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Awel y Môr Offshore Wind Farm

Offshore Written Scheme of Investigation

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Awel y Môr Offshore Wind Farm

Offshore Written Scheme of Investigation

1 INTRODUCTION

1.1 Project background

- 1.1.1 Wessex Archaeology has been commissioned by Awel y Môr Offshore Wind Farm Limited (hereafter referred to as 'the Client'), to produce an outline offshore archaeological written scheme of investigation (WSI) for the proposed Awel y Môr Offshore Wind Farm (hereafter referred to as 'AyM') relevant to offshore archaeology and cultural heritage during its construction, Operation & Maintenance (O&M) and decommissioning.
- 1.1.2 This outline offshore archaeological WSI follows on from a marine archaeological Desk-Based Assessment technical report (Wessex Archaeology 2021a) which was included as an appendix in the Preliminary Environmental Information Report (ES) (RWE 2021a), Volume 2: Chapter 11: Offshore Archaeology and Cultural Heritage (Application ref: 6.3.8). Following further consultation, an Environmental Statement (ES) (RWE forthcoming) has been produced in support of AyM, and this outline offshore archaeological WSI forms part of the mitigation.
- 1.1.3 The WSI will come into effect when it has been discussed with the archaeological curators and agreed with NRW. Following consent, to ensure best practice the draft WSI will be given consideration for those activities
- 1.1.4 AyM is a proposed extension to the operational Gwynt y Môr OWF off the north-east coast of Wales (Figures 1-21). The array area of AyM will cover approximately 78 km² (not including Subsea Infrastructure and Temporary Works, Other Wind Farm Infrastructure Zone and GyM interlink) with a cable corridor running from the east of the array up to and including the intertidal zone. The landfall will be situated between Rhyl and Prestatyn on the north Wales coast, approximately 2.7 km to the north-east of Rhyl in Denbighshire.
- 1.1.5 The ES summarises relevant consultation with stakeholders and Archaeological Curators including Cadw and the Royal Commission on the Ancient and Historic Monuments of Wales (RCHAMW).

1.2 Development description

- 1.2.1 The following section describes the engineering parameters of the project design envelope defined in Volume 2, Chapter 2: Offshore Project Description.
- 1.2.2 This development will comprise of turbines, up to two Offshore Substation Platform (OSP), one meteorological mast (met mast) and/or floating LIDAR buoys and Permanent Vessel Moorings (PVMs). Inter-array cables will connect all of the wind turbines and the OSPs, Buoys, Met Masts and GyM wind farm. There will be a maximum of two export cables. The number of construction vessels during maximum peak construction is estimated at 99.



1.3 Scope of document

- 1.3.1 This outline offshore archaeological WSI sets out the aims of the offshore investigation, and the methodologies and standards that will be employed by the Client and Retained Archaeologist to implement the mitigation strategy set out in the ES (RWE 2022,). In format and content, it conforms to current best practice and to the guidance outlined in *Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects (The Crown Estate and Wessex Archaeology 2021)*, the Joint Nautical Archaeology Policy Committee *Code of Practice for Development* (JNAPC 2006) and the relevant guidance from the Chartered Institute for Archaeologists (CIfA) (CIfA 2014a-g), as applicable.
- 1.3.2 This document will be submitted to the Archaeological Curator(s) for approval, prior to the commencement of any investigative work. If elements of the outline offshore archaeological WSI need to be discussed with relevant external stakeholders, including the Receiver of Wreck or Ministry of Defence, then this should also occur prior to the outline offshore archaeological WSI being approved. This could include methodologies for recovering and reporting material or development works that could impact a protected site under the *Merchant Shipping Act 1995* or the *Protection of Military Remains Act 1986*.

2 THE ARCHAEOLOGICAL ASSESSMENT AREAS

2.1 Co-ordinate system

All positions were recorded and expressed as WGS84 UTM Zone 30 coordinates.

2.2 Archaeological Assessment Areas

- 2.2.1 This outline offshore archaeological WSI addresses the offshore elements of the current AyM project to the Mean Low Water Springs (MLWS). The onshore and intertidal elements of the scheme will be addressed in the outline onshore archaeological WSI (application ref: 8.14).
- 2.2.2 The study area comprises the array area, the offshore ECC, other wind farm infrastructure zone, interlink zone and 500 m buffer around the order limits.

3 AIMS AND OBJECTIVES

3.1 Aims

- 3.1.1 The aim of the outline offshore archaeological WSI is to put in place the offshore archaeological mitigation as set out in the ES (RWE forthcoming) for agreement in principle with Cadw and RCAHMW.

3.2 Objectives

- 3.2.1 The objectives of this outline offshore archaeological WSI are as follows:

- to fulfil the requirements of Cadw and the RCAHMW in respect of archaeological monitoring and mitigation works associated with this project;
- to provide the position and extent of Archaeological Exclusion Zones (AEZs) that may be required, and to establish methods for their monitoring, modification and/ or removal in the future;
- to ensure that any further geophysical and geotechnical investigations associated with the project are subject to archaeological input, review, recording and sampling;

- to ensure that any ROV and/ or diver surveys associated with the project are subject to archaeological input and that any relevant data produced is archaeologically assessed;
- to propose measures for the mitigation of unexpected archaeological remains encountered during further survey work or construction work associated with the project;
- to set out methodologies for post-construction monitoring; and
- to establish the reporting and archiving requirements for the archaeological works undertaken during construction and post-construction monitoring.

3.3 Addressing questions from the Research Agendas

3.3.1 Themes of areas of research from the agendas may inform survey designs and will be addressed in the results of any reports.

Table 1 Themes/ areas for future research from the Research Agenda(s)

Research Agenda	Theme/Question
A Research Framework for the archaeology of Wales (https://www.archaeoleg.org.uk/documents2017.html)	<ul style="list-style-type: none">- More work is needed on the wrecks around the coast of Wales including their background, archaeological significance and who is managing them (https://www.archaeoleg.org.uk/pdf/review2017/maritimekeyvesselsites2017.pdf).- Marine Palaeolithic & Mesolithic work could also be researched further https://www.archaeoleg.org.uk/pdf/review2017/palaeolithicreview2017.pdf

4 ROLES, RESPONSIBILITIES AND COMMUNICATION

4.1 Schedule

4.1.1 Mitigation measures required to inform the final engineering design for this project must be undertaken, completed and reported in time to inform the design. Any Method Statements produced for works must be submitted to the Archaeological Curator(s) with sufficient time to receive comments prior to any works commencing.

4.2 Client

4.2.1 The Client will be responsible for implementing this outline offshore archaeological WSI and the mitigation measures, such as AEZs.

4.2.2 The Client and/or their representative will commission a Retained Archaeologist after the DCO has been granted.

4.2.3 The Client and/or their representative will consult the Retained Archaeologist during the planning stages for any further work.

4.2.4 The Client and/or their representative will commission Archaeological Method Statements prior to works being undertaken that may impact the seabed.

4.2.5 The Client and/or their representative will ensure that the Retained Archaeologist is provided with all relevant project datasets, to ensure that they are in an informed position to advise the project team. This is particularly important between the planning and

construction phase, and at any stage if the Retained Archaeologist changes, to ensure consistency.

- 4.2.6 The Client and/or their appointed representatives will ensure that recovered material identified as 'wreck' must be reported to the Receiver of Wreck within 28 days of discovery. The Client and/or their representative will be responsible for the submission of this report, the legal obligations under the *Merchant Shipping Act* 1995 and all correspondence. If recovered material is held by the Retained Archaeologist, it is essential they are included in all correspondence with the Receiver of Wreck and are aware of any updates or changes to the reports (commonly known as droits) associated with the material. The Client and/or their appointed representatives will be responsible for ensuring the legal obligations associated with the droits are undertaken.
- 4.2.7 It is recommended that the Client and/or their appointed representatives will be responsible for administering the obligations of the *Merchant Shipping Act* 1995 with specific regard to reports of wreck and salvage and will ensure that droit reports are dealt with accordingly.
- 4.2.8 The Client and/ or their appointed representatives, or any archaeological body they may appoint to manage the implementation of the outline offshore archaeological WSI, will seek curatorial advice from the Archaeological Curator(s) as appropriate. RCAHMMW provides advice within Welsh territorial waters, extending from MLWS to the 12 nautical mile limit. The remit of the Powys County Council Archaeologists extends to MLWM; although the intertidal works are included in the Onshore WSI, the archaeology continues seamlessly through both zones, so they are included in the event that their advice is needed.
- 4.2.9 Interaction with the Archaeological Curator(s) will be administered by the Client and/ or their appointed representatives with advice where appropriate through the Retained Archaeologist. Should a new site of archaeological importance be discovered during construction, the Archaeological Curator(s) will be contacted immediately.
- 4.2.10 Other offshore archaeological services will be undertaken in the event that they are applicable and agreed in advance with the Client (e.g. archaeological assessments of survey data) and planned and delivered through bespoke method statements if required (Section 8 and 9).
- 4.2.11 The Client and/ or their appointed representatives will ensure that Contractors make project personnel aware of this outline offshore archaeological WSI, any AEZs in force, and a bespoke Protocol for Archaeological Discoveries.

4.3 Retained Archaeologist

- 4.3.1 The Retained Archaeologist will oversee archaeological mitigation, as required, and will implement the outline offshore archaeological WSI.
- 4.3.2 The Retained Archaeologist, or suitable alternative will produce Archaeological Method Statements for works, as appropriate.
- 4.3.3 Where instructed to do so, the Retained Archaeologist will act as the specialist advisor for any unexpected archaeological discoveries. The Retained Archaeologist will cover the administration of the reporting of discoveries made by the client and/or their representative and will provide immediate actions, including recording, handling and storage, and introduction of measures to prevent or reduce damage if the presence of a significant archaeological site is suspected. The Retained Archaeologist will ensure any unexpected

discoveries of archaeological material are assessed, as per the protocol (see section 9.10), and reported to the relevant curators and stakeholders.

4.4 Archaeological Curator(s)

- 4.4.1 Method statements for archaeological works will be submitted to the Archaeological Curator(s) for comment/approval no less than one month prior to the planned commencement of surveys/works, in order to allow for sufficient time for the review and any amendments to be completed and agreed.
- 4.4.2 From Mean Low Water Springs (MLWS) to the 12 nm limit, the relevant Archaeological Curator is RCAHMMW. However, as their overall remit is nationwide, they will also review intertidal work, as covered by the Onshore Written Scheme of Investigation.

4.5 Other Key Stakeholders

Receiver of Wreck

- 4.5.1 Material identified as 'wreck' that has either been recovered within UK territorial waters or brought into UK territorial waters must be reported to the Receiver of Wreck under the *Merchant Shipping Act 1995*. The Receiver of Wreck is located within the Maritime Coastguard Agency and works with other government departments and heritage organisations.
- 4.5.2 Wreck material is reported to the Receiver of Wreck by completing a 'Report of wreck and salvage' form (MSF 6200), available via their website¹, and sending it to row@mcga.gov.uk
- 4.5.3 The Receiver of Wreck's contact details are as follows:
- The Receiver of Wreck, Maritime & Coastguard Agency, Spring Place, 105 Commercial Road, Southampton, SO15 1EG. Tel: 0203 817 2575. Email: row@mcga.gov.uk
- 4.5.4 Further details about how to manage discoveries of wreck material can be found in Section 11.6.

Ministry of Defence

- 4.5.5 Under the *Protection of Military Remains Act 1986*, any aircraft that crashed while in military service are automatically protected. Therefore, based on the precautionary principal, all finds, or sites of aircraft should be reported to the Joint Casualty and Compassionate Centre (JCCC) of the Ministry of Defence, unless it can be proven without a doubt that the aircraft material is non-military. In any case, all finds of aircraft material should also be reported to the Receiver of Wreck.
- 4.5.6 Further details about how to manage discoveries of aircraft material, including restrictions, licensing, and guidance can be found in Section 11.5.

4.6 Archaeological Contractor(s)

- 4.6.1 Archaeological Contractor(s) may be appointed to carry out specific packages of work, for example works beyond the in-house capabilities of the Retained Archaeologist, or additional works, as required. The Archaeological Contractor(s) may be appointed by the Client or their appointed representatives (the Client, the Retained Archaeologist or other contractors/sub-contractors). In these instances, the Archaeological Contractor will ensure that works

¹ <https://www.gov.uk/government/publications/report-a-wreck-or-salvage-form-msf-6200>

are specified, planned, undertaken and reported in accordance with this outline offshore archaeological WSI.

4.7 Client Contractors

4.7.1 The responsibility for implementing the outline offshore archaeological WSI rests with the Client and their appointed representatives (including their Contractors).

4.7.2 All relevant Contractors engaged in the construction of the project shall:

- familiarise themselves with the requirements of the outline offshore archaeological WSI and make them available to all of their staff working on the project (e.g. for Protocol briefings and archaeological input into method statements);
- communicate with the Retained Archaeologist in the planning stages of any further survey work, to ensure archaeological objectives are included, as appropriate;
- implement a Protocol for Archaeological Discoveries;
- obey legal obligations in respect of 'wreck' and 'treasure' under the *Merchant Shipping Act* 1995 and the *Treasure Act* 1996, respectively;
- obey legal obligations in respect of *Protection of Military Remains Act* 1986.
- respect constraint maps and AEZs;
- assist and afford access to archaeologists employed by the Client; and
- inform the Retained Archaeologist of any environmental constraint or matter relating to health, safety and welfare of which they are aware that is relevant to the archaeologists' activities.

4.8 Stakeholder Liaison

4.8.1 The onshore and offshore archaeological resource should be approached seamlessly, particularly in areas of overlap. Therefore, to cover such areas, there should be liaison with stakeholders, including communication between the onshore and offshore Retained Archaeologists, the onshore and offshore archaeological curators, academics, and other interested parties. This could be particularly important with regards to issues concerning the intertidal/ foreshore/ landfall area, to ensure a joined-up approach is consistently applied.

5 ARCHAEOLOGICAL BASELINE SUMMARY

5.1 Introduction

5.1.1 The results within this baseline are summarised from the ES (RWE forthcoming) and associated annexes: Awel y Môr Offshore Wind Farm: Volume 4, Annex 11.1: Marine Archaeological Technical Annex (Wessex Archaeology 2021a).

5.2 Previous archaeological work

5.2.1 Previous archaeological work has been undertaken in relation to GyM OWF including a walkover survey, and a detailed list of surveys and reports can be found in the ES (RWE 2022).

5.2.2 Following on from the work undertaken for GyM OWF, a Technical Report was produced for AyM. It was included as Volume 4 Annex 11.1 in the ES (RWE 2022), and it comprised:

- a Desk-Based Assessment (Wessex Archaeology 2021a) of available information, including data from the RCAHWM, the United Kingdom Hydrographic Office (UKHO) and local Historic Environment Records (HERs) including Gwynedd Archaeological Trust (GAT) and Clwyd-Powys Archaeological Trust (CPAT).
- a walk-over survey; and
- an archaeological assessment of marine geophysical survey data acquired in 2021. Datasets included sidescan sonar (SSS), magnetometer, sub-bottom profiler (SBP) and multibeam echosounder (MBES).

5.3 Summary of known and potential archaeological assets

Intertidal / terrestrial

5.3.1 The intertidal area to the MLWS is discussed in more detail in the Offshore Archaeological and Cultural Heritage technical report (Wessex Archaeology 2021a) while the remaining area of the intertidal zone and terrestrial sites are discussed in (Wessex Archaeology 2021b). There are no designated sites within the intertidal area. The onshore and intertidal elements of the scheme will be addressed in the outline onshore archaeological WSI (application ref: 8.14).

Palaeogeographic Assessment

5.3.2 There are no designated or known sites within the array and cable route. However, there is potential for archaeological material of a prehistoric date to exist within the study area. A detailed description of the geological and prehistoric baselines, and a detailed palaeogeographic assessment, are forthcoming in Volume 4, Annex 11.1: Marine Archaeological Technical Annex.

Palaeogeographic potential

5.3.3 During assessment of the sub-bottom profiler data, a number of palaeogeographic features of archaeological potential were identified within the Array area and Infrastructure zone. The distribution of these features is illustrated in Figure 4.

5.3.4 An extensive area of interpreted Channel Complex Deposits was identified in the north and north-west of the Array area and Infrastructure zone (Figure 5), suggesting the study area was located within a terrestrial environment between the Last Glacial Maximum (LGM) and the Holocene marine transgression.

5.3.5 These features correlate with a potential palaeo-coastline and associated deltaic features identified during the West Coast Palaeolandscape Survey (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.

5.3.6 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.

- 5.3.7 A number of sporadically distributed features with no clear association or alignments have also been identified within the Array area and Infrastructure zone. These features are all interpreted as cut and fills, potentially representing 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.
- 5.3.8 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 older geologically units. As such, they are classified as of possible archaeological potential.
- 5.3.9 A deposit of overlying seabed sediment is present throughout the Array area and Infrastructure zone, ranging from a thin veneer to a relatively thick area of mega-ripples and sand waves. As a post-transgression (modern) sedimentary deposit, the seabed sand is not considered of archaeological potential in itself; however, it has the potential to bury archaeological sites (e.g. shipwrecks) in areas where the sediment is sufficiently thick and mobile and contain reworked material from older underlying geological units.

Known maritime

- 5.3.10 None of the sites in the array study and cable route area have been designated.
- 5.3.11 *SS Albanian* (70326) Figure 10, Figure 6 and Figure 9 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 of the pipework in 1993 by the Petrel. 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 and was identified within the geophysical data at the charted position. Dimensions from the geophysical data were 88.7 x 27.4 x 3.8 m with an associated magnetic anomaly of 4727 nT, and the wreck was seen to be orientated approximately north-south. The wreck appears to be in at least two pieces with a collapsed central section, which correlates with the known condition of the wreck. Nine associated potential debris fields and individual pieces of debris (70327, 70328, 70329, 70330, 70331, 70332, 70333, 70334, and 70336) have been identified close to the wreck, all of which have been assigned an A1 archaeological potential rating.
- 5.3.12 *Dublin* (70019) Figure 11, Figure 7 and Figure 9 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 out with the array, in the array area buffer and was identified within the geophysical data at the charted position. Dimensions from the geophysical data were 58.3 x 13.2 x 5.5 m with an associated magnetic anomaly of 2015 nT, and the wreck was seen to be orientated approximately NNW-SSE. The wreck appears upright and fairly intact, which correlates with the known condition of the wreck. Two distinct debris fields (70018 and 70021) have been identified immediately adjacent to the wreck, and two possibly associated pieces of debris (70016 and 70023) have been identified approximately 41 m east and 47 m west respectively. These have all also been assigned an A1 archaeological potential rating.

- 5.3.13 *Chacabuco* (Possibly) (70293) Figure 12, Figure 9 and Figure 6 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 one bulkhead and two 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 and was identified within the geophysical data at the charted position. Dimensions from the geophysical data were 70.3 x 37.1 x 2.2 m with an associated magnetic anomaly of 1616 nT, and the wreck was seen to be orientated approximately northwest-southeast. The wreck appears highly degraded and partially buried within the seabed sediment, which correlates with the known condition of the wreck. Due to its position within an area of mobile seabed sediment, it is possible that the wreck is periodically completely buried.
- 5.3.14 An unknown wreck (70042) Figure 13, Figure 9 and Figure 7 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 and was identified within the geophysical data at the charted position. Dimensions from the geophysical data were 29.0 x 8.6 x 3.7 m, and the wreck was seen to be orientated approximately east-west. The wreck is located within an area of mobile seabed sediment, and so is potentially buried periodically.
- 5.3.15 An unknown wreck (70180) Figure 14, Figure 9 and Figure 7 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 and was identified within the geophysical data at the charted position. Dimensions from the geophysical data were 21.8 x 10.4 x 3.2 m, and the wreck was seen to be orientated approximately northeast-southwest. The wreck is currently charted as an obstruction based on Civil Hydrography Programme bathymetric data acquired in 2020, which shows an isolated mound. The current geophysical data show an elongate area of debris extending northeast of this mound, which is tentatively interpreted as a possible boiler, and the site has been reinterpreted as a wreck.
- 5.3.16 An unknown wreck (70252) Figure 9 and Figure 6 recorded in 1939 as being 8.5 miles off Great Ormes Head and recorded in a general depth of 15 m. The date and circumstance of

loss is unknown. The recorded location of this wreck is within the array area, but it was not identified within any of the geophysical data sets. As such, this has been assigned an A3 archaeological potential rating.

Known aviation

- 5.3.17 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.

Maritime and aviation archaeological potential

Geophysical anomalies

- 5.3.18 A total of 626 features have been identified as being of possible archaeological potential across all four study areas and are discriminated as described in the Offshore Archaeological and Cultural Heritage technical report (Wessex Archaeology 2021a). 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.

Maritime potential

- 5.3.19 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.
- 5.3.20 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).
- 5.3.21 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.
- 5.3.22 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.
- 5.3.23 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 (Natural Resources Wales 2015b).

- 5.3.24 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 Llwydfaen 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).
- 5.3.25 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.
- 5.3.26 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).
- 5.3.27 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.

- 5.3.28 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.
- 5.3.29 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.
- 5.3.30 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.
- 5.3.31 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.

Aviation potential

- 5.3.32 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).

6 POTENTIAL IMPACTS

- 6.1.1 The ES (RWE 2022) has identified the potential effects on offshore archaeology, which might occur from the construction, operation, and decommissioning of AyM OWF.
- 6.1.2 Mitigation measures have been put in place within the project design to reduce effects on known offshore archaeology. These include:
- the development of this outline offshore archaeological WSI to detail mitigation measures; and
 - the avoidance of AEZs.

6.2 Construction

Direct Impacts

- 6.2.1 The direct impacts resulting in potential adverse effects upon archaeological receptors as part of construction works are those involving contact with the seabed or the removal of seabed sediments. Offshore archaeological receptors with height, such as shipwrecks, may also be impacted by activities that occur within the water column. Impacts may include: seabed preparation, installation of turbine foundations, placement of scour protection, installation of the offshore substation, ancillary installations, cable laying, cable protection, vessel moorings, jack-up barges and anchoring.
- 6.2.2 There could be permanent physical loss or disturbance of potential seabed receptors in shallow sediments from seabed preparation and construction activities. These receptors could include shallowly buried shipwrecks or aircraft crash sites.
- 6.2.3 There could also be permanent physical loss or disturbance of known and potential palaeogeographic features from construction activities where activities penetrate the surface.

Indirect Impacts

- 6.2.4 Indirect impacts occur as a result of changes to sedimentation and erosion patterns during construction. The Marine Geology, Oceanography and Physical Processes assessment undertaken for the ES (RWE forthcoming) indicates that the magnitude of impact is expected to be negligible.
- 6.2.5 Any discoveries that are potentially sensitive should be kept confidential between the Client, their subcontractors and the RA, and the curators as they may be a target for illegal salvage activities if knowledge of such discoveries becomes widespread.

6.3 Operation and Maintenance (O&M)

Direct Impacts

- 6.3.1 Activities undertaken as part of O&M works have the potential to directly impact marine archaeological receptors on or under the seabed. Direct impacts could include anchors of vessels deployed during periodic overhauls and scheduled or unscheduled O&M, and seabed contact by the legs of jack-up vessels.

Indirect Impacts

- 6.3.2 Indirect impacts could include changes to hydrodynamic and sedimentary regimes from the presence of foundation structures. However, based on the Marine Geology, Oceanography and Physical Processes assessment undertaken for the ES (RWE forthcoming) these are expected to be negligible.

6.4 Decommissioning Phase

Direct Impacts

- 6.4.1 Activities undertaken as part of decommissioning works could have direct impacts, including where required, the removal of turbine and offshore substation foundations, scour protection, cable protection and cables; anchors of vessels employed for decommissioning; and seabed contact by the legs of jack-up vessels.

