlink
- Offshore Export Cable Corridor

Terrestrial Sites and Findspots in the Intertidal Zone

- Findspot
- Site

Known Maritime and Aviation Sites

- Findspot
- Wreck

Data Source:
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PROJECT TITLE:
AWEL Y MÔR OFFSHORE WINDFARM

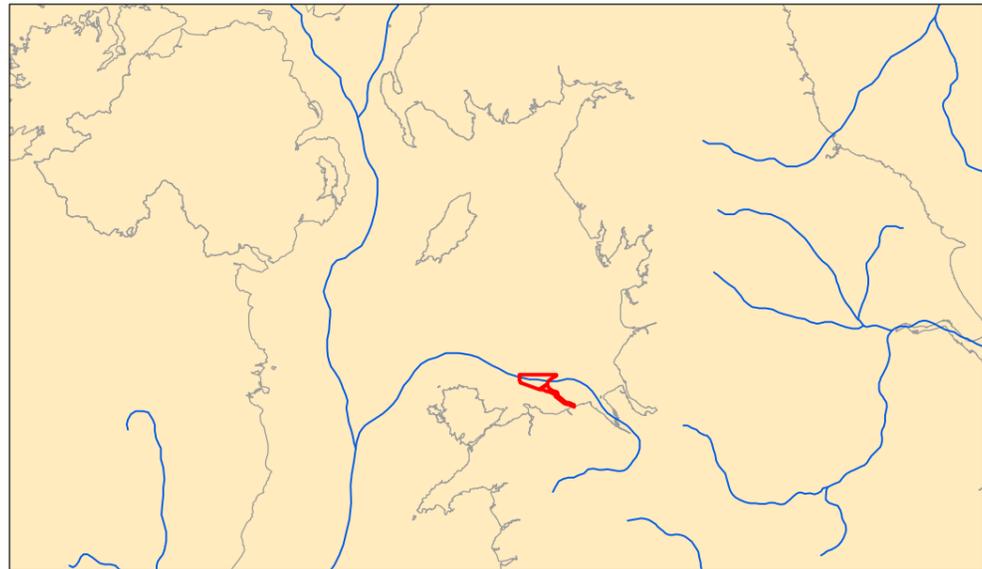
FIGURE TITLE:
Cable Corridor Study Area

VER	DATE	REMARKS	Drawn	Checked
1	20/07/2021	For Issue	KJF	LR

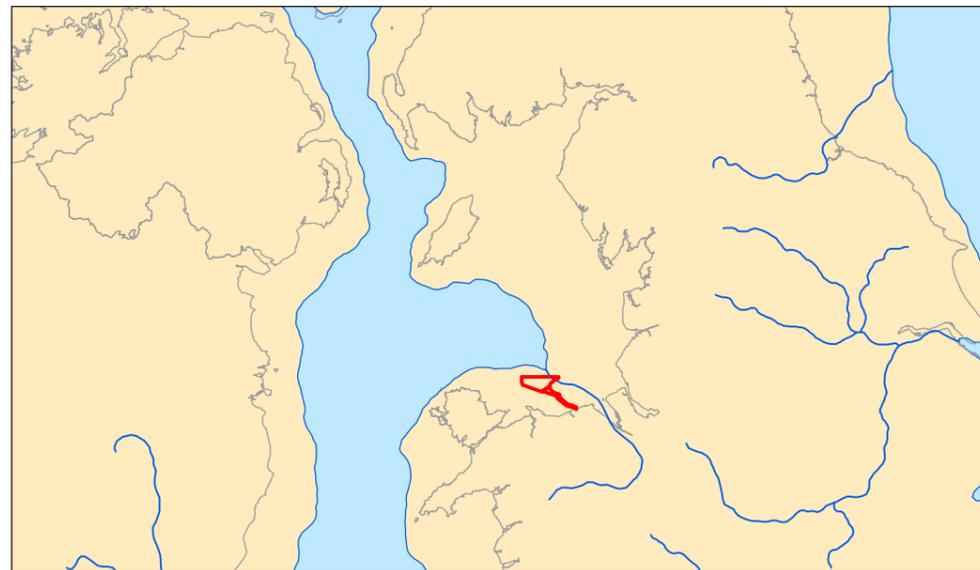
FIGURE NUMBER:
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SCALE: 1:100,000 PLOT SIZE: A3 DATUM: WGS84 PROJECTION: UTM30N

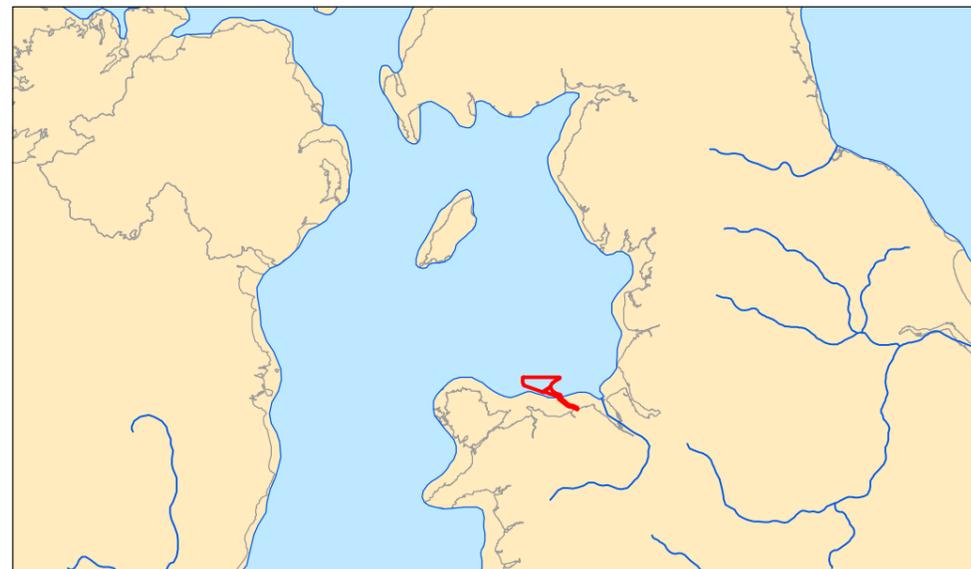




16,000 BP - 13,000 BP



10,000 BP



5000 BP

LEGEND

- Proposed Offshore Development Area
- Present high water

Data Source:

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PROJECT TITLE:

AWEL Y MÔR OFFSHORE WINDFARM

FIGURE TITLE:

Generalised palaeogeography
of the Irish Sea (after Coles, 1998)

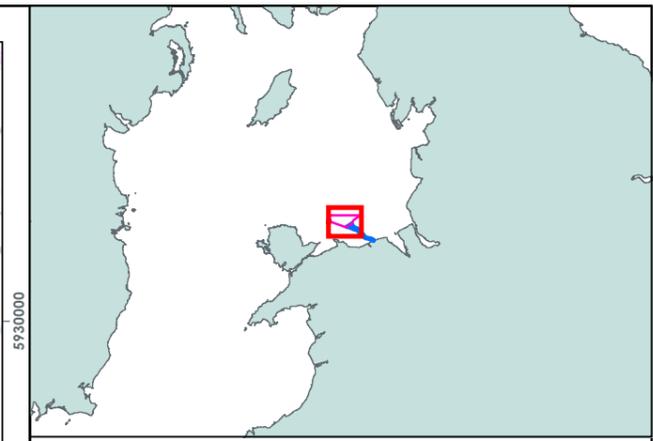
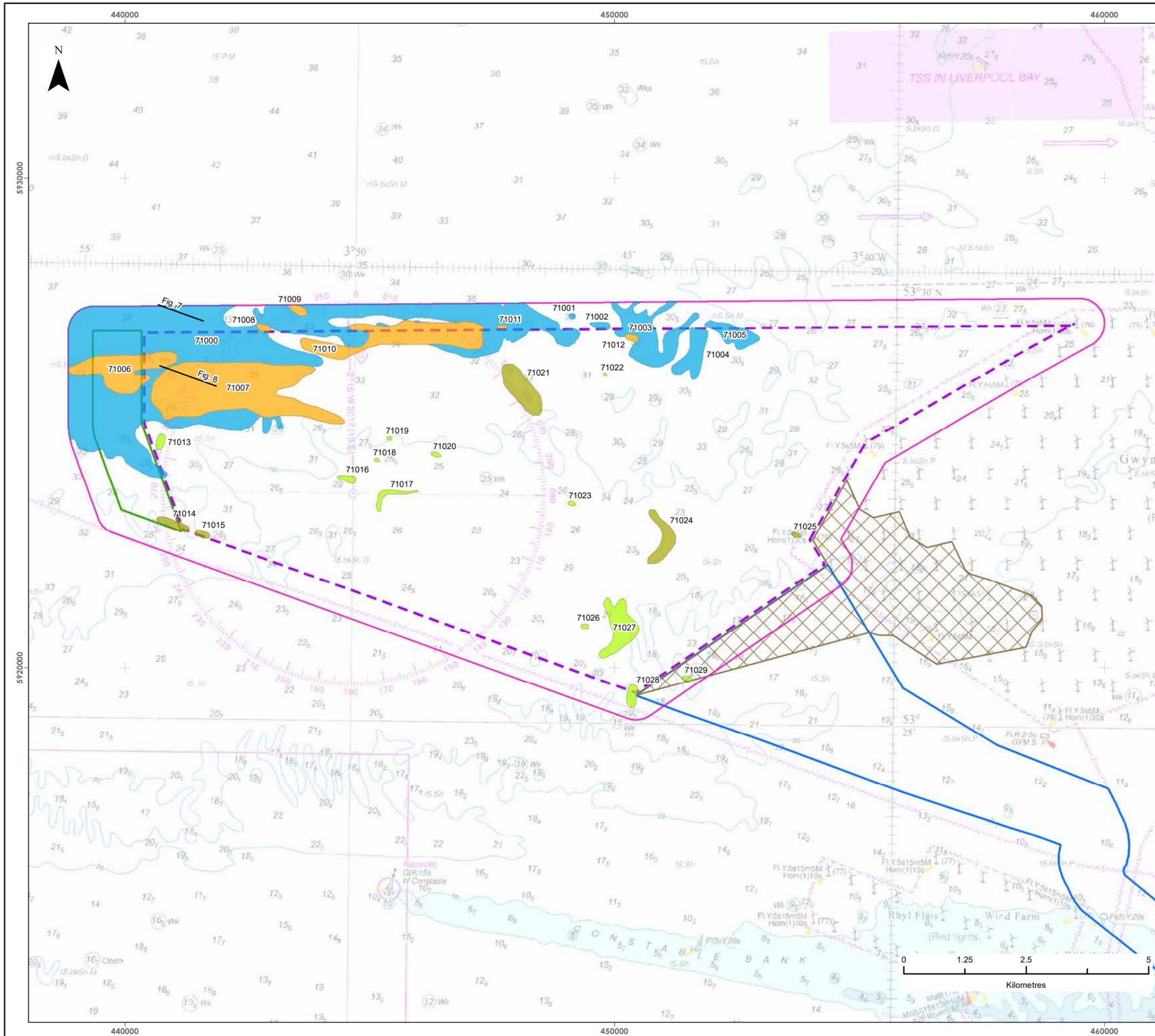
VER	DATE	REMARKS	Drawn	Checked
1	20/07/2021	For Issue	KJF	DH

FIGURE NUMBER:

Figure 5

SCALE: 1:4,000,000	PLOT SIZE: A3	DATUM: WGS84	PROJECTION: UTM30N
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Fferm Wynt Alltraeth
AWEL Y MÔR
Offshore Wind Farm



LEGEND

- Array Area
- Other Wind Farm Infrastructure Zone
- Array area/Infrastructure zone buffer
- AyM to GyM interlink
- Offshore Export Cable Corridor
- Data example locations

Palaeogeographic Features

- Fine grained deposit
- Channel complex
- Complex cut and fill
- Simple cut and fill

Data Source:
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PROJECT TITLE:
AWEL Y MÔR OFFSHORE WINDFARM

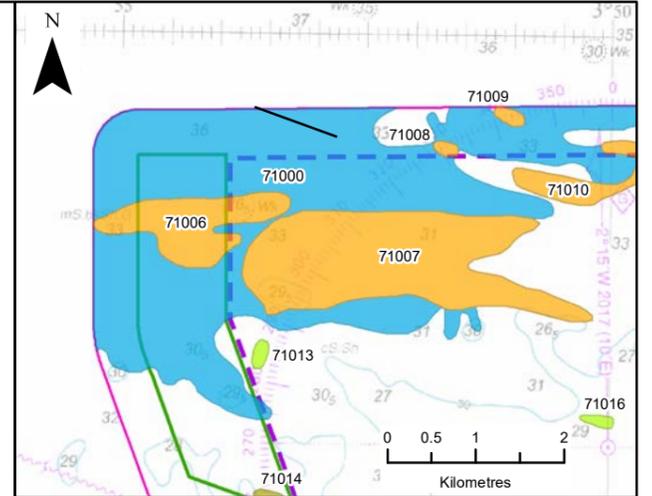
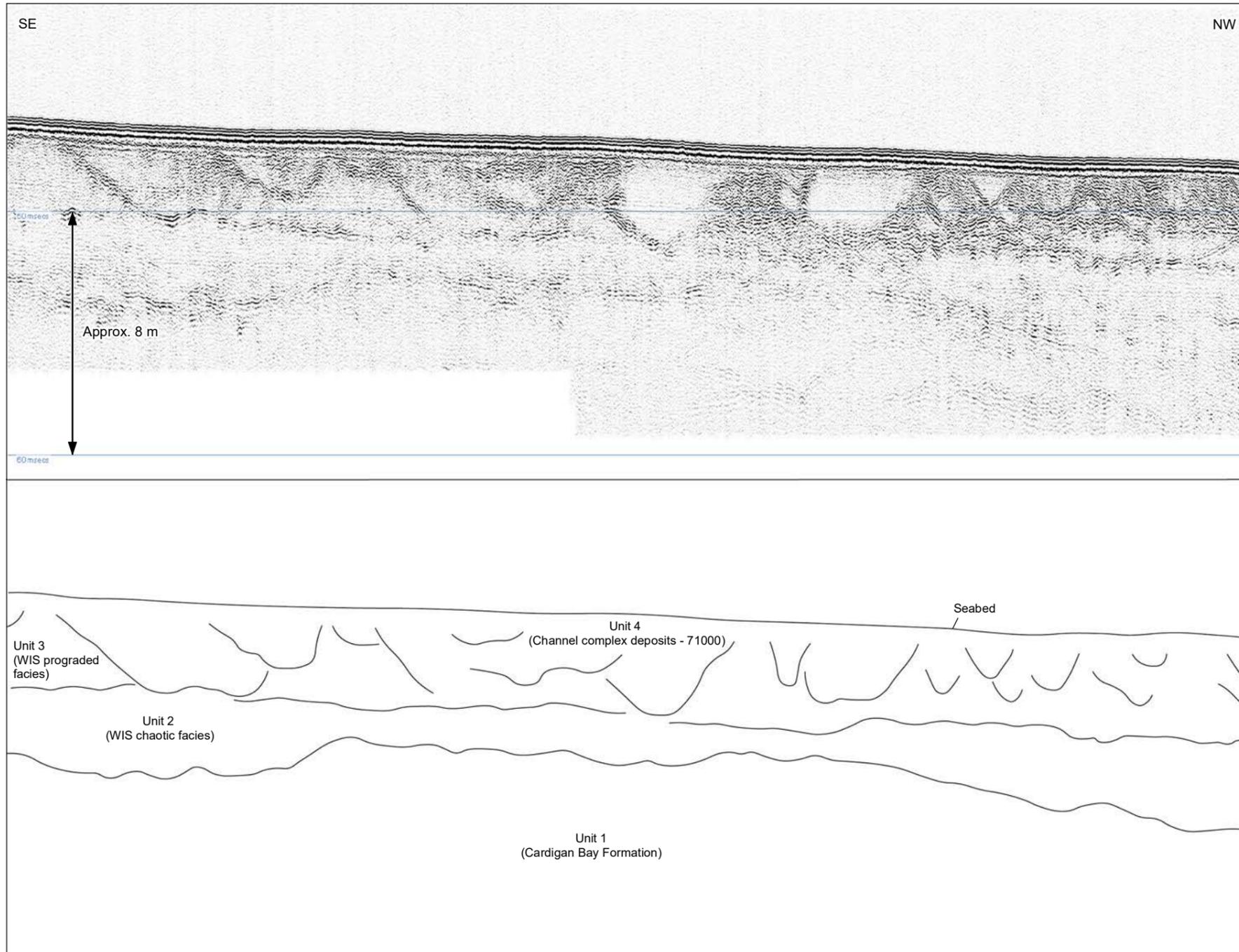
FIGURE TITLE: Palaeogeographic features of archaeological potential – Array area and Infrastructure zone

