

# MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

## Environmental Statement

### Outline offshore written scheme of investigation for archaeology

Deadline: 4

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Image of an offshore wind farm

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

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## MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

### Glossary

| Term                                             | Meaning                                                                                                                                                                                                                                                           |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Applicant                                        | Morgan Offshore Wind Limited.                                                                                                                                                                                                                                     |
| Developer                                        | The entity responsible for the construction of the Morgan Generation Assets.                                                                                                                                                                                      |
| Development Consent Order (DCO)                  | An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Projects (NSIP).                                                                                                                               |
| Ensonification                                   | To fill with sound. For example, the mechanism of detection is to ensonify with an acoustic source and measure the intensity of the returning sound waves.                                                                                                        |
| Environmental Statement                          | The document presenting the results of the Environmental Impact Assessment (EIA) process for the Morgan Offshore Wind Project: Generation Assets.                                                                                                                 |
| Gazetteer                                        | A geographical index or dictionary.                                                                                                                                                                                                                               |
| Inter-array cables                               | Cables which connect the wind turbines to each other and to the offshore substation platforms. Inter-array cables will carry the electrical current produced by the wind turbines to the offshore substation platforms.                                           |
| Interconnector cables                            | Cables that may be required to interconnect the offshore substation platforms in order to provide redundancy in the case of cable failure elsewhere.                                                                                                              |
| Morgan Array Area                                | The area within which the wind turbines, foundations, inter-array cables, interconnector cables, scour protection, cable protection and offshore substation platforms (OSPs) forming part of the Morgan Offshore Wind Project: Generation Assets will be located. |
| Morgan Offshore Wind Project                     | The Morgan Offshore Wind Project is comprised of both the generation assets and Morgan and Morecambe Offshore Wind Farms: Transmission Assets and associated activities.                                                                                          |
| Morgan Offshore Wind Project: Generation Assets  | This is the name given to the Morgan Generation Assets project as a whole (includes all infrastructure and activities associated with the project construction, operations and maintenance, and decommissioning).                                                 |
| Non-statutory consultee                          | Organisations that an applicant may choose to consult in relation to a project who are not designated in law but are likely to have an interest in the project.                                                                                                   |
| Offshore Substation Platform (OSP)               | A fixed structure located within the wind farm sites, containing electrical equipment to aggregate the power from the wind turbine generators and convert it into a more suitable form for export to shore.                                                       |
| Outline Offshore Written Scheme of Investigation | The Outline Offshore Written Scheme of Investigation (WSI) sets out the proposed approaches and commitments to archaeological survey and investigation to be undertaken post-consent offshore.                                                                    |
| Palaeoenvironmental                              | An environment of a past geological age.                                                                                                                                                                                                                          |
| Pre-construction site investigation surveys      | Pre-construction geophysical and/or geotechnical surveys undertaken offshore to inform, amongst other things, the final design of the Morgan Generation Assets.                                                                                                   |
| Statutory consultee                              | Organisations that are required to be consulted by an applicant pursuant to the Planning Act 2008 in relation to an application for development consent. Not all consultees will be statutory consultees (see non-statutory consultee definition).                |
| Vibrocoring                                      | A technique for collecting core samples of the seabed sub-strata sediments, consists of a vibrating mechanism attached to a metallic core which is driven into the sediment by the force of gravity, enhanced by vibration energy                                 |
| Wind turbines                                    | The wind turbine generators, including the tower, nacelle and rotor.                                                                                                                                                                                              |

## MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

### Acronyms

| Acronym               | Description                                               |
|-----------------------|-----------------------------------------------------------|
| AC                    | Archaeological Curator                                    |
| AD                    | Anno domini                                               |
| ADS                   | Archaeological Data Service                               |
| AEZ                   | Archaeological Exclusion Zone                             |
| BP                    | Before Present                                            |
| CIfA                  | Chartered Institute for Archaeologists                    |
| COWRIE                | Collaborative Offshore Wind Research into the Environment |
| EnBW                  | Energie Baden-Württemberg AG                              |
| GIR                   | Ground Investigation Report                               |
| GIS                   | Geographic Information System                             |
| HE                    | Historic England                                          |
| HER                   | Historic Environment Record                               |
| JNAPC                 | Joint Nautical Archaeology Policy Committee               |
| LAT                   | Lowest Astronomical Tide                                  |
| LGM                   | Last Glacial Maximum                                      |
| MBES                  | Multibeam Echosounder                                     |
| MHWS                  | Mean High Water Springs                                   |
| MMO                   | Marine Management Organisation                            |
| MNH                   | Manx National Heritage                                    |
| MOD                   | Ministry of Defence                                       |
| MPS                   | Marine Policy Statement                                   |
| MS                    | Method Statement                                          |
| NMRW                  | National Monuments Record of Wales                        |
| NRHE                  | National Record of the Historic Environment               |
| <a href="#">NWRRE</a> | <a href="#">North West Regional Research Framework</a>    |
| OASIS                 | Online Access to the Index of Investigations              |
| OSPs                  | Offshore Substation Platforms                             |
| PAD                   | Protocol for Archaeological Discoveries                   |
| PEIR                  | Preliminary Environmental Information Report              |
| RA                    | Retained Archaeologist                                    |
| ROV                   | Remotely Operated Vehicle                                 |
| RoW                   | Receiver of Wreck                                         |
| SI                    | Site Investigations                                       |
| SPVA                  | Service Personnel and Veterans Agency                     |

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| Acronym | Description                             |
|---------|-----------------------------------------|
| SSS     | Side Scan Sonar                         |
| TAEZ    | Temporary Archaeological Exclusion Zone |
| UKHO    | United Kingdom Hydrographic Office      |
| UXO     | Unexploded Ordnance                     |
| WSI     | Written Scheme of Investigation         |

## Units

| Unit            | Description       |
|-----------------|-------------------|
| km <sup>2</sup> | Square kilometres |
| km              | Kilometres        |
| m               | Meters            |
| MW              | Megawatts         |

# 1 Outline Offshore written scheme of investigation

## 1.1 Introduction

1.1.1.1 This document forms an Outline Offshore Written Scheme of Investigation (WSI), produced to support the Volume 2, Chapter 8: Marine archaeology and cultural heritage of the Environmental Statement (Document Reference F2.8) in support of the Morgan Offshore Wind Project: Generation Assets (hereafter referred to as Morgan Generation Assets). The Outline Offshore WSI sets out the basis for archaeological mitigation which will be confirmed through the development of a final Offshore WSI which will form the basis of the agreement between the Applicant contractors and regulators.

~~1.1.1.1~~1.1.1.2 This version of the WSI has been submitted at Deadline 4 of the Morgan Generation Assets Examination. This was requested within the Examining Authority questions submitted at Deadline 3 and in response to comments from Historic England's Written Representation.

~~1.1.1.2~~1.1.1.3 The purpose of the document is to set out of the marine archaeology mitigation proposed for the Morgan Generation Assets as detailed in section 1.6, and how this mitigation will be secured and delivered. The document also sets out further work related to marine archaeology which has been recommended within Volume 2, Chapter 8: Marine archaeology and cultural heritage of the Environmental Statement (Document Reference F2.8).

~~1.1.1.3~~1.1.1.4 This document has been produced in line with best practice guidance, in particular, Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects by The Crown Estate (2021).

~~1.1.1.4~~1.1.1.5 This Outline Offshore WSI and the Protocol for Archaeological Discoveries (PAD) are prepared in relation to the offshore works of the Morgan Generation Assets only. This Outline Offshore WSI details the principles to be implemented to ensure the protection of marine archaeological receptors through all three phases of the project (construction, operations and maintenance, and decommissioning).

~~1.1.1.5~~1.1.1.6 The Outline Offshore WSI will be converted into a final Offshore WSI which will be monitored and updated throughout the lifetime of Morgan Generation Assets to ensure that the document is appropriate for all activities associated with the project. More detailed Method Statements (MS) may be required for each phase of work and will be prepared by appropriately qualified archaeologists and submitted to the Archaeological Curator (AC). The Offshore WSI will continue to be developed in consultation with Historic England (HE) who are the lead marine archaeology stakeholder in relation to Morgan Generation Assets and will be submitted to the Marine Management Organisation (MMO) for approval prior to construction.

~~1.1.1.6~~1.1.1.7 The Offshore WSI is an 'accompanying document' to the Morgan Generation Assets Environmental Statement. It is therefore a standalone document which ensures that the archaeological baseline that corresponds to the Offshore WSI is available to consultees.

### 1.1.1 Background

1.1.1.1 Morgan Offshore Wind Limited (hereafter 'the Applicant') is a joint venture between Energie Baden-Württemberg AG (EnBW) and bp. Morgan Generation Assets includes

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the wind turbines, foundations, inter-array cables, Offshore Substation Platforms (OSPs) and interconnector cables.

- 1.1.1.2 The Morgan marine archaeology study area considered in Volume 2, Chapter 8: Marine archaeology and cultural heritage of the Environmental Statement (Document Reference F2.8) is shown in Figure 1.1 and consists of the Morgan Array Area with an additional 2 km buffer. The Morgan marine archaeology study area has been defined to better characterise the archaeological resource within the Morgan Array Area (set out within Volume 4, Annex 8.1: Marine archaeology technical report of the Environmental Statement (Document Reference F4.8.1)). The mitigation set out within this document (section 1.6) is focused on Morgan Generation Assets.