Indirect Impacts

- 6.4.2 There could be indirect impacts due to changes in hydrodynamic and sedimentary regimes, caused by the removal of foundation structures.

7 MITIGATION

7.1 Introduction

- 7.1.1 Mitigation measures for AyM have been set out in the ES (RWE forthcoming). This section provides a brief overview for each of the receptor types. More detailed information about the types of mitigation and the way that they will be implemented can be found in the Scheme of Investigations.

7.2 A1s

- 7.2.1 Best practice favours the preservation in situ of archaeological remains as the first option, and therefore the ideal mitigation is avoidance (TCE and Wessex Archaeology 2021). For AyM, impact to A1 geophysical anomalies will be avoided through the implementation of AEZs. All development and related activities that could impact the seabed are prohibited within the boundaries of an AEZ, therefore AEZs do not restrict remote survey work (eg vessels entering the zone to acquire geophysical datasets).
- 7.2.2 The final development layout will take into account the locations of all AEZs. All AEZs will be marked on the scheme masterplans. Although AEZs are fixed, provision should be made for them to be refined or removed (with agreement of the Archaeological Curator(s)), if required, subject to additional archaeological assessment of subsequent surveys that may be required. Surveys could include further geophysical, ROV, or diver surveys. In addition, in order to maximise the archaeological benefits of the surveys, and surveys covering AEZs should include archaeological advice in the planning stages.
- 7.2.3 If impacts to sites of archaeological importance within an AEZ cannot be avoided, measures to reduce, remedy or offset disturbance will be agreed with the Archaeological Curator(s) but could include further survey through to complete excavation.

7.3 A2 geophysical anomalies

- 7.3.1 AEZs have not been recommended at this time for features assigned A2 archaeological potential ratings, and in order to facilitate the design of the development scheme, buffers are not currently proposed for any of these anomalies. However, avoidance of these features by micro-siting is recommended. If there is potential for them to be impacted by the development, they will need to be assessed on a case-by-case basis, in order to accurately position the site and effectively confirm its character, in agreement with the Archaeological Curator(s). This will allow an assessment of the anomaly's relative value. The methodologies for assessing the features could include further geophysical survey, ROV survey, for example in combination with a UXO survey, or diver survey, and these are discussed in more detail in the Scheme of Investigations. Should any further surveys be planned, archaeological advice should be included at the planning stage, to maximise results for archaeological assessment.
- 7.3.2 It is possible that these anomalies could represent material from wreck sites of considerable age and be of higher archaeological value and importance than those already suggested for AEZs, and therefore further AEZs could be instituted if required. However, it is also possible that these anomalies could comprise modern debris of no archaeological significance.

7.3.3 If it is not possible to preserve *in situ* A2 geophysical anomalies or findspots, disturbance will be offset by appropriate and satisfactory measures, also known as 'preservation by record'. In these circumstances, the extent of the further survey required will be determined based on the assessed value or importance of the feature, and through discussions with the Archaeological Curator(s). Further works could include survey, recording and/ or excavation, to any depth likely to be impacted, prior to the impact occurring and will be detailed in a specific method statement. The impact of the development, if and where appropriate, may also be remedied by restabilising sites that have already been destabilised but not destroyed, or by offsetting damage to a site by detailed analysis and safeguarding of otherwise comparable sites elsewhere.

7.3.4 Information gathered through further survey or other archaeological works must be disseminated, for example through reporting.

7.4 Unexpected discoveries

7.4.1 Should any previously unknown sites or material be encountered during development works, measures will be taken to reduce the level of impact. In order to provide for these unexpected discoveries, a Protocol for Archaeological Discoveries (TCE and Wessex Archaeology 2021) will be adopted.

7.4.2 The Protocol for Archaeological Discoveries is a system for reporting and investigating unexpected archaeological discoveries encountered during pre-construction, construction and post-construction activities, with the Retained Archaeologist providing guidance and advising the Client and any Contractors on the implementation of the Protocol. The Protocol makes provision for the implementation of temporary exclusion zones around areas of possible archaeological interest, for prompt advice, and, if necessary for archaeological inspection of important features prior to further construction in the vicinity.

7.4.3 The Protocol provides a mechanism to comply with the *Merchant Shipping Act* 1995, including compiling reports of wreck and salvage to be submitted by the Client to the Receiver of Wreck. The process for reporting to the Receiver of Wreck is currently being updated with an online digital version and the Protocol will adapt as necessary. The Protocol also compiles reports of relevant finds such as aircraft related material to the Ministry of Defence and will liaise with both the Ministry of Defence and Receiver of Wreck bodies throughout until droits are closed and a decision has been made on the outcome for the finds, even if it is discarded.

7.4.4 Any discoveries that are potentially sensitive should be kept confidential between the Client, their subcontractors and the RA, and the curators as they may be a target for illegal salvage activities if knowledge of such discoveries becomes widespread.

7.4.5 More details about the implementation of The Protocol can be found in the Scheme of Investigations Section 9.10.

7.5 Palaeogeographic assessment

7.5.1 Within the development area (array area, infrastructure zone, and offshore ECC) a number of palaeogeographic features of archaeological potential have been identified. Of particular interest from an archaeological perspective are the channel complex deposits and possible pre-transgression terrestrial deposits identified during the Desk-based Assessment and related ES (Unit 4 and Unit 5, Wessex Archaeology 2022, RWE forthcoming). These are potentially deposits formed during a time when the region was exposed as a terrestrial

environment, and some may relate to a palaeo-shoreline of Mesolithic date; as such, they are possibly of high archaeological potential.

- 7.5.2 No geotechnical sampling has been undertaken within the study area to date, although it is expected sampling will be undertaken in the future. Should any such sampling (e.g. by vibrocore, borehole, etc.) be planned, the Retained Archaeologist should be consulted during the sample site selection process to identify any sample locations of particularly high archaeological potential. Any resulting core logs from geotechnical sampling should be made available for geoarchaeological assessment by the Retained Archaeologist.

8 METHOD STATEMENTS

- 8.1.1 This outline offshore archaeological WSI provides a framework for further archaeological investigations for AyM OWF. All works will be undertaken in accordance with the methodology set out within this outline offshore archaeological WSI and in compliance with the standards outlined by the ClfA (ClfA 2014a-g), excepting where they are superseded by statements made below.
- 8.1.2 Detailed method statements will be produced, as required, for further archaeological works, such as those identified in the 'Scheme of Investigations' section, below.
- 8.1.3 Each archaeological method statement will correspond to a package of works, for example, archaeological assessment of marine geophysical data, archaeological assessment of ROV data from the UXO survey, and archaeological investigation using divers and/or ROVs.
- 8.1.4 Method statements will provide details about:
- form of commission and contractual relationship with the Client;
 - relation between the method statement, the outline offshore archaeological WSI and the license condition(s);
 - context in terms of relevant construction works;
 - specific objectives of archaeological works;
 - extent of investigation;
 - investigation methodology
 - anticipated post-investigation actions, including processing, assessment and analysis of finds and samples;
 - reporting;
 - timetable;
 - monitoring arrangements; and
 - health, safety and welfare.
- 8.1.5 Method statements will be provided to the Client for comment. On receipt of comments from the Client, the Retained Archaeologist will produce a final method statement addressing these comments.
- 8.1.6 Method statements will be submitted to the Archaeological Curator(s) for approval and will include provision for the relevant Archaeological Curator(s) to monitor the progress of the archaeological works, as appropriate, be that through site visits or meetings with the Client, the Contractor(s), and the Retained Archaeologist.

9 SCHEME OF INVESTIGATIONS

9.1 Introduction

- 9.1.1 The Mitigation section (Section 7) above provided a brief overview of the type of further archaeological investigations recommended for archaeological receptors, as set out in the ES (RWE forthcoming). This Scheme of Investigations section sets out how these investigations will be undertaken. It has been informed by the Historic Environment Guidance for the Offshore Renewable Energy Sector (Wessex Archaeology 2007) and Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects (TCE and Wessex Archaeology 2021), as well as the standards and guidance listed below, as applicable.
- 9.1.2 The Retained Archaeologist will provide input on Contractors' proposed survey method statements to ensure data collection is optimised so that it can be used to identify and characterise features of archaeological importance that could be impacted by development works and inform mitigation proposals such as avoidance of wrecks and debris.

9.2 Standards and guidance

- 9.2.1 The method statements and specifications in this document are based on archaeological best practice and guidance for offshore development. The principal sources are:
- *Code for Practice for Seabed Development* (Joint Nautical Archaeology Policy Committee (JNAPC) 2006);
 - *Historical Environment Guidance for the Offshore. Renewable Energy Sector* (COWRIE 2007).
 - *Standard and guidance for archaeological field evaluation* (ClfA 2014a);
 - *Standard and guidance for nautical archaeological recording and reconstruction* (ClfAe 2014g)
 - *Standard and guidance for historic environment desk-based assessment* (ClfA 2020)
 - *Caring for Coastal Heritage* (Cadw 1999);
 - *Caring for Military Sites of the Twentieth Century* (Cadw 2009);
 - *Managing the Marine Historic Environment of Wales* (Cadw 2019);
 - *Conservation Principles for the Sustainable Management of the Historic Environment in Wales* (Cadw 2011);
 - *Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects* (TCE and Wessex Archaeology 2021);
 - *Planning Policy Wales Edition 11* (2021);
 - *JNAPC Code of Practice for Seabed Development* (Joint Nautical Archaeology Policy Committee and The Crown Estate 2006);
 - *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);
- *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* (Natural Resources Wales 2015)

9.3 Archaeological exclusion zones

- 9.3.1 *In situ* preservation is favoured by government policy (Planning Policy Wales Edition 11 2021) and international best practice as the first option (The Crown Estate and Wessex Archaeology 2021), and the principle means used to preserve in situ any features or deposits of potential or known archaeological interest are AEZs. AEZs are placed around discrete sites, or more extensive areas identified by the impact assessment, and prohibit development related activities within their extents, however they do not restrict remote survey work or other activities that do not impact the seabed. The Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects (TCE and Wessex Archaeology 2021) states that AEZs are formed by establishing a buffer around the known extents of sites for which the available evidence suggests that there could be archaeological material present on the seabed.
- 9.3.2 The final development layout will take into account the locations of all AEZs. All AEZs will be marked on the scheme masterplans. The Client will require its Contractor(s) to conduct all construction activity in such a way as to prevent any impacts by construction or related works within any AEZs, and keep records that this can be evidenced, if required.
- 9.3.3 Once established, AEZs may be altered (enlarged, reduced, moved or removed) as a result of further archaeological assessment of data or field evaluation, however, the alteration of AEZs will only be undertaken with the agreement of the relevant stakeholders and the Archaeological Curator(s). Following alteration, a new plan giving details of the current AEZs will be drawn up and issued to each relevant party.
- 9.3.4 If it becomes apparent that activities have taken place within any AEZ without prior consent, the party responsible will obtain advice from the Retained Archaeologist in accordance with their obligations with respect to the outline offshore archaeological WSI, and the AEZ may require monitoring to determine the level and extent of impact.

9.4 Micrositing

- 9.4.1 Where possible, the turbines, associated infrastructure, cables, legs of jack-up crane vessels and/ or anchors of other vessels will be micrositied to avoid the AEZs and A2 geophysical anomalies of archaeological potential.

9.5 Marine geophysical investigations

- 9.5.1 It is expected that further geophysical surveys will be undertaken during the development design process, potentially including pre-construction clearance/unexploded ordnance (UXO) surveys. The Client will allow for archaeological involvement in the planning and

review of further geophysical survey surveys related to UXO and/or any further geophysical investigations.

9.5.2 For all aspects of marine geophysical investigations, the Client will adhere to applicable standards and guidance. For example, geophysical surveys will be undertaken in line with *Marine Geophysics Data Acquisition, Processing and Interpretation* (Plets *et al.* 2013) and *Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects* (TCE 2021).

9.5.3 The specifications of any proposed marine geophysical survey whose primary aim is non-archaeological (i.e. UXO, engineering or environmental) will be subject to advice from the Retained Archaeologist to ensure that archaeological input is provided at the planning stage and to enable archaeological considerations to be taken into account without compromising the primary objective of the survey. The additional archaeological input will comprise advice from an appropriately qualified marine archaeologist on the following points:

- available details of sites and/or anomalies identified in the desk-based technical report and archaeological assessment of geophysical survey data (Wessex Archaeology 2021);
- archaeological potential of areas where no existing sites and/or anomalies are yet known;
- methodologies, including geophysical survey equipment specifications and proposed acquisition settings, survey line spacing, and orientation of lines and cross lines;
- proposed geophysical data deliverable types and file formats;
- requirements for post-processing, interpreting, and archiving resulting data.

9.5.4 Should any surveys be carried out primarily for archaeological purposes, the specification should be prepared by a suitably qualified archaeologist or marine geophysicist. In addition, the survey should be carried out by a survey company with appropriate archaeological expertise and include geophysicists with appropriate expertise.

9.5.5 For bathymetry data gathered and assessed for non-archaeological purposes (for example as part of a UXO survey or boulder/obstruction clearance), the raw bathymetry data must be retained and made accessible to the Retained Archaeologist, should anomalies subsequently be determined to be of archaeological interest.

9.5.6 The results of further geophysical interpretation will be compiled as an Archaeological Report by the Retained Archaeologist or Archaeological Consultant with suitable geophysical experience and expertise, consistent with the provisions on reporting within this outline offshore archaeological WSI (Section 12.2).

9.6 Marine geoarchaeological investigations

9.6.1 No geotechnical sampling has been undertaken within the study area to date, however geotechnical surveys are planned for Q2 of 2022. Borehole locations were selected with reference to the geophysical survey and will not impact AEZs. RCAHWW were consulted with the borehole locations and had no objections.

- 9.6.2 Should any such sampling (e.g. by vibrocore, borehole, etc.) be planned, the Retained Archaeologist should be consulted during the sample site selection process to identify any sample locations of particularly high archaeological potential. There should be an appropriate level of liaison at the planning stage to review the potential for data to be gathered in a manner that is beneficial to both the initial intent and archaeological investigations, without compromising the original intention of the survey.
- 9.6.3 Any resulting core logs from geotechnical sampling should be made available for geoarchaeological assessment by the Retained Archaeologist.
- 9.6.4 To help frame marine geoarchaeological investigations, Wessex Archaeology has developed a five-stage approach, encompassing different levels of investigation appropriate to the results obtained at each stage, accompanied by formal reporting of the results obtained at the level achieved (Table 1).

Table 1 Geoarchaeological programme of analysis

Stage	Method	Description
1	Assessment	A desk-based archaeological assessment of the borehole and CPT logs generated by geotechnical contractors aims to establish the likely presence of horizons of archaeological interest and broadly characterise them, as a basis for deciding whether and what Stage 2 archaeological recording is required. The Stage 1 report will state the scale of Stage 2 work proposed.
2	Geoarchaeological Recording	Archaeological recording of selected retained or new core samples should be undertaken. This will entail the splitting of the cores, with half of each core being cleaned and recorded. The Stage 2 report will state the results of the archaeological recording and will indicate whether any Stage 3 work is warranted.
3	Sampling and Assessment	Dependent upon the results of Stage 2, sub-sampling and palaeoenvironmental assessment (pollen, diatoms and foraminifera) may be required. Subsamples will be taken from one core-half, with the other core-half retained intact for further sub-sampling, should it be required. Assessment will comprise laboratory analysis of the samples to a level sufficient to enable the value of the palaeoenvironmental material surviving within the cores to be identified. Subsamples will also be taken and retained at this stage in case radiocarbon dating is required during Stage 4. The Stage 3 report will set out the results of each laboratory assessment together with an outline of the archaeological implications of the combined results and will indicate whether any Stage 4 work is warranted.
4	Analysis and Dating	Full analysis of pollen, diatoms and/or foraminifera assessed during Stage 3 will be undertaken. Typically, Stage 4 will be supported by radiocarbon dating of suitable subsamples. Stage 4 will result in an account of the successive environments within the coring area, a model of environmental change over time, and an outline of the archaeological implications of the analysis.
5	Final Report	If required Stage 5 will comprise the production of a final report of the results of the previous phases of work for publication in an appropriate journal. This report will be compiled after the final phase of archaeological work, whichever phase that is.

- 9.6.5 Cores that have the potential for archaeological assessment and/or been selected for archaeological assessment should be split in half prior to any further sampling to enable further analysis if required and where it doesn't compromise the original intention of the survey. More detail about geoarchaeological assessment can be found in *Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects* (TCE and Wessex Archaeology 2021).

9.7 Archaeological assessment of UXO ROV survey data gathered for non-archaeological purposes

- 9.7.1 The *Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects* (The Crown Estate and Wessex Archaeology 2021) states that the Client should seek archaeological input at the planning stages of any proposed diver/ ROV surveys undertaken primarily for engineering, ecological, or other purposes, in order to maximise the potential benefits. Archaeological input could include advice from the Retained Archaeologist on whether the surveys are likely to cover any areas of archaeological interest, such as AEZs, A2s, areas where unexpected discoveries have been made, and areas of archaeological potential, or whether the surveys are not likely to be of archaeological interest.
- 9.7.2 Therefore, archaeological advice should be sought at the planning stages for any ROV and/or diver surveys, for example undertaken as part of route clearance or other activities, and, if appropriate, a separate method statement could be produced, in order to maximise the survey results for archaeological assessment.
- 9.7.3 These surveys could be used to validate, alter or remove existing AEZs, in conjunction with discussions with the Archaeological Curator(s), or to identify and characterise material on the seabed, for example A2 geophysical anomalies or unexpected discoveries. Should any wreck or aircraft material be discovered, the RoW and MoD will be contacted respectively.
- 9.7.4 Data collected should be reviewed by an appropriately qualified and experienced archaeologist. The assessment will include any investigation reports, video stills, video data, blue view sonar or other geophysical data, and the location and nature of any obstructions encountered.
- 9.7.5 The results of the archaeological assessment need to be disseminated as per "Reporting" (Section 12.3). The reporting will include the investigative and visual outcomes, which can provide insightful and significant information. Prior to the surveys being undertaken, the Receiver of Wreck should be contacted to discuss the potential for the discovery of unrecovered material on the seabed during the survey and how they want information of such discoveries disseminated to them. The final gazetteer, which presents the results of the archaeological assessment in a tabulated format including as-found and as-left locations, will be disseminated to the Receiver of Wreck for inclusion in their archive, however, the archaeological material will not receive official droit numbers, although this should be confirmed with the Receiver of Wreck early in the process and prior to the outline offshore archaeological WSI being finalised. If aircraft material is encountered during the survey, a copy of the gazetteer should also be disseminated to the Ministry of Defence.
- 9.7.6 Should any sensitive sites come to light, management plans will be put in place, through consultation with the Archaeological Curator, as additional information is gathered as required.

9.8 Archaeological investigations using divers and/or ROVs

- 9.8.1 The *Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects* (TCE and Wessex Archaeology 2021) states that the Client should seek archaeological input at the planning stages of any proposed diver/ ROV surveys undertaken primarily for engineering, ecological, or other purposes, in order to maximise the potential benefits. Archaeological input could include advice from the Retained Archaeologist on whether the surveys are likely to cover any areas of archaeological interest, such as AEZs, A2s, areas where unexpected discoveries have been made, and areas of archaeological potential, or whether the surveys are not likely to be of archaeological interest.
- 9.8.2 Therefore, archaeological advice should be sought at the planning stages for any ROV and/or diver surveys, for example undertaken as part of route clearance or other activities, and, if appropriate, a separate method statement could be produced, in order to maximise the survey results for archaeological assessment.
- 9.8.3 These surveys could be used to validate, alter or remove existing AEZs, in conjunction with discussions with the Archaeological Curator(s), or to identify and characterise material on the seabed, for example A2 geophysical anomalies or unexpected discoveries.

9.9 Archaeological watching briefs

- 9.9.1 For the proposed offshore works, due to their nature, a bespoke Protocol for Archaeological Discoveries will be used to deal with any finds of unexpected archaeological material that come to light during construction. Should archaeological material of high archaeological importance be reported through a bespoke Protocol for Archaeological Discoveries, an archaeological watching brief could be instituted, following discussions with the Archaeological Curator(s). The archaeological watching brief would require a works specific method statement, which would be based on the specifics in this outline offshore archaeological WSI and would be undertaken in line with the *Standard and Guidance for an archaeological watching brief* (ClfA 2014c) and should be approved by the Archaeological Curator(s) prior to works being undertaken.
- 9.9.2 Watching briefs could be used for activities such as obstruction clearance.
- 9.9.3 A watching brief may be required for intertidal works, and this will be covered in the Onshore Written Scheme of Investigation.

9.10 Protocol for Archaeological Discoveries

- 9.10.1 A protocol does not replace the process of archaeological assessment and evaluation, but rather acts as a safety net in the event of unexpected discoveries during the course of development works (The Crown Estate and Wessex Archaeology 2021).
- 9.10.2 The protocol can be implemented in conjunction with many types of proposed works and is designed to operate when it is not practical or safe for an archaeologist to be present. Works that may require an archaeological protocol include geotechnical surveys, UXO surveys, pre-lay grapnel runs, clearance works, construction, O&M, decommissioning, or any other works with the potential for the discovery of material on the seabed and/or recovery of material to the surface. Method Statements relating to these activities should include provision for reporting discoveries through a protocol.
- 9.10.3 The aim of a Protocol for Archaeological Discoveries is to reduce any adverse effects of the development on the historic environment by enabling people working on the development



to report archaeological discoveries in a manner that is both convenient to their everyday work and effective with regard to the requirements of the Archaeological Curator(s).

- 9.10.4 Any discoveries by Project Staff are reported to a Site Champion on their vessel or site (usually the senior person on-board or on site). The Site Champion could be a UXO specialist, Vessel Master, a Construction Foreman, or any other person in a position to control the immediate works. The Site Champion then reports to the Nominated Contact, who has been formally identified by the Client and/ or their representative to co-ordinate the implementation of the Protocol. The Nominated Contact will in turn inform the Retained Archaeologist and the Client 's Project Manager(s).
- 9.10.5 The Retained Archaeologist will in turn liaise with the Nominated Contact, the Client and/ or their representative, the Archaeological Curator(s) and others, as necessary. Provision will be made by the Client and/ or their representative, in accordance with the Protocol, for the prompt reporting/ recording to the Archaeological Curator(s) of archaeological remains encountered or suspected during the works. If the find is recovered and constitutes 'wreck' within the terms of the *Merchant Shipping Act* 1995, then the Retained Archaeologist will compile a Report of Wreck and Salvage to be signed by the Client and sent to the Receiver of Wreck within 28 days of recovery. Should a find comprise material suspected to be from an aircraft lost while in military service, both the Receiver of Wreck and the Ministry of Defence will be notified by the Client as advised by the Retained Archaeologist, as the material will still be considered 'wreck' under the *Merchant Shipping Act* 1995 but could also be protected under the *Protection of Military Remains Act* 1986. With regards recovery of 'wreck', the Client and/ or their representative will be responsible for the legal obligations under the *Merchant Shipping Act* 1995 and all correspondence with the Receiver of Wreck. If recovered material is held by the Retained Archaeologist, it is essential they are included in all correspondence with the Receiver of Wreck and are aware of any updates or changes to the reports (commonly known as droits) associated with the material.
- 9.10.6 For discoveries of high archaeological importance, call-out investigations could be instituted, following discussions with the Archaeological Curator(s).
- 9.10.7 As the Protocol is designed to operate when an archaeologist is not present, it is recognised that for the Protocol to be effective, participants (such as the Nominated Contact, Site Champions and Project Staff) should receive Protocol Awareness training from the Retained Archaeologist or appropriate alternative. Project Staff involved with the following works in particular should undergo training: UXO survey(s), pre-lay grapnel runs, clearance works, and any other works with potential for the discovery of material on the seabed and/ or recovery of material to the surface. This will ensure that staff are familiar with the Protocol for Archaeological Discoveries, are able to recognise finds of archaeological potential, understand how to record them, and are aware of the reporting process.
- 9.10.8 Protocol Awareness talks can be undertaken by the Retained Archaeologist for all relevant staff, through short 'Toolbox Talks', and hard copies of the Protocol can be made available for use on board vessels. The relevant staff on applicable pre-construction, construction, O&M and decommissioning vessels will be informed of the Protocol, details of the find types that may be of archaeological interest, and the potential importance of any archaeological material encountered. The Client and/ or their representative should ensure that all staff are aware of any areas to be considered to be of archaeological sensitivity and should be informed to exercise due vigilance during any works in these areas.
- 9.10.9 Full contact details for all relevant parties will be held by the Retained Archaeologist.