VER	DATE	REMARKS	Drawn	Checked
1	16/07/2021	For Issue	KJF	DH

FIGURE NUMBER:
Figure 6

SCALE: 1:80,000 PLOT SIZE: A3 DATUM: WGS84 PROJECTION: UTM30N





LEGEND

- Array Area
- Other Wind Farm Infrastructure Zone
- Array area/Infrastructure zone buffer
- Data example locations

Palaeogeographic Features

- Fine grained deposit
- Channel complex
- Complex cut and fill
- Simple cut and fill

Data Source:

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PROJECT TITLE:

AWEL Y MÔR OFFSHORE WINDFARM

FIGURE TITLE:

SBP data example – 71000

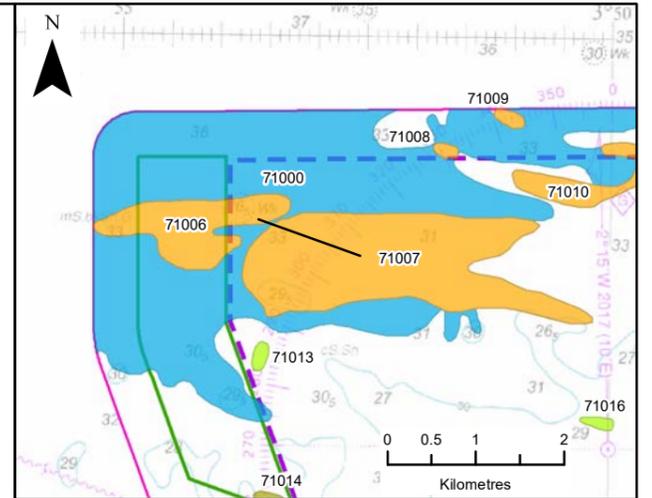
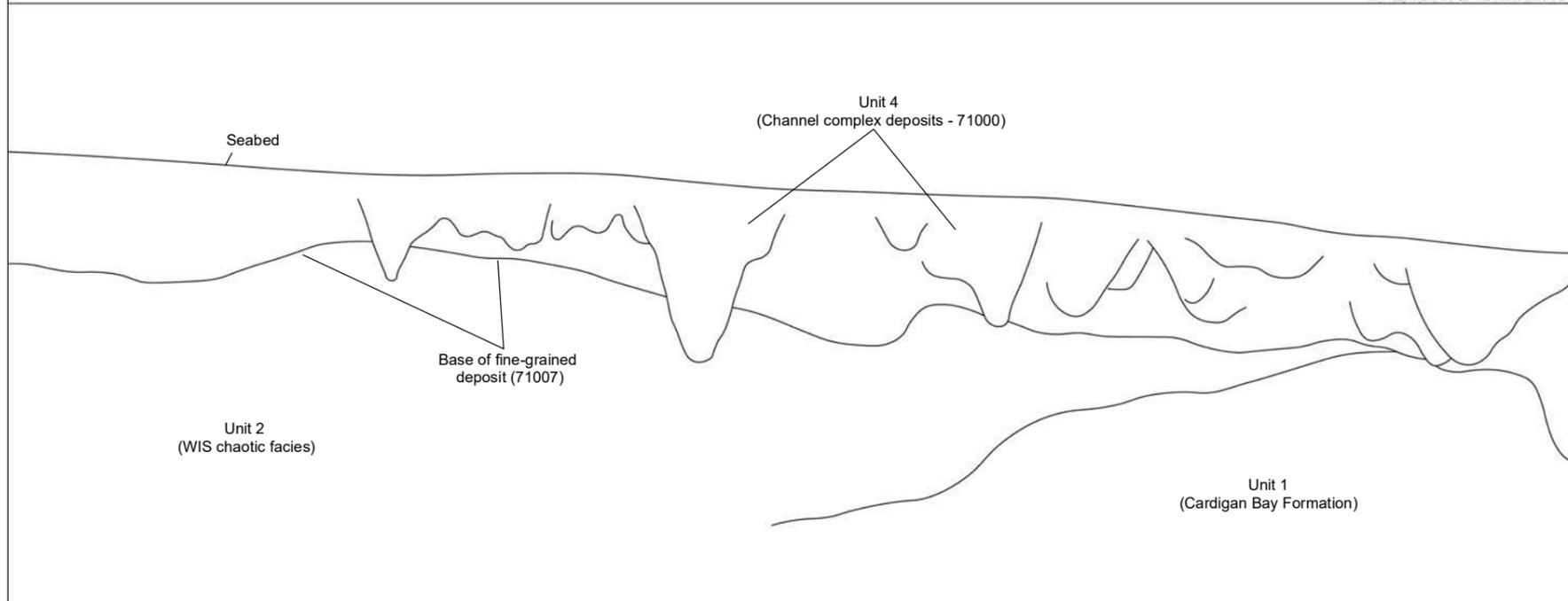
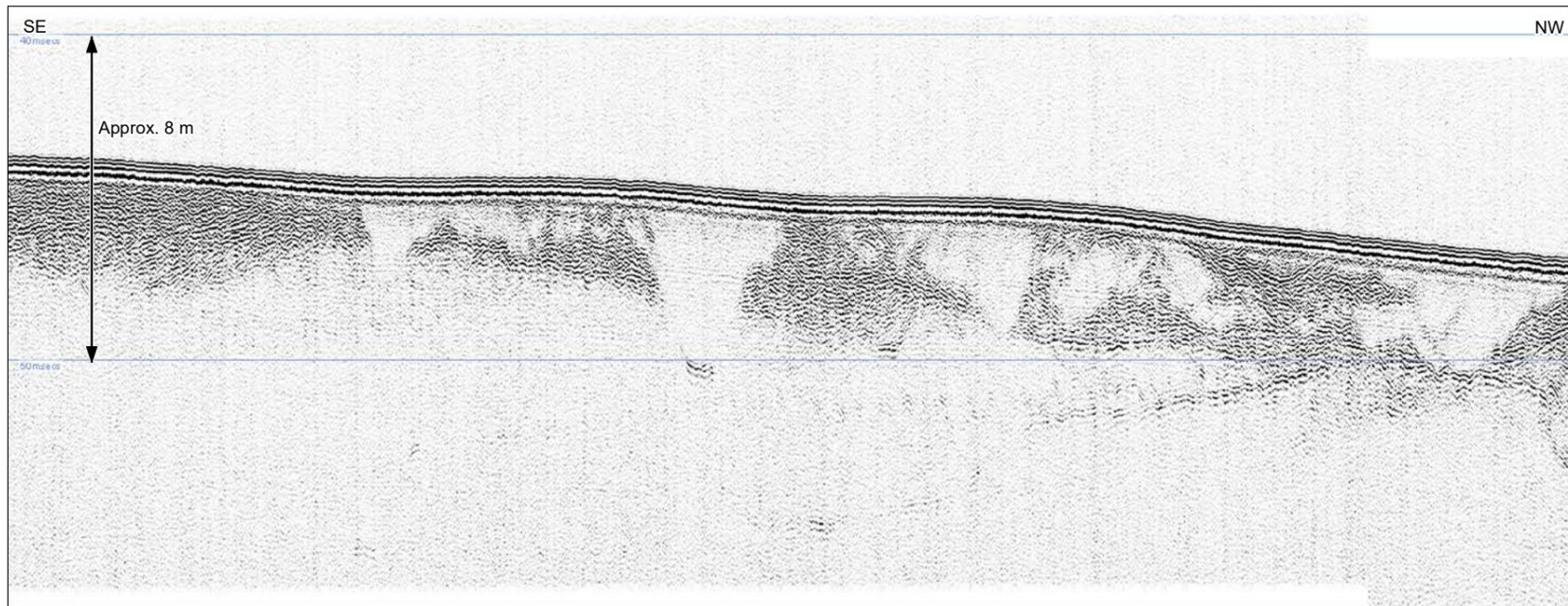
VER	DATE	REMARKS	Drawn	Checked
1	16/07/2021	For Issue	KJF	DH

FIGURE NUMBER:

Figure 7

SCALE: Location 1:80,000	PLOT SIZE: A3	DATUM: WGS84	PROJECTION: UTM30N
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Fferm Wynt Alltraeth
AWEL Y MÔR
Offshore Wind Farm



- LEGEND**
- Array Area
 - Other Wind Farm Infrastructure Zone
 - Array area/Infrastructure zone buffer
 - Data example locations
- Palaeogeographic Features**
- Fine grained deposit
 - Channel complex
 - Complex cut and fill
 - Simple cut and fill

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PROJECT TITLE:
AWEL Y MÔR OFFSHORE WINDFARM

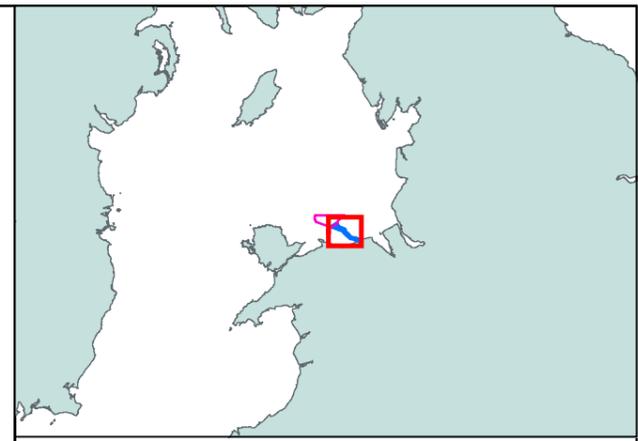
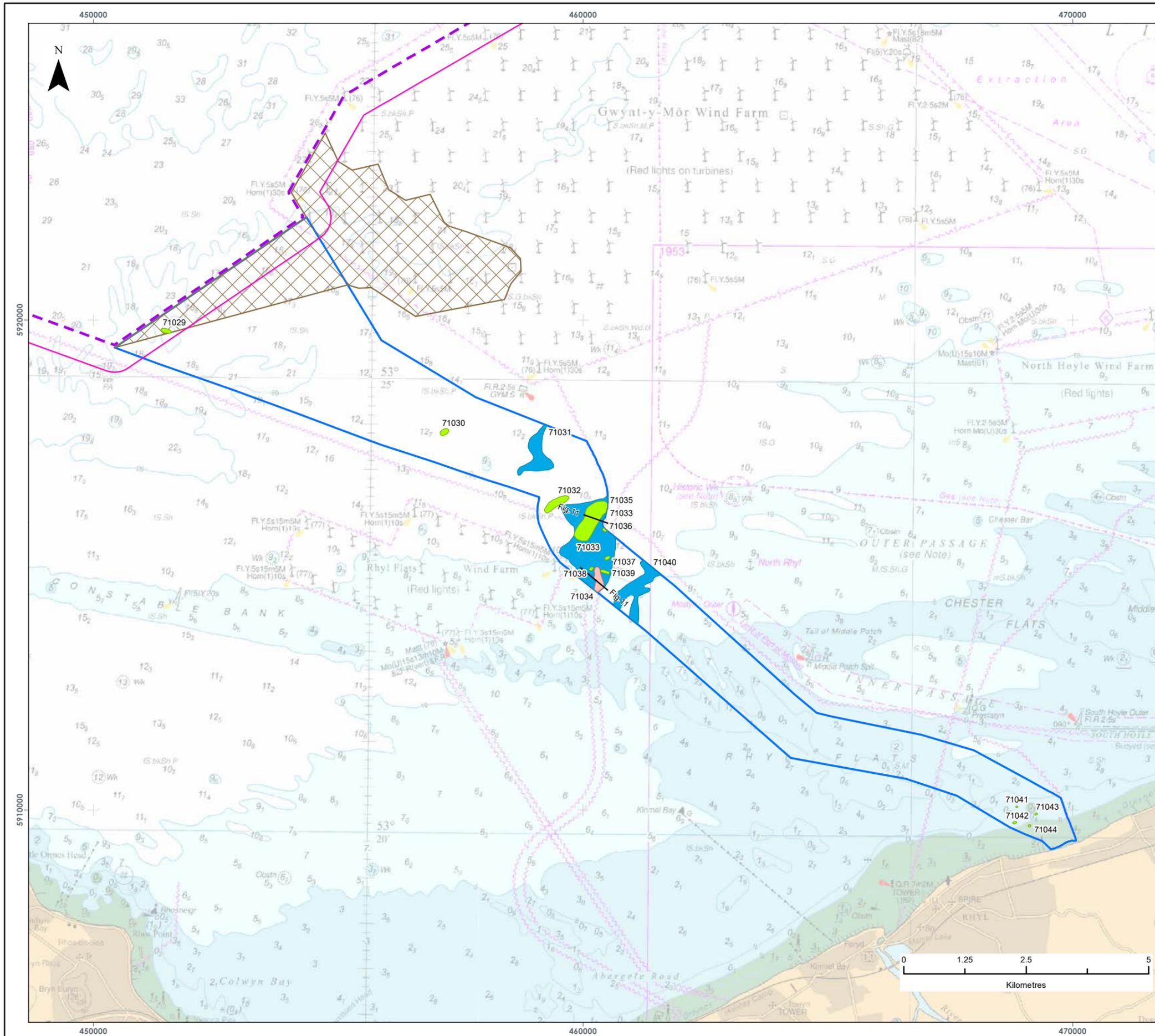
FIGURE TITLE:
SBP data example – 71007

VER	DATE	REMARKS	Drawn	Checked
1	16/07/2021	For Issue	KJF	DH

FIGURE NUMBER:
Figure 8

SCALE: Location 1:80,000 | PLOT SIZE: A3 | DATUM: WGS84 | PROJECTION: UTM30N





LEGEND

- Array Area
- Array area/Infrastructure zone buffer
- AyM to GyM interlink
- Offshore Export Cable Corridor
- Data example locations

Palaeogeographic Features

- Channel
- High amplitude reflector
- Simple cut and fill

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 Licence No. EK001-0582-MF0050.