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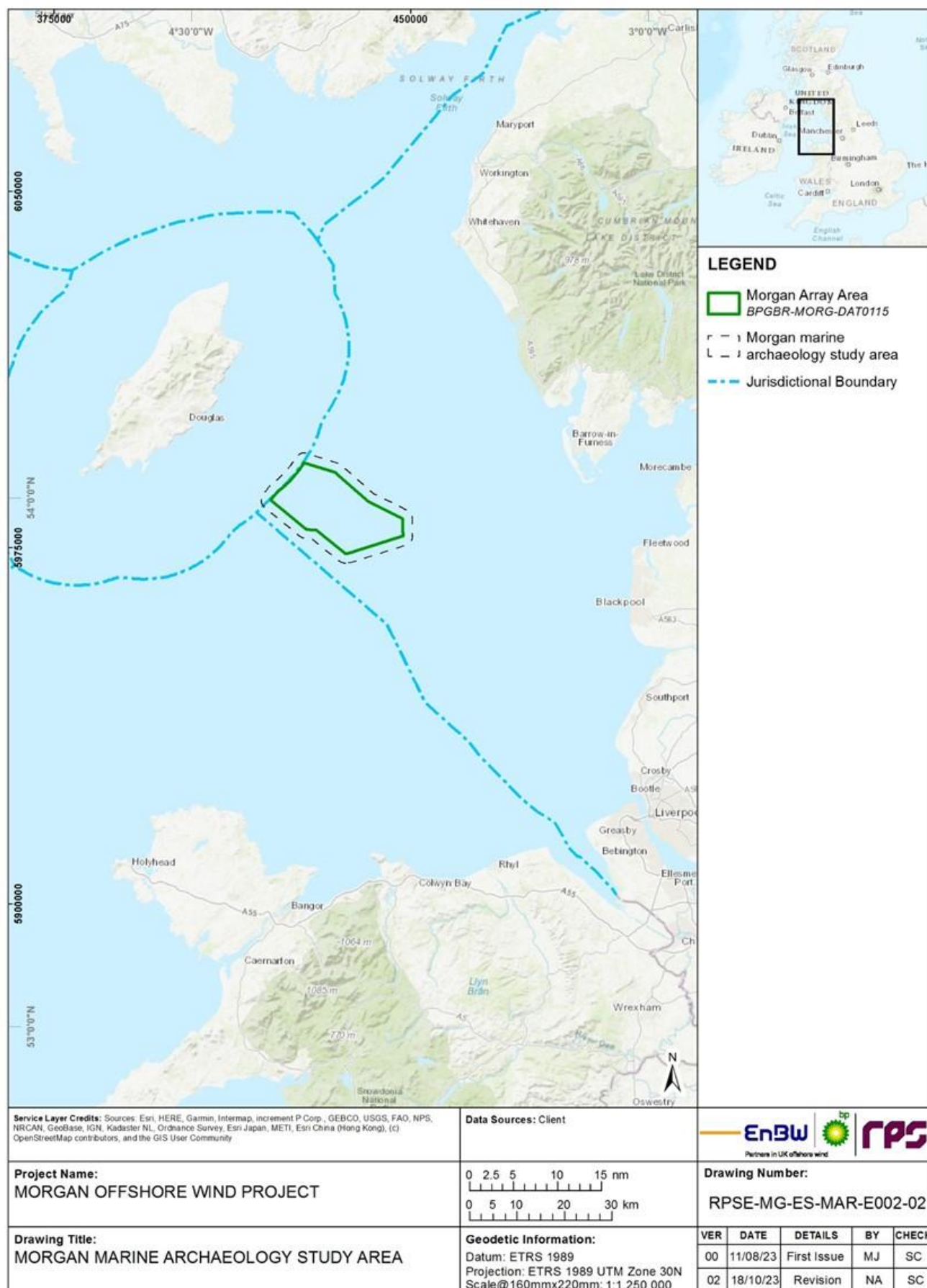


Figure 1.1: Morgan Marine Archaeology study area.

## **1.1.2 Aims and objectives**

1.1.2.1 The aim of this Outline Offshore WSI is to present the archaeological mitigation measures to be undertaken by the Applicant prior to and throughout the construction, operations and maintenance, and decommissioning phases of Morgan Generation Assets. The Outline Offshore WSI is informed by pre-application consultation with HE and the baseline review of known and potential archaeology within the Morgan marine archaeology study area (Figure 1.1) as outlined in section 1.4 and presented within the Marine archaeology technical report of the Environmental Statement (Document Reference F4.8.1).

1.1.2.2 The objectives of this Outline Offshore WSI are as follows:

- Set out the roles and respective responsibilities of the Applicant, contractors, and Retained Archaeologist (RA) and Archaeological Contractor(s) and formal lines of communication between these parties and the AC (section 1.2.1)
- Outline the known and potential archaeological receptors that could be impacted by Morgan Generation Assets (section 1.3)
- Outline the agreed measures adopted as part of the project and requirements for archaeological work to be undertaken in various circumstances (section 1.6)
- Set out the importance of consulting archaeological research frameworks for setting objectives that are met through the archaeological work undertaken by Morgan Generation Assets (section 1.4.6)
- Provide methodologies for the required archaeological work, to be employed in the post-consent period (section 1.7).

### **Guidance**

1.1.2.3 This Outline Offshore WSI has been produced in line with best practice guidance, including:

- Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects by (The Crown Estate, 2021)
- HE's Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment (English Heritage (now Historic England), 2008)
- Code of Conduct (Chartered Institute for Archaeologists, 2014 (updated 2022))
- Collaborative Offshore Wind Research into the Environment (COWRIE) Historic Environment Guidance for the Offshore Renewable Energy Sector (Wessex Archaeology, 2007)
- Offshore Renewables Protocol for Archaeological Discoveries (The Crown Estate, 2014)
- Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector (Gribble and Leather, 2011)
- Marine Geophysics Data Acquisition, Processing and Interpretation, Guidance Notes (English Heritage (now Historic England), 2013)
- Identifying and Protecting Palaeolithic Remains (English Heritage, 1998)
- Military Aircraft Crash Sites (English Heritage (now Historic England), 2002)

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- Aircraft Crash Sites at Sea (Wessex Archaeology, 2008)
- Code of Practice for Seabed Development (Joint Nautical Archaeology Policy Committee (JNAPC), 2006).

## 1.2 Implementation of the Outline Offshore WSI

### 1.2.1 Roles and responsibilities

#### The Applicant

- 1.2.1.1 The Applicant will directly engage with the appointed construction contractor and the RA, as necessary. The responsibility for implementing the Offshore WSI rests with the Applicant and its appointed representatives. Following the grant of development consent, the Applicant will provide the RA with the programme of construction.
- 1.2.1.2 The Applicant or their representatives will submit the archaeological MS or reports to the MMO in the first instance who will then forward to the AC for approval. The Applicant will be responsible for any consultation requirements with the MMO and the AC, with advice from the RA.

#### Retained Archaeologist (RA)

- 1.2.1.3 The Applicant shall employ the services of a suitably qualified and experienced marine archaeologist (the RA) to ensure the effective implementation of the Offshore WSI and other relevant commitments in relation to archaeology.
- 1.2.1.4 Prior to the Application submission, RPS (supported by MSDS Marine) are acting in the role of the RA.
- 1.2.1.5 In relation to the implementation of the Offshore WSI, the RA will report to the Applicant or their named representative. Interaction with the Applicant's construction team will be administered by the Applicant or their appointed representative and advised by the RA.
- 1.2.1.6 The responsibilities of the RA will include:
- Maintaining, reviewing and updating the Offshore WSI as required
  - Advising the Applicant's construction team on those elements of Morgan Generation Assets that require archaeological involvement
  - Ensuring the scope of work specifications Morgan Generation Assets to meet archaeological requirements
  - Liaising with the Applicant's construction team or other construction contractors regarding timescales of completion of site investigations (SI) to ensure sufficient time is available to complete all archaeological work in accordance with the Offshore WSI
  - Advising the Project Manager for Morgan Generation Assets on the micro-siting of infrastructure
  - Advising, preparing and issuing MS to the AC for approval
  - Implementing and monitoring of the PAD
  - Providing advice to vessel staff/Unexploded Ordnance (UXO) specialists in the event of a discovery of high archaeological interest

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- Monitoring the work of and liaising with the Archaeological Contractor(s) where this is not the RA
- Monitoring the preparation and submission of Archaeological Reports as appropriate and making them available to the AC for approval
- Preparing provisions for the management of Morgan Generation Assets archives in consultation with an appropriate museum
- Advising the Applicant and the AC on final arrangements for the analysis, archive deposition, publication and popular dissemination of the results of the archaeological works.

### Archaeological contractors

- 1.2.1.7 Archaeological Contractors may be employed by the Applicant or the RA. Suitably qualified Archaeological Contractors may be contracted to provide a range of services relating to specialised archaeological provisions (e.g. divers, the piloting of Remotely Operated Vehicles (ROVs), geotechnical analysis etc.)