- 9.10.10 Should any sensitive sites come to light, management plans will be put in place, through consultation with the Archaeological Curator, as additional information is gathered as required.

10 POST CONSTRUCTION MITIGATION

10.1 Post-Construction Monitoring

- 10.1.1 Archaeological Method Statement(s) will be developed for post-construction monitoring by the Retained Archaeologist and agreed through discussions with the Archaeological Curator(s) and the Regulator. They will include provision for the archaeological assessment of post-construction monitoring survey data, particularly in relation to AEZs and A2 geophysical anomalies in areas of potential impact from the development (either through direct or indirect impact), as well as areas where unexpected discoveries of archaeological interest were made during development works. The work will also likely include areas of high archaeological potential, areas of scour, or other areas of interest as set out in the outline offshore archaeological WSI.
- 10.1.2 With the implementation of the recommended mitigation, AEZs and A2 geophysical anomalies will be avoided, and therefore no impact from the construction works will have occurred. However, post-construction monitoring is recommended to confirm and demonstrate that impacts have been as negligible as anticipated.
- 10.1.3 Post-construction monitoring of AEZs should be carried out in accordance with the methods and agreed timescales.

10.2 Mitigation for Operations & Maintenance

- 10.2.1 The mitigation outlined in this outline offshore archaeological WSI will continue to be implemented through the O&M phase. In particular:
- AEZs will be retained, and no works that impact the seabed will be undertaken within them (Section 9.3);
 - A2s where possible will be microsited around/avoided subject to additional investigation and appropriate mitigation where avoidance is not possible, including by jack-up legs, anchors, and any O&M works on the seabed (Section 9.4);
 - should geophysical and/or geotechnical surveys be planned, the Retained Archaeologist should be consulted to determine if archaeological objectives can be met (Sections 9.5 and 9.6); and
 - a Protocol will be implemented for any unexpected discoveries (Section 9.10).
- 10.2.2 A method statement(s) will be produced for relevant O&M activities (such as cable replacement or other activities) that may impact the seabed and will be reviewed and approved by the Archaeological Curator(s) before those works commence. The method statement will include details about all AEZs (including any implemented or amended during the pre-construction or construction phases), A2 anomalies, and the Protocol.
- ### **10.3 Mitigation for decommissioning**
- 10.3.1 As decommissioning works will be planned in the distant future, and may come under a new EIA process, it is not possible to provide specific mitigation details at this time. However, mitigation will likely comprise a continuation of that outlined for O&M activities, ie: retaining AEZs; avoiding A2 anomalies; and a Protocol for unexpected discoveries.



11 FINDS AND ENVIRONMENTAL

11.1 Finds

General

- 11.1.1 A separate outline onshore archaeological WSI (application ref: 8.14) has been written for onshore and intertidal sites (Wessex Archaeology forthcoming). This section considers finds from below Mean Low Water.
- 11.1.2 All archaeological finds from marine contexts will be retained, although those from features of modern date (19th century or later) may be recorded on site and not retained, depending on the research objectives of the project. Where appropriate, soil samples may be taken and sieved to aid in finds recovery.
- 11.1.3 Any finds from marine contexts that require conservation or specific storage conditions will be dealt with immediately in line with *First Aid for Finds* (Watkinson and Neal 1998) and *First Aid for Underwater Finds* (Robinson 1998). A full record will be made of any treatment given.
- 11.1.4 Finds and other items of archaeological interest recovered offshore in the course of investigation are the property of The Crown Estate as the landowner, with the exception of any human remains, and 'wreck' covered by the obligations of the *Merchant Shipping Act 1995*, or material covered by the *Protection of Military Remains Act 1986*.
- 11.1.5 See sections 11.3 to 11.6 below for further information.

11.2 Ordnance

- 11.2.1 The development will have a programme of UXO clearance incorporated into its construction plan to be conducted by suitably qualified EOD company.
- 11.2.2 If items of unexpected ordnance are discovered, they will be treated with extreme care. Company Health & Safety policies and established operational procedures should always take priority over archaeological reporting of munitions and ordnance.

11.3 Human remains

- 11.3.1 In the event of discovery of any human remains (articulated or disarticulated, cremated or unburnt), all excavation of the deposit(s) will cease pending the Retained Archaeologist obtaining a Ministry of Justice Licence where required, or following the process set out in the Development Consent Order (this includes cases where remains are to be left *in situ*).
- 11.3.2 Should human remains require removal, all excavation and post-excavation will be in accordance with the Retained Archaeologist's protocols with any directions which may be given by the Secretary of State, and current guidance documents (e.g. McKinley 2013) and the standards set out in ClfA Technical Paper 13 *Excavation and post-excavation treatment of cremated and inhumed remains*. Appropriate specialist guidance/site visits will be undertaken if required.
- 11.3.3 The final deposition of human remains subsequent to the appropriate level of osteological analysis and other specialist sampling/examinations will follow the requirements set out in the DCO or Ministry of Justice licence as applicable.



11.4 Treasure

- 11.4.1 The Retained Archaeologist will immediately notify the Client and the Curator(s) on discovery of any material covered, or potentially covered, by the *Treasure Act* 1996 (as amended by *The Coroners and Justice Act* 2009). All information required by the *Treasure Act* (i.e., finder, location, material, date, associated items etc.) will be reported to the Coroner within 14 days. Items falling under the *Treasure Act* will be removed from the site by the Retained Archaeologist and stored in a secure location, pending a decision by the Coroner.
- 11.4.2 Material recovered below Mean High Water Springs (MHWS) to 12 nm may be regarded as Wreck under the *Merchant Shipping Act* 1995.

11.5 Aircraft

- 11.5.1 Under the *Protection of Military Remains Act* 1986, it is an offence to tamper with, damage, move or unearth any items related to a military aircraft crash site, unless the Ministry of Defence has issued a licence authorising such an activity. A licence is required irrespective of whether the aircraft was in the service of another nation's armed forces.
- 11.5.2 Application for a licence, and any subsequent work, should be undertaken in line with the Ministry of Defence's *Military Aircraft of Historical Interest: Licensing of Excavations in the UK: Notes for Guidance of Recovery Groups* (Revised 2018). Should human remains be discovered, they should not be touched, but must be reported immediately to the Ministry of Defence (as per paragraph 15 of the guidance).
- 11.5.3 Any finds that are suspected of being military aircraft will be reported immediately to the Retained Archaeologist. In the case of a military aircraft being investigated under licence, any human remains will be reported immediately.
- 11.5.4 For the archaeological assessment of aircraft remains, the Retained Archaeologist will refer to available guidance from Archaeological Curator(s), such as *Caring for Military Sites of the Twentieth Century* (Cadw 2009).

11.6 Wreck

- 11.6.1 There is a legal obligation under the *Merchant Shipping Act* 1995 that all material identified as 'wreck' must be reported to the Receiver of Wreck within 28 days of discovery.
- 11.6.2 According to section 255 of the Act, 'wreck' can be defined as 'jetsam, flotsam, lagan and derelict found in or on the shores of the sea or any tidal water' that have come from a ship, aircraft or hovercraft (vessel) and includes cargo and equipment.
- 11.6.3 Not only does the legislation cover wreck material recovered from within UK territorial waters (12 nautical miles), but also material that has been brought into UK territorial waters from elsewhere. The Receiver of Wreck's remit does not extend to lakes or rivers beyond tidal reach.
- 11.6.4 Wreck material is reported to the Receiver of Wreck by completing a 'Report of wreck and salvage' form (MSF 6200). A droit number will be assigned to each report of wreck, which could include single or multiple objects from one location/wreck site.
- 11.6.5 The Receiver of Wreck's remit is to research and establish who owns the wreck and to liaise with the finder, owner or other interested parties including archaeologists and museums.

- 11.6.6 All material reported as wreck must be retained and held on indemnity to the Receiver of Wreck's orders whilst the droit remains open, which could extend beyond a year. The location(s) of such storage will be confirmed following discussion between the Client and/or their appointed representatives and the Retained Archaeologist. The Receiver of Wreck must be made aware of these storage locations and any further movement of reported material.
- 11.6.7 If the Receiver of Wreck has not found ownership of any recovered wreck material within one year, the material becomes 'unclaimed' and as such the property of the Crown or grantee of the Crown. The Receiver of Wreck can then dispose of these items on behalf of the Crown. For material that is of historical or archaeological importance, the Receiver of Wreck will try to ensure that it is offered to an appropriate museum. If an appropriate museum or institution is not found, then the Receiver of Wreck may offer the material to the finder *in lieu* of salvage. Due to the longevity of this process, it is essential that the Client/their representative are fully aware of the obligations of the *Merchant Shipping Act* 1995 and frequently liaise with the Receiver of Wreck until a decision on ownership has been made and the droits can be formally closed.
- 11.6.8 If a museum or suitable institution is found by the Retained Archaeologist, this should be confirmed through liaison between the Client/their representative (as the named finder on the Report of Wreck and Salvage) with the Receiver of Wreck. It is furthermore recommended that droits are formally closed by the Receiver of Wreck prior to material being accessioned by a museum.

11.7 Environmental

- 11.7.1 Sampling undertaken for archaeological purposes will be undertaken following the Retained Archaeologist's in-house guidance, which adheres to the principles outlined in Historic England's guidance (English Heritage 2011 and Historic England 2015b).
- 11.7.2 Bulk environmental soil samples, for the recovery of plant macrofossils, wood charcoal, small animal bones and other small artefacts, will be taken as appropriate from well-sealed and dateable contexts or features.
- 11.7.3 If waterlogged or mineralised deposits are encountered, an environmental sampling strategy will be devised and agreed with the Curator(s) as appropriate. Specialist guidance will be provided by the Retained Archaeologist, with site visits undertaken if required.
- 11.7.4 Any samples undertaken for archaeological purposes will be of an appropriate size – typically 40 litres for the recovery of environmental evidence from dry contexts, and 10 litres from waterlogged deposits.
- 11.7.5 Following specialist advice, other sampling methods such as monolith, Kubiena or contiguous small bulk (column) samples may be employed to enable investigation of deposits with regard to microfossils (e.g., pollen, diatoms) and macrofossils (e.g., molluscs, insects), soil micromorphological or soil chemical analyses.

11.8 Conservation and storage

- 11.8.1 All recovered materials of archaeological interest, from land or underwater, will be subject to a Conservation Assessment to gauge whether special measures are required while the material is being held. This Conservation Assessment will be carried out by the Retained Archaeologist or an Archaeological Contractor with an appropriate level of expertise, with advice from appropriate specialists. The Retained Archaeologist or an Archaeological

Contractor with appropriate expertise will implement recommendations arising from the assessment. If no special conservation measures are recommended, finds will be conserved, bagged, boxed and stored in accordance with industry guidelines (ClfA 2014b). Finds will be stored as per section 13 below.

12 POST-EXCAVATION AND REPORTING

12.1 Finds

- 12.1.1 All retained finds will, as a minimum, be washed, weighed (where applicable), counted and identified. They will then be recorded to a level appropriate to the aims and objectives of the investigation. The report will include a table of finds by period and/or feature group.
- 12.1.2 Metalwork from stratified contexts will be X-rayed and, along with other fragile and delicate materials, stored in a stable environment. The X-raying of objects and other conservation needs will be undertaken by the Retained Archaeologist's in-house conservation staff, or by another approved conservation centre.
- 12.1.3 Artefacts and other finds will be suitably bagged and boxed in accordance with the guidance given by the relevant museum and generally in accordance with the standards of the ClfA (2014b).

12.2 Reporting

General

- 12.2.1 Following completion of the fieldwork and/or the assessment of the data, draft report(s) will be submitted for approval to the Client and the Curator(s), for comment. Reports may be issued for individual fieldwork or assessment packages with a final close-out report, or the work summarised in a single final report. Once approved, a final version will be submitted.
- 12.2.2 The report will typically include the following elements:
- a non-technical summary;
 - the aims and methods of the work;
 - the results of the work including finds and environmental remains;
 - a statement of the potential of the results;
 - proposals for further analysis and publication;
 - appendices;
 - illustrations; and
 - references
- 12.2.3 A copy of the report(s) will be deposited with the RCAHMW, which acts as the repository for the deposition of all archaeological fieldwork records and archives. The surveyed spatial digital data (.dxf or shapefile format) relating to the evaluation will also be deposited there.
- 12.2.4 It is essential that information from this project be made publicly available, as this will lead to beneficial effects. The information can then support appreciation and enjoyment of the historic environment, on local, regional and national levels, and also enable further academic research and inform marine plans. In addition, dissemination can bring about greater awareness of the historic environment, which can in turn engender local pride.

Publication

- 12.2.5 If no further mitigation works are undertaken, a short report on the results of the evaluation will be prepared for publication in a suitable journal, if considered appropriate and agreed with the Client and the Curator(s). There may be confidentiality issues that could delay or prevent publication.

OASIS

- 12.2.6 An OASIS online record (<http://oasis.ac.uk/pages/wiki/Main>) will be created, with key fields completed, and a .pdf version of relevant reports submitted, within six months of each report being approved by the Client. Copies of the OASIS record will be integrated into the relevant local and national records and published through the Archaeology Data Service ArchSearch catalogue. However, projects subject to any contractual requirements on confidentiality, or with the discovery of vulnerable sites, will only be uploaded to OASIS following confirmation from the Client and/or Archaeological Curator.

13 ARCHIVE STORAGE AND CURATION

13.1 Museum

- 13.1.1 Every effort will be made to identify a suitable repository for the archive resulting from the investigation. If no suitable repository is identified, the Retained Archaeologist or suitable Archaeological Contractor will continue to store the archive. Discussions about finds deposition should be had with Amgueddfa Cymru – National Museum (National Panel for Archaeological Archives in Wales 2017, section 7.1)
- 13.1.2 For material reported as 'wreck' under the *Merchant Shipping Act* 1995, the Receiver of Wreck, as per their guidance, will try to ensure that it is offered to an appropriate museum. It should be confirmed as early as possible as to who will undertake this research, the Receiver of Wreck or the Retained Archaeologist. Deposition of any finds with a museum will only be carried out with the full agreement of the Receiver of Wreck (on behalf of the Crown or grantee of the Crown) or the owner (as confirmed by the Receiver of Wreck). If the Retained Archaeologist is responsible for finding a suitable museum, any associated droits should be closed by the Receiver of Wreck prior to material being accessioned.

13.2 Transfer of title

- 13.2.1 On completion of the investigation (or extended fieldwork programme), every effort will be made to encourage the legal owner of any finds recovered (i.e., The Crown Estate), with the exception of:
- human remains and any objects covered by the *Treasure Act* 1996 (as amended by the *Coroners and Justice Act* 2009);
 - recovered wreck material covered by the *Merchant Shipping Act* 1995 as administered by the Receiver of Wreck. One year after the report form is received by the Receiver of Wreck, any unclaimed material becomes the property of the Crown or grantee of the Crown, whereby the Receiver of Wreck can dispose of this material on their behalf or try to ensure it is offered to an appropriate museum or institution if historically or archaeologically important. Furthermore, any Receiver of Wreck droits associated with recovered material must be formally closed prior to material being accessioned to a museum. Or;
 - aircraft material covered by the *Protection of Military Remains Act* 1986 and would therefore be under the ownership of the Joint Casualty and Compassionate Centre

of the Ministry of Defence, to transfer their ownership to the museum in a written agreement and in liaison with the Receiver

13.3 Preparation of archive

- 13.3.1 The complete project archive, which may include paper records, graphics, artefacts, ecofacts and digital data, will be prepared following the standard conditions for the acceptance of excavated archaeological material by a suitable repository and in general following nationally recommended guidelines (SMA 1995; ClfA 2014d; Brown 2011; ADS 2013). The archive will usually be deposited within one year of the completion of the project, with the agreement of the Client. However, bearing in mind that the Receiver of Wreck has until the droit is closed, it is possible that artefacts may not be accessioned until after this time frame and once the droit has been closed. Liaising with the Receiver of Wreck throughout is essential, especially if accessioning needs to occur prior to droits being officially closed.
- 13.3.2 The relevant Archaeological Curator(s) and the Retained Archaeologist will agree with the receiving institution a policy for the selection, retention and disposal of recovered or excavated material, and confirm requirements in respect of the format, presentation and packaging of archive records and materials. Where possible, the receiving institution will be notified in advance of any fieldwork. However, due to the nature of some types of fieldwork whereby it is often unknown what finds could be recovered, these discussions may take place during or even after fieldwork has ended. Additionally, selection, retention and disposal of recovered or excavated material should only occur if the legislative requirements of the *Merchant Shipping Act* 1995 and *Protection of Military Remains Act* 1986 are fully undertaken and the Receiver of Wreck and Ministry of Defence are involved in any such decisions.
- 13.3.3 Digital data created by Retained Archaeologists or Archaeological Contractors will be considered part of the primary archive and will accord with the procedures recommended by The Crown Estate, Marine Environment Data and Information Network (MEDIN), Archaeological Data Service (ADS) and the accepting institution.
- 13.3.4 Data will be compiled in accordance with *The National Standard and Guidance for Collecting and Depositing Archaeological Archives in Wales* (2017 and 2019) and will be deposited in line with the *Guidance for the Submission of Data to the Welsh Historic Environment Records* (The Welsh Archaeological Trusts 2018).

13.4 Selection strategy

Finds archive

- 13.4.1 Selection, retention and disposal of recovered or excavated material should only occur if the legislative requirements of the *Merchant Shipping Act* 1995 and *Protection of Military Remains Act* 1986 are first and foremost fully undertaken and the Receiver of Wreck, Ministry of Defence and other relevant stakeholders including the Archaeological Curator are involved in any such decisions. Ownership of material must be confirmed prior to any decisions being made on their selection, retention and disposal, which will be undertaken in line with guidance from the National Panel for Archaeological Archives in Wales (2019).
- 13.4.2 Consultation with all stakeholders regarding project-specific selection decisions will be undertaken throughout the project as necessary, however at a minimum of three project review points:

- data gathering: if any unforeseen discovery on site necessitates an amendment to the proposed collection strategy, or if adjustments are made to any sampling strategy;
- end of data gathering (assessment stage); and
- archive compilation.

13.4.3 The following selection, retention and disposal decisions may only occur where ownership of material (if applicable) has been formally transferred to the finder or Retained Archaeologist by the Receiver of Wreck. If material is not accepted by a museum or other organisation and all legislative requirements are fully undertaken, then consideration will be given to the suitability for their use within handling or teaching collections by the museum or Wessex Archaeology, or whether they are of particular interest to the local community. Remaining de-selected material will be disposed of. All such material will be adequately recorded to the appropriate level before de-selection.

13.4.4 The National Panel for Archaeological Archives in Wales (2019) says that retention is the action of recording all that has been found as well as all decisions that are taken, their justifications and considerations that may lead to any disposal. A key part of selection and retention is ensuring that the assemblage is fully recorded in the site digital archive prior to any disposal being actioned.

Documentary and digital archive

13.4.5 It is widely accepted that not all records collected during the course of an archaeological project require preservation in perpetuity. These records will be subject to selection in order to establish what will be retained for long-term curation, with the aim of ensuring that all elements selected to be retained are appropriate to establish the significance of the project and support future research, outreach, engagement, display and learning activities, i.e. the retained archive should fulfil the requirements of both future researchers and the receiving Museum.

13.4.6 The selection strategy, which details the project-specific selection process, is underpinned by national guidelines on selection and retention (Brown 2011, section 4, National Panel for Archaeological Archives in Wales 2019) and generic selection policies (SMA 1993; Wessex Archaeology's internal selection policy) and follows ClfA's Toolkit for Selecting Archaeological Archives. It should be agreed by all stakeholders (Wessex Archaeology's internal specialists, external specialists, local authority, museum) and fully documented in the project archive.

13.4.7 The National Panel for Archaeological Archives in Wales (2019) says that if an archive is suitable for retention, or possibly suitable for retention, then discussions with a museum curator should be entered into at an early stage of the project not towards the end. Digital records should go to RCAHMS.

13.4.8 To promote long-term future reuse, deposition file formats will be of archival standard, open source and accessible in nature following national guidance from ADS 2013, ClfA 2014c and the requirements of the digital repository.

13.4.9 Any sensitive data to be handled according to Wessex Archaeology data policy to ensure it is stored and transferred securely. The identity of individuals will be protected in line with GDPR. If required, data will be anonymised and redacted. Selection and retention of sensitive data for archival purposes will occur in consultation with the client and relevant

stakeholders. Confidential data will not be selected for archiving and will be handled as per contractual obligation.

- 13.4.10 De-selected data will be stored on Wessex Archaeology secured servers on offsite storage locations. The Wessex Archaeology IT department has a backup strategy and policies that involves daily, weekly and monthly and annual backups of data as stated in the DMP. This strategy is non-migratory, and original files will be held at Wessex Archaeology under their unique project identifier, as long as they remain useful and usable in their final version format. This data may also be used for teaching or reference collections by the museum, or by Wessex Archaeology unless otherwise required by contractual or copyright obligations.

Palaeoenvironmental material

- 13.4.11 All contexts suitable for environmental sampling will be considered for sampling. All environmental sampling will be undertaken following Wessex Archaeology's in-house guidance, which adheres to the principles outlined in Historic England's guidance (English Heritage 2011 and Historic England 2015a). Where applicable, the Archaeological Curator should be included in any discussions.
- 13.4.12 De-selected material from samples will be disposed of after processing and post-excavation recording. All processed material will be adequately recorded to the appropriate level before de-selection.

13.5 Security copy

- 13.5.1 In line with current best practice (e.g., Brown 2011), on completion of the project a security copy of the written records will be prepared in the form of a digital PDF/A file. PDF/A is an ISO-standardised version of the Portable Document Format (PDF) designed for the digital preservation of electronic documents through omission of features ill-suited to long-term archiving.