PROJECT TITLE:
AWEL Y MŌR OFFSHORE WINDFARM

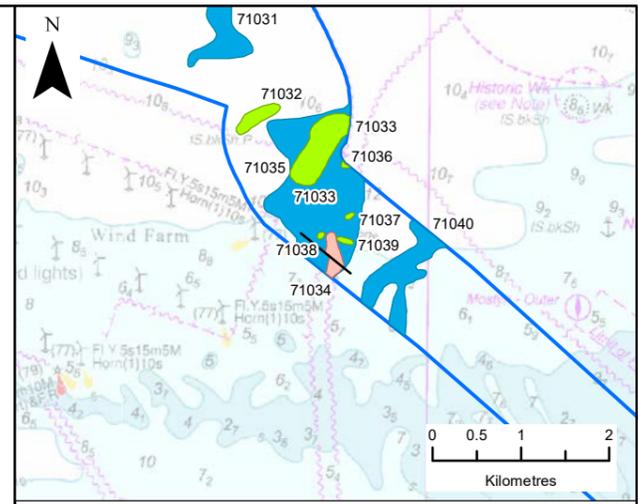
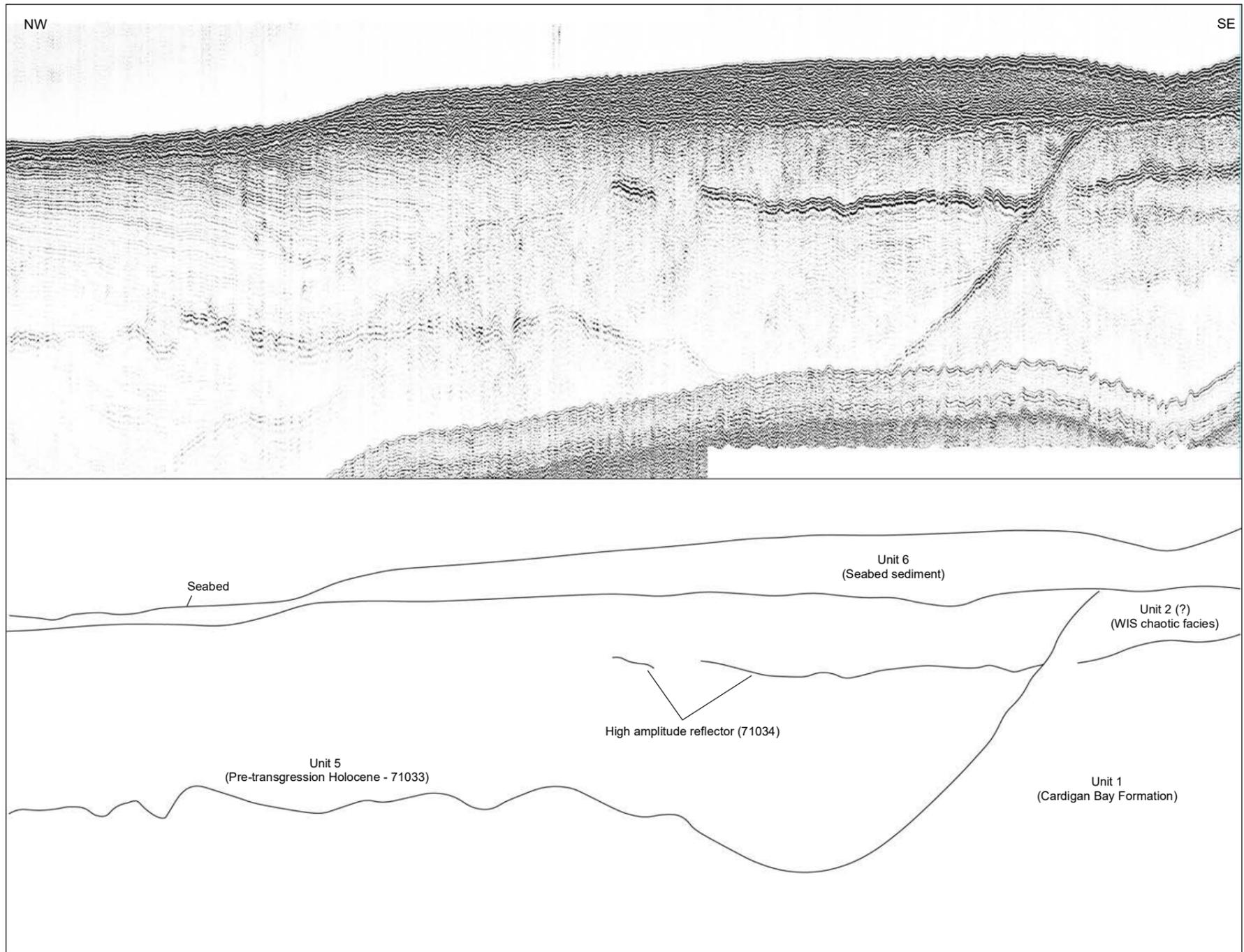
FIGURE TITLE: Palaeogeographic features of archaeological potential – Offshore export cable corridor

VER	DATE	REMARKS	Drawn	Checked
1	16/07/2021	For Issue	KJF	DH

FIGURE NUMBER:
Figure 9

SCALE: 1:80,000	PLOT SIZE: A3	DATUM: WGS84	PROJECTION: UTM30N
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LEGEND

- Offshore Export Cable Corridor
- Data example locations

Palaeogeographic Features

- Channel
- High amplitude reflector
- Simple cut and fill

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PROJECT TITLE:
AWEL Y MÔR OFFSHORE WINDFARM

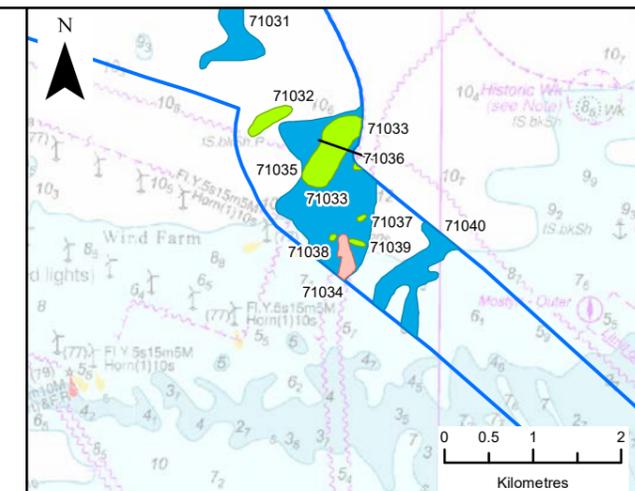
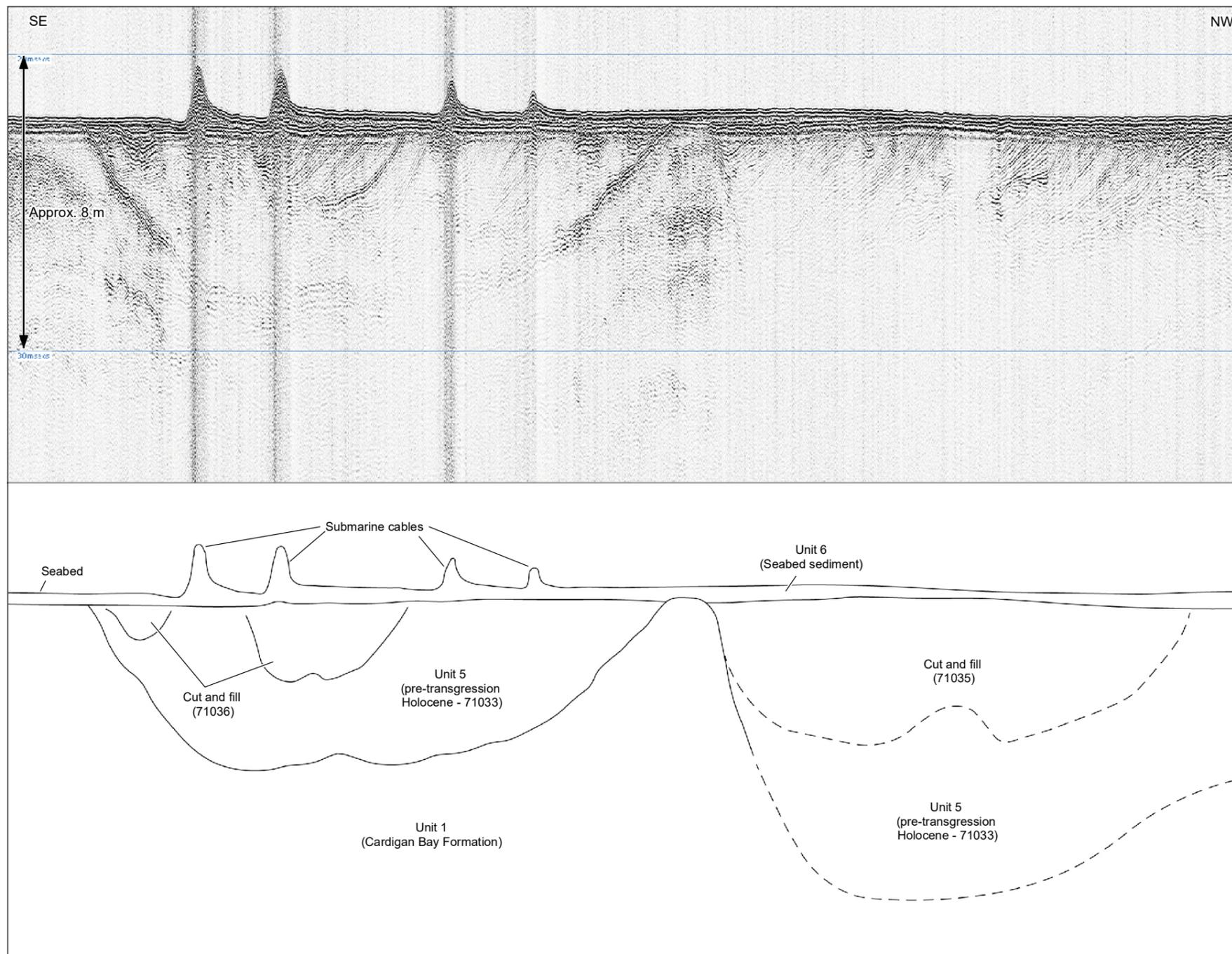
FIGURE TITLE:
SBP data example – 71033, 71034

VER	DATE	REMARKS	Drawn	Checked
1	16/07/2021	For Issue	KJF	DH

FIGURE NUMBER:
Figure 10

SCALE: Location 1:80,000 PLOT SIZE: A3 DATUM: WGS84 PROJECTION: UTM30N





LEGEND

Offshore Export Cable Corridor

Data example locations

Palaeogeographic Features

Channel

High amplitude reflector

Simple cut and fill

Data Source:

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PROJECT TITLE:

AWEL Y MÔR OFFSHORE WINDFARM

FIGURE TITLE: **SBP data example –
71033, 71035, 71036**

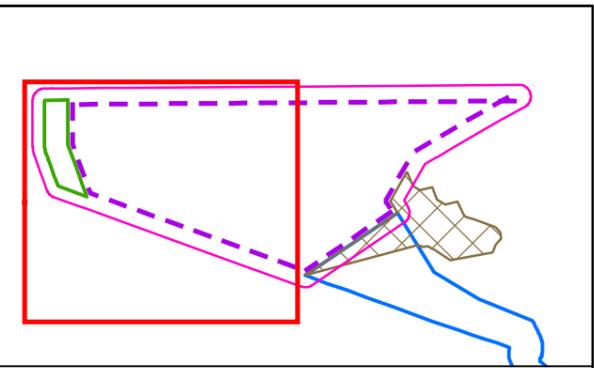
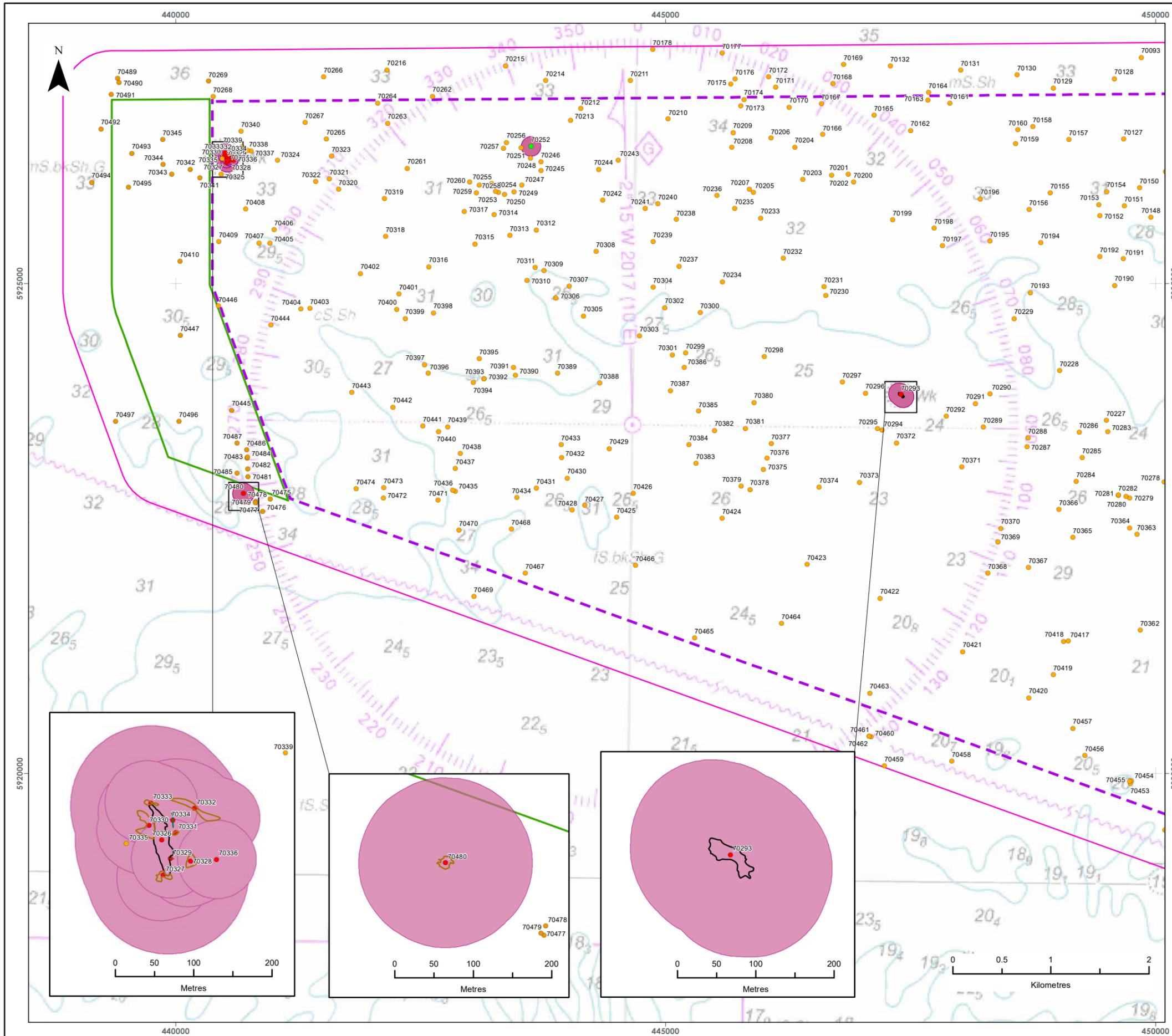
VER	DATE	REMARKS	Drawn	Checked
1	20/07/2021	For Issue	KJF	DH

FIGURE NUMBER:

Figure 11

SCALE: Location 1:80,000 PLOT SIZE: A3 DATUM: WGS84 PROJECTION: UTM30N

Fferm Wynt Alltraeth
AWEL Y MÔR
Offshore Wind Farm



LEGEND

- Array Area
- Other Wind Farm Infrastructure Zone
- Array area/Infrastructure zone buffer
- Recommended archaeological exclusion zones

Anomalies of archaeological potential

- A1: Anthropogenic origin of archaeological interest
- A2: Uncertain origin of possible archaeological interest
- A3: Historic record of possible archaeological interest

Feature boundaries

- Wreck
- Debris field
- Seabed disturbance

Linear features

- Debris
- Rope/chain

Data Source:
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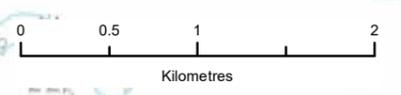
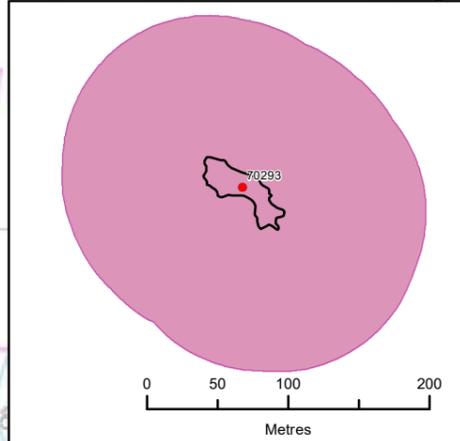
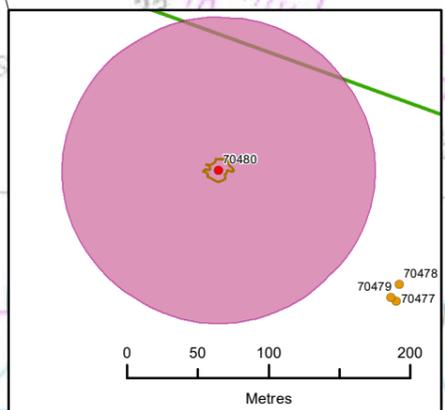
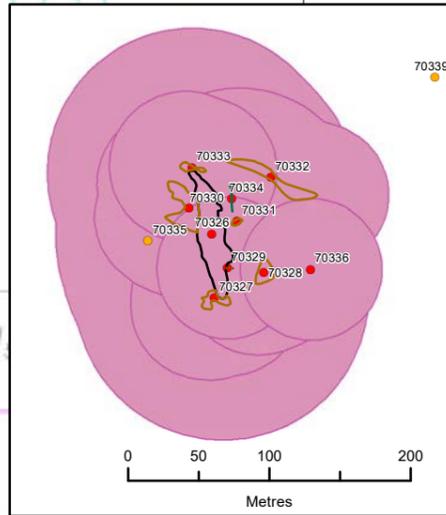
PROJECT TITLE:
AWEL Y MÔR OFFSHORE WINDFARM