### Construction contractors

- 1.2.1.8 All construction contractors engaged in the construction, operations and maintenance and decommissioning of Morgan Generation Assets shall:
- Familiarise themselves with the requirements of the Offshore WSI and make them available to their staff
  - Obey legal obligations in respect of 'wreck' under the Merchant Shipping Act 1995
  - Obey legal obligations in respect of 'treasure' under the Treasure Act 1996
  - Respect constraint maps, Archaeological Exclusion Zones (AEZ)s and Temporary Archaeological Exclusion Zones (TAEZ)s
  - Notify the RA prior to any diving/ROV investigation
  - Notify the RA in advance of any construction works that warrant archaeological mitigation
  - Assist and afford access to archaeologists employed by the Applicant
  - Inform the RA of any environmental constraint or matter relating to health, safety and welfare of which they are aware that is relevant to the archaeologist's activities
  - Implement the PAD
  - Suspend work in areas where objects have been identified as being of potential archaeological interest and contact the RA in the event of an archaeological discovery.

### Archaeological Curator (AC)

- 1.2.1.9 HE is the AC for heritage matters offshore up to Mean High Water Springs (MHWS). HE are the public body responsible for the care and protection of England's historic environment, which includes marine archaeology within English territorial waters. Contact from the Applicant with the AC will be through the MMO as the Regulator.

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- 1.2.1.10 MSs, assessment reports or other deliverables will be submitted by the Applicant to the MMO who will forward on to the AC for approval. Their agreement/acceptance of the documents will be assumed if no contrary response is received within 30 working days of submission.
- 1.2.1.11 To encourage timely decisions relating to archaeological mitigation and avoid disruptions to the Morgan Generation Assets programme, the MMO and HE will be consulted as soon as practicable on discoveries made during the programme of works and regarding the management and removal of AEZs or Temporary AEZs.

### Contacts

- 1.2.1.12 The relevant contacts for the purposes of this Offshore WSI are given in Table 1.1 below.

**Table 1.1: Key contacts for the Offshore WSI.**

| Contact                 | Address                                                                                              | Email                        | Phone                        |
|-------------------------|------------------------------------------------------------------------------------------------------|------------------------------|------------------------------|
| Historic England        | To be completed post consent                                                                         | To be completed post consent | To be completed post consent |
| Receiver of Wreck (RoW) | The Maritime and Coastguard Agency<br>Spring Place<br>105 Commercial Road<br>Southampton<br>SO15 1EG | █@mcga.gov.uk                | 0131 247 4120                |

## 1.2.2 Reviewing the Offshore WSI

- 1.2.2.1 Provision will be made for the Offshore WSI to be revised and MSs appended as appropriate, should particular archaeological issues be encountered. The Offshore WSI encompasses a wide range of development options, and therefore the Offshore WSI will be reviewed and updated throughout the development process to ensure the final Offshore WSI is appropriate for the final design. At each stage of the project, the RA will advise as to the potential requirements of the specific archaeological investigations as outlined in this document. Appropriate MSs will be prepared as required for each element, in line with the requirements of the Offshore WSI, and these will be submitted to the MMO for approval. Revisions will be prepared by the RA and submitted to the Applicant who will ensure submission to and approval by the MMO, in addition to other relevant licencing and consenting bodies in consultation with the AC. Approval by the AC will be assumed if no response is received within 30 working days of submission.

## 1.2.3 Compliance with the Offshore WSI

- 1.2.3.1 Compliance with this Offshore WSI will be ensured by regular meetings between the RA and the Applicant. The regularity of meetings may alter during different phases of Morgan Generation Assets; however, regular contact will be maintained to ensure compliance with the Offshore WSI. These meetings ensure compliance through agendas which include discussions of the construction programme and any upcoming work which may require archaeological input, as per the stipulations of this Offshore WSI. The RA also advises the Applicant of the scope of any necessary works and plans these works at the meetings and other meetings as required.

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- 1.2.3.2 Following this advice, appropriate MSs will be prepared as required for each element of Morgan Generation Assets which requires archaeological involvement, in line with the requirements of the Offshore WSI. These will be submitted to the MMO and the AC for approval. Approval by the AC will be assumed if no response is received within 30 working days of submission. The RA will ensure compliance with these MSs during the subsequent works, thereby also ensuring compliance with the Offshore WSI.
- 1.2.3.3 The performance of the Offshore WSI will also be monitored through the provision of archaeological reports, prepared to inform on the results of various activities undertaken under its auspices. These include a review of new geophysical, geotechnical and environmental data; and the implementation of the PAD for reporting finds of archaeological interest during all works associated with Morgan Generation Assets. These reports will be submitted to the Applicant who will ensure their dissemination to the AC.
- 1.2.3.4 The responsibility for ensuring the implementation of the PAD for reporting finds of archaeological interest rests with the Applicant, who will ensure that its agents and contractors are contractually bound to implement the PAD.
- 1.2.3.5 During any site evaluation/investigation or construction work that has the potential to affect any archaeological receptors, the RA will advise the Applicant who will liaise directly with the AC with regard to site monitoring and reporting. The Applicant will be kept informed of any contact between the RA and the AC. A programme of monitoring visits (if deemed appropriate) by the AC and the Applicant will be agreed in advance of the commencement of work on site.

### 1.2.4 Health and safety

- 1.2.4.1 The RA will ensure that any MSs prepared to meet the requirements of the Offshore WSI are compliant with the requirements of the Applicant's Health and Safety Plans for Morgan Generation Assets.
- 1.2.4.2 Health and Safety considerations will be of paramount importance in conducting all archaeological work. Safe working practices will override archaeological considerations at all times.
- 1.2.4.3 All work will be carried out in accordance with the Health and Safety at Work etc. Act 1974, the Management of Health and Safety at Work Regulations 1999, the SCAUM (Standing Conference of Archaeological Unit Managers) health and safety manual Health and Safety in Field Archaeology (SCAUM, 2007) and all other relevant Health and Safety legislation, regulations and codes of practice in force at the time.

## 1.3 Morgan Generation Assets details

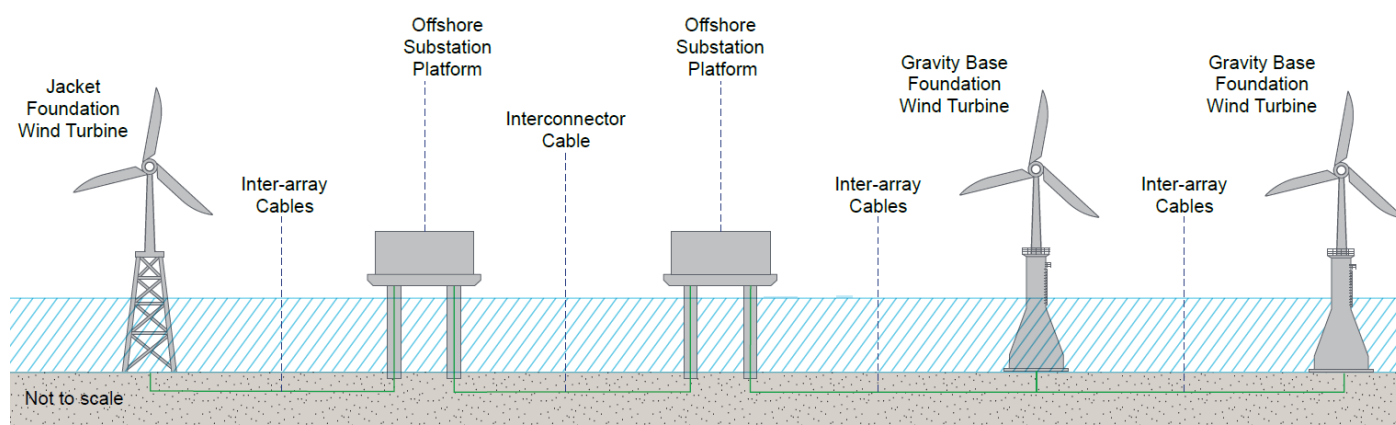
- 1.3.1.1 Morgan Generation Assets will be located in the east Irish Sea and will include up to 96 wind turbines. The proposed capacity of the Morgan Generation Assets is over 100 MW, therefore it is within the Planning Act 2008 thresholds for an English offshore generating station being a Nationally Significant Infrastructure Project (NSIP). The final capacity of the Morgan Generation Assets will be determined based on available technology and constrained by the design envelope of the wind turbines. The offshore infrastructure will include up to 60 km of interconnector cable and 390 km of inter-array cable.
- 1.3.1.2 The key components of the Morgan Generation Assets are shown in Figure 1.2 and the key parameters are presented in Table 1.2.

## MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.3.1.3 The Applicant intends to commence construction of the Morgan Generation Assets in 2026 and for it to be fully operational by 2030 in order to help meet the UK Government's renewable energy targets.

**Table 1.2: Key parameters for Morgan Generation Assets.**

| Parameter                                                         | Value  |
|-------------------------------------------------------------------|--------|
| Morgan Array Area (km <sup>2</sup> )                              | 280    |
| Average water depth (m Lowest Astronomical Tide)                  | -38.27 |
| Maximum number of wind turbines                                   | 96     |
| Maximum blade tip height above Lowest Astronomical Tide (LAT) (m) | 364    |
| Maximum number of OSPs                                            | 4      |
| Maximum length of inter-array cables (km)                         | 390    |
| Maximum length of interconnector cables (km)                      | 60     |



**Figure 1.2: Overview of Morgan Generation Assets infrastructure.**

## 1.4 Archaeological baseline

### 1.4.1 Approach

- 1.4.1.1 A baseline assessment including desktop study and archaeological assessment of geophysical and geotechnical survey data has been undertaken in support of the Environmental Statement. The methodology and results of this assessment are set out in detail within Volume 4, Annex 8.1: Marine archaeology technical report of the Environmental Statement (Document Reference F4.8.1). This section presents a summary of this assessment.