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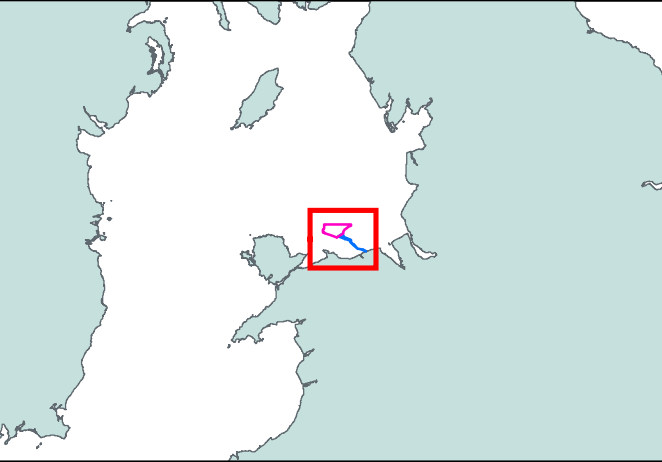
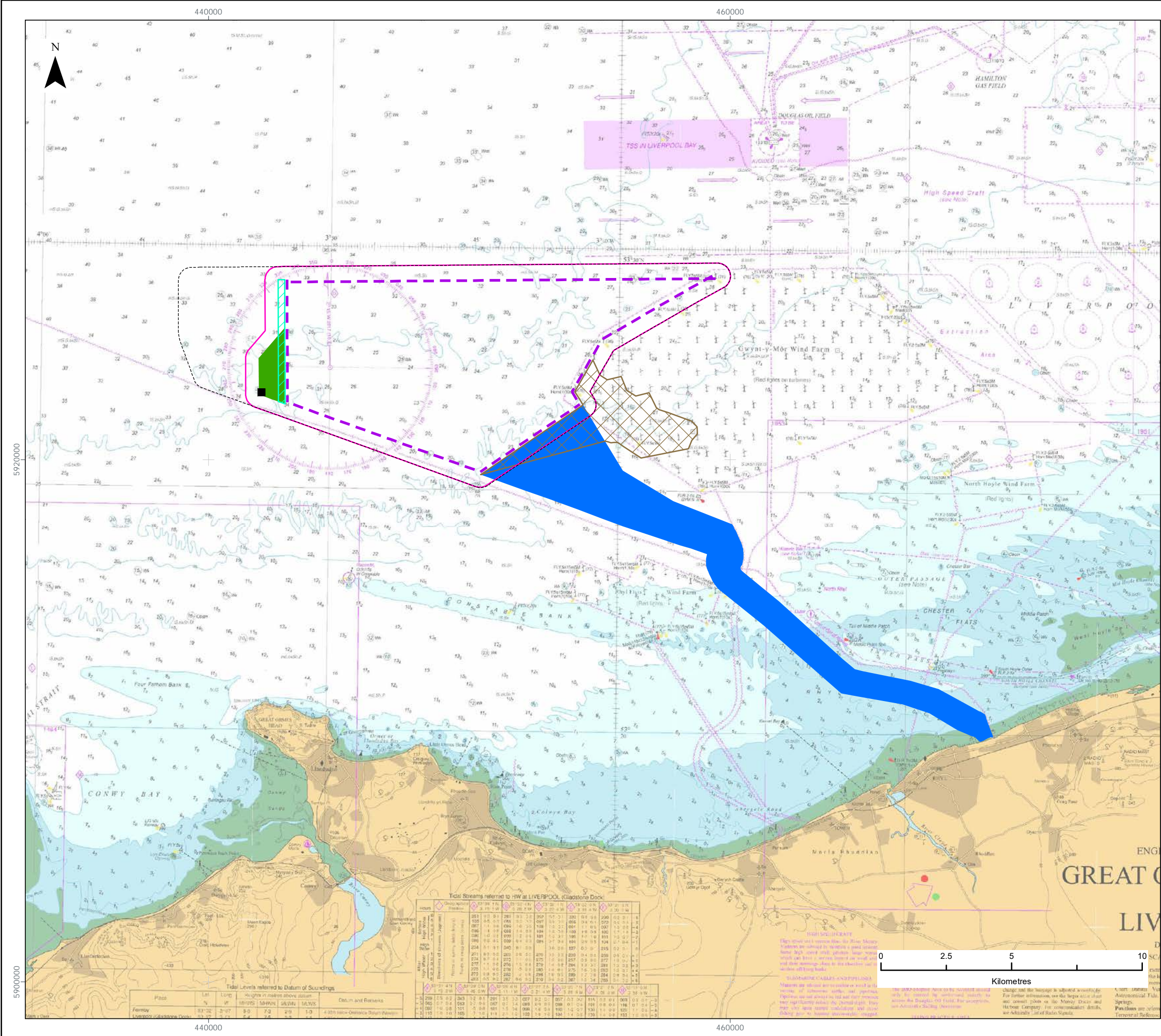
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FS 606559



LEGEND

- Met Mast Location
- Array Area
- Subsea Infrastructure and Temporary Works
- Other Wind Farm Infrastructure Zone
- Array and Infrastructure Zones buffer
- Geophysical reporting extent
- AyM to GyM interlink
- Offshore Export Cable Corridor

Data Source:
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PROJECT TITLE:
AWEL Y MÔR OFFSHORE WINDFARM

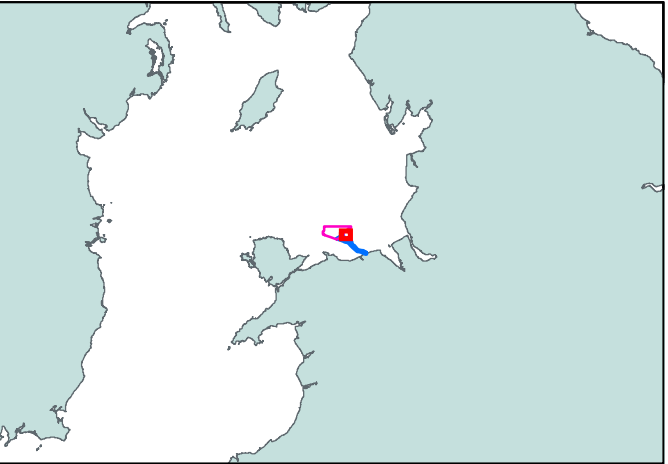
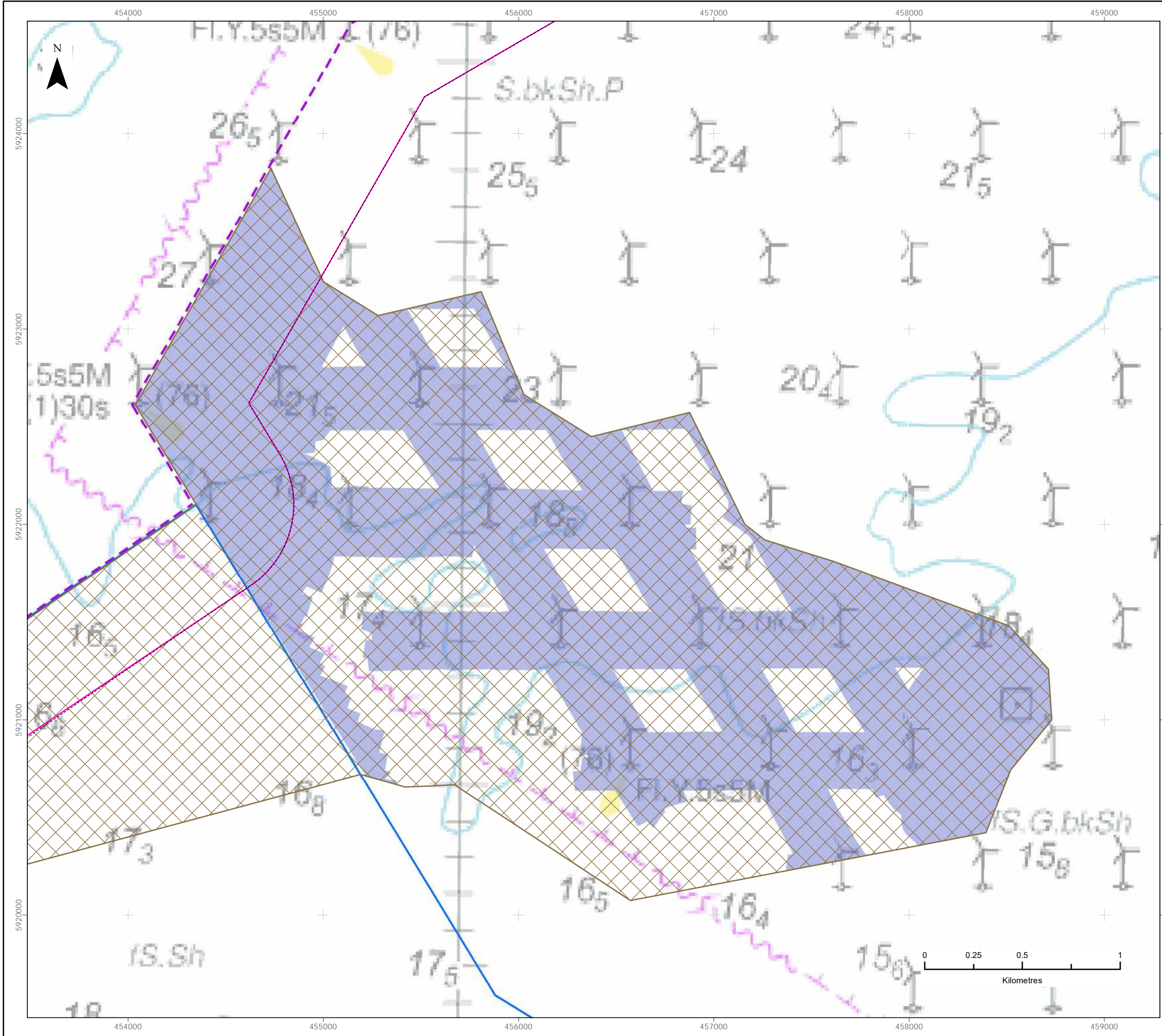
FIGURE TITLE:
Study Area

VER	DATE	REMARKS	Drawn	Checked
1	14/02/2022	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
- Array and Infrastructure Zones buffer
- Geophysical reporting extent
- AyM to GyM interlink
- Offshore Export Cable Corridor
- Combined 2010 and 2020 geophysical data coverage

Data Source:

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PROJECT TITLE:

AWEL Y MÔR OFFSHORE WINDFARM

FIGURE TITLE: **Interlink geophysical data coverage**

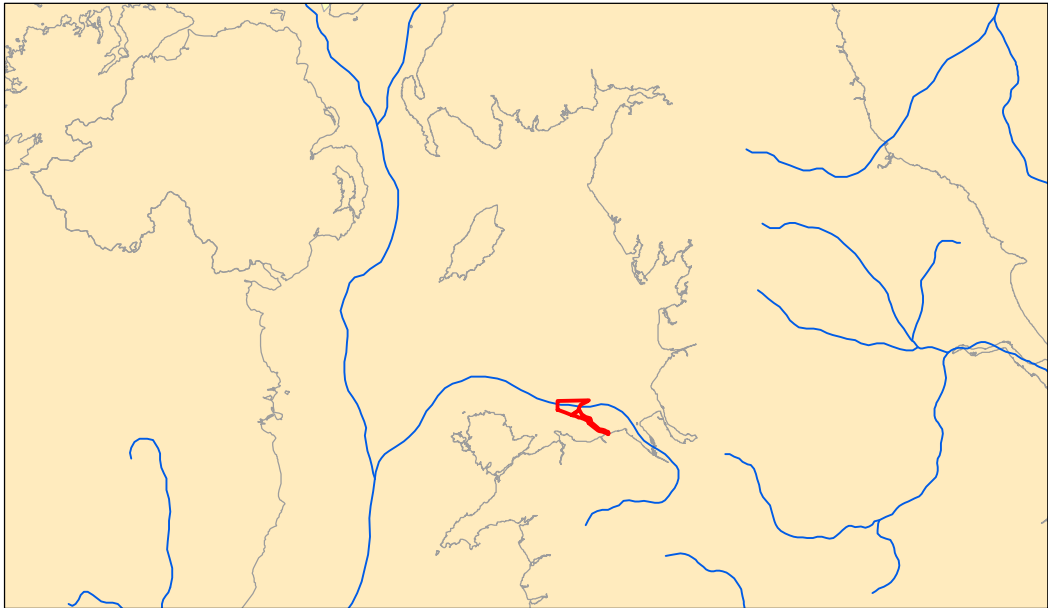
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1	14/02/2022	For Issue	KF	DH

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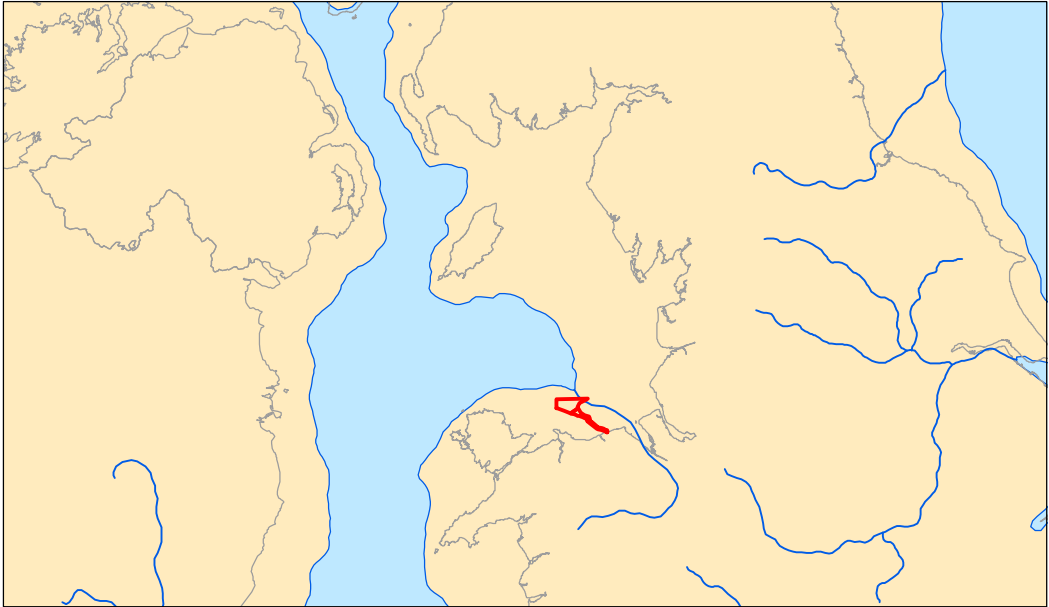
Figure 2

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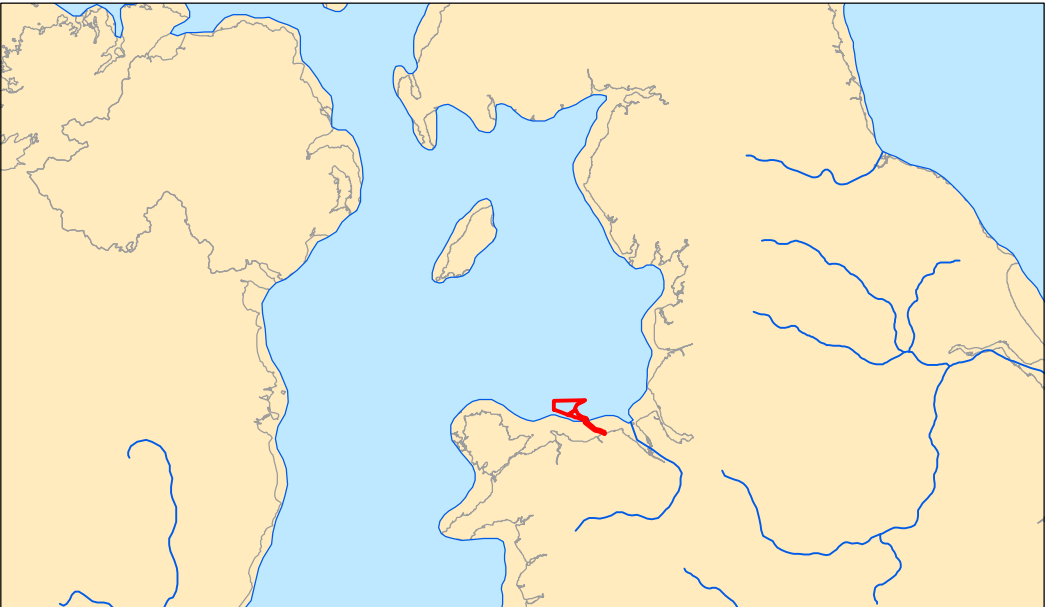
Fferm Wynt Alltraeth
AWEL Y MÔR
Offshore Wind Farm



16,000 BP - 13,000 BP



10,000 BP



5000 BP

LEGEND

Proposed Offshore Development Area

Present high water

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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	29/11/2021	For Issue	KJF	DH

FIGURE NUMBER:

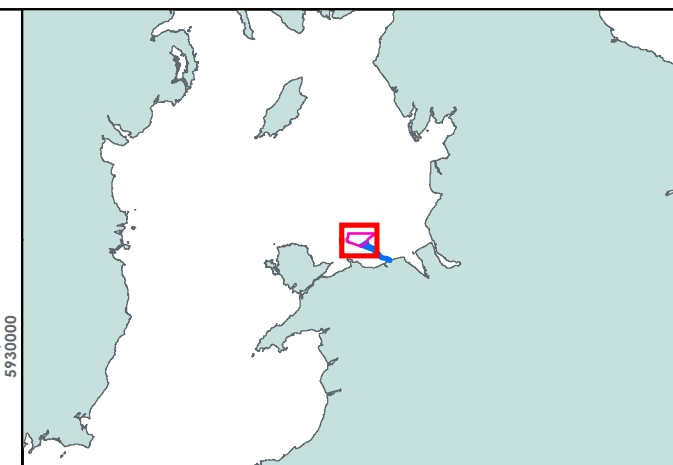
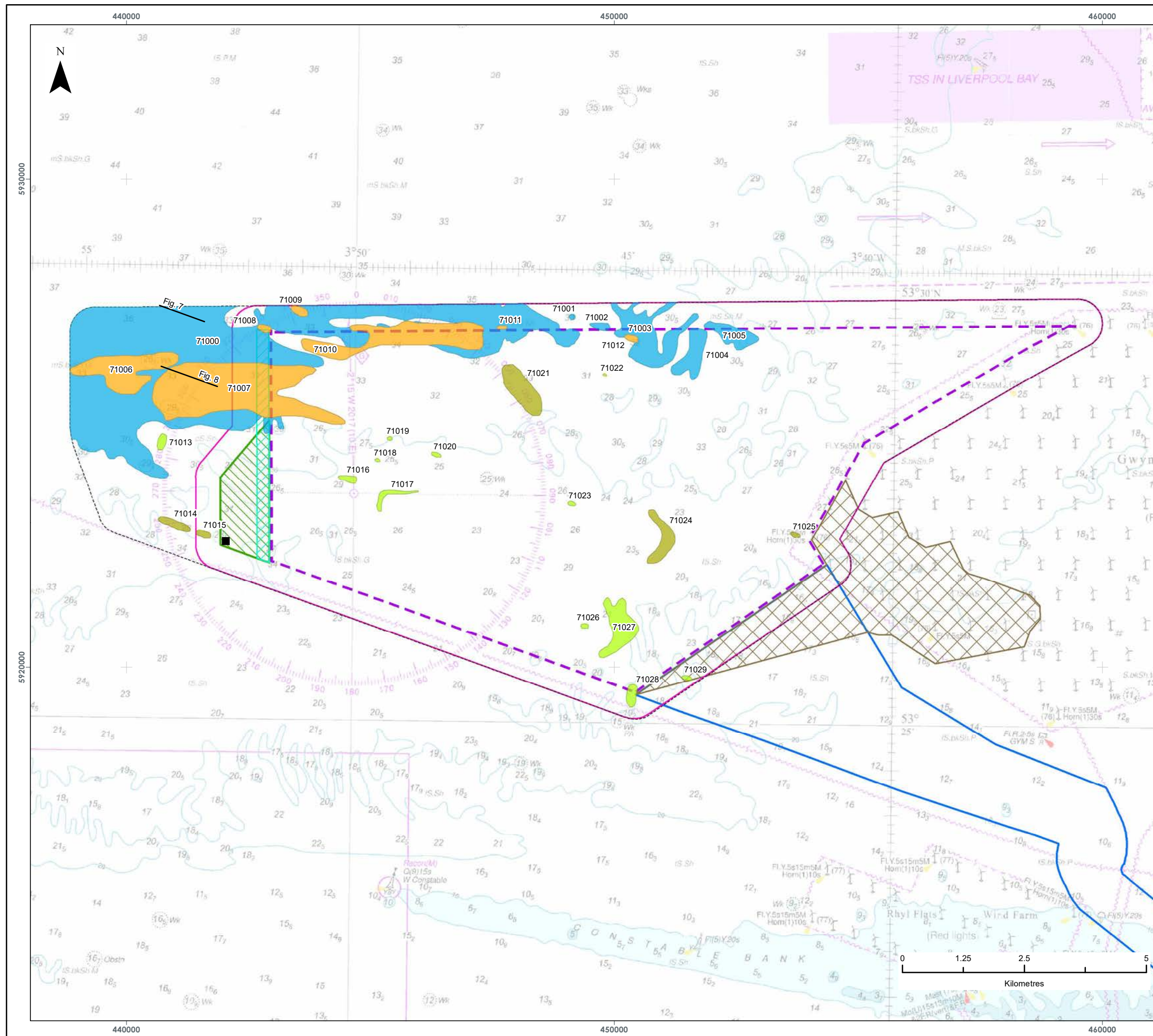
Figure 3

SCALE: 1:4,000,000	PLOT SIZE: A3	DATUM: WGS84	PROJECTION: UTM30N
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Fferm Wynt Ailtraeth

AWEL Y MÔR

Offshore Wind Farm



LEGEND

- Met Mast Location
- Array
- Array and Infrastructure zones buffer
- Geophysical reporting extent
- AyM to GyM interlink
- Offshore Export Cable Corridor
- Subsea Infrastructure and Temporary Works
- Other Wind Farm Infrastructure Zone
- 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

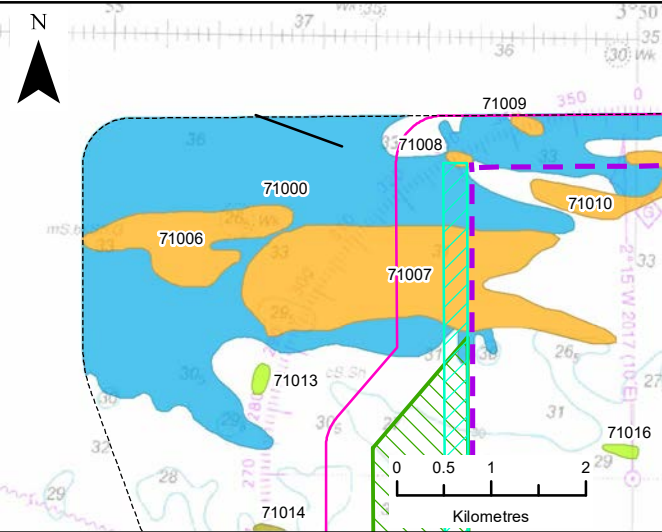
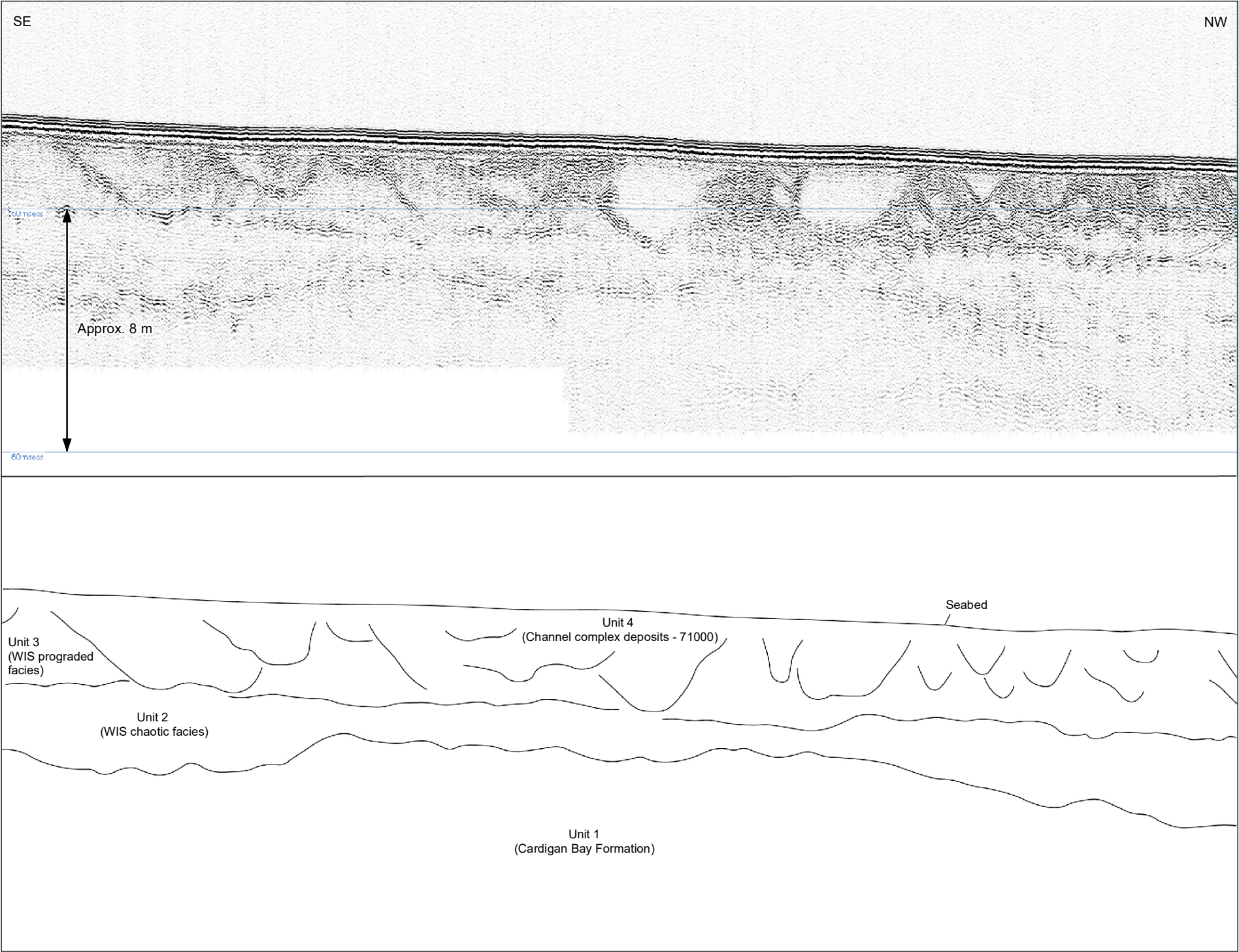
FIGURE TITLE: Palaeogeographic features of archaeological potential – Array area and Infrastructure zone