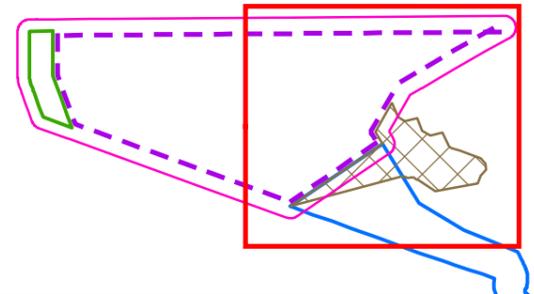
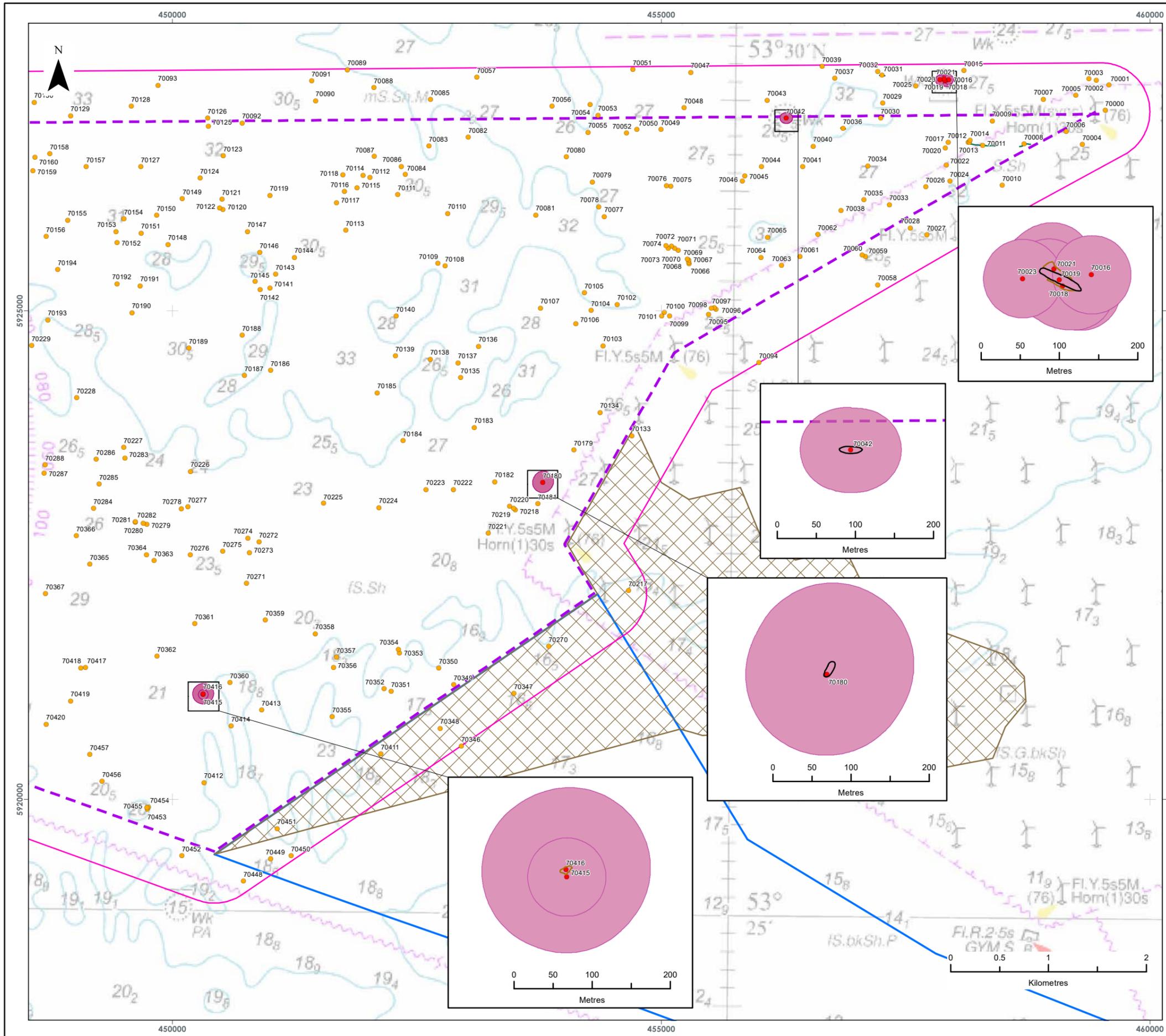
FIGURE TITLE:
Seabed features of archaeological potential – Array area and Infrastructure zone

VER	DATE	REMARKS	Drawn	Checked
1	20/07/2021	For Issue	KF	DH

FIGURE NUMBER:
Figure 12a

SCALE: 1:40,000	PLOT SIZE: A3	DATUM: WGS84	PROJECTION: UTM30N
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LEGEND

- Array Area
- Array area/Infrastructure zone buffer
- AyM to GyM interlink
- Offshore Export Cable Corridor
- Recommended archaeological exclusion zones

Anomalies of archaeological potential

- A1: Anthropogenic origin of archaeological interest
- A2: Uncertain origin of possible archaeological interest
- A3: Historic record of possible archaeological interest

Feature boundaries

- Wreck
- Debris field
- Seabed disturbance

Linear features

- Debris
- Rope/chain

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PROJECT TITLE:
AWEL Y MÔR OFFSHORE WINDFARM

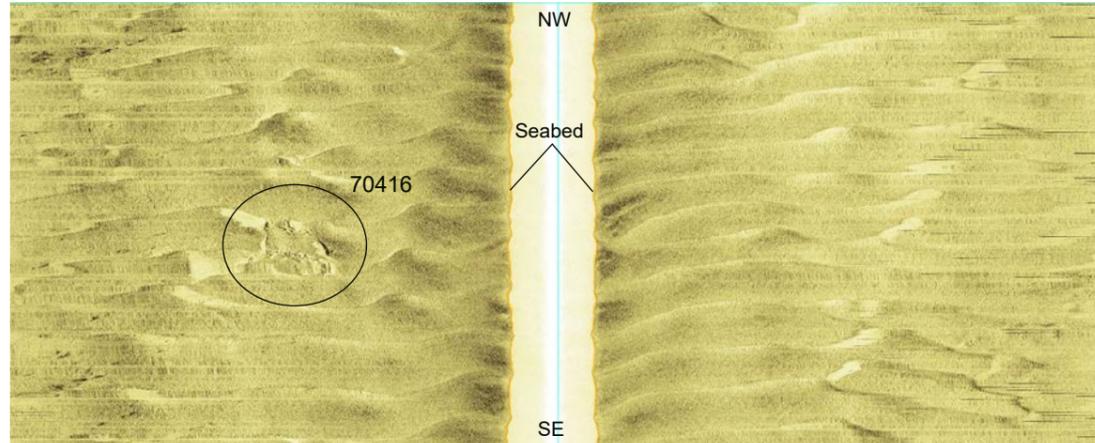
FIGURE TITLE:
Seabed features of archaeological potential – Array area and Infrastructure zone

VER	DATE	REMARKS	Drawn	Checked
1	20/07/2021	For Issue	KF	DH

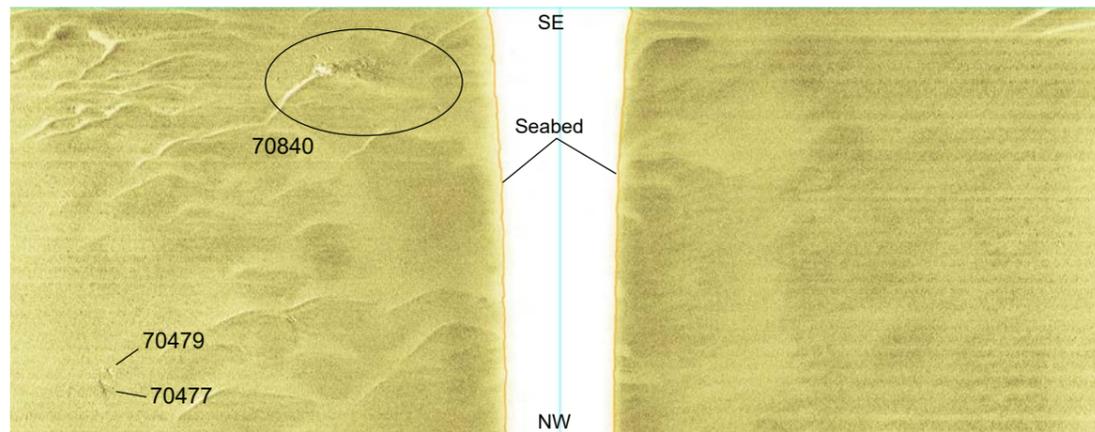
FIGURE NUMBER:
Figure 12b

SCALE: 1:40,000	PLOT SIZE: A3	DATUM: WGS84	PROJECTION: UTM30N
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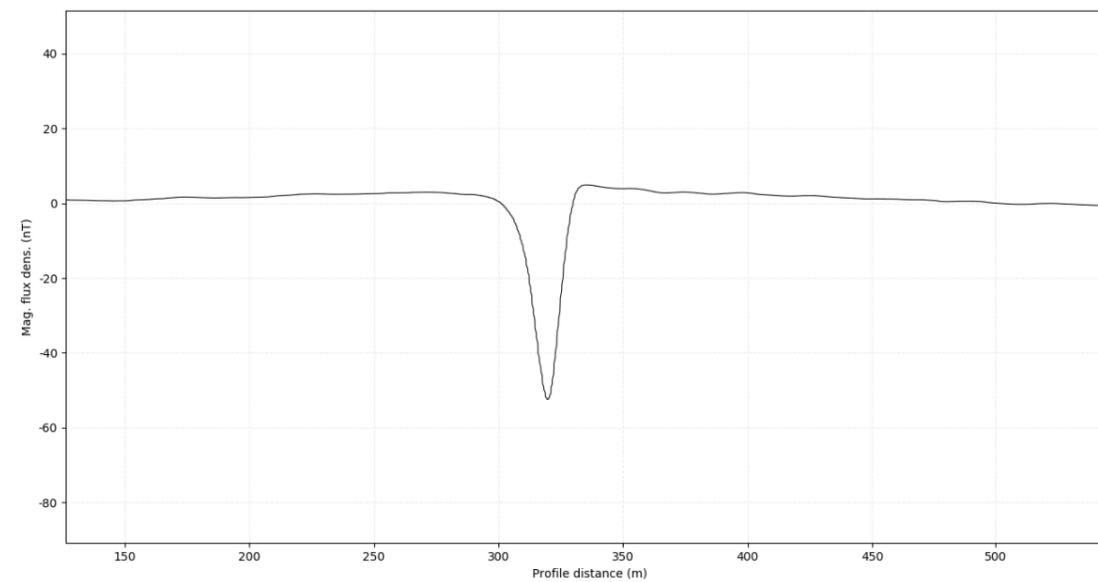




Anomaly **70416**, SSS waterfall image, 100 m range per channel



Anomaly **70480**, SSS waterfall image, 100 m range per channel



Anomaly **70480**, Mag. profile image

Data Source:

PROJECT TITLE:

AWEL Y MÔR OFFSHORE WINDFARM

FIGURE TITLE: **Data examples – Array area and Infrastructure zone**

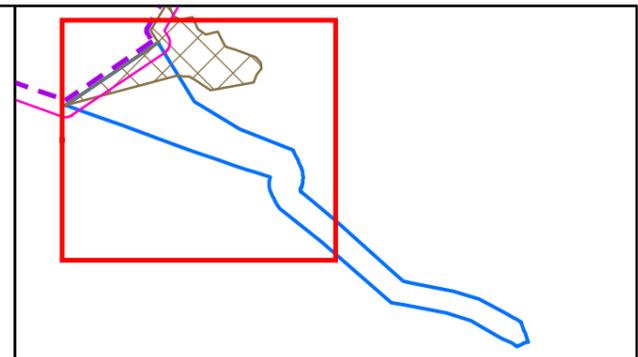
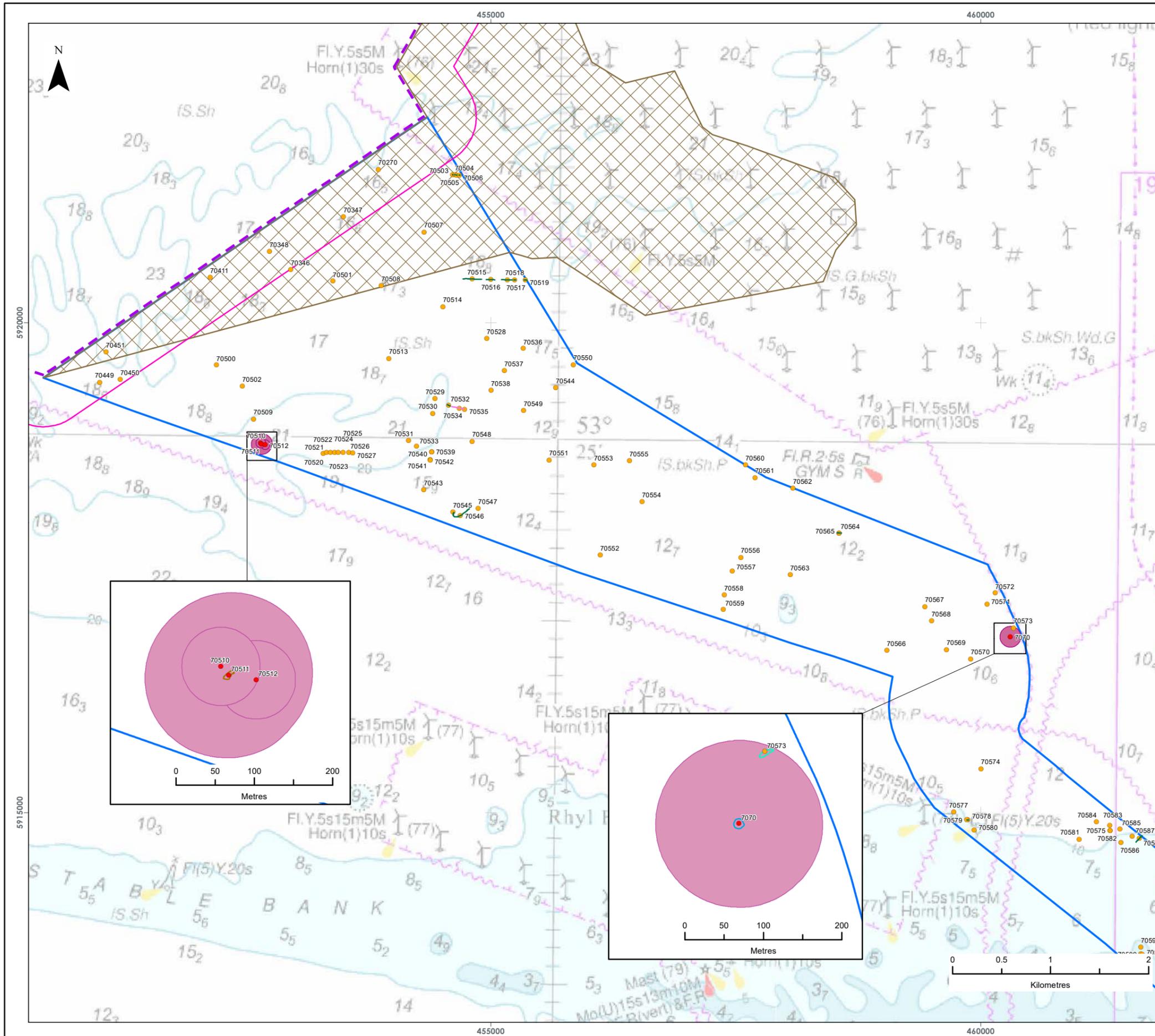
VER	DATE	REMARKS	Drawn	Checked
1	23/06/2021	For Issue	KJF	DH

FIGURE NUMBER:

Figure 13

SCALE:	PLOT SIZE:	DATUM:	PROJECTION:
N/A	A3	N/A	N/A

Ferm Wynt Alltraeth
AWEL Y MÔR
 Offshore Wind Farm



LEGEND

- Array Area
- Array area/Infrastructure zone buffer
- AyM to GyM interlink
- Offshore Export Cable Corridor
- Recommended archaeological exclusion zones

Anomalies of archaeological potential

- A1: Anthropogenic origin of archaeological interest
- A2: Uncertain origin of possible archaeological interest

Feature boundaries

- Debris field
- Mound
- Seabed disturbance

Linear features

- Bright reflector
- Debris
- Rope/chain

Data Source:
 Charts from MarineFIND.co.uk. © Crown Copyright 2021. All rights reserved.
 Licence No. EK001-0582-MF0050.