### 1.4.2 Submerged prehistoric archaeology

- 1.4.2.1 The prehistoric archaeological record of the British Isles covers the period from the earliest hominin occupation more than 780,000 BP (Before Present) to the Roman invasion of Britain in 43 anno domini (AD). During this long span of time, sea level fluctuations caused by three major glaciations (the Anglian, Wolstonian and the Devensian) have shaped the submerged prehistoric landscape within the Morgan

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marine archaeology study area. The changes in sea level have at times exposed the seabed floor creating a terrestrial and potentially habitable environment, suitable for hominin occupation and exploitation.

1.4.2.2 Geological periods referred to in this section are defined by the date ranges presented in Table 1.3.

**Table 1.3: Geological periods.**

| Period                                                                | Date Range                  | Notes                                                                                                                                                                                                           |
|-----------------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Holocene                                                              | 10,000 BP to Present Day    | Mesolithic, Neolithic, Bronze Age, Iron Age, Roman, Medieval, Post Medieval and Modern periods. The Holocene is the current time period within the larger geological time scale known as the Quaternary Period. |
| Devensian from Post Late Glacial Maximum to Late Glacial Interstadial | 18,000 BP to 10,000 BP      | Coincides with the Late Upper Palaeolithic and the early Mesolithic.                                                                                                                                            |
| Devensian up to Late Glacial Maximum                                  | c. 73,000 to 18,000 BP      | Arrival in the UK of Late Middle Palaeolithic Neanderthals, who were followed approximately 31,000 BP by Early Upper Palaeolithic, anatomically modern humans ( <i>Homo sapiens</i> ).                          |
| Ipswichian (interglacial)                                             | c. 130,000 to c. 115,000 BP | Last interglacial period in the UK. Overlaps with the Late Middle Palaeolithic.                                                                                                                                 |
| Wolstonian                                                            | c. 374,000 to c. 130,000 BP | Predominantly Pleistocene glaciation. Incorporates the earliest period of the Late Middle Palaeolithic.                                                                                                         |

### Late Middle Palaeolithic (186,000 to 45,000 BP, 184,000 to 43,000 BC)

1.4.2.3 Evidence in the form of the presence of deposits representing the Wolstonian Glaciation indicate that the Morgan marine archaeology study area would have been subglacial during the Late Middle Palaeolithic. The analysis of seismic data from within the Morgan Array Area and evidence from the wider area suggests that deposits representing environments favourable for human occupation dating to this period are not likely to be present within the Morgan marine archaeology study area (Jackson *et al.*, 1995; Mellett *et al.*, 2015; Wood, 2022).

### Upper Palaeolithic (45,000 to 10,000 BP, 43,000 to 8,000 BC)

1.4.2.4 The Devensian glaciation coincides with the Upper Palaeolithic and follows the Ipswichian Interglacial, which was the last period of glaciation to affect the UK. Deglaciation may have commenced from c. 20,000 BP with the Morgan marine archaeology study area being ice free by 18,000 BP. However, the proximity of the Morgan marine archaeology study area to areas of glaciation would suggest a very low potential for human occupation or activity, and therefore the presence of submerged prehistoric archaeological material dating to this period.

1.4.2.5 Sea level and landscape changes within the Morgan marine archaeology study area and its surrounding environs during the Upper Palaeolithic are not conclusively

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understood. Some studies suggest that the Liverpool Bay area would have been an entirely marine environment during this time, whilst other evidence indicates that it would have been a partially terrestrial environment dominated by fluvial systems and related floodplains (Brooks *et al.*, 2011; Jackson *et al.*, 1995; Mellett *et al.*, 2015; Fitch *et al.*, 2011). The West Coast Palaeolandscape Study and glaciolacustrine and glaciomarine deposits identified within the geophysical and geotechnical survey data support the latter in finding that areas of Liverpool Bay would have been terrestrial following the Last Glacial Maximum (LGM) and therefore potentially capable of supporting human habitation. The date around which the final submergence of the area took place is also not conclusive, with some studies (Brooks *et al.*, 2011) indicating submergence of the Morgan Generation Assets c. 13,000 BP and others arguing for c. 6,000 to 7,000 BP (Fitch *et al.*, 2011).

- 1.4.2.6 Even if the theory that the Morgan marine archaeology study area was a partially terrestrial environment during the Upper Palaeolithic is accepted, it would likely not have been a favourable environment for human exploitation. Permafrost would have been present in the area, limiting the growth of vegetation and therefore the availability of resources for human exploitation.

### Mesolithic (10,000 to 6,000 BP, 12,000 to 4,000 BC)

- 1.4.2.7 Evidence from the site-specific geophysical and geotechnical survey conducted in the Morgan Array Area and modelling conducted as part of the West Coast Palaeolandscape Study (Fitch *et al.*, 2011) suggests that the Morgan marine archaeology study area would have been partially intertidal during the Mesolithic. The intertidal represents an environment that is rich in available resources for human exploitation. The landscape would have been one of low energy river systems, kettle holes and water-filled incisions, these features may have also been focal points of prehistoric activity and kettle holes have the potential for Mesolithic and palaeoenvironmental assemblages as evidenced at other kettle hole sites in Killerby, North Yorkshire and Slotseng, Denmark (Hunter and Waddington 2018; Noe-Nygaard *et al.*, 2007). The West Coast Palaeolandscape Study indicates that Morgan Generation Assets may be situated adjacent to a kettle hole lake.
- 1.4.2.8 Geotechnical assessment from the Morgan Array Area indicates that by between 16,000 and 13,000 BP there was an influx of glaciomarine sedimentation, suggesting the beginnings of submergence (Li, *et al.*, 2023). Although the chronology for submergence is debated academically, the data shows that the earlier date of 13,000 BP is accepted then the area would have been fully submerged by the advent of the Mesolithic and therefore incapable of sustaining human occupation and therefore would lack the potential for the survival of archaeological material.

## 1.4.3 Maritime and aviation archaeology

### Early prehistoric (Palaeolithic and Mesolithic)

- 1.4.3.1 There is currently no evidence in the UK for maritime archaeological remains pre-dating the start of the Holocene.
- 1.4.3.2 Watercraft may have been used in the rivers and estuaries during the Mesolithic for coastal journeys, fishing expeditions, and possibly longer journeys in favourable weather. However due to the paucity of evidence within the archaeological record and the extent of fluvial activity across the Morgan marine archaeology study area, the potential for the survival of any archaeology from the Palaeolithic and Mesolithic periods is considered low.

### **Neolithic and Bronze Age**

- 1.4.3.3 The potential for evidence of watercraft dating to the Neolithic period within the Morgan marine archaeology study area is considered to be low.
- 1.4.3.4 Evidence of Bronze Age maritime activity has been recorded throughout England with the discovery of a number of inland watercraft and sea faring vessels. No such examples have been recorded within or close to the Morgan marine archaeology study area however it is possible that similar crafts may have been utilised to traverse the area. Generally based on the available evidence the potential for the discovery of maritime archaeology dating to the Bronze Age is considered to be low.

### **Iron Age and Romano-British**

- 1.4.3.5 Evidence of Iron Age maritime activity has been discovered in Britain in the form of Romano-Celtic boats which are examples of a new form of ship construction that was emerging in northwest Europe at the time. No evidence has been found within the Morgan marine archaeology study area and based on the available evidence the archaeological potential is considered to be low.
- 1.4.3.6 The Roman occupation of Britain was by necessity a maritime endeavour, which would have required continuous transportation of resources and people to the military and civilian sites established by the Romans. Sites such as these can be found along Liverpool Bay and therefore it is likely that there would have been substantial Roman maritime traffic in this area. No evidence has been found within the Morgan marine archaeology study area and based on the available evidence the archaeological potential is considered to be low to moderate.

### **Early Medieval and Medieval**

- 1.4.3.7 The Early Medieval period marked a change in ship construction techniques coinciding with the end of the Roman occupation of Britain in the 5th century AD and an increasing Anglo-Saxon presence in the form of Norse and Danish Vikings. Several examples have been recorded in Britain.
- 1.4.3.8 With the Medieval period came a boom in maritime trade across Europe and trade expanded across the Irish Sea at this time also, with Dublin becoming an increasingly important commercial port, contributing to the maritime transportation of goods through the Irish Sea. The rapid technological advances in ship construction during the medieval period can also be attributed to increased military campaigns.
- 1.4.3.9 Due to the large increase of maritime traffic that would have occurred in the Irish Sea during the early medieval and medieval period, the potential for the discovery of archaeological remains dating from this period is considered to be moderate.

### **Post Medieval and Modern**

- 1.4.3.10 Records of known wreck sites and losses in UK waters are biased towards the Post-Medieval and Modern periods and therefore the precise locations of most wrecks pre-dating these periods in UK waters are not known. The majority of known and recorded wreck sites lie relatively close to the coast.
- 1.4.3.11 Only one recorded loss has been identified within the National Monuments Record of Wales (NMRW) data for the Morgan marine archaeology study area. A further 11 recorded losses are contained within the HER data supplied by Manx National Heritage (MNH). The full details of all recorded losses are presented in Volume 4,

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Annex 8.1: Marine archaeology technical report of the Environmental Statement (Document Reference F4.8.1). The position of these records, however, have not been identified through the site-specific surveys but the possibility that material could survive within the Morgan marine archaeology study area remains.