VER	DATE	REMARKS	Drawn	Checked
1	14/02/2022	For Issue	KJF	DH

FIGURE NUMBER:
Figure 4

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

- Array Area
- Array and Infrastructure Zones buffer
- Geophysical reporting extent
- Subsea Infrastructure and Temporary Works
- Other Wind Farm Infrastructure Zone
- Data example locations

Palaeogeographic Features

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

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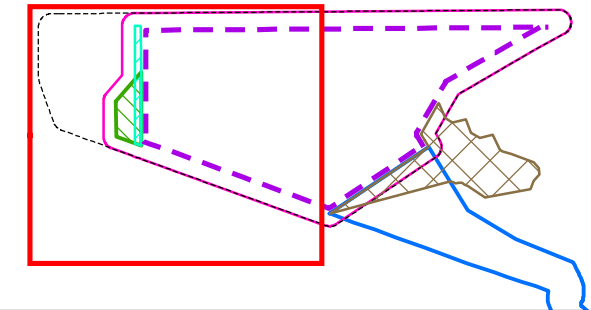
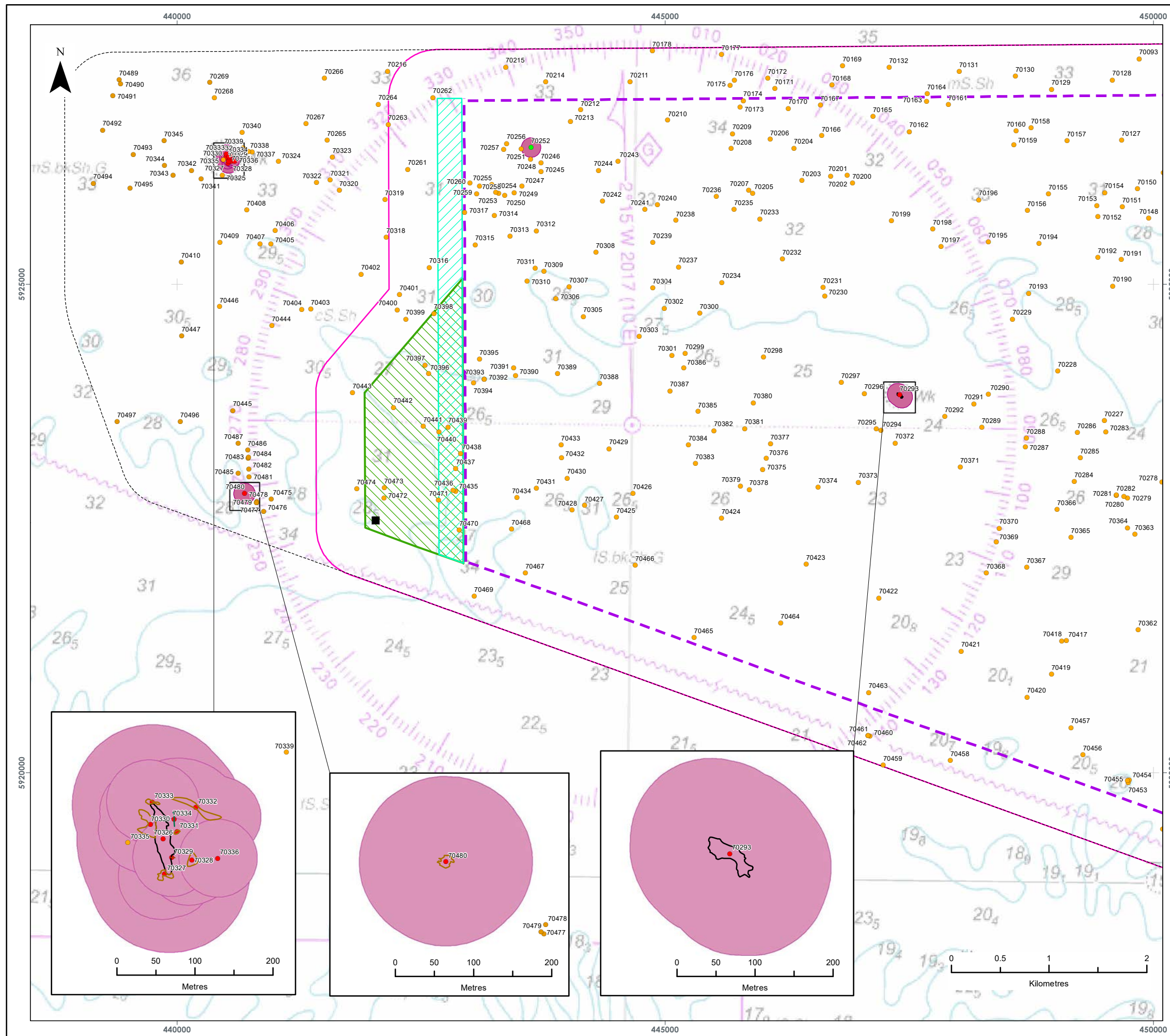
PROJECT TITLE:
AWEL Y MÔR OFFSHORE WINDFARM

FIGURE TITLE:
SBP data example – 71000

VER	DATE	REMARKS	Drawn	Checked
1	14/02/2022	For Issue	KJF	DH

FIGURE NUMBER:
Figure 5

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

- Met Mast Location
- Array Area
- Array and Infrastructure zones buffer
- Geophysical reporting extent
- Subsea Infrastructure and Temporary Works
- Other Wind Farm Infrastructure Zone
- 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

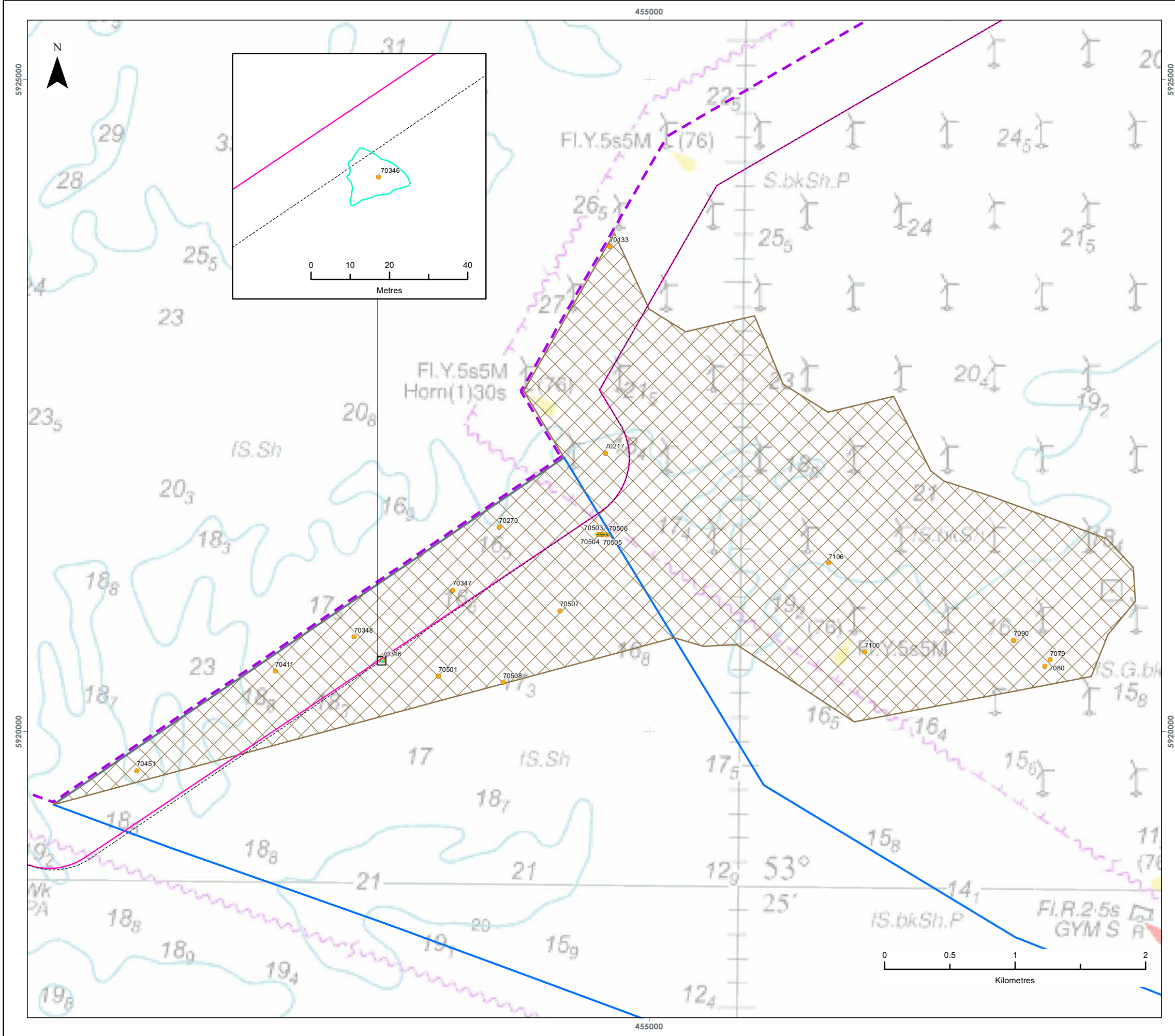
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1	14/02/2022	For Issue	KF	DH

FIGURE NUMBER:

Figure 6

SCALE:	1:40,000	PLOT SIZE:	A3	DATUM:	WGS84	PROJECTION:	UTM30N
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Fferm Wynt Alltraeth
AWEL Y MÔR
Offshore Wind Farm



LEGEND

- Array Area
- Array and Infrastructure zones buffer
- Geophysical reporting extent
- 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	14/02/2022	For Issue	KF	DH

FIGURE NUMBER:

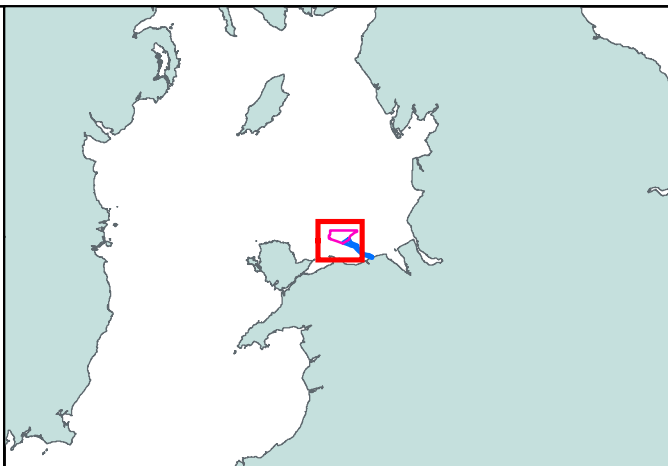
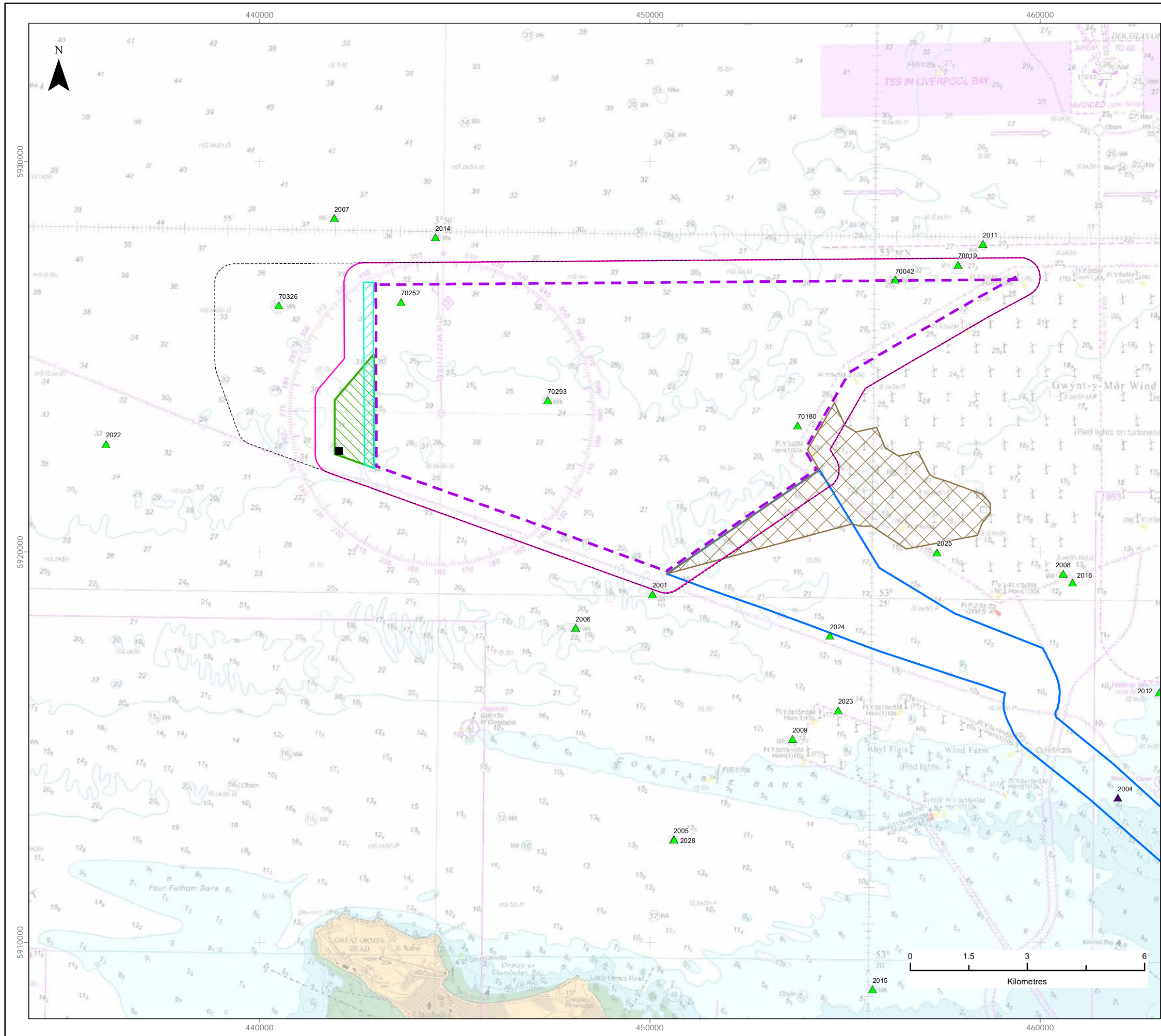
Figure 8

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

Fferm Wynt Alltraeth

AWEL Y MÔR

Offshore Wind Farm



LEGEND

- Met Mast Location
- Array Area
- Array and Infrastructure zones buffer
- Geophysical reporting extent
- AyM to GyM interlink
- Subsea Infrastructure and Temporary Works
- Other Wind Farm Infrastructure Zone
- Offshore Export Cable Corridor
- Known Maritime and Aviation Sites
 - Findspot
 - Wreck

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PROJECT TITLE:
AWEL Y MÔR OFFSHORE WINDFARM

FIGURE TITLE:
Offshore Wind Farm Study Area

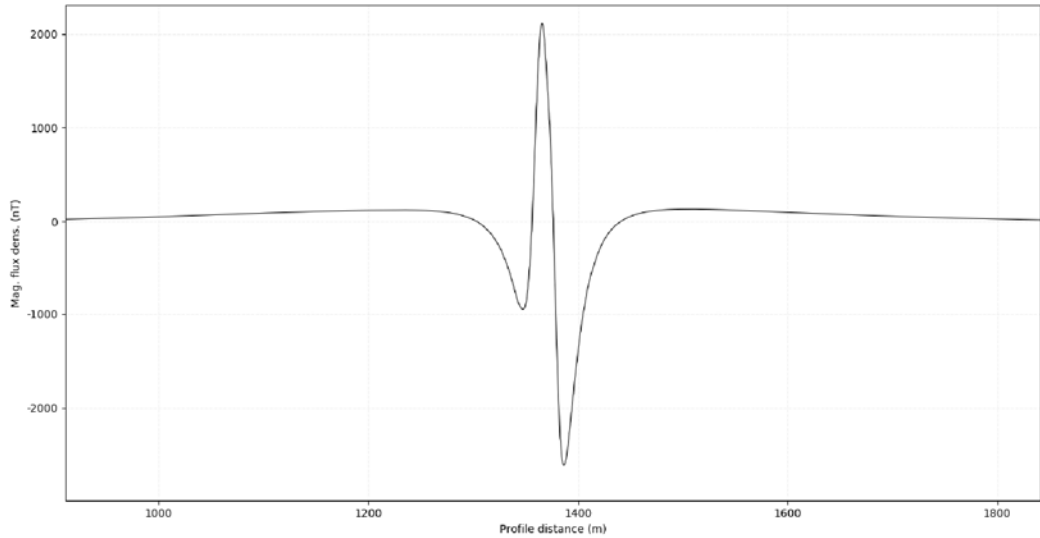
VER	DATE	REMARKS	Drawn	Checked
1	14/02/2022	For Issue	KJF	LR

FIGURE NUMBER:
Figure 9

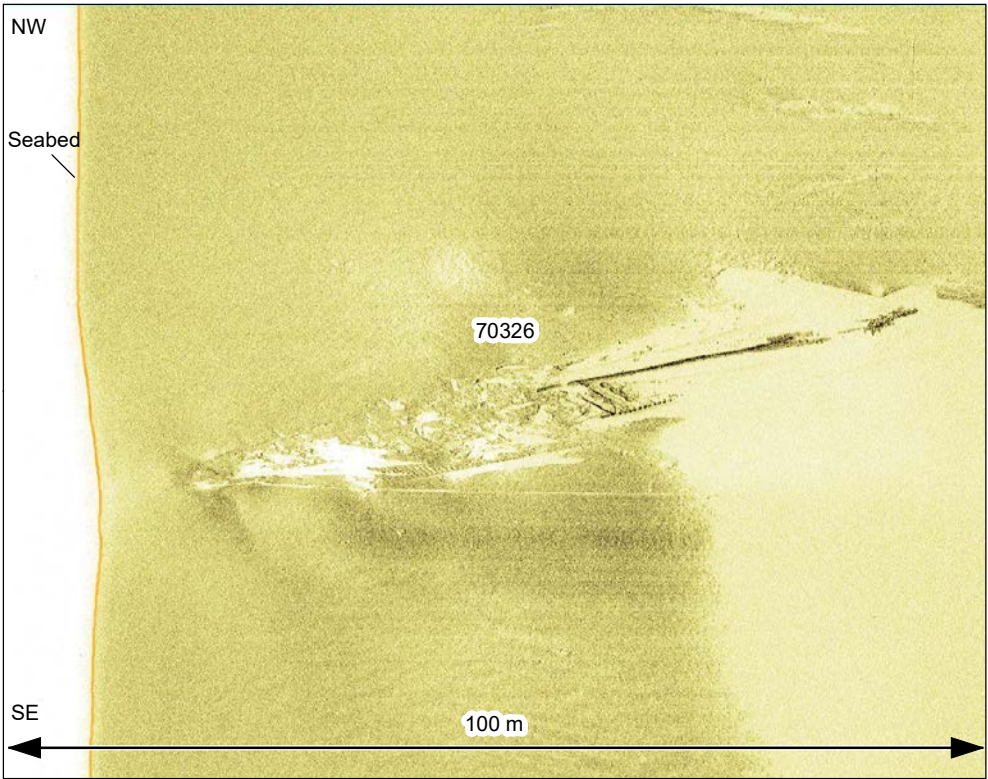
SCALE:	PLOT SIZE:	DATUM:	PROJECTION:
1:100,000	A3	WGS84	UTM30N

Fferm Wynt Ailtraeth
AWEL Y MÔR
Offshore Wind Farm

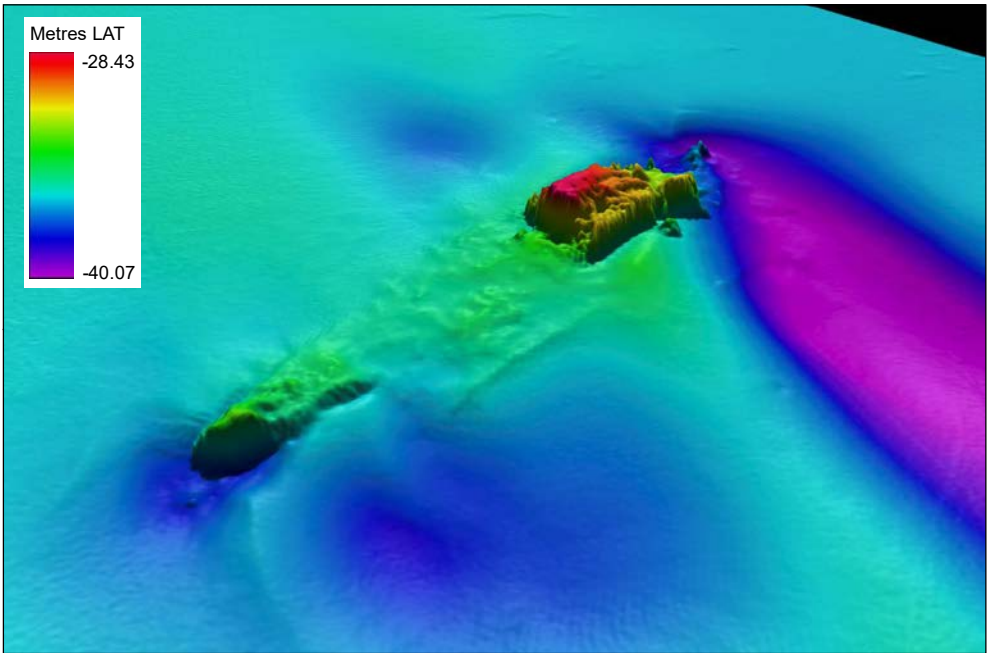
Location		440517 E 5926285 N	Area	2020 Array – Block D
Archaeological Importance		High		
Geophysical survey dimensions and notes		Wreck 70326 is situated in the north-western section of the array area, and corresponds with the recorded location of the SS <i>Albanian</i> (UKHO 8124).		
		Wreck 70326 is 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.		
		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.		
		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.		
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		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> .		
		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.		
		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.		