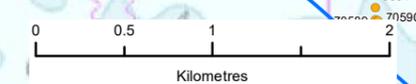
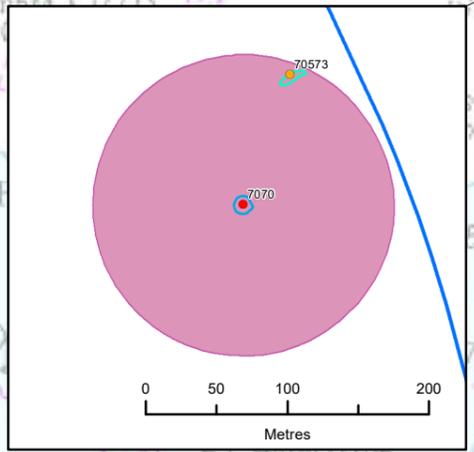
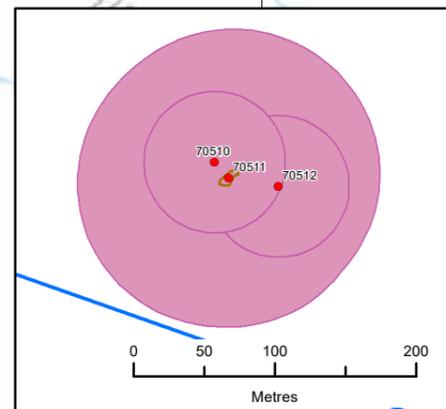
PROJECT TITLE:
AWEL Y MŌR OFFSHORE WINDFARM

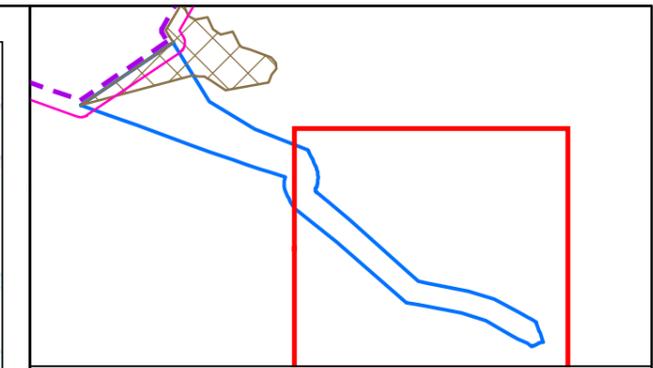
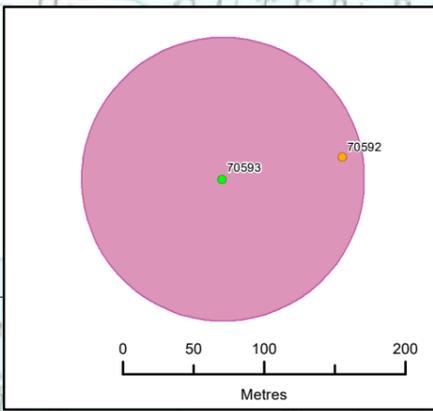
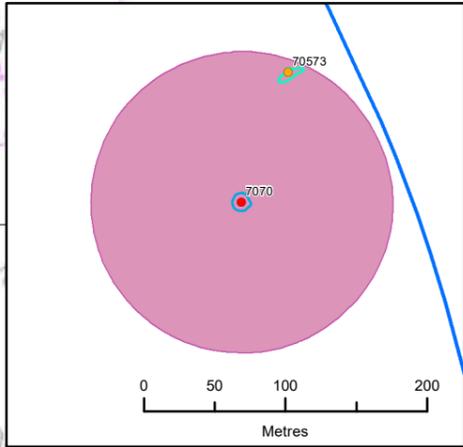
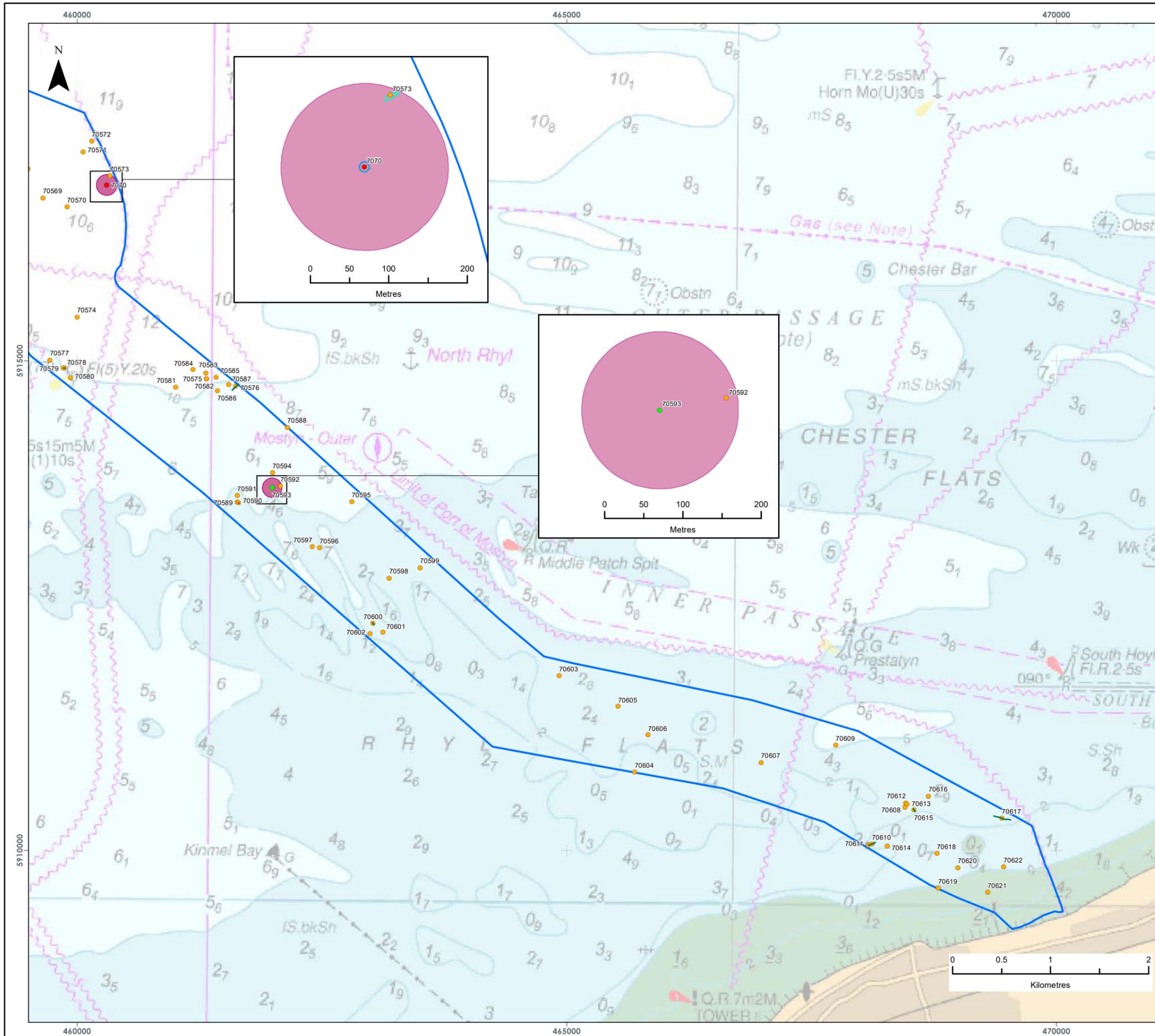
FIGURE TITLE:
Seabed features of archaeological potential – Offshore Export Cable Corridor

VER	DATE	REMARKS	Drawn	Checked
1	20/07/2021	For Issue	KF	DH

FIGURE NUMBER:
Figure 14a

SCALE: 1:40,000 PLOT SIZE: A3 DATUM: WGS84 PROJECTION: UTM30N





LEGEND

- Offshore Export Cable Corridor
- Recommended archaeological exclusion zones
- Anomalies of archaeological potential**
 - A1: Anthropogenic origin of archaeological interest
 - A2: Uncertain origin of possible archaeological interest
 - A3: Historic record of possible archaeological interest
- Feature boundaries**
 - Mound
 - Seabed disturbance
- Linear features**
 - Debris
 - Rope/chain

Data Source:
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PROJECT TITLE:
AWEL Y MÔR OFFSHORE WINDFARM

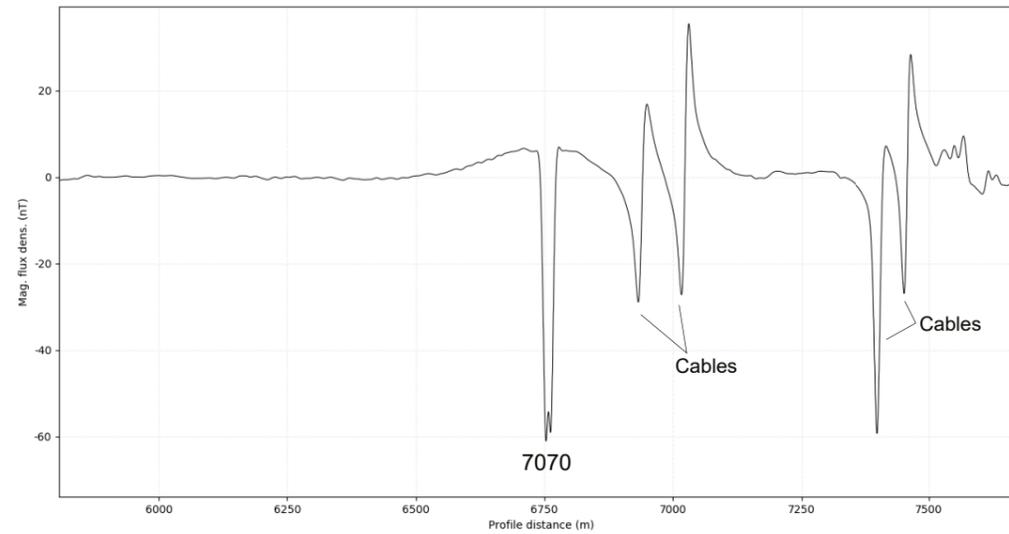
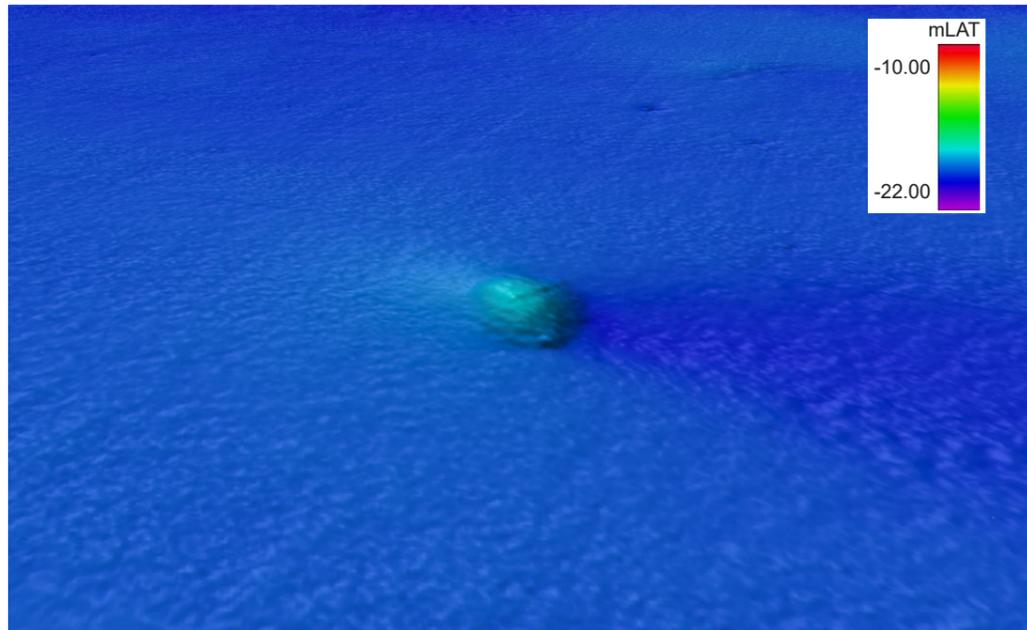
FIGURE TITLE:
Seabed features of archaeological potential – Offshore Export Cable Corridor

VER	DATE	REMARKS	Drawn	Checked
1	20/07/2021	For Issue	KF	DH

FIGURE NUMBER:
Figure 14b

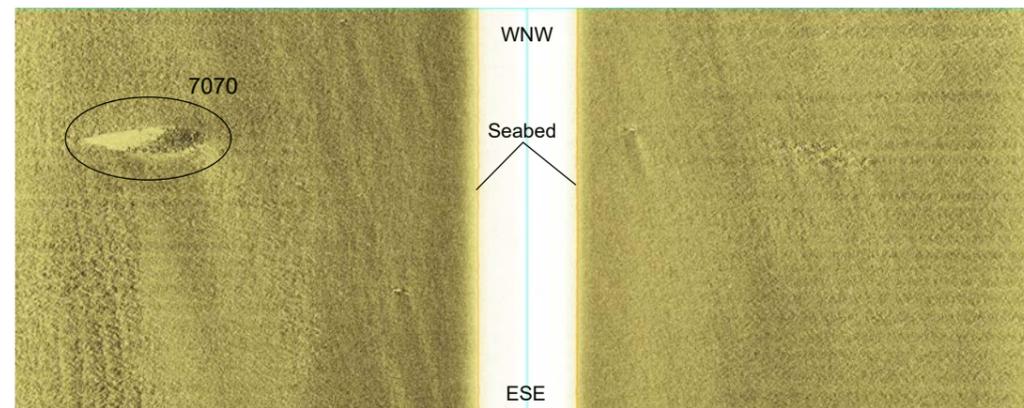
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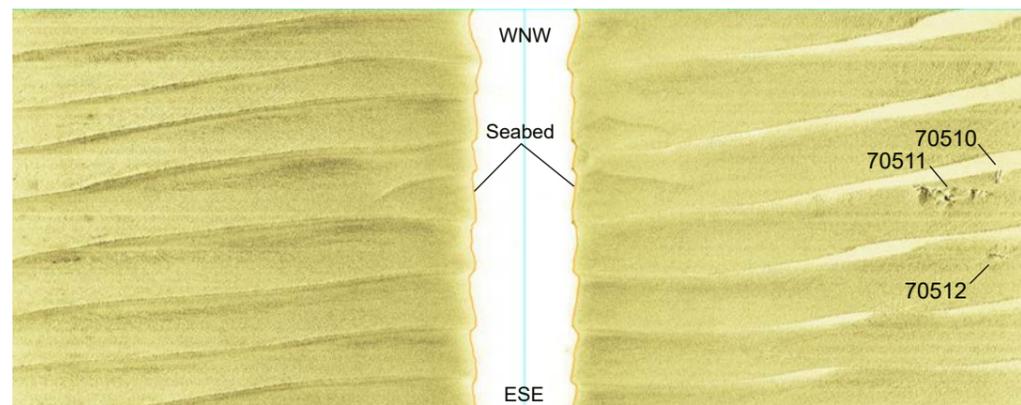


Anomaly **7070**, MBES grid image, x1 vertical exaggeration, looking north

Anomaly **7070**, Mag. profile image



Anomaly **7070**, SSS waterfall image, 100 m range per channel



Anomalies **70510** to **70512**, SSS waterfall image, 100 m range per channel

Data Source:

PROJECT TITLE:

AWEL Y MÔR OFFSHORE WINDFARM

FIGURE TITLE:

**Data examples -
ECC**

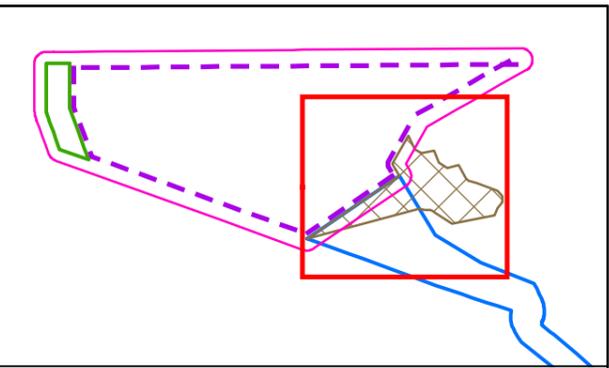
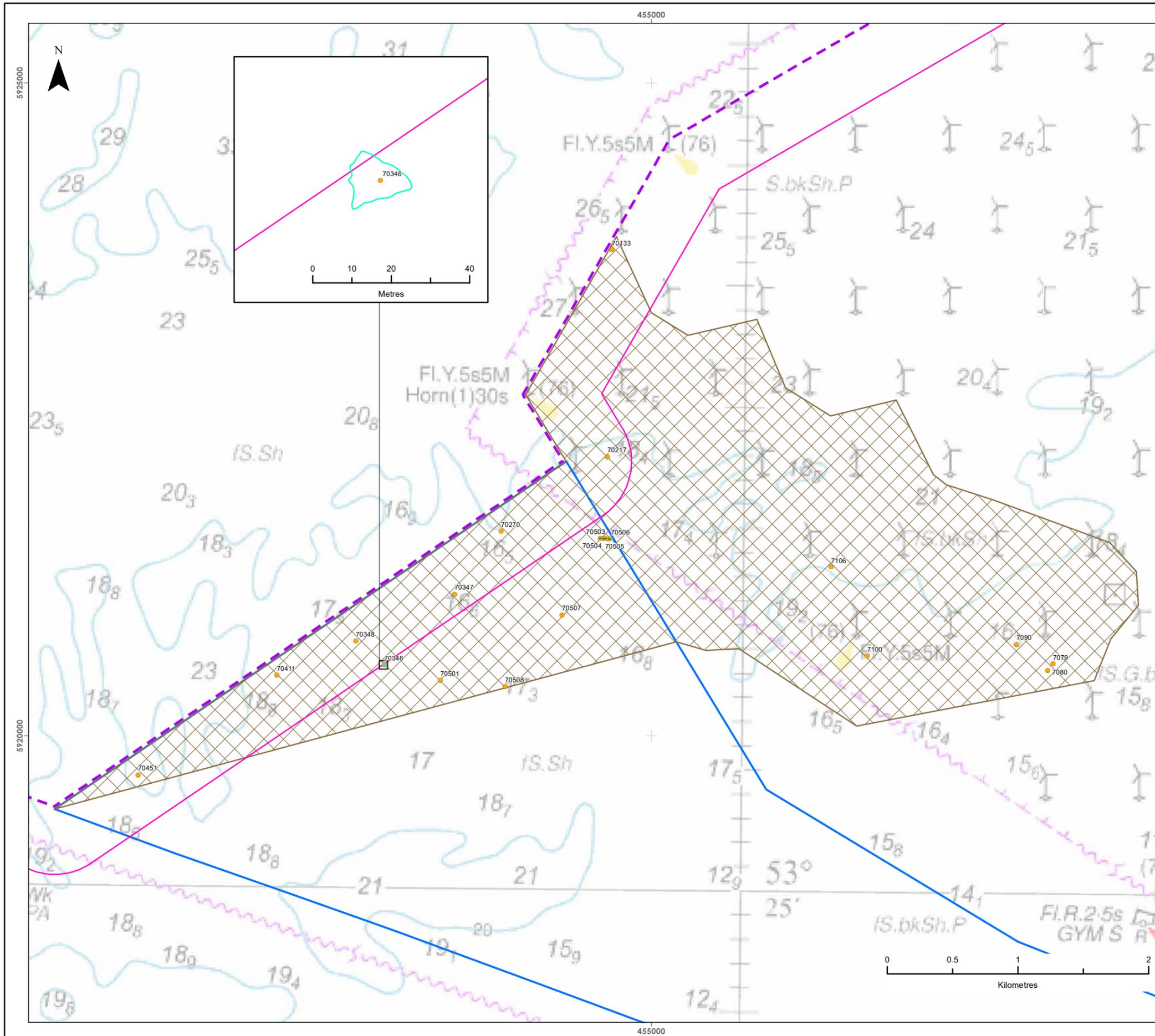
VER	DATE	REMARKS	Drawn	Checked
1	23/06/2021	For Issue	KJF	DH

FIGURE NUMBER:

Figure 15

SCALE:	PLOT SIZE:	DATUM:	PROJECTION:
N/A	A3	N/A	N/A

Ferm Wynt Alltraeth
AWEL Y MÔR
Offshore Wind Farm



LEGEND

- Array Area
- Array area/Infrastructure zone buffer
- AyM to GyM interlink
- Offshore Export Cable Corridor

Anomalies of archaeological potential

- A2: Uncertain origin of possible archaeological interest

Feature boundaries

- Seabed disturbance

Linear features

- Rope/chain

Data Source:
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PROJECT TITLE:
AWEL Y MÔR OFFSHORE WINDFARM

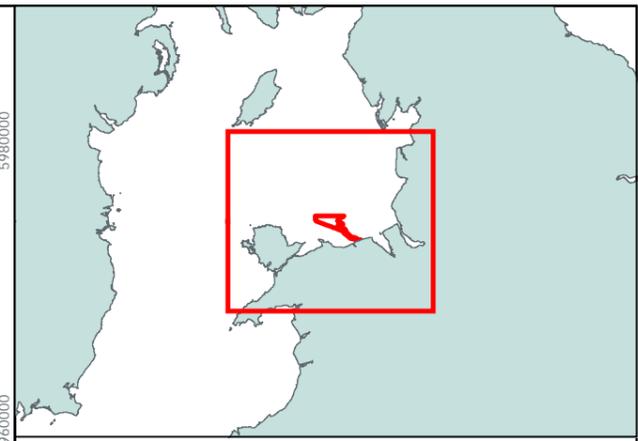
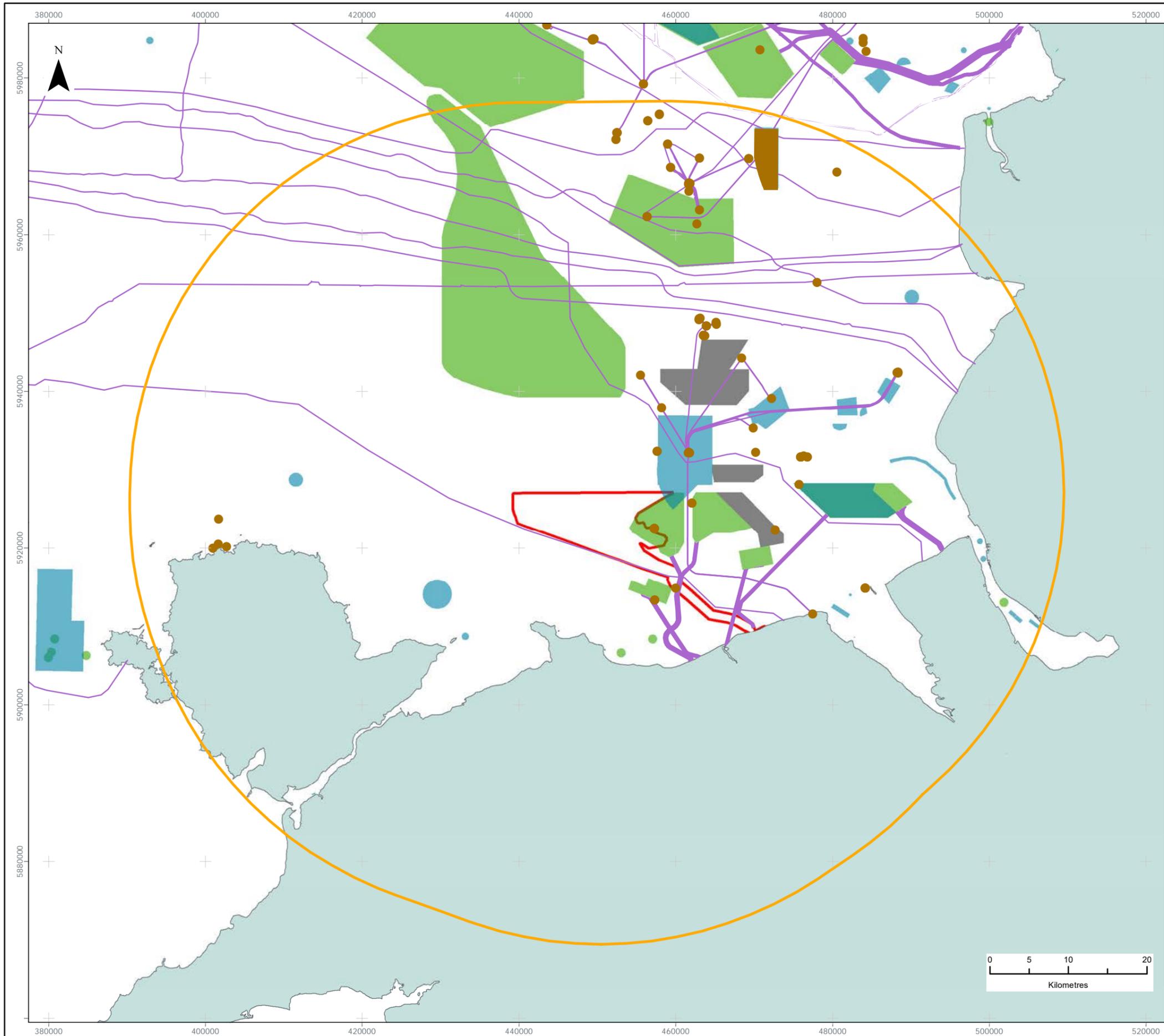
FIGURE TITLE:
Seabed features of archaeological potential – AyM to GyM interlink

VER	DATE	REMARKS	Drawn	Checked
1	20/07/2021	For Issue	KF	DH

FIGURE NUMBER:
Figure 16

SCALE: 1:30,000 PLOT SIZE: A3 DATUM: WGS84 PROJECTION: UTM30N





- LEGEND**
- Proposed Offshore Development Area
 - Cumulative Impact Assessment 50 km buffer
 - Aggregates
 - Disposal sites
 - Offshore Energy
 - Cables and pipelines
 - Oil and gas

Data Source:

PROJECT TITLE:
AWEL Y MÔR OFFSHORE WINDFARM

FIGURE TITLE:
Cumulative Impact Assessment

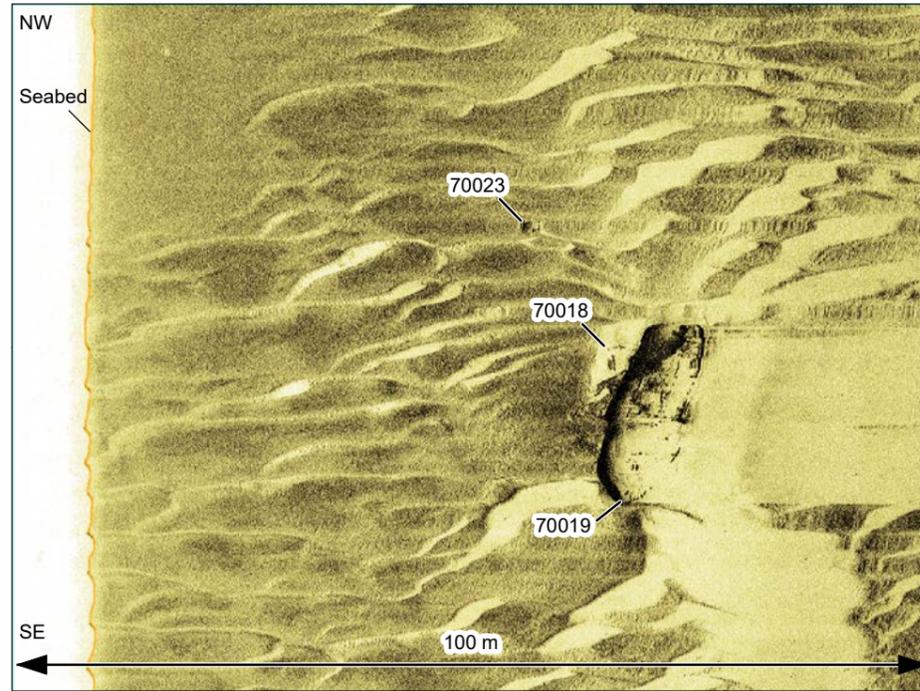
VER	DATE	REMARKS	Drawn	Checked
1	20/07/2021	For Issue	KJF	LR

FIGURE NUMBER:
Figure 17

SCALE: 1:500,000 PLOT SIZE: A3 DATUM: WGS84 PROJECTION: UTM30N



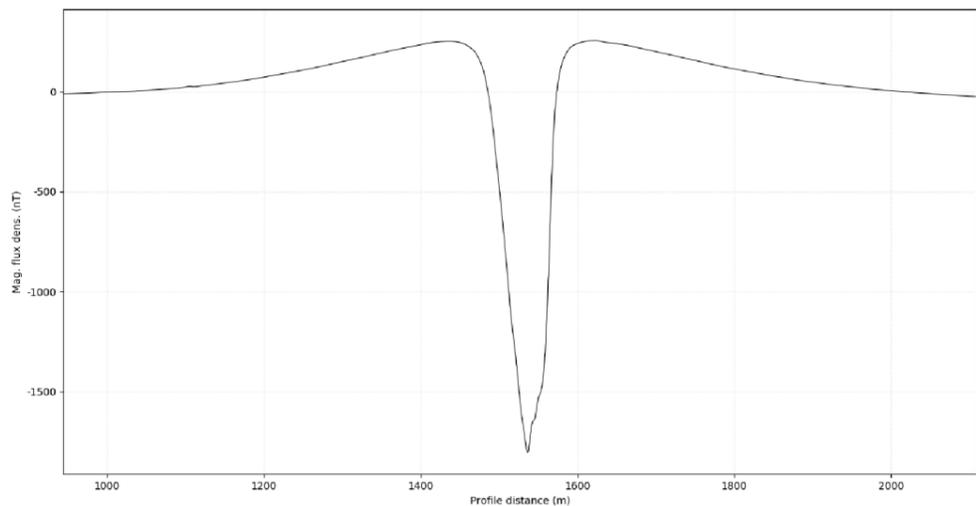
Location	457899 E 5927359 N	Area	Array area buffer
Archaeological Importance	High		
Geophysical survey dimensions and notes	Wreck 70019 is an upright, intact wreck situated in the north-eastern section of the array area buffer. The wreck is orientated approximately ESE-WSW and has an associated UKHO record (7693) which describes it as the wreck of the <i>Dublin</i> , a steamship built in Dublin by Walpole and Webb in 1866.		
	The wreck is visible in the 2020 SSS dataset as a clear outline of upright, intact wreck with dimensions 58.3 x 13.2 x 5.5. A very large, clear shadow is visible, which is roughly in two sections and has a very tall, narrow section which may represent a standing mast. Some complex internal features are also visible.		
	The wreck is visible in the MBES dataset as a large intact wreck with visible internal structure. There is a slight depression on the western edge. The wreck is located in an area of mobile seabed sediment with some sediment build up visible on the southern edge.		
Build	Type	Steam ship	
	Construction	Unknown, but assumed at least partially ferrous, 476 gross tonnage, 350 HP engines	
	Dimensions (m)	53x8.2x4.3	
	Shipyard	Walpole and Webb 1866, Dublin	
Loss	Cause	Struck by paddle steamer ' <i>Longford</i> '	
Extent of Survival	Built in Dublin by Walpole and Webb in 1866, and owned by the United Kingdom Screw Col Co., the <i>Dublin</i> left the River Mersey on Friday 26 October 1866, bound from Garston for Dublin. Was struck in the early hours of the morning by the paddle steamer ' <i>Longford</i> ', and sank almost immediately. There was no loss of life; the passengers and crew escaped into lifeboats.		
	Wreck 70019 was first recorded in 1948 (HMS <i>Seagull</i>) and recorded as UKHO 7693. Originally believed to be the wreck of the SS <i>Albanian</i> , the wreck was confirmed as the <i>Dublin</i> following retrieval of various items from the wreck in the 1980's and 1990's.		
Previous surveys also indicate the wreck is fairly intact, but badly corroded, which correlates with the current geophysical results. The wreck is located within an area of mobile sediment, and so is potentially periodically buried.			