- 1.4.3.12 The increased volume of losses from this period is consistent with the increase of trade to and from Liverpool from the 16th century and the increase of military activity from the 18th century. From the 18th century onwards there was also rapid developments in shipbuilding technology including the advent of the steam engine and the use of iron hulls. These advances in shipbuilding mean that the incorporation of metal into ship design made shipwrecks more likely to survive on the seafloor and be identifiable in geophysical surveys.
- 1.4.3.13 Further advances in technology occurred during both World Wars and the east Irish Sea saw extensive activity associated with these periods, therefore the potential for the presence of modern military remains within the Morgan marine archaeology study area is high. All of the recorded losses are Post Medieval and predominantly lost to weather rather than enemy action. None of the recorded losses were in active service with the Royal Navy and thus do not qualify for designation under the Protection of Military Remains Act 1986.

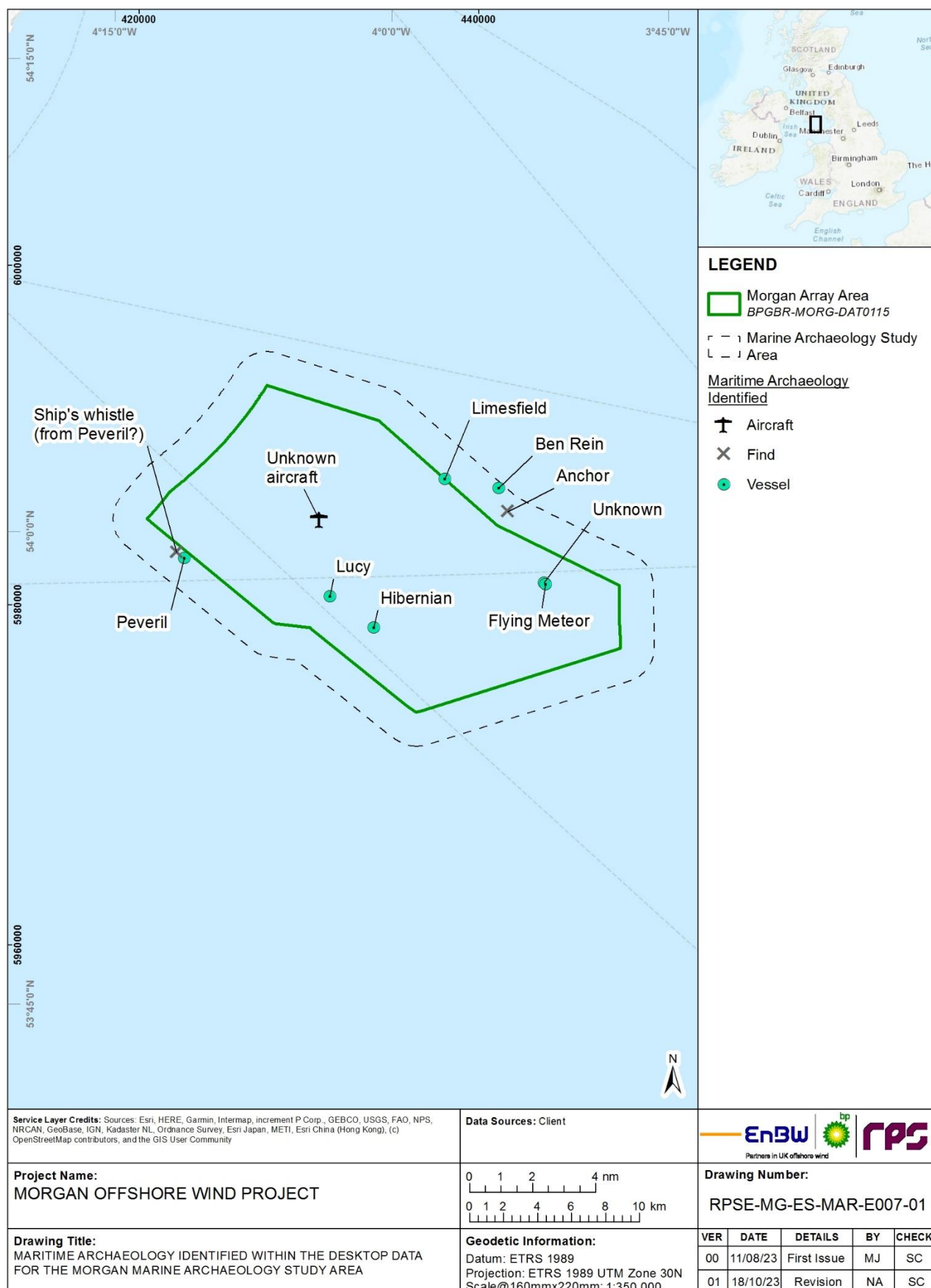
### Aviation archaeology

- 1.4.3.14 Since World War II, despite the volume of both military and civilian air traffic, there have been few aviation losses off the west coast of England and north Wales, in the vicinity of the Morgan Generation Assets. The potential for post-war aircraft remains to be discovered within the Morgan marine archaeology study area for the transmission assets is therefore considered to be low. Civilian aircraft wrecks are not subject to protection under the terms of the Protection of Military Remains Act 1986.
- 1.4.3.15 One record relating to a potential aircraft crash site was returned from the United Kingdom Hydrographic Office (UKHO) data (UKHO 5418; National Record of the Historic Environment (NRHE) 909495) within the Morgan Array Area (Figure 1.3) and considered 'live' by the UKHO. This relates to aircraft wreckage reported by divers in 1991. No wreck, or material of anthropogenic origin was identified within the geophysical data at the stated position. Due to the value of this receptor, a TAEZ with a 100 m radius has been established around the coordinates of this record. Full details of AEZs and TAEZs are given in section 1.6.2

## **1.4.4 Known and recorded maritime archaeology**

- 1.4.4.1 No designated sites have been identified within the datasets for the Morgan marine archaeology study area.
- 1.4.4.2 Within the UKHO data there are 11 entries that relate to wreck sites within the Morgan marine archaeology study area and one that corresponds to the aircraft. Of these, six are considered 'live'; the further five are all listed as 'dead' indicating that no remains of these wrecks are currently visible on the seabed. This has been confirmed by the geophysical survey and the wrecks are not considered to survive at these locations (Figure 1.3). Of the six entries, five have been located by the site-specific geophysical survey and are discussed further in section 1.4.5.

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**Figure 1.3: Maritime archaeology identified within the desktop data for the Morgan marine archaeology study area.**

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### 1.4.5 Results of the geophysical seabed features assessment

- 1.4.5.1 Geophysical data collected for the Morgan Generation Assets recorded 51 anomalies of potential archaeological interest. Of these, five are considered to be high potential anomalies, five are of medium potential and 41 have been classed as low potential anomalies. One anomaly of low potential was identified during the assessment but following the refinement of the project boundaries now lies outside the Morgan marine archaeology study area and, as such, is not concluded in the anomaly total in this report.
- 1.4.5.2 The distribution of anomalies with medium potential identified within the Morgan marine archaeology study area is shown in Figure 1.4; four are within the Morgan Array Area and one (ID Morgan\_0005) within the 2km buffer. Anomalies with high potential are shown in Figure 1.5; three are within the Morgan Array Area and two are within the 2 km buffer. The 41 low potential anomalies have been assessed against all available evidence and as a result are considered unlikely to have any archaeological significance and so will not be discussed further in this chapter.
- 1.4.5.3 The five medium potential anomalies could represent marine archaeology sites from potential debris to wreck. These are shown in Figure 1.4 and presented in Table 1.4.

**Table 1.4: Medium potential anomalies.**

| ID          | Category            |
|-------------|---------------------|
| Morgan_0015 | Unidentified debris |
| Morgan_0025 | Potential wreck     |
| Morgan_0030 | Potential debris    |
| Morgan_0116 | Potential debris    |
| Morgan_0005 | Seabed disturbance  |

- 1.4.5.4 Five high potential anomalies were identified within the Morgan marine archaeology study area (Figure 1.5), all five of which have also been recorded within the UKHO as live wrecks.
- 1.4.5.5 Morgan\_0008 (Figure 1.5) lies within the Morgan marine archaeology study area, with its central point approximately 11 m east of the eastern boundary of the Morgan Generation Assets. The anomaly is visible in both the Side Scan Sonar (SSS) and Multibeam Echosounder (MBES) data and is recorded by the UKHO and NRHE as the *Limesfield* (UKHO 5463, NRHE 909403). A British steamship sunk by submarine UB57 on 07 February 1918 whilst on passage from Belfast to Preston with a cargo of cotton waste.
- 1.4.5.6 Morgan\_0017 (Figure 1.5) lies in the east of the Morgan Generation Assets, approximately 4.3 km west of the Morgan Array Area boundary. The anomaly is visible in the SSS and MBES data and is recorded by the UKHO and NRHE as the *Flying Meteor* (UKHO 8250, NRHE 909493). A British paddle steamer tug built in 1864 and sank on 13 March 1874 whilst towing the barque *Ravenbourne* from Liverpool to Troon.
- 1.4.5.7 Morgan\_0096 (Figure 1.5) is located approximately 290 m southwest of the extent of the Morgan marine archaeology study area. The anomaly is visible in the SSS and MBES data and is recorded by the UKHO and NRHE as the *Ben Rein* (UKHO 5462, NRHE 909472). A British carrier built in 1905 and sunk by submarine UB57 on 07