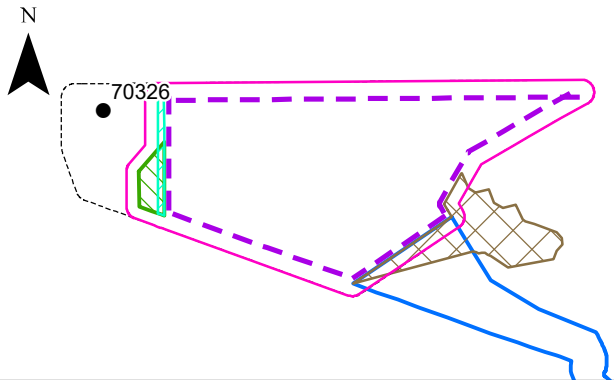
Mag. profile image



SSS waterfall image, 100 m range per channel



MBES grid image, x1 vertical exaggeration, looking west



LEGEND

- Array Area
- Array and Infrastructure zones buffer
- Geophysical reporting extent
- AyM to GyM interlink
- Subsea Infrastructure and Temporary Works
- 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	14/02/2022	For Issue	KF	DH

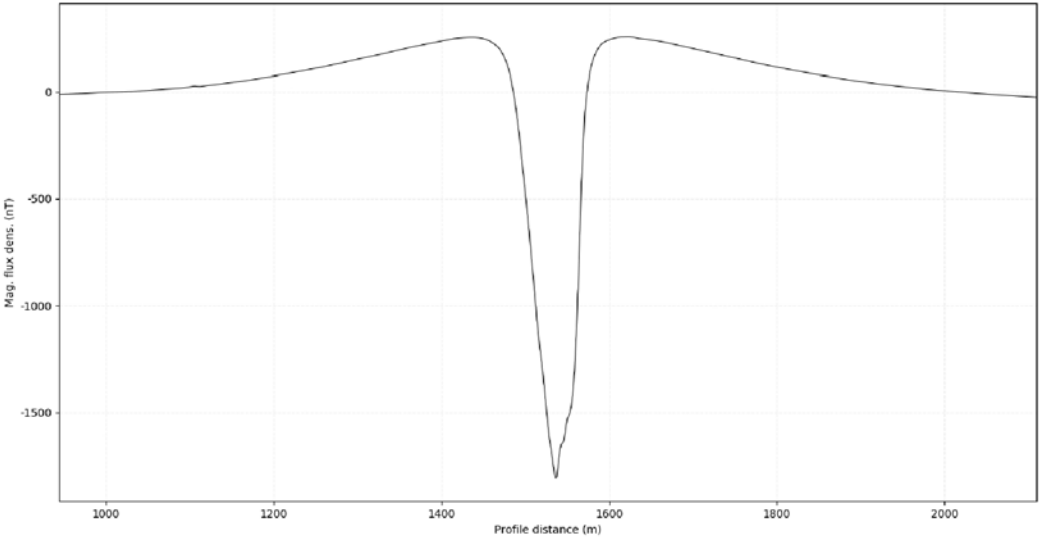
FIGURE NUMBER:

Figure 10

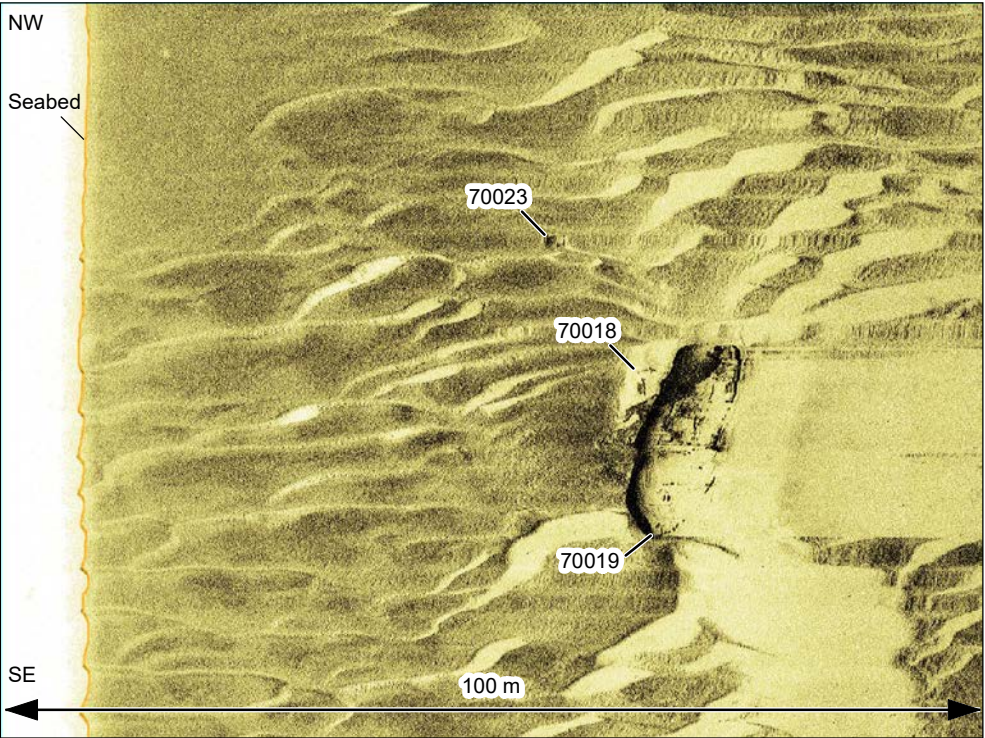
SCALE: NTS	PLOT SIZE: A3	DATUM: WGS84	PROJECTION: UTM30N
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Fferm Wynt Alltraeth
AWEL Y MÔR
Offshore Wind Farm

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.		
		An associated very large, sharp asymmetric magnetic dipole (2015 nT) identified within the Mag. dataset suggests ferrous construction and/or the presence of ferrous material.		
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.		



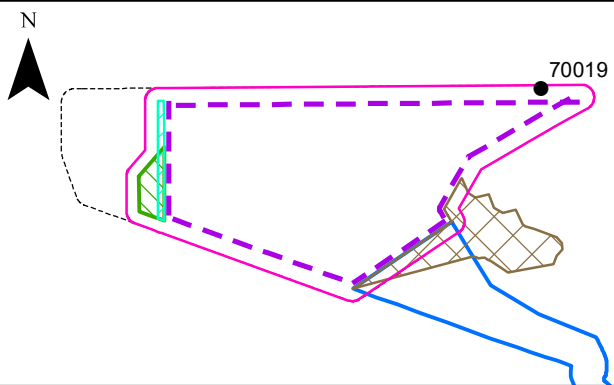
Mag. profile image



SSS waterfall image, 100 m range per channel



MBES grid image, x1 vertical exaggeration, looking west



LEGEND

Array Area

Array and Infrastructure zones buffer

Geophysical reporting extent

AyM to GyM interlink

Subsea Infrastructure and Temporary Works

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	14/02/2022	For Issue	KF	DH

FIGURE NUMBER:

Figure 11

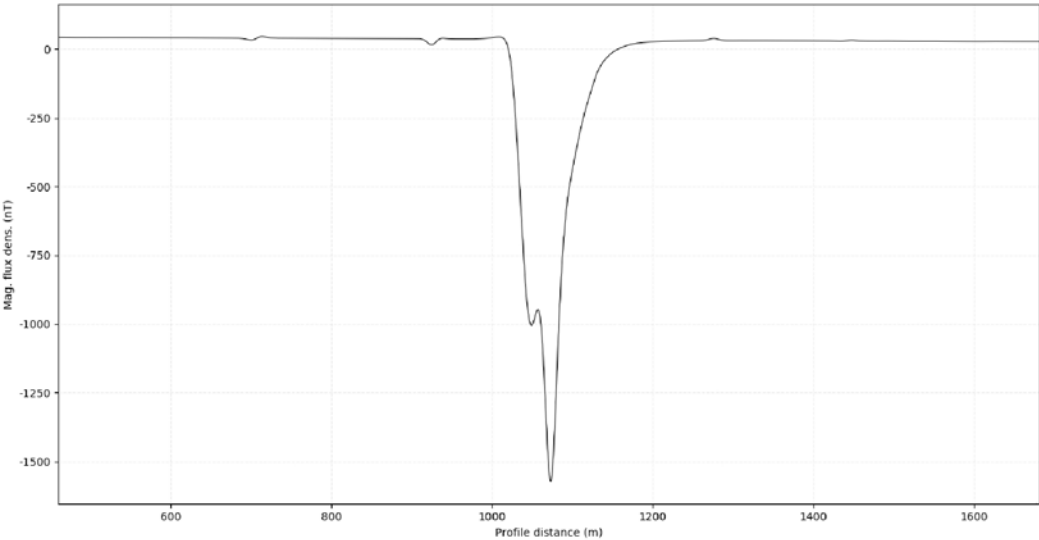
SCALE:	PLOT SIZE:	DATUM:	PROJECTION:
NTS	A3	WGS84	UTM30N

Fferm Wynt Alltraeth

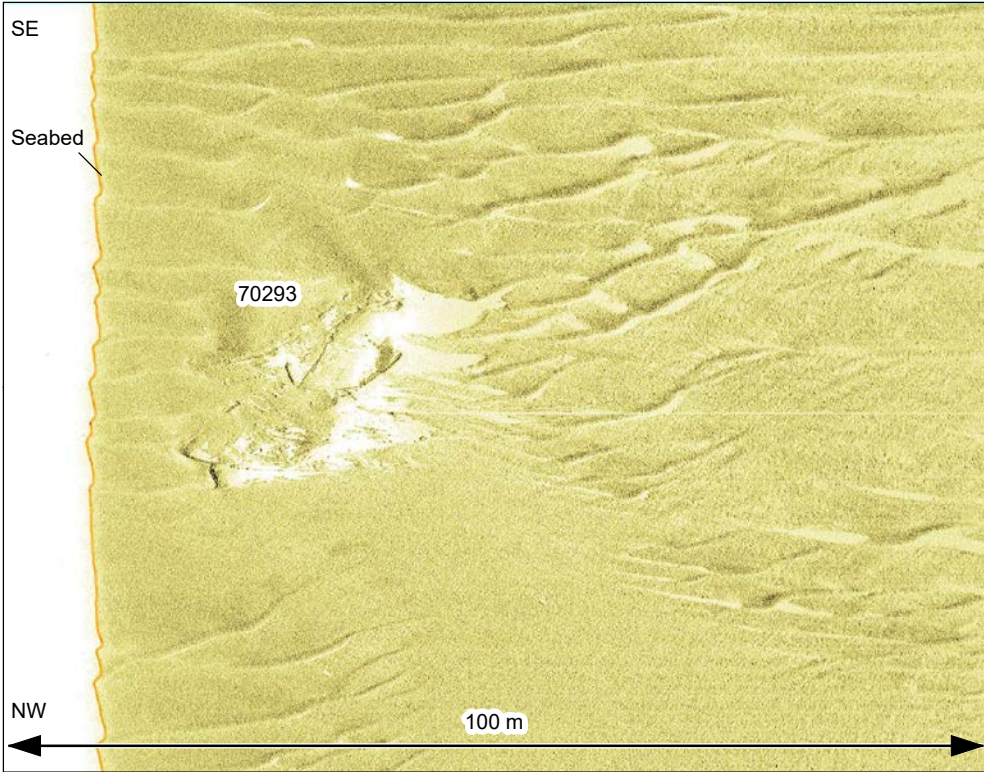
AWEL Y MÔR

Offshore Wind Farm

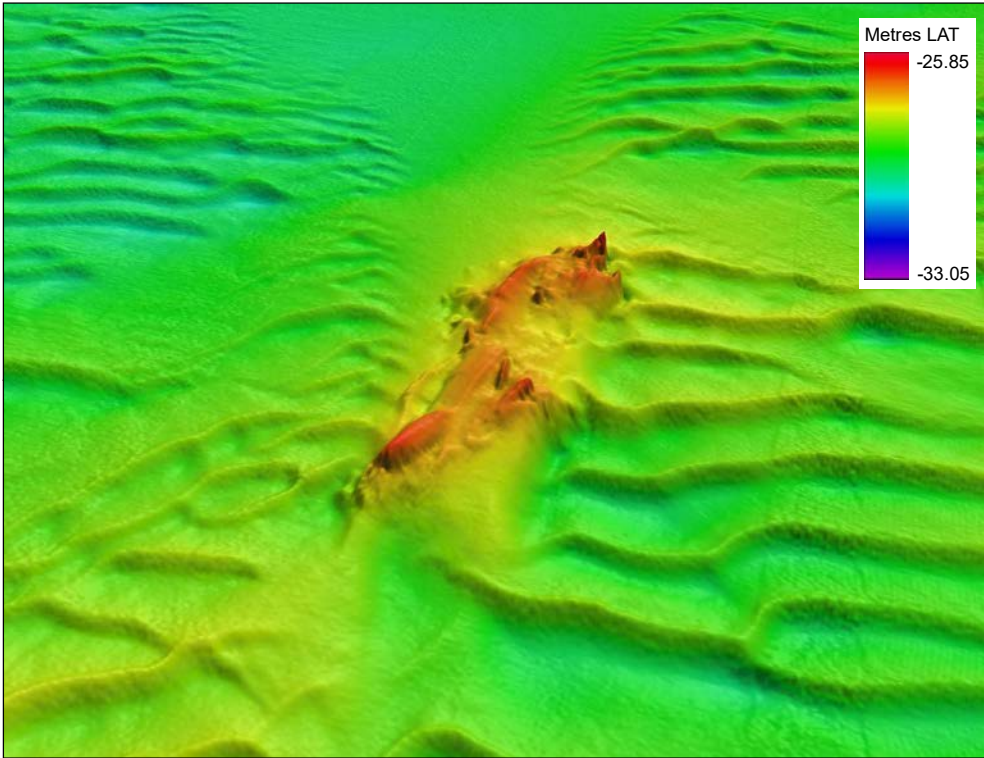
Location		447402 E 593866 N	Area	Array area
Archaeological Importance		High		
Geophysical survey dimensions and notes		Wreck 70293 is a highly degraded and potentially partially buried wreck situated around the centre of the array area. The wreck corresponds with UKHO record 7620, and is possibly the 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.		
		An anomaly with an amplitude of 1616 nT was identified in the Mag. data indicates the presence of significant amounts of ferrous material.		
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.		



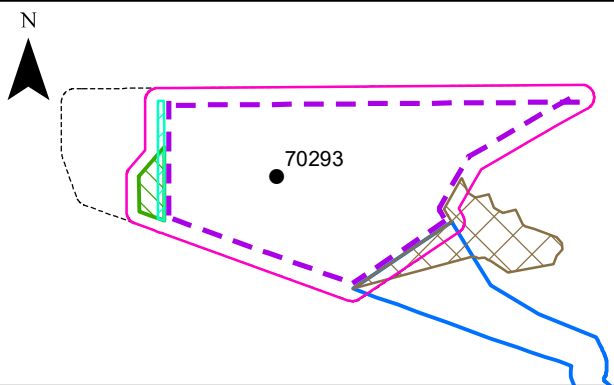
Mag. profile image



SSS waterfall image, 100 m range per channel



MBES grid image, x3 vertical exaggeration, looking west



LEGEND

Array Area

Array and Infrastructure zones buffer

Geophysical reporting extent

AyM to GyM interlink

Subsea Infrastructure and Temporary Works

Other Wind Farm Infrastructure Zone

Offshore Export Cable Corridor

Wreck location

Data Source:

PROJECT TITLE:
AWEL Y MÔR OFFSHORE WINDFARM

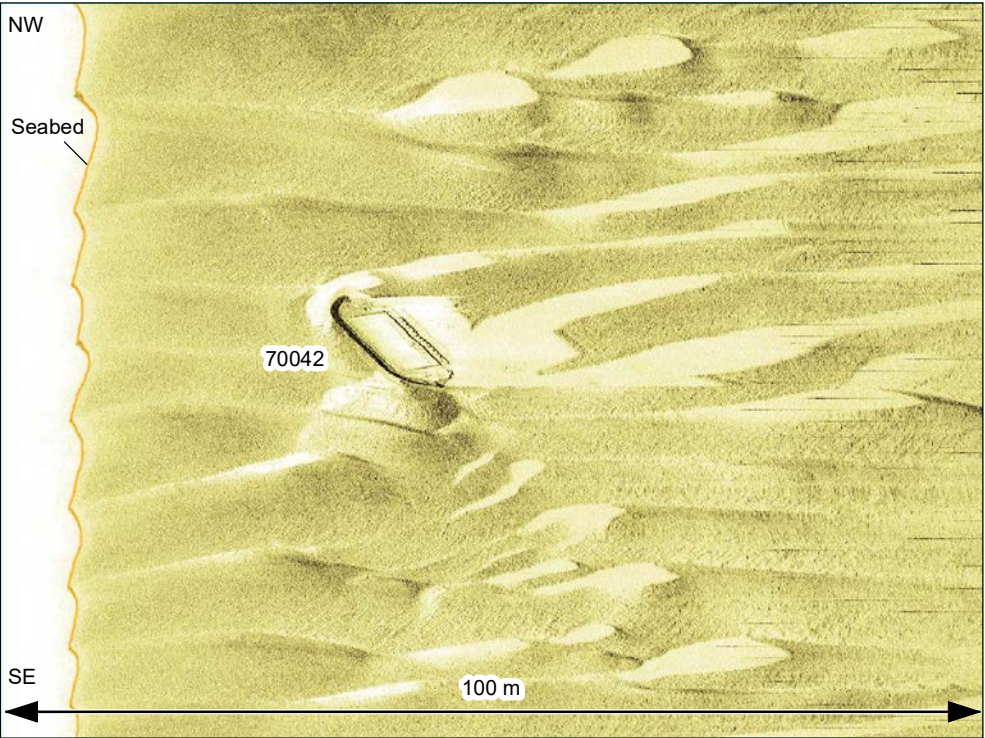
FIGURE TITLE:
**ID 70293 –
UKHO 7620 – Chacabuco**

VER	DATE	REMARKS	Drawn	Checked
1	14/02/2022	For Issue	KF	DH

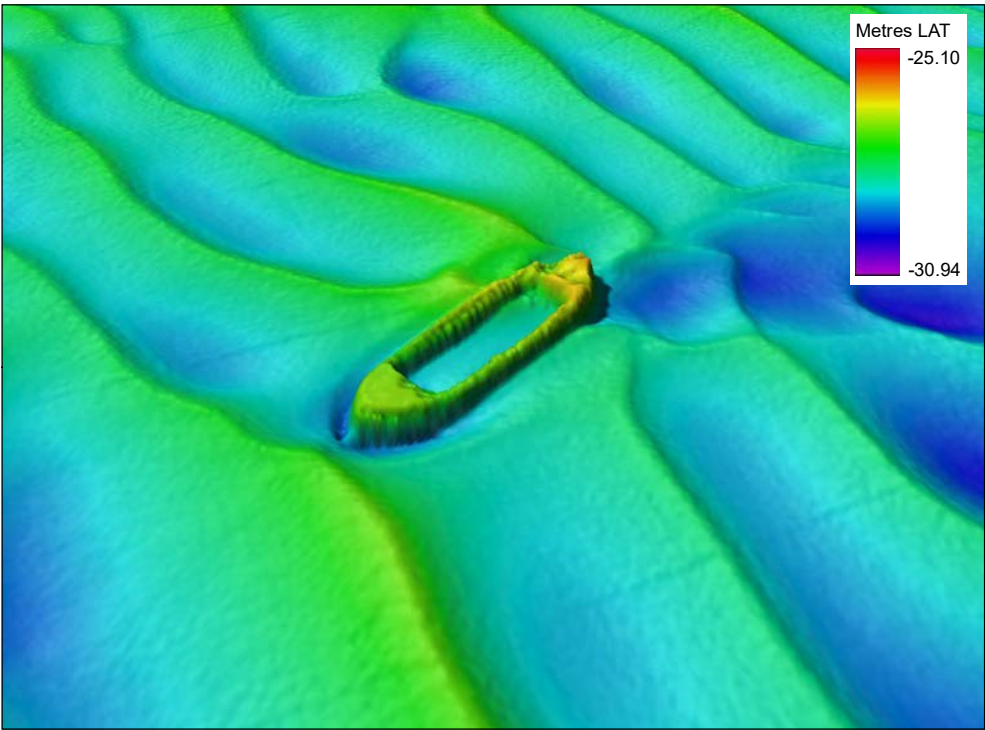
FIGURE NUMBER:
Figure 12

SCALE: NTS	PLOT SIZE: A3	DATUM: WGS84	PROJECTION: UTM30N
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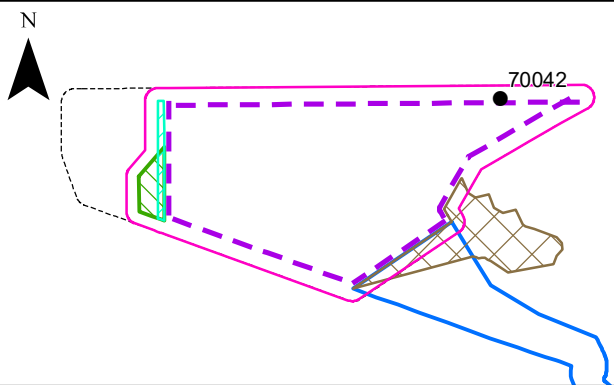
Location		456278 E 596972 N	Area	Array area
Archaeological Importance		High		
Geophysical survey dimensions and notes		Wreck 70042 is an upright and intact wreck situated in the north-east section of the array area, recorded as an unknown dangerous wreck by the UKHO (93229).		
		The wreck is visible 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.		
		The wreck is situated midway between two magnetometer survey lines, and so the potential ferrous content of the construction is unknown.		
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
- Array and Infrastructure zones buffer
- Geophysical reporting extent
- AyM to GyM interlink
- Subsea Infrastructure and Temporary Works
- 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

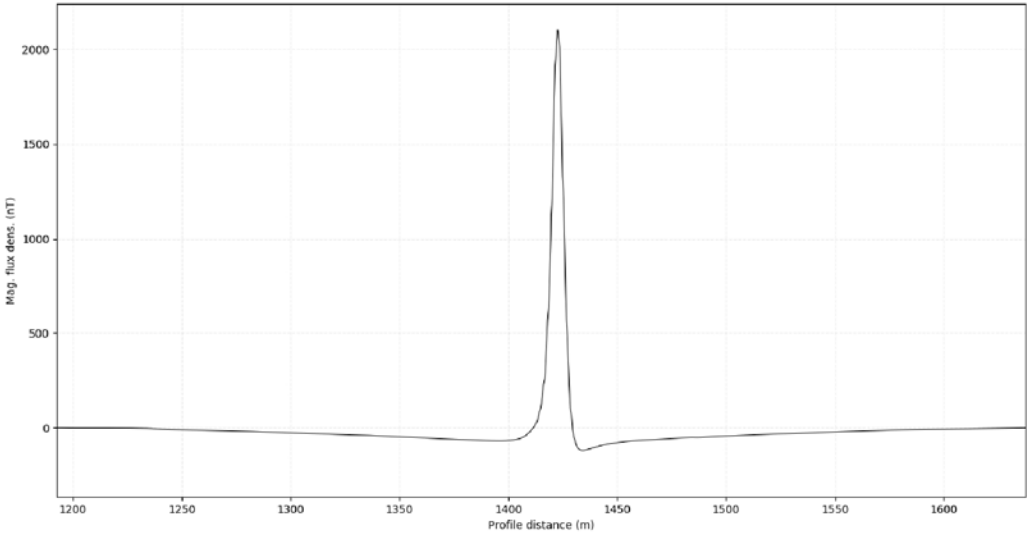
VER	DATE	REMARKS	Drawn	Checked
1	14/02/2022	For Issue	KF	DH