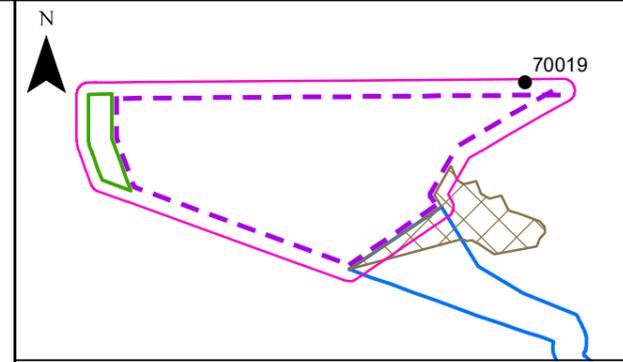
SSS waterfall image, 100 m range per channel



MBES grid image, x1 vertical exaggeration, looking west



Mag. profile image



LEGEND

- Array area/Infrastructure zone buffer
- AyM to GyM interlink
- Array Area
- Other Wind Farm Infrastructure Zone
- Offshore Export Cable Corridor
- Wreck location

Data Source:
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PROJECT TITLE:
AWEL Y MÔR OFFSHORE WINDFARM

FIGURE TITLE:
ID 70019 – UKHO 7693 – *Dublin*

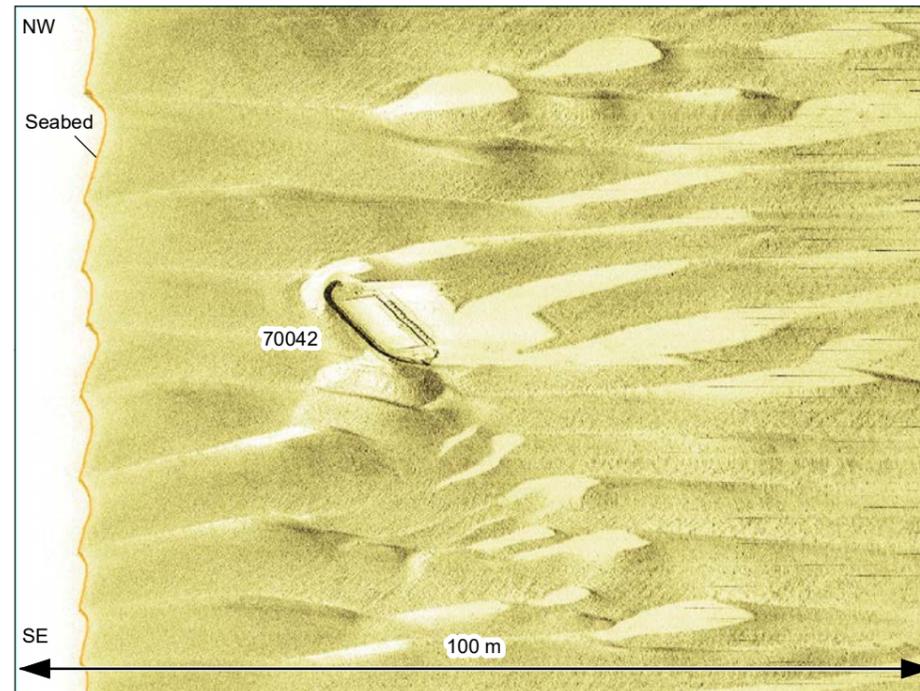
VER	DATE	REMARKS	Drawn	Checked
1	05/07/2021	For Issue	KF	DH

FIGURE NUMBER:
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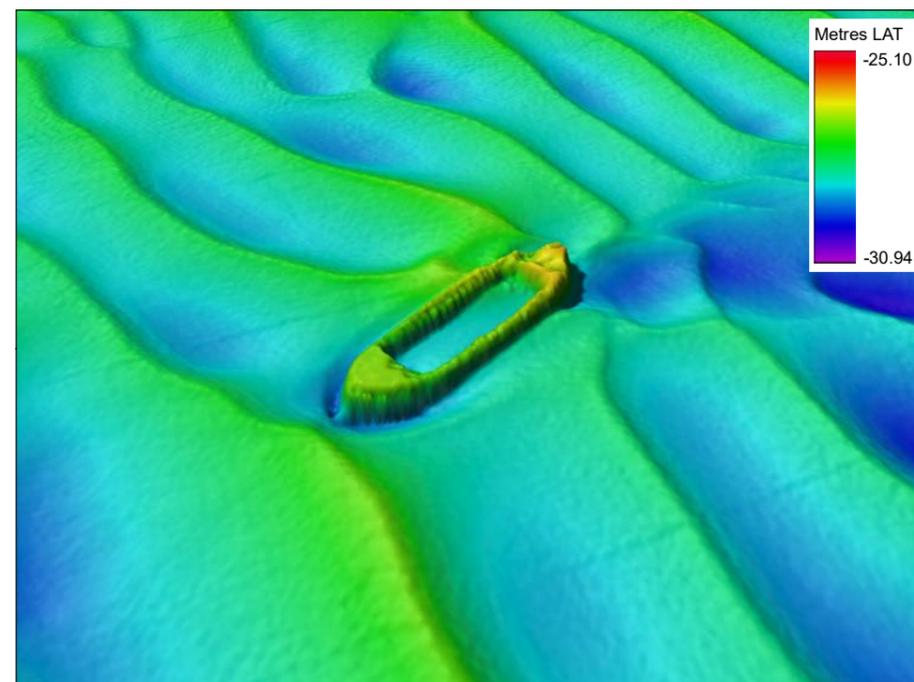
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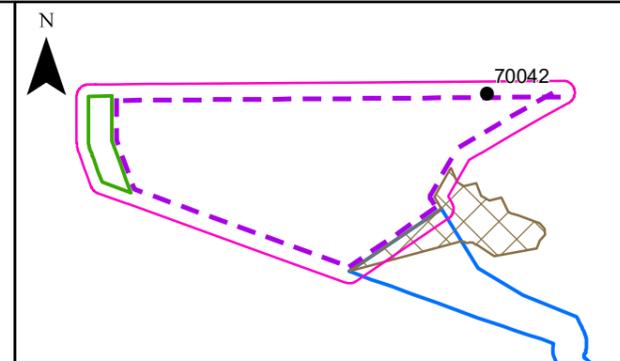
Location	456278 E 596972 N	Area	Array area
Archaeological Importance	High		
Geophysical survey dimensions and notes	Wreck 70042 is an upright and intact wreck situated in the north-east section of the array area, recorded as an unknown dangerous wreck by the UKHO (93229).		
	The wreck is visible in the 2020 SSS dataset as a relatively small wreck with an irregular shadow, measuring 29.0 x 8.6 x 3.7 m. The hull outline is clear but no internal features visible, apart from a central rectangular depression.		
	The MBES data show the wreck is orientated east-west, with scour at the eastern end, and is situated within mobile seabed sediment.		
Build	Type	Unknown	
	Construction	Unknown	
	Dimensions (m)	Unknown	
	Shipyard	Unknown	
Loss	Cause	Unknown	
Extent of Survival	UKHO record 93229 indicates the wreck was first identified by Clinton Marine during a Civil Hydrography Programme survey in 2020, and as such there is no additional survey history.		
	The wreck appears upright and intact, with no visible debris spread. Its position within mobile sediment indicates it is potentially buried periodically.		



SSS waterfall image, 100 m range per channel



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



LEGEND

- Array area/Infrastructure zone buffer
- AyM to GyM interlink
- Array Area
- Other Wind Farm Infrastructure Zone
- Offshore Export Cable Corridor
- Wreck location

Data Source:

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PROJECT TITLE:

AWEL Y MÔR OFFSHORE WINDFARM

FIGURE TITLE:

ID 70042 – UKHO 93229 – Unknown

VER	DATE	REMARKS	Drawn	Checked
1	05/07/2021	For Issue	KF	DH

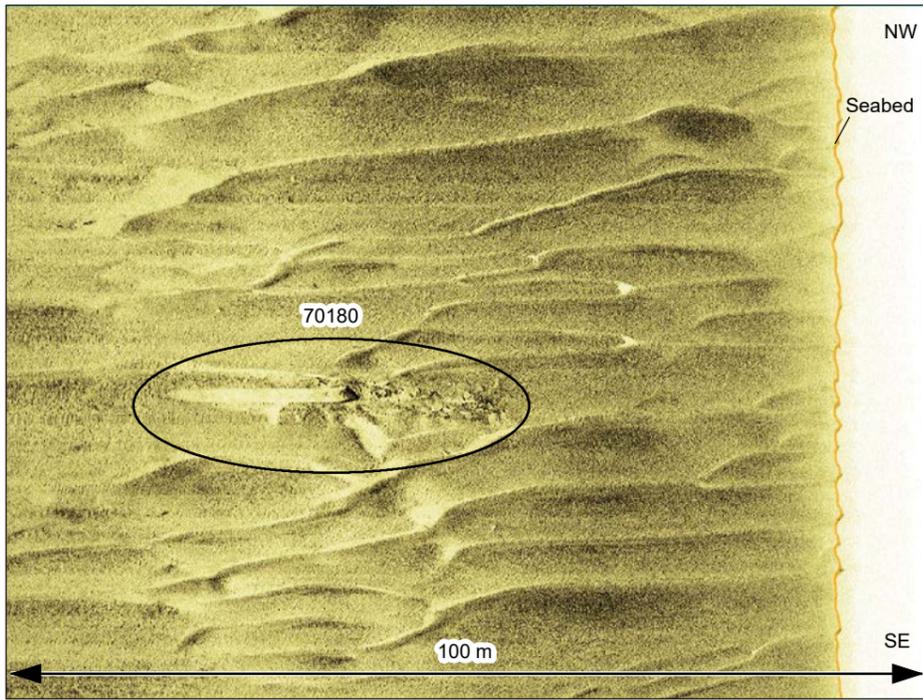
FIGURE NUMBER:

Sheet 2

SCALE: NTS	PLOT SIZE: A3	DATUM: WGS84	PROJECTION: UTM30N
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Fferm Wynt Alltraeth
AWEL Y MÔR
Offshore Wind Farm

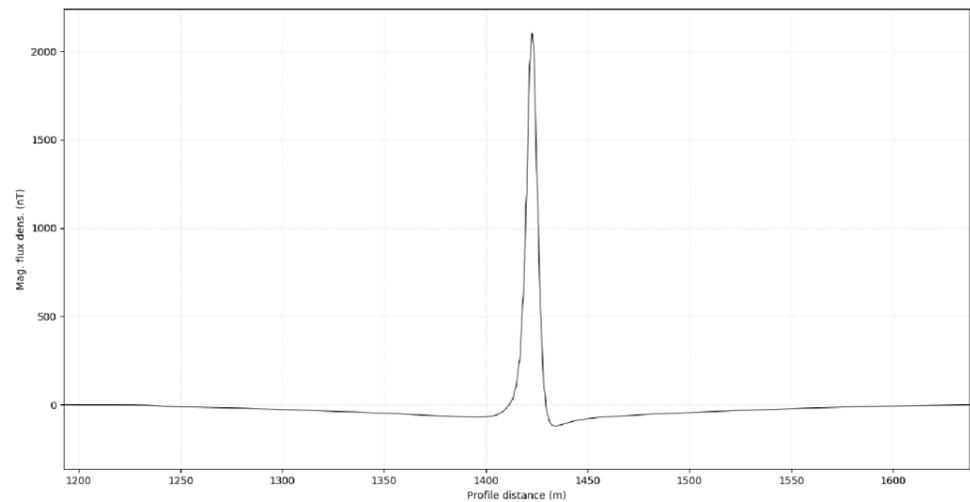
Location		453786 E 5923243 N	Area	Array area
Archaeological Importance		High		
Geophysical survey dimensions and notes		Wreck 70180 is a potential unidentified wreck situated in eastern part of the array area. It is recorded by the UKHO as an obstruction (94513).		
		The potential wreck is visible in the 2020 SSS data set as an elongate, irregular seabed disturbance with a large, square dark reflector with associated large, straight shadow at the south-western end, which may be an intact boiler. The total area of disturbance, including possible boiler, measures approximately 21.8 x 10.4 x 3.2 m.		
		In the MBES dataset, the main section of the potential wreck appears as a low, elongate mound, trending north-east to south-west. The potential boiler is visible at the south-western end of the main section as a distinct, taller mound with multiple peaks.		
Build		Type	Unknown	
		Construction	Unknown, but assumed at least partially ferrous	
		Dimensions (m)	Unknown	
Loss		Shipyard	Unknown	
		Cause	Unknown	
Extent of Survival		The potential boiler is recorded by the UKHO as an obstruction (94513), first identified by Clinton Marine during a Civil Hydrography Programme survey in 2020, and as such there is no additional survey history. However, the record does not mention the rest of the seabed disturbance extending to the north-east, which may indicate further buried and/or low-lying debris.		
		This suggests the wreck is severely degraded and/or mostly buried, with only solid features such as the potential boiler remaining relatively intact. The wreck is situated within mobile seabed sediment, and is therefore likely to be periodically buried.		



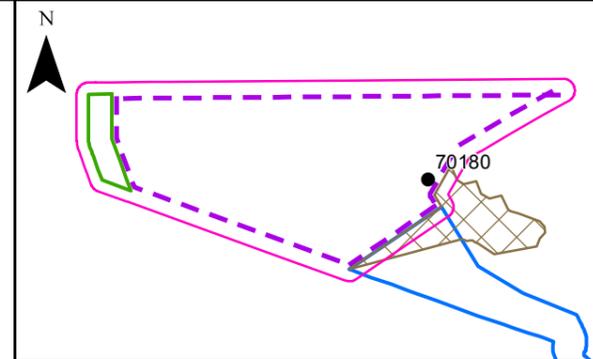
SSS waterfall image, 100 m range per channel



MBES grid image, x1 vertical exaggeration, looking north



Mag. profile image



LEGEND

- Array area/Infrastructure zone buffer
- AyM to GyM interlink
- Array Area
- Other Wind Farm Infrastructure Zone
- Offshore Export Cable Corridor
- Wreck location

Data Source:

PROJECT TITLE:

AWEL Y MÔR OFFSHORE WINDFARM

FIGURE TITLE:

ID 70180 – UKHO 94513 – Unknown

VER	DATE	REMARKS	Drawn	Checked
1	05/07/2021	For Issue	KF	DH

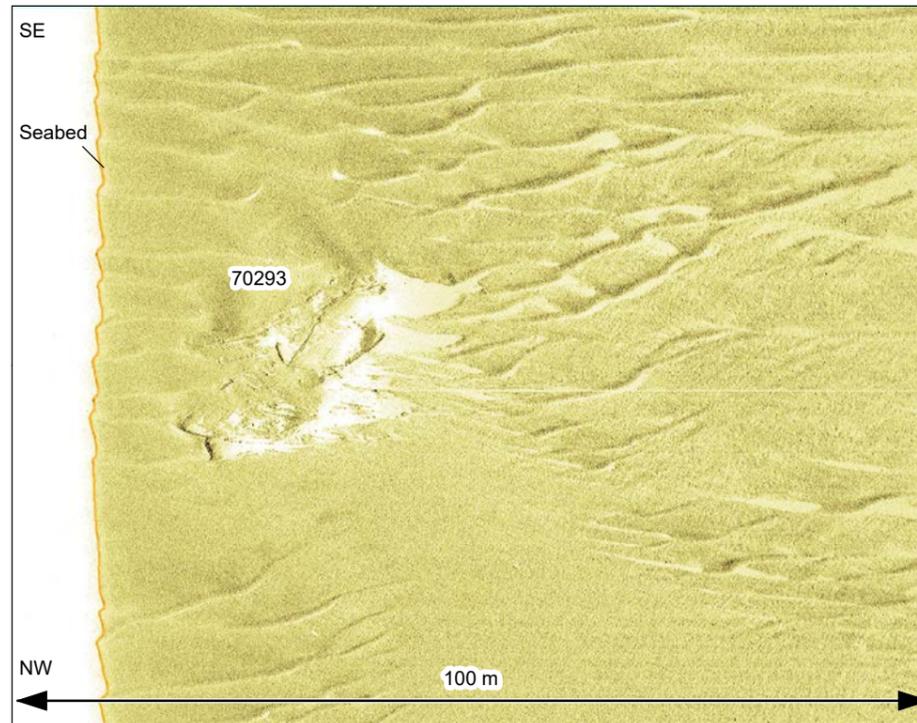
FIGURE NUMBER:

Sheet 3

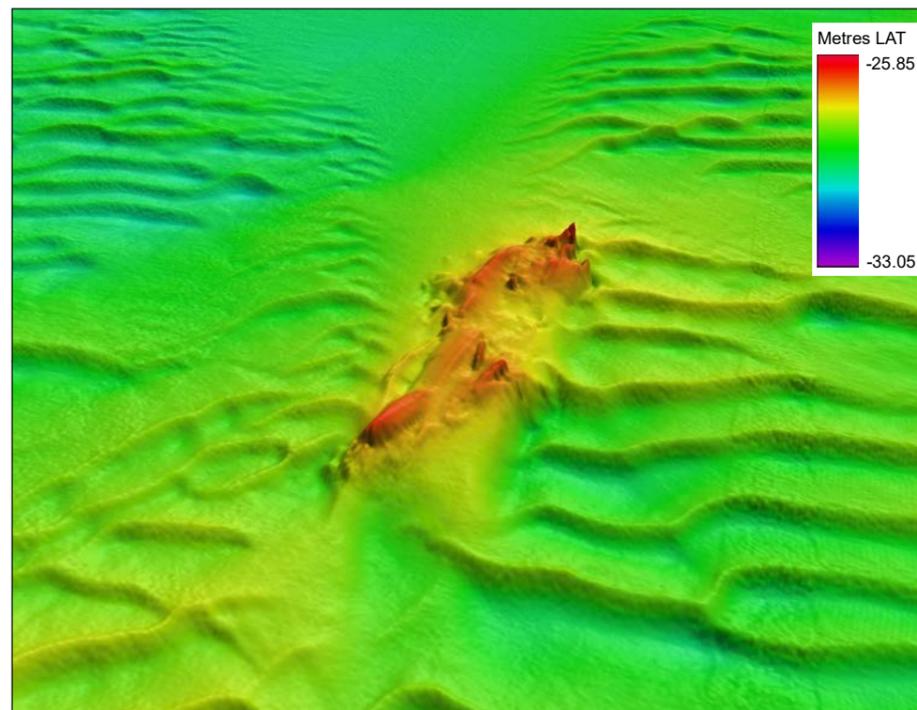
SCALE: NTS	PLOT SIZE: A3	DATUM: WGS84	PROJECTION: UTM30N
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Fferm Wynt Alltraeth
AWEL Y MÔR
Offshore Wind Farm

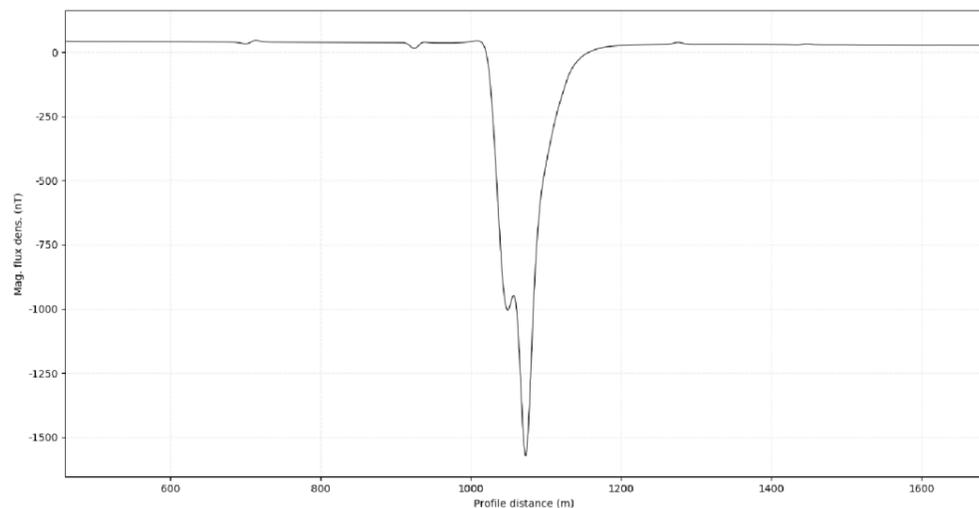
Location	447402 E 593866 N	Area	Array area
Archaeological Importance	High		
Geophysical survey dimensions and notes	Wreck 70293 is a highly degraded and potentially partially buried wreck situated around the centre of the array area. The wreck corresponds with UKHO record 7620, and is possibly the wreck of the sailing vessel <i>Chacabuco</i> .		
	The wreck comprises an area of irregular, incoherent dark reflectors with significant shadow identified in the 2020 SSS data. The wreck is highly degraded and potentially partially buried in mobile seabed sediment, although a series of parallel dark reflectors with shadows identified at the east end could indicate intact vessel frame. The wreck area measures approximately 70.3 x 37.1 x 2.2 m.		
	The wreck is visible in the MBES data as a large north-west to south-east orientated area of angular elongate objects, ranging from 3.5 m to 28.5 m in length.		
Build	Type	Sailing vessel	
	Construction	Unknown, but assumed to be at least partially ferrous	
	Dimensions (m)	62.2 x 10.4 x 6.4, 999 tonnes (gross)	
	Shipyard	Unknown	
Loss	Cause	Collision with SS <i>Torch</i>	
Extent of Survival	Recorded by UKHO as the possible wreck of the sailing vessel <i>Chacabuco</i> (7620) which is reported to have sank following a collision with the SS <i>Torch</i> .		
	The wreck was first identified during survey in 1939 HMS <i>Eglet</i> , and recorded as probably the <i>Chacabuco</i> following diver survey in 1989. The survey found collapsed steel wreckage and rigging consistent with a large sailing vessel		
	The wreck is recorded as being highly broken-up and degraded, partially buried in a sandwave, and with a significant amount of collapsed steel wreckage, which correlates with the geophysical anomalies observed during this assessment. It's location within an area of mobile seabed sediment suggests it is likely to be periodically buried.		



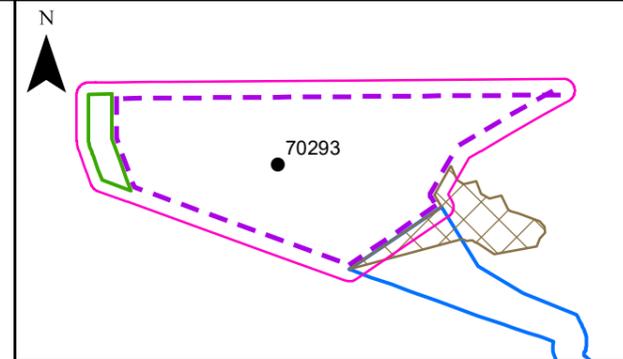
SSS waterfall image, 100 m range per channel



MBES grid image, x3 vertical exaggeration, looking west



Mag. profile image



LEGEND

- Array area/Infrastructure zone buffer
- AyM to GyM interlink
- Array Area
- Other Wind Farm Infrastructure Zone
- Offshore Export Cable Corridor
- Wreck location

Data Source:

PROJECT TITLE:

AWEL Y MÔR OFFSHORE WINDFARM

FIGURE TITLE:

**ID 70293 –
UKHO 7620 – Chacabuco**

VER	DATE	REMARKS	Drawn	Checked
1	05/07/2021	For Issue	KF	DH

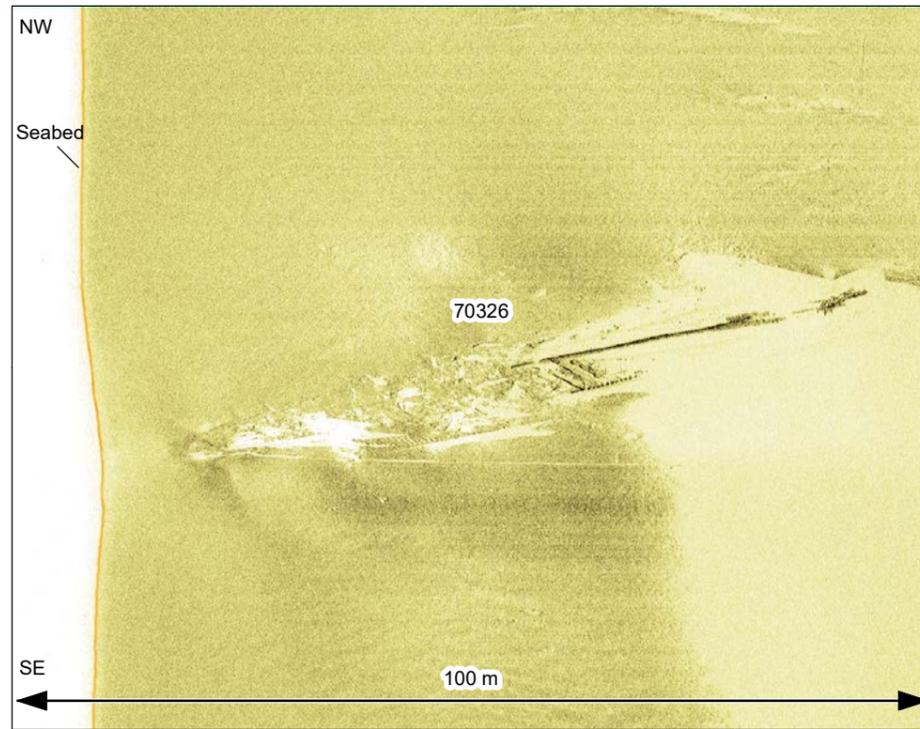
FIGURE NUMBER:

Sheet 4

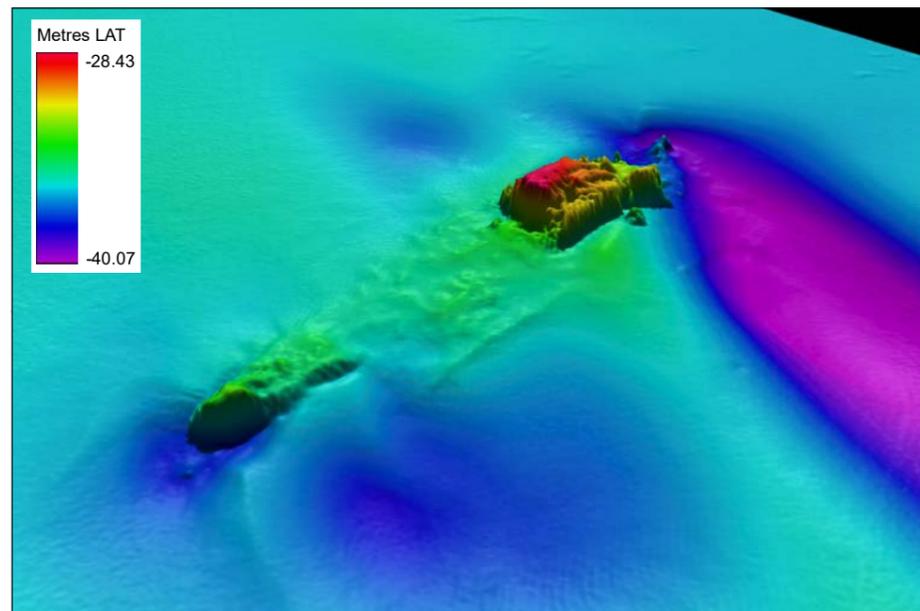
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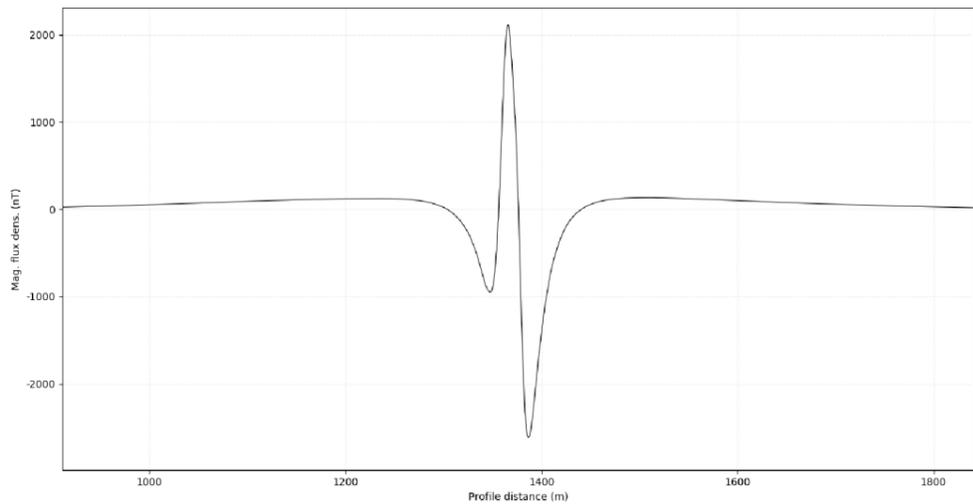
Location	440517 E 5926285 N	Area	2020 Array – Block D
Archaeological Importance	High		
Geophysical survey dimensions and notes	<p>Wreck 70326 is situated in the north-western section of the array area, and corresponds with the recorded location of the SS <i>Albanian</i> (UKHO 8124).</p> <p>Wreck 70326 is identified in the 2020 SSS dataset as a distinct wreck with clear sections relatively intact and recognisable as vessel structure. The wreck has dimensions of approximately 88.7 x 27.4 x 3.8 m, and is surrounded by a number of small debris fields and individual pieces of debris.</p> <p>However, the MBES data show the wreck to be split into two sections, with a central separating area within which it is difficult to identify individual objects, suggesting it is degraded and/or partially buried. The exposed northern section is an extant, well defined feature, with a series of regular elongate dark reflectors indicating some coherent internal structure. The south section of the vessel appears less distinctive and may indicate higher level of degradation in this area, however some possible internal structure can still be seen. There is some sedimentation at the southern end, however the exposed section is proud of the seabed and is relatively intact. There is scour visible predominantly at intervals along the eastern side, with the largest at the northern end extending approximately 160 m to the east with a depth of up to 6.0 m.</p> <p>In the Mag. data, the wreck is associated with a very large, sharp symmetric dipole with an amplitude of 4727 nT, suggesting significant ferrous content.</p>		
	Build	Type	Steam ship
	Construction	Unknown but assumed steel hull.	
	Dimensions (m)	89.0 x 9.4 x 7.0, 1417 tonnes gross.	
	Shipyard	T Royden & Sons, Liverpool	
Loss	Cause	Collision with the wooden barque <i>Nydia</i> .	
Extent of Survival	<p>The SS <i>Albanian</i> was a steamship built in 1870 by T Royden & Sons of Liverpool, with two boilers and a single-shaft compound inverted engine. It was lost in 1877 after being struck by a wooden barque, the <i>Nydia</i>.</p> <p>The wreck was first recorded by the UKHO in 1982. It was dived in 1984 and found to be lying upright but with no remaining superstructure. The wreck was partially salvaged in 1992 and confirmed as the SS <i>Albanian</i>. Salvaging has caused degradation of the wreck, reported as being in three pieces in 1993. In 2014, the forward part was part collapsed, midships upright, and the stern broken and lying to starboard.</p> <p>The record indicates the wreck was already well broken up during initial surveys, and has degraded further as a result of salvaging efforts. This correlates with the degraded state of the central area of the wreck, and the identified surrounding debris, as visible in the geophysical data.</p>		



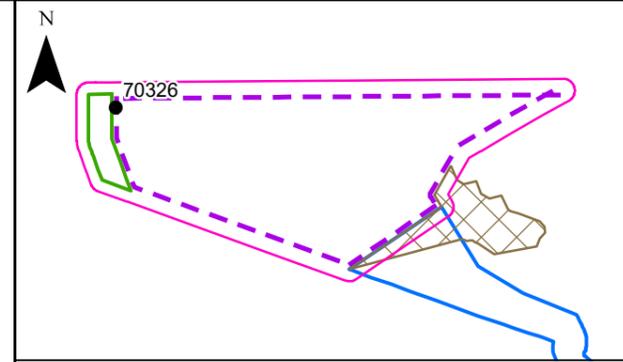
SSS waterfall image, 100 m range per channel



MBES grid image, x1 vertical exaggeration, looking west



Mag. profile image



- LEGEND**
- Array area/Infrastructure zone buffer
 - Array Area
 - Other Wind Farm Infrastructure Zone
 - Offshore Export Cable Corridor
 - Wreck location

Data Source:

PROJECT TITLE:
AWEL Y MÔR OFFSHORE WINDFARM

FIGURE TITLE:
**ID 70326 –
UKHO 8124 – SS Albanian**

VER	DATE	REMARKS	Drawn	Checked
1	05/07/2021	For Issue	KF	DH

FIGURE NUMBER:
Sheet 5

SCALE: NTS PLOT SIZE: A3 DATUM: WGS84 PROJECTION: UTM30N

Fferm Wynt Alltraeth
AWEL Y MÔR
Offshore Wind Farm



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