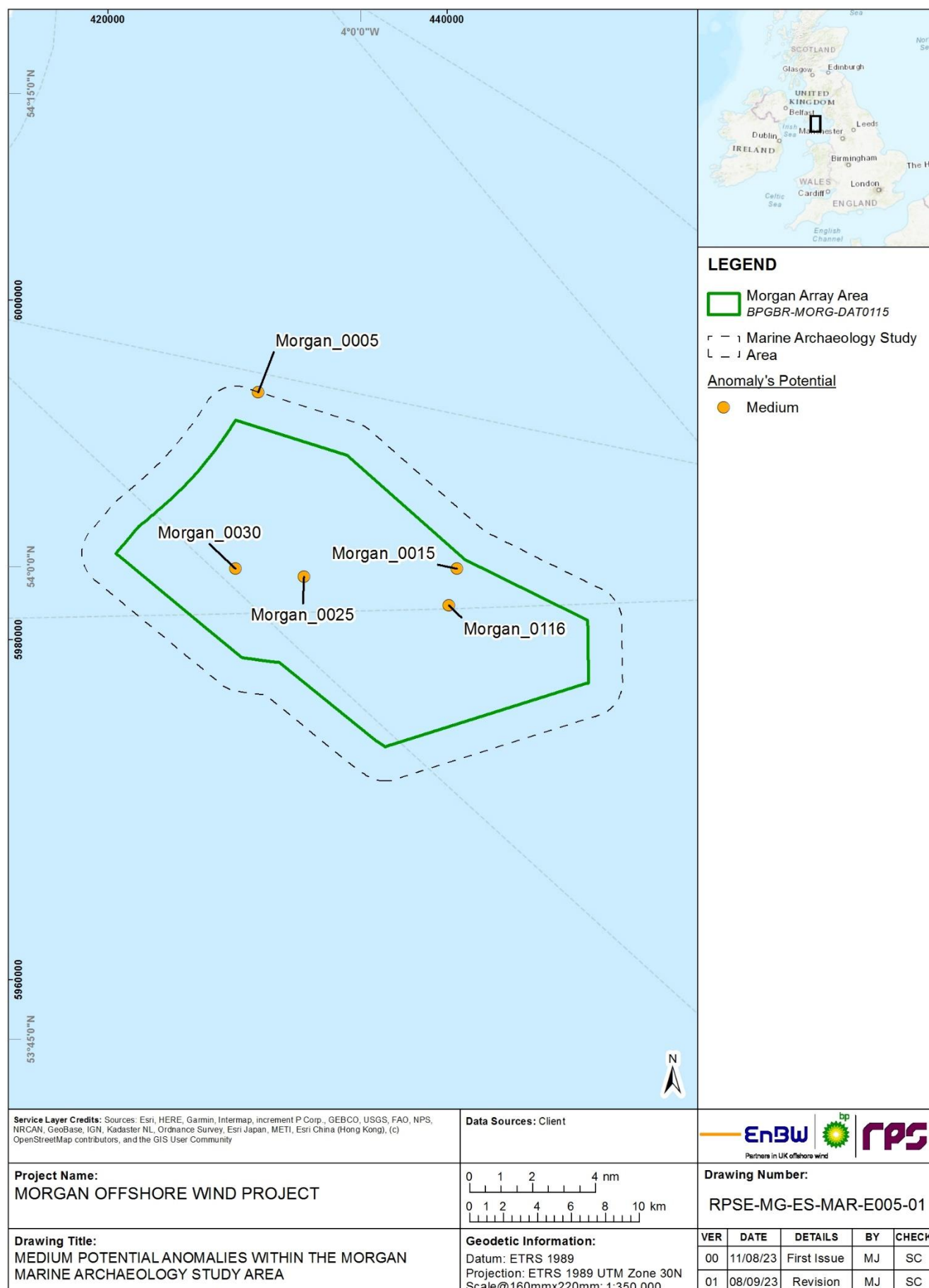
## MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

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February 1918. The crew were allowed to leave the vessel on a small boat and no casualties were reported. The vessel was on passage to Belfast from Liverpool with a general cargo.

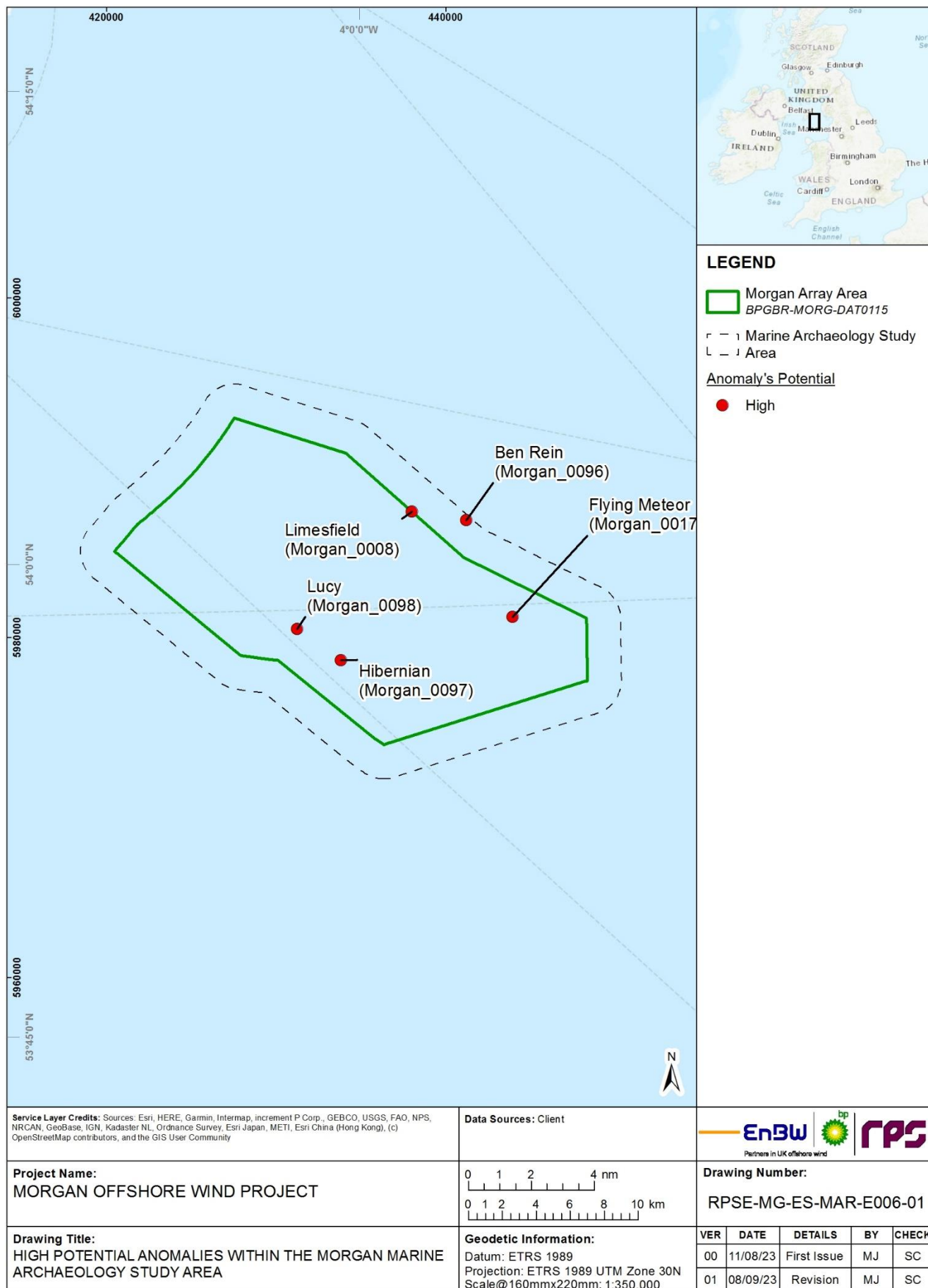
- 1.4.5.8 Morgan\_0097 (Figure 1.5) lies towards the south of the Morgan Array Area, approximately 5.6 km north-northwest of the most south point. The anomaly is visible in the SSS and MBES data and is recorded by the UKHO, NRHE and NMRW (UKHO 7458, NRHE 909402, NMRW 506875) as the wreck of the *Hibernian*, a British steam ship built in 1875 and lost on 12 August 1894 following a collision with the British paddle steamer Prince of Wales whilst on passage from Garston to Glasgow.
- 1.4.5.9 Morgan\_0098 (Figure 1.5) lies towards the south of the Morgan Array Area, approximately 2.3 km northeast of the southwest boundary. The anomaly is visible in the SSS and MBES data and is recorded by the UKHO and NMRW (UKHO 7459, NMRW 506874) as the wreck of the *Lucy*, a small British steam ship built in 1899 and sunk on the 21 July 1910 whilst on passage from Weston Point to Douglas with a cargo of moulding.

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**Figure 1.4: Geophysical Anomalies with medium archaeological potential within the Morgan Generation Assets marine archaeology study area.**

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**Figure 1.5: Geophysical Anomalies with high archaeological potential within the Morgan Generation Assets marine archaeology study area.**

## Historic Seascape Character

- ~~1.4.5.10~~ — ~~Historical cultural processes which have shaped the character of the Morgan marine archaeology study area are predominantly related to fishing and navigation activity. Infrastructure for the modern energy industry dominates the current seascape character.~~
- ~~1.4.5.11~~ — ~~The sub-character types can be broken down into the following categories:~~
- ~~• — Modern installations and activities such as submarine cables~~
  - ~~• — Shellfish dredging in the modern period~~
  - ~~• — Navigation routes, both modern and post medieval~~
  - ~~• — Wrecks and maritime debris of unknown date~~
  - ~~• — Seabed types and characteristics of coarse sediment plains.~~
- ~~1.4.5.12~~ — ~~There are also known to be a number of proposed offshore wind projects within the wider vicinity of the Morgan Generation Assets, including: the Mona Offshore Wind Project, Morecambe Offshore Windfarm: Generation Assets and the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. Overall, the Morgan Generation Assets will be in line with the seascape character of the Liverpool Bay area.~~

## 1.4.6 Research Frameworks

- 1.4.6.1 Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects (The Crown Estate, 2021) states that an Offshore WSI should ‘*set out the importance of research frameworks in setting objectives that are delivered through realisation of the work*’.
- 1.4.6.2 Several research frameworks have been identified as relevant to the marine archaeology resource of the Morgan marine archaeology study area. These include:
- People and the Sea: A Maritime Archaeological Research Agenda for England (Ransley *et al.*, 2013)
  - The North West ~~England~~ regional research framework [\(NWRRF\)](#) (Research Frameworks, 2023).
- 1.4.6.3 Additional research frameworks may be identified as relevant depending on the specific archaeological work to be undertaken. Any archaeological work and reporting under this Offshore WSI will tie research into the relevant research frameworks, ensuring that the project makes a contribution to archaeological knowledge. The objectives of the research framework will be used to guide work and recommendations made by the RA to the Applicant.
- 1.4.6.4 [In particular, the identified research frameworks will be used to inform the design of further geoarchaeological analysis. The staged analysis of geotechnical data gathered through the agreed campaign of works \(section 1.7.5\), will be planned and undertaken with reference to the Morgan Generation Assets geological ground model \(Wood, 2022; bp/EnBW, 2023\), in order –tie any identified palaeolandscapes into a wider regional context and answer specific research questions such as the timing of the marine transgression and of the Devensian ice retreat in the East Irish Sea, and identifying drowned early Mesolithic sites \(NWRRF, PH24\).](#)
- 1.4.6.5 The connection with the specific archaeological work package to be undertaken, and the relevant research framework, aims and objectives, will be identified within the MSs which will precede archaeological work. The MS will also set out how the work

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undertaken will be tied into the relevant research framework during Online Access to the Index of Investigations (OASIS) reporting (see section 1.8).

### **1.5 Potential Impacts**

- 1.5.1.1 The impacts of the construction, operations and maintenance, and decommissioning phases of Morgan Generation Assets have been assessed on marine archaeology. The potential impacts arising from the construction, operations and maintenance, and decommissioning phases of Morgan Generation Assets are listed in Table 1.5.

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**Table 1.5: Potential impacts.**

| Potential Impact                                                                                                                                                   | Phases Assessed                                            | Morgan Generation Assets Project Activities                                                                                                                                                                                                                                                                                                                                    | Measures adopted as part of Morgan Generation Assets                                                                                                                                                                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sediment disturbance and deposition leading to indirect impacts on marine archaeology receptors.                                                                   | Construction, operations and maintenance, decommissioning. | <u>Construction phase.</u><br>Sandwave clearance, foundation installation, cable installation.<br><u>Operations and maintenance phase.</u><br>Cable repair.<br><u>Decommissioning phase.</u><br>Removal of infrastructure.                                                                                                                                                     | Monitoring and watching briefs (section 1.6.3).<br><br>Preservation by record (section 1.6.4).<br><br>Commitment to the preparation, agreement and implementation of a PAD (section 1.6.5)                                       |
| Direct damage to maritime archaeology receptors (e.g. wrecks, debris, submerged prehistoric receptors (palaeolandscapes and associated archaeological receptors)). | Construction, operations and maintenance, decommissioning. | <u>Construction phase.</u><br>Sandwave clearance, cable installation, anchor placements, disused cable removal, UXO removal.<br><u>Operations and maintenance phase.</u><br>Repair and maintenance activities, including cable repair and reburial, jack-up events and anchor placement.<br><u>Decommissioning phase.</u><br>Cable removal, anchor placements, jack up events. | AEZs and TAEZs (section 1.6.2)<br><br>Monitoring and watching briefs (section 1.6.3).<br><br>Preservation by record (section 1.6.4).<br><br>Commitment to the preparation, agreement and implementation of a PAD (section 1.6.5) |
| Direct damage to deeply buried marine archaeology receptors – submerged prehistoric receptors (e.g. palaeolandscapes and associated archaeological receptors).     | Construction.                                              | <u>Construction phase.</u><br>Foundation installation.                                                                                                                                                                                                                                                                                                                         | AEZs and TAEZs (section 1.6.2)<br><br>Monitoring and watching briefs (section 1.6.3).<br><br>Preservation by record (section 1.6.4).<br><br>Commitment to the preparation, agreement and implementation of a PAD (section 1.6.5) |

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| Potential Impact                          | Phases Assessed             | Morgan Generation Assets Project Activities                             | Measures adopted as part of Morgan Generation Assets                                                                                                                                       |
|-------------------------------------------|-----------------------------|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alteration of sediment transport regimes. | Operations and maintenance. | <u>Operations and maintenance phase.</u><br>Presence of infrastructure. | Monitoring and watching briefs (section 1.6.3).<br><br>Preservation by record (section 1.6.4).<br><br>Commitment to the preparation, agreement and implementation of a PAD (section 1.6.5) |

## 1.6 Measures adopted as part of Morgan Generation Assets

### 1.6.1 Overview

- 1.6.1.1 A number of measures (primary and tertiary) have been adopted as part of Morgan Generation Assets to reduce the potential for impacts on marine archaeology. As there is a secured commitment to implementing these measures for Morgan Generation Assets, they have been considered in the assessment presented in Volume 2, Chapter 8: Marine archaeology and cultural heritage of the Environmental Statement (Document Reference F2.8) (i.e. the determination of magnitude and therefore significance assumes implementation of these measures).

### 1.6.2 Archaeological Exclusion Zones

- 1.6.2.1 Best practice favours the preservation in situ of archaeological remains, therefore the ideal preferred mitigation for archaeological remains is avoidance (Wessex Archaeology for the Crown Estate, 2021). For Morgan Generation Assets, AEZs have been proposed that prohibit development-related activities within their extents, which vary depending upon the nature of the site. The final Morgan Generation Assets design will take into account these preliminary zones, which may evolve or be removed (with the agreement of the MMO and HE) as Morgan Generation Assets progresses, subject to the project design and additional subsequent surveys that may be required.
- 1.6.2.2 The appropriateness and effectiveness of the AEZs and condition of the archaeological assets will be monitored, where required, through the acquisition of survey data during the lifetime of Morgan Generation Assets. Data relating to the marine archaeology assets will be archived with HE through OASIS at the outset of Morgan Generation Assets and as it is collected through its lifetime.
- 1.6.2.3 All AEZs, agreed with HE, are marked on the Offshore historic environment plan of the Environmental Statement (Document Reference B7). If impacts cannot be avoided, measures to reduce, remedy or offset disturbance will be agreed.
- 1.6.2.4 In view of their potential archaeological significance, AEZs (either in the form of individual AEZs or clusters) will be placed around the five anomalies classified as being of high archaeological potential and the five anomalies classed as being of medium potential that have been identified within the Morgan Generation Assets. These anomalies have been recommended AEZs based on the size of the anomaly, the extents of any debris, the potential significance of the anomaly, the potential impact of the Morgan Generation Assets and the seabed dynamics within the area.
- 1.6.2.5 Dependant on the form of the anomaly, AEZs have either been recommended as a radius from the centre point of the anomaly or as a distance from the extents. Particularly in the case of shipwrecks, which tend to be longer in length than width, the use of a circle provides unequal protection around the extents. This not only impacts the protection afforded but does not present proportional mitigation.
- 1.6.2.6 The proposed AEZs for the Morgan Array Area are listed in Table 1.6 and shown in Figure 1.6. Scope is allowed for their amendment in light of further evidence and with the involvement of consultees. AEZs can be different sizes depending on the size of the archaeological anomaly and the extent to which there is associated debris present on the seabed.
- 1.6.2.7 The AEZs identified for the Morgan Array Area have been reviewed against desk based and site-specific data, and as a result of this review AEZs have been identified of varying sizes according to the size and spread of the individual archaeological

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receptor. AEZs are presented as either extents or radius, extents indicate the distance proposed from the furthest extents of the archaeological anomaly whilst a radius AEZ is one that is measured as a circumference from the central point of the anomaly.

- 1.6.2.8 Three TAEZs are proposed for the Morgan marine archaeology study area and their details are given in Table 1.7 and shown in Figure 1.6. As a precautionary approach a TAEZ for UKHO 5418 is proposed due to the potential for military aviation wreckage and thus protection under the Protection of Military Remains Act 1986. Details of this record is presented in section 1.4.3. TAEZs can be reviewed upon receipt of the refinement of the Morgan and Morecambe Offshore Wind Farms: Transmission Assets project boundary and the assessment for removal of the impact-receptor pathway. TAEZs have been assigned to Morgan\_0096 (the wreck of the *Ben Rein*), and Morgan\_0005 as a precautionary measure due to their position within the Morgan Generation Assets marine archaeology study area, however, this may be subject to change following the refinement of the boundary after the Transmission Assets Preliminary Environmental Information Report (PEIR) phase .
- 1.6.2.9 Further TAEZs and AEZs may be assigned during the course of the project as anomalies that have been identified in the data do not necessarily represent all of the marine archaeological material that is on the seafloor. For example, wooden wrecks can be buried under the seabed and may not appear in the data. If previously unidentified material of cultural significance is identified, it would require an AEZ.
- 1.6.2.10 Where further survey work has, as one of its objectives, the ensonification of previously identified sites and / or anomalies in order to alter or remove an AEZ, the Applicant will make provision for a suitably qualified Archaeological Geophysical Contractor (which may be the RA) to be available to provide advice and input into the survey and as the survey is ongoing. In some cases, this may include the presence of the RA on the vessel alongside the vessel crew, or, in most cases, this advice may be given remotely.
- 1.6.2.11 Low potential anomalies are not provided AEZs or TAEZs but will be considered in the final project design through micro-siting via the acquisition of high-resolution geophysical data, to be acquired post-consent.

**Table 1.6: Proposed AEZs within Morgan marine archaeology study area.**

| ID          | Description         | Potential | Easting   | Northing   | AEZ (m)    |
|-------------|---------------------|-----------|-----------|------------|------------|
| Morgan_0098 | Wreck               | High      | 431235.40 | 5980516.90 | 50 extents |
| Morgan_0030 | Unidentified debris | Medium    | 427532.81 | 5984191.77 | 25 radius  |
| Morgan_0116 | Unidentified debris | Medium    | 440109.49 | 5982030.42 | 30 radius  |
| Morgan_0017 | Wreck               | High      | 443931.72 | 5981226.52 | 50 extents |
| Morgan_0097 | Wreck               | High      | 433834.14 | 5978659.42 | 50 extents |
| Morgan_0008 | Wreck               | High      | 438011.85 | 5987429.65 | 50 extents |
| Morgan_0015 | Unidentified debris | Medium    | 440592.83 | 5984185.02 | 25 radius  |
| Morgan_0025 | Potential debris    | Medium    | 431565.53 | 5983703.41 | 35 radius  |

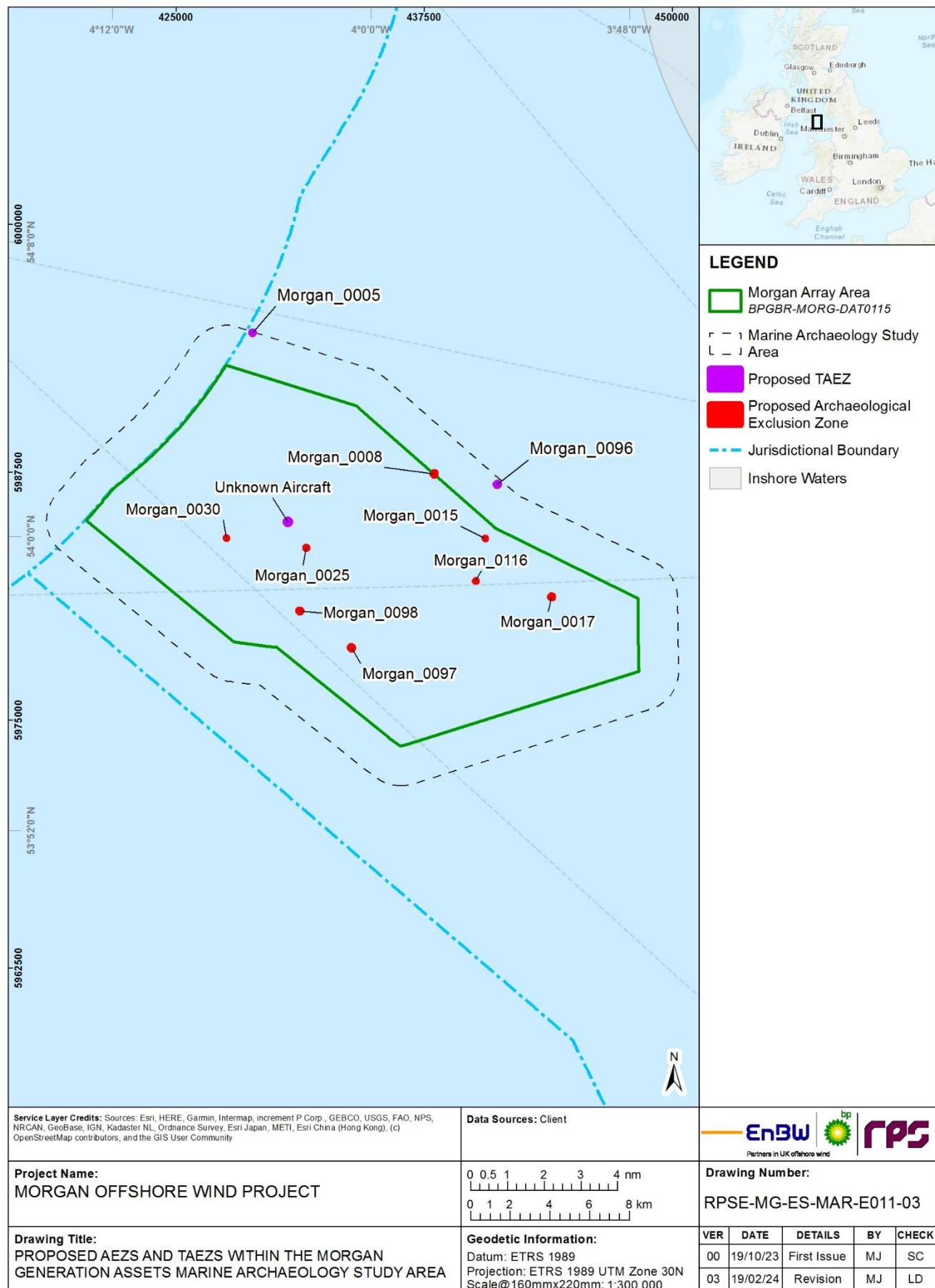
**Table 1.7: Proposed TAEZs within the Morgan marine archaeology study area.**

| ID          | Description        | Potential | Easting   | Northing   | AEZ (m)   |
|-------------|--------------------|-----------|-----------|------------|-----------|
| Morgan_0005 | Seabed disturbance | Medium    | 428856.55 | 5994556.41 | 50 radius |

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| ID          | Description      | Potential | Eastings  | Northings  | AEZ (m)    |
|-------------|------------------|-----------|-----------|------------|------------|
| Morgan_0096 | Wreck            | High      | 441193.65 | 5986904.68 | 50 extents |
| UKHO 5418   | Unknown aircraft | N/A       | 430634.9  | 5985017    | 100 radius |

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**Figure 1.6: Proposed AEZs and TAEZs within the Morgan Array Area and marine archaeology study area.**

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### 1.6.3 Monitoring and watching briefs

- 1.6.3.1 In addition to the ongoing monitoring of AEZs where appropriate, measures adopted as part of Morgan Generation Assets include:
- Archaeological input into specifications for, and archaeological analysis of, any further pre-construction geophysical and geotechnical surveys
  - Archaeologists to be consulted in the preparation of any pre-construction ROV/diver surveys and in monitoring/checking of data where required
  - Archaeologists to be consulted in the preparation of pre-construction cable route clearance or other pre-construction clearance operation and, if appropriate, to carry out archaeological monitoring of such work.
- 1.6.3.2 The proposed mitigation strategy, ~~which is based on the current understanding of archaeological remains and construction techniques, does not require a marine watching brief~~ which is based on the current understanding of archaeological remains and construction techniques does not foresee the need for a watching brief at this stage. However, should ~~Should~~ future work lead to the identification of further archaeological remains for example through post-consent geophysical surveys or through the PAD, or should the construction methods or locations be altered, a marine watching brief may be required.
- 1.6.3.3 If a marine watching brief is required it would be conducted by a suitably qualified and experienced marine archaeologist, in line with the Chartered Institute for Archaeologists Standards and Guidance for Archaeological Watching Briefs (Chartered Institute for Archaeologists (CifA), 2014a). A detailed MS would also be produced and approved by the AC before any watching brief activities are undertaken.
- 1.6.3.4 Where an archaeological watching brief ~~is required~~ s are necessary, a detailed MS for the proposed works will be produced and agreed with HE prior to any watching brief activities taking place. All watching briefs will be conducted in line with Standards and Guidance for Archaeological Watching Briefs (CifA, 2014a).
- 1.6.3.5 If significant archaeological or palaeoenvironmental evidence are encountered then the Applicant, in consultation with HE, will make provision for the Archaeological Contractor to undertake a