FIGURE NUMBER:
Figure 13

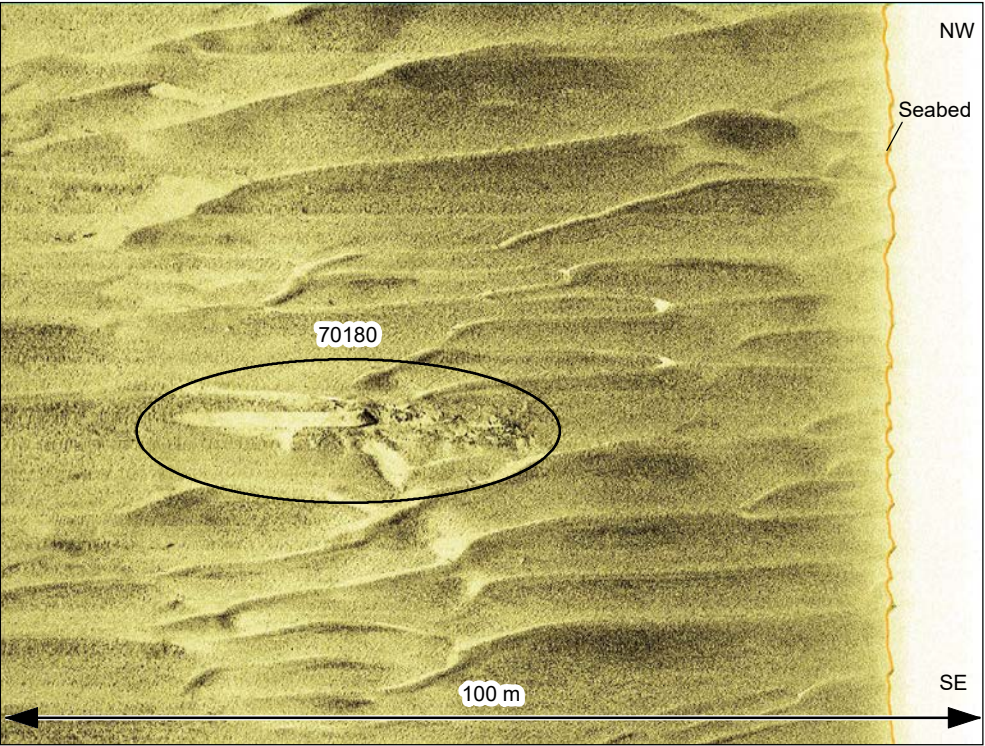
SCALE: NTS	PLOT SIZE: A3	DATUM: WGS84	PROJECTION: UTM30N
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AWEL Y MÔR
Offshore Wind Farm

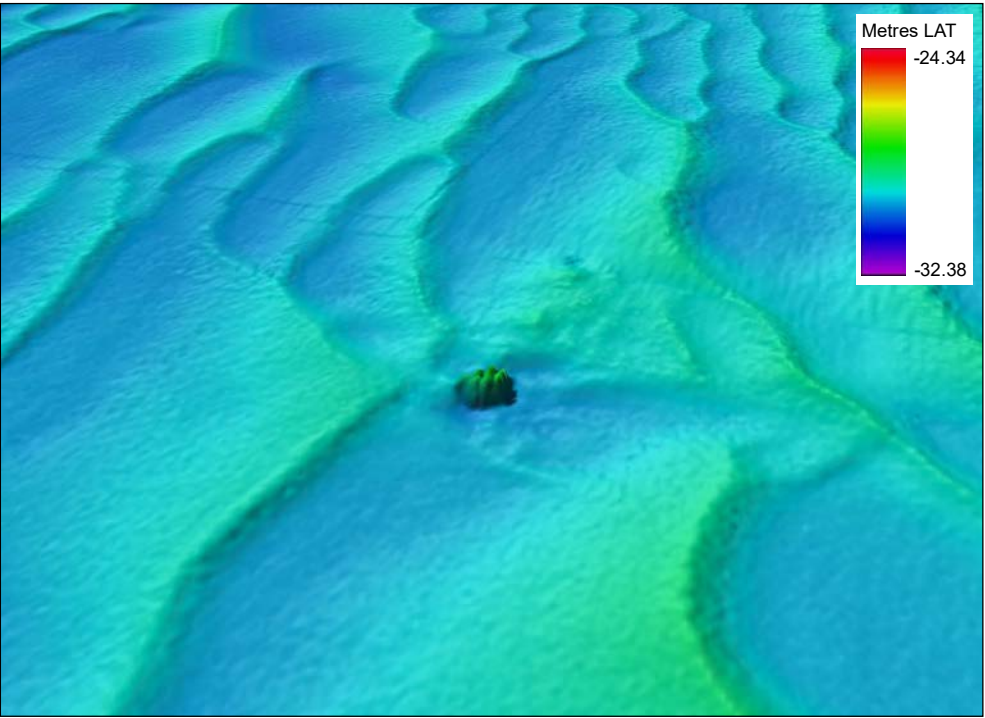
Location		453786 E 5923243 N	Area	Array area
Archaeological Importance		High		
Geophysical survey dimensions and notes		Wreck 70180 is a potential unidentified wreck situated in eastern part of the array area. It is recorded by the UKHO as an obstruction (94513).		
		The potential wreck is visible in 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.		
		In the Mag. data, the potential wreck is associated with a very large, sharp positive monopole of magnitude 2225 nT, indicating a significant amount of ferrous material.		
Build	Type	Unknown		
	Construction	Unknown, but assumed at least partially ferrous		
	Dimensions (m)	Unknown		
	Shipyard	Unknown		
Loss	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.		



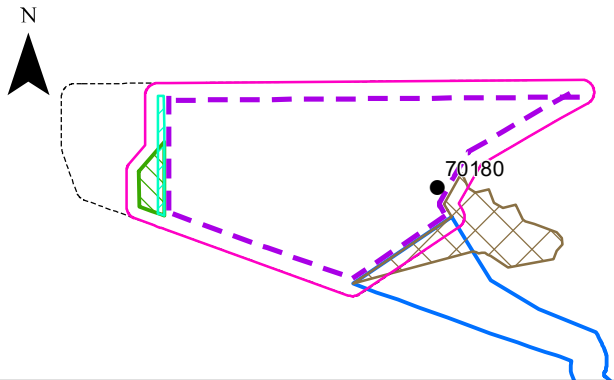
Mag. profile image



SSS waterfall image, 100 m range per channel



MBES grid image, x1 vertical exaggeration, looking north



LEGEND

Array Area

Array and Infrastructure zones buffer

Geophysical reporting extent

AyM to GyM interlink

Subsea Infrastructure and Temporary Works

Other Wind Farm Infrastructure Zone

Offshore Export Cable Corridor

Wreck location

Data Source:

PROJECT TITLE:
AWEL Y MÔR OFFSHORE WINDFARM

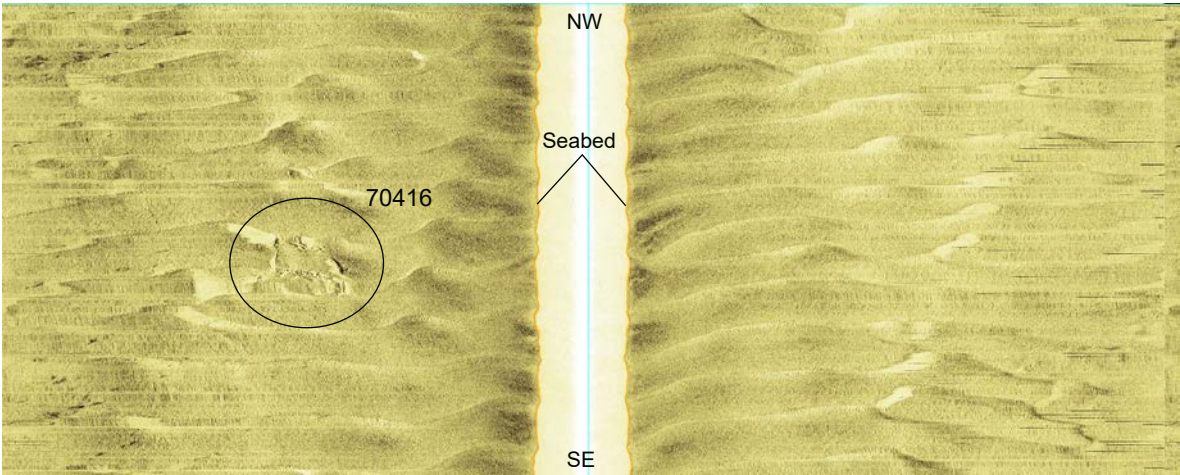
FIGURE TITLE:
ID 70180 – UKHO 94513 – Unknown

VER	DATE	REMARKS	Drawn	Checked
1	14/02/2022	For Issue	KF	DH

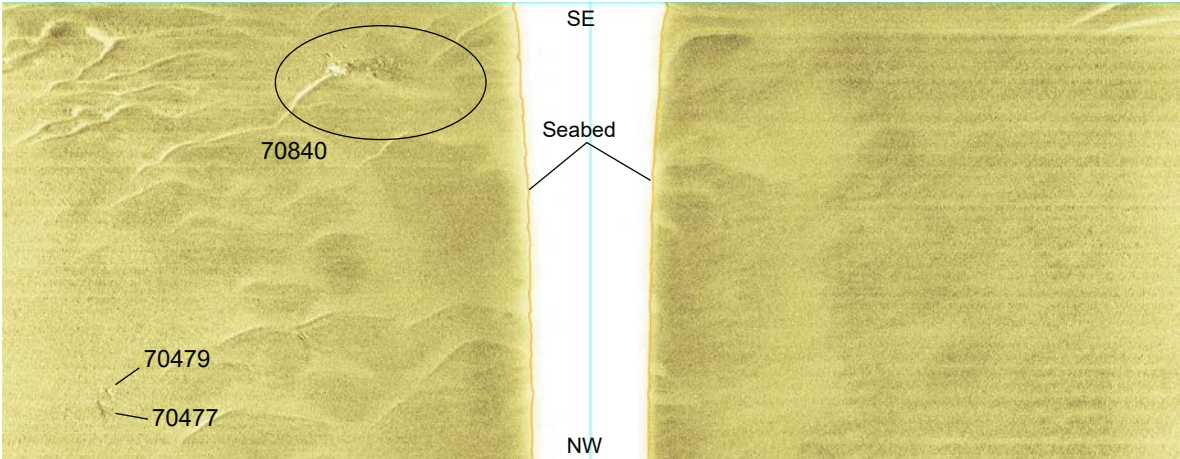
FIGURE NUMBER:
Figure 14

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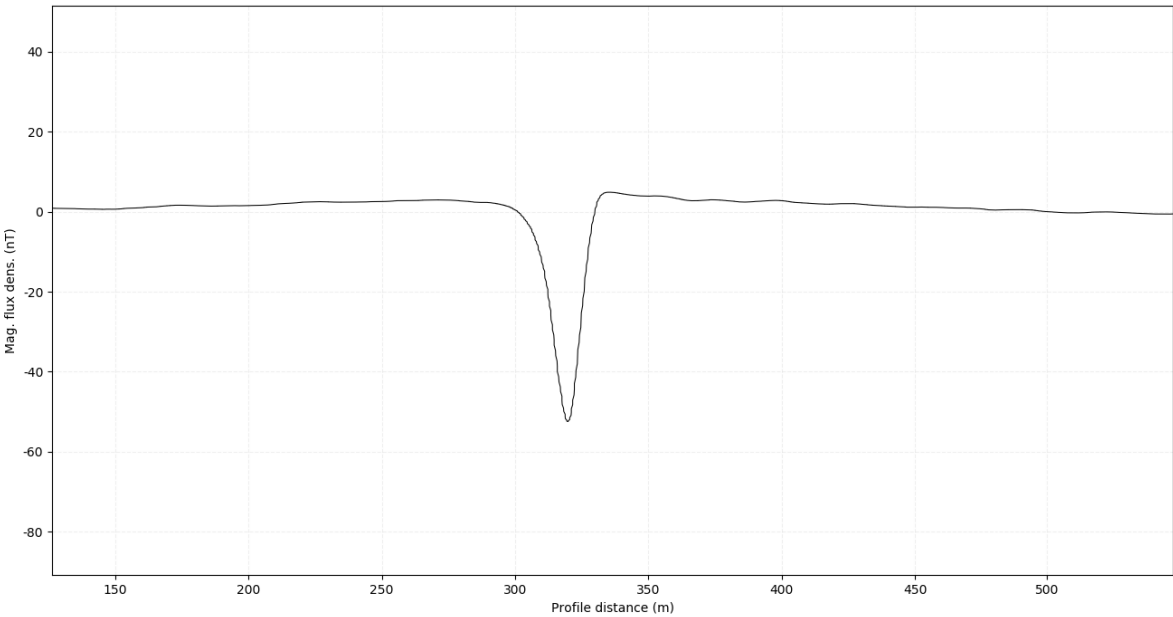
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AWEL Y MÔR
Offshore Wind Farm



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**

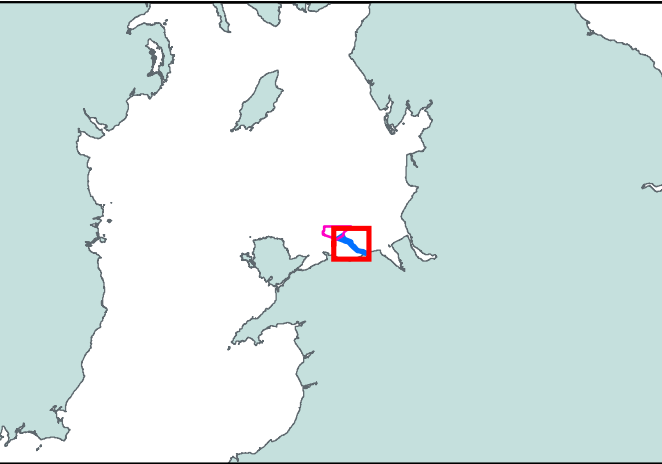
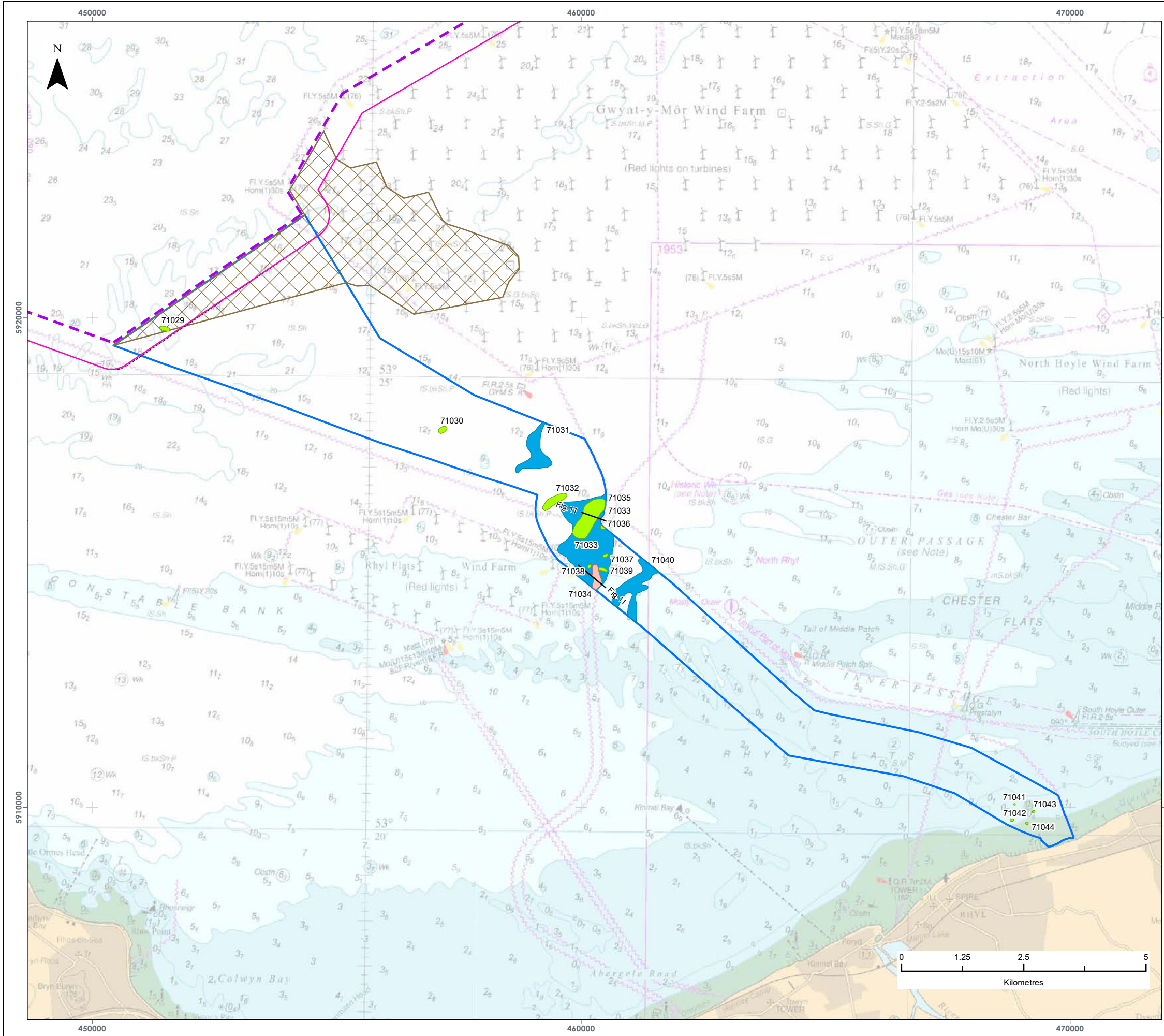
VER	DATE	REMARKS	Drawn	Checked
1	23/06/2021	For Issue	KJF	DH

FIGURE NUMBER:
Figure 15

SCALE: N/A	PLOT SIZE: A3	DATUM: N/A	PROJECTION: N/A
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Offshore Wind Farm



LEGEND

- Array Area
- Array and Infrastructure zones buffer
- Geophysical reporting extent
- AyM to GyM interlink
- 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

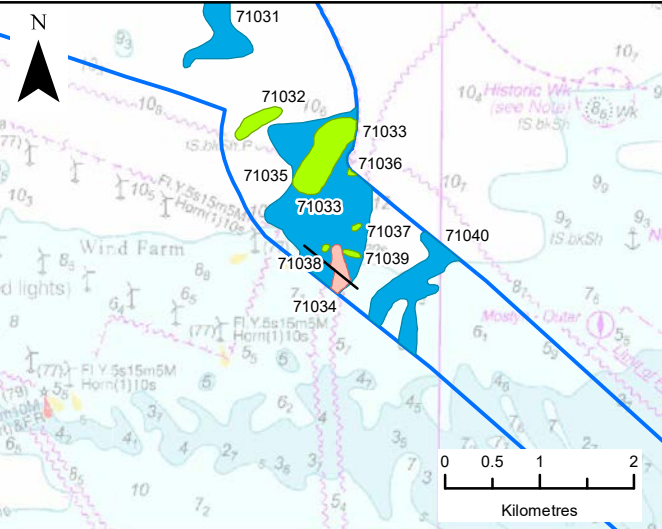
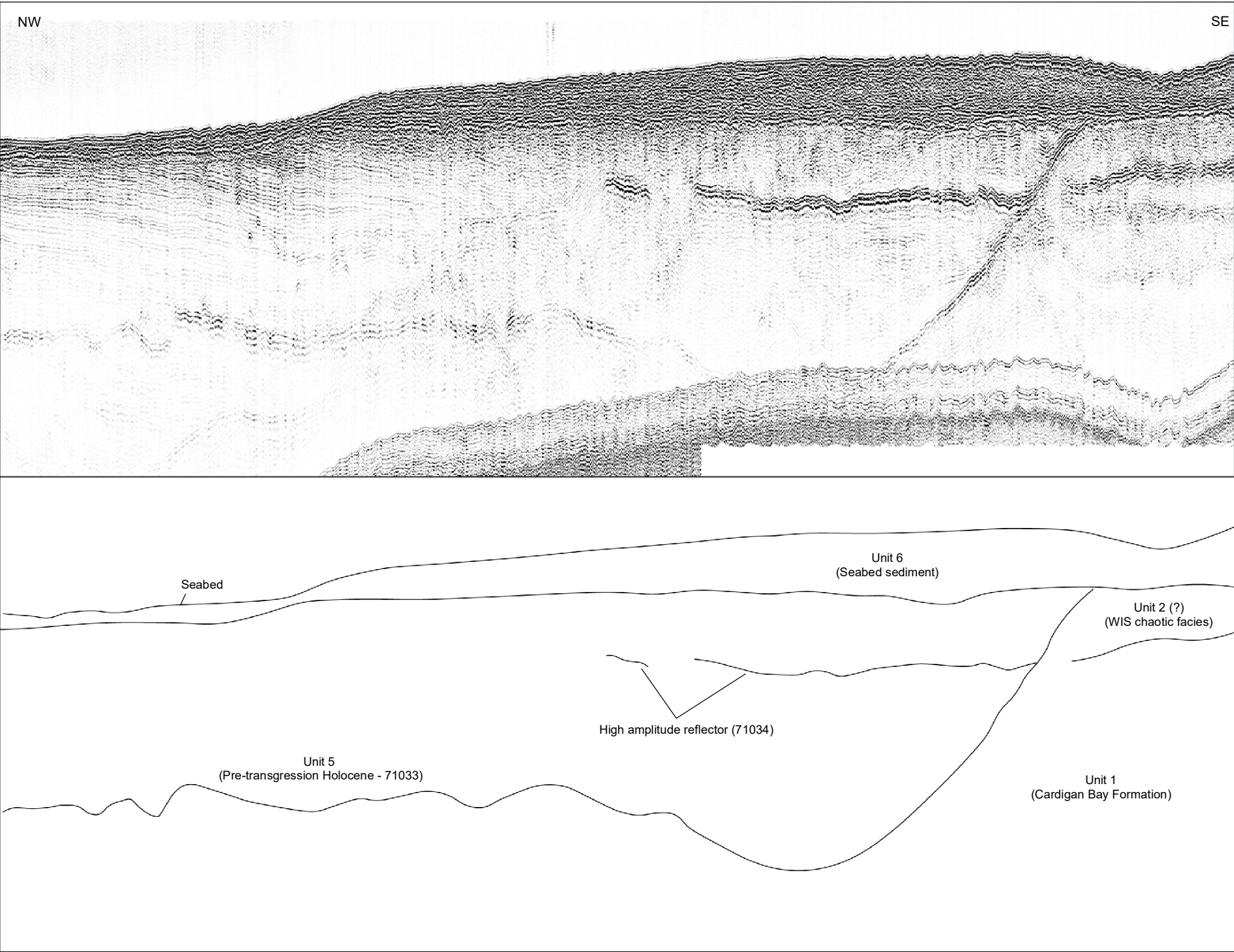
FIGURE TITLE: **Palaeogeographic features
of archaeological potential –
Offshore export cable corridor**

VER	DATE	REMARKS	Drawn	Checked
1	14/02/2022	For Issue	KJF	DH

FIGURE NUMBER:
Figure 16

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

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Offshore Wind Farm



- LEGEND**
- Offshore Export Cable Corridor
 - Data example locations
 - Palaeogeographic**
 - Channel
 - High amplitude reflector
 - Simple cut and fill

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PROJECT TITLE:
AWEL Y MÔR OFFSHORE WINDFARM

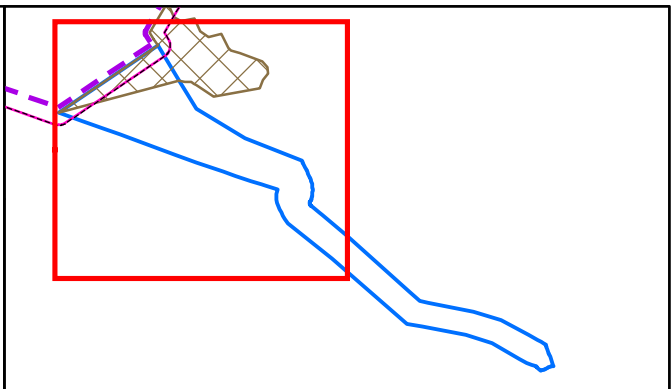
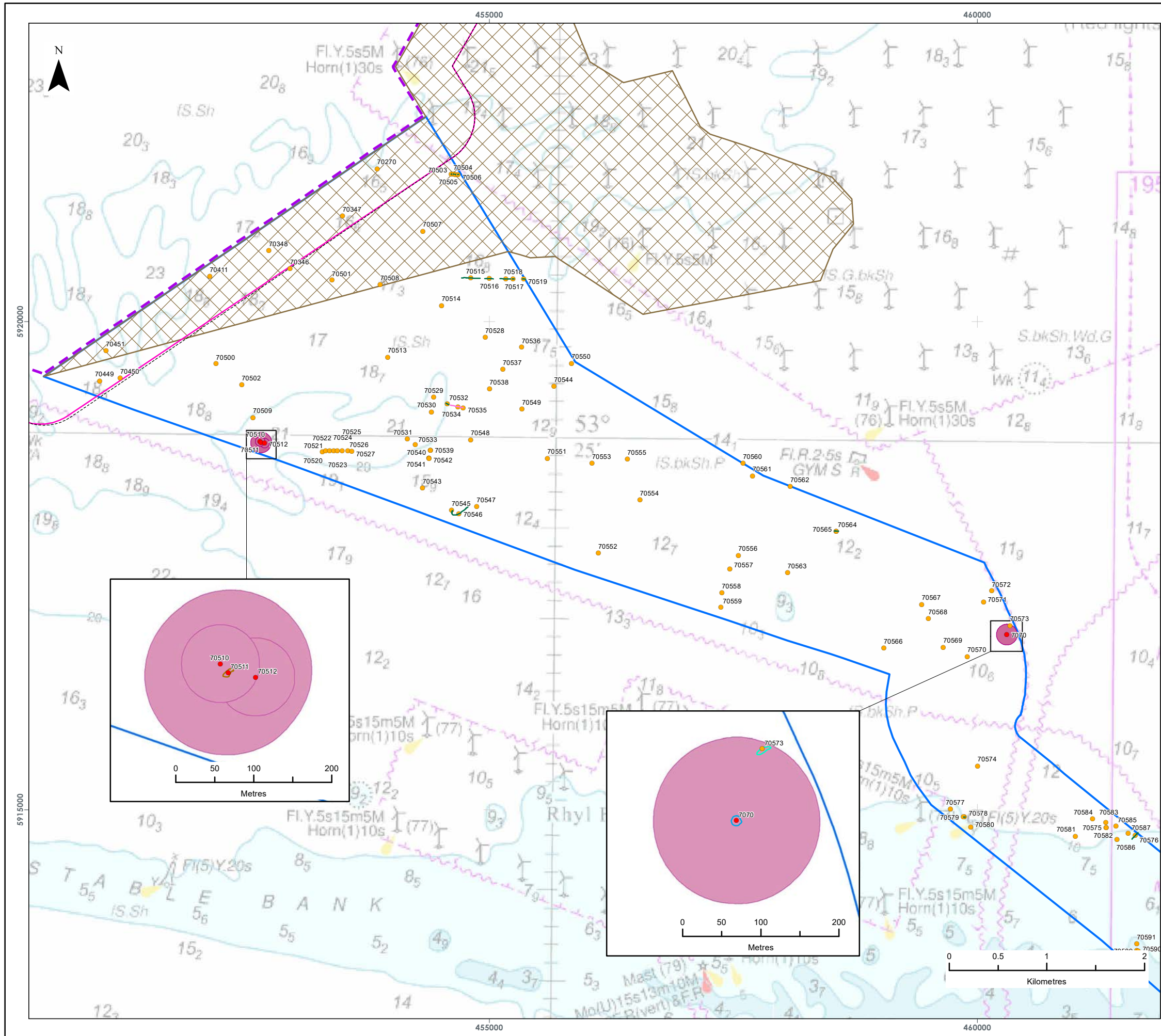
FIGURE TITLE:
SBP data example – 71033, 71034

VER	DATE	REMARKS	Drawn	Checked
1	14/02/2022	For Issue	KJF	DH

FIGURE NUMBER:
Figure 17

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



LEGEND

- Array Area
- Array and Infrastructure zones buffer
- Geophysical reporting extent
- 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:
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PROJECT TITLE:
AWEL Y MÔR OFFSHORE WINDFARM

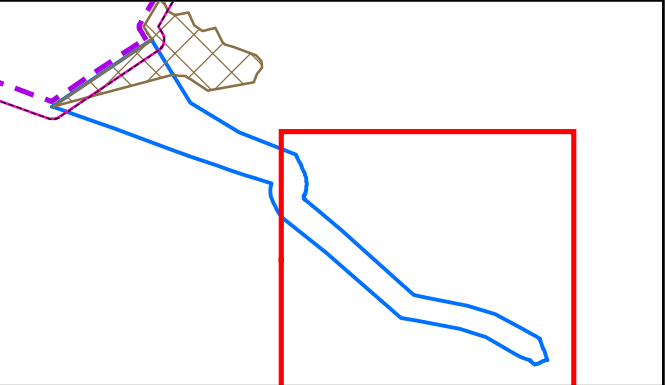
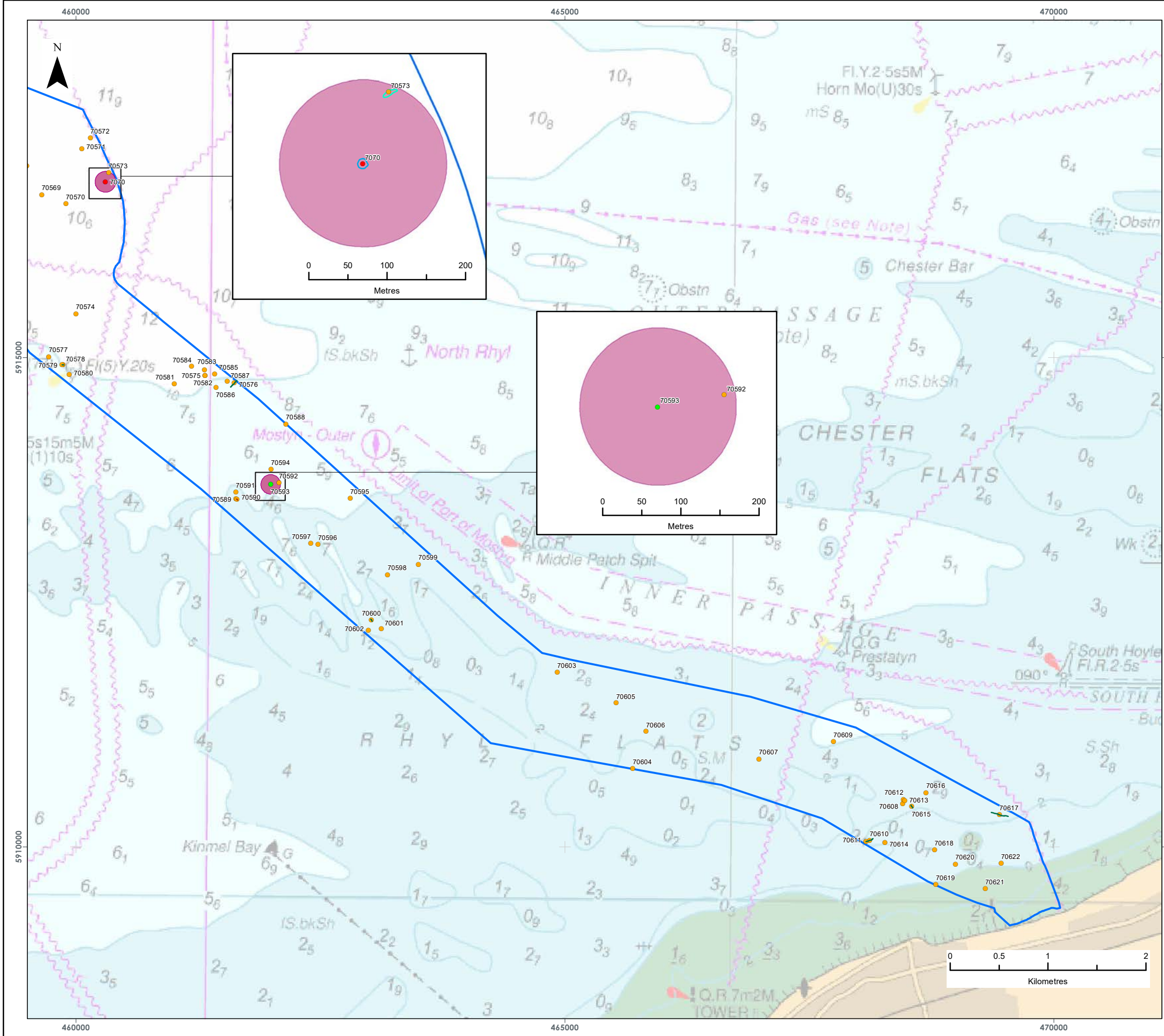
FIGURE TITLE:
Seabed features of archaeological potential – Offshore Export Cable Corridor

VER	DATE	REMARKS	Drawn	Checked
1	14/02/2022	For Issue	KF	DH

FIGURE NUMBER:
Figure 18

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

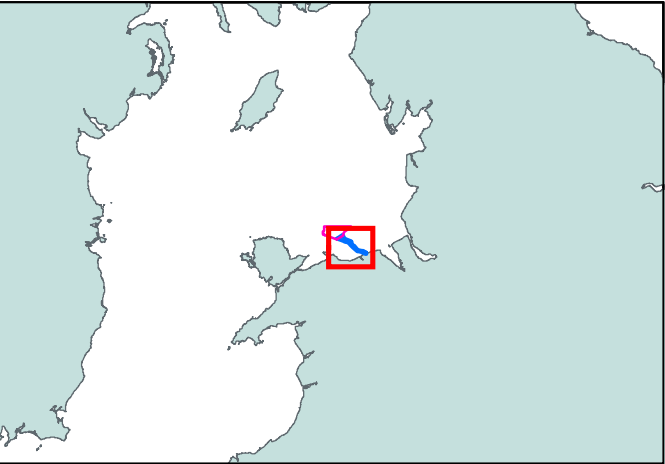
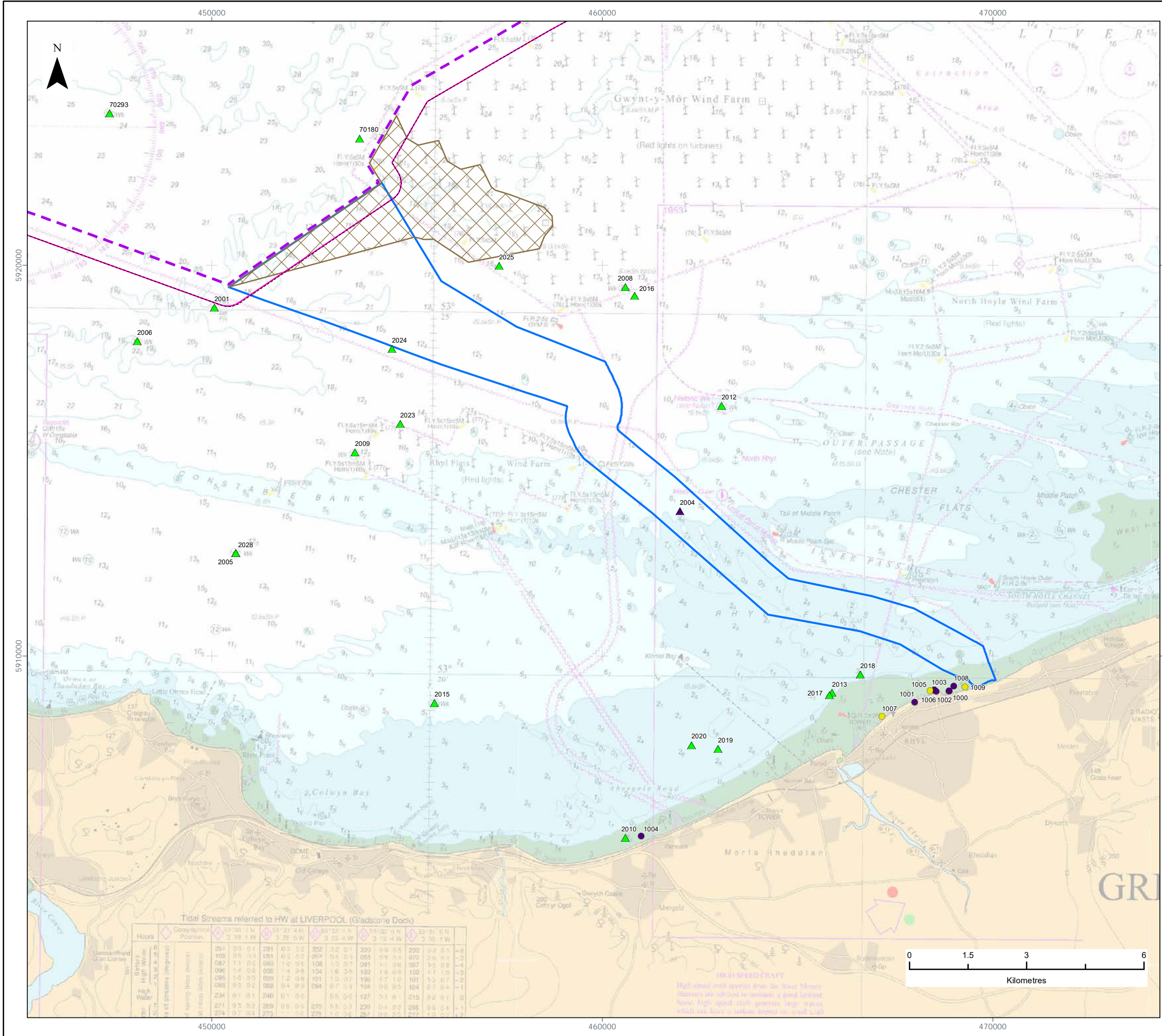
FIGURE TITLE:
Seabed features of archaeological potential – Offshore Export Cable Corridor

VER	DATE	REMARKS	Drawn	Checked
1	14/02/2022	For Issue	KF	DH

FIGURE NUMBER:
Figure 19

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

- Array Area
- Array and Infrastructure zones buffer
- Geophysical reporting extent
- 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

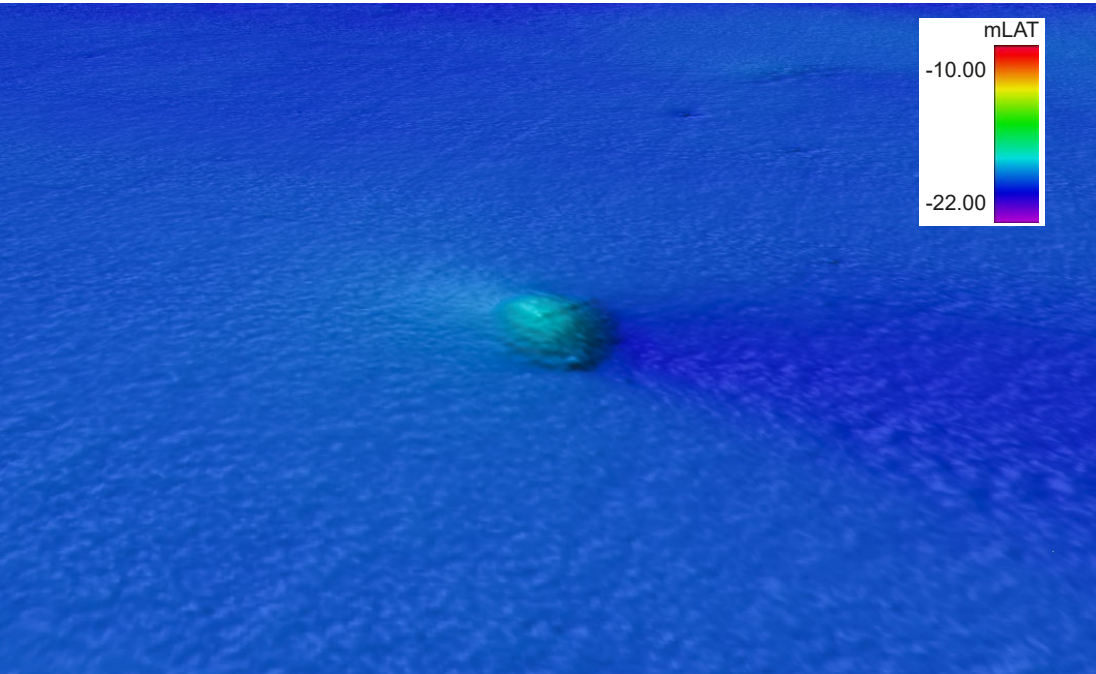
FIGURE TITLE:
Cable Corridor Study Area

VER	DATE	REMARKS	Drawn	Checked
1	14/02/2022	For Issue	KJF	LR

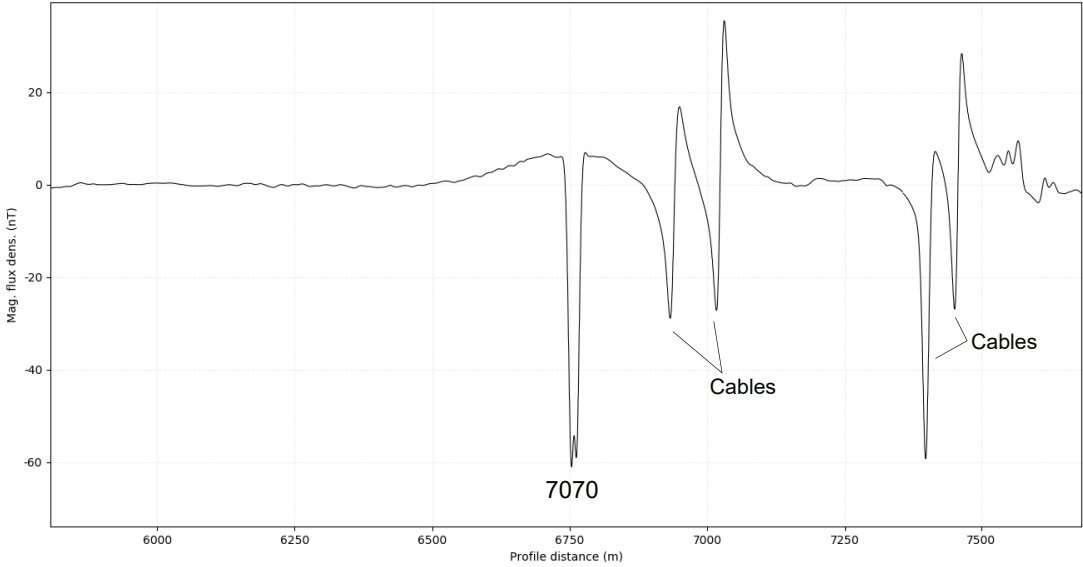
FIGURE NUMBER:
Figure 20

SCALE: 1:100,000	PLOT SIZE: A3	DATUM: WGS84	PROJECTION: UTM30N
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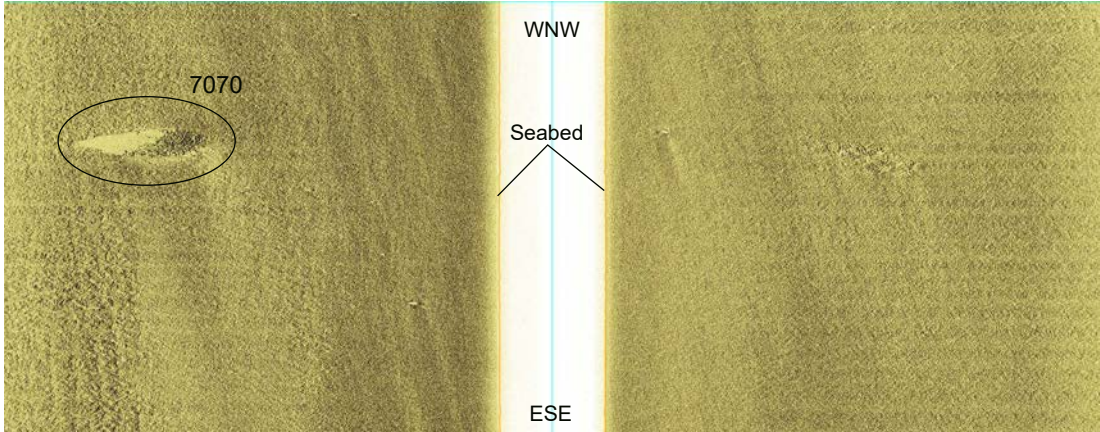
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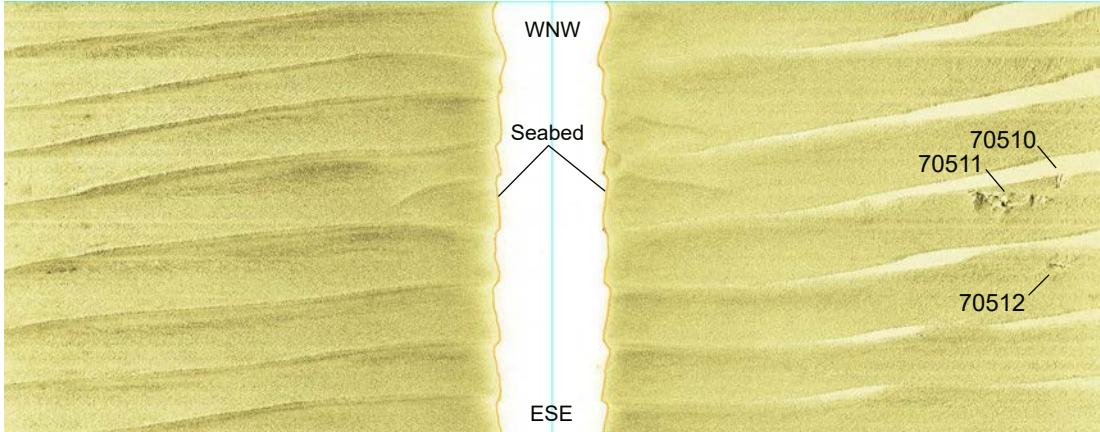
Anomaly **7070**, MBES grid image, x1 vertical exaggeration, looking north



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 21

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

Fferm Wynt Ailtraeth

AWEL Y MÔR
Offshore Wind Farm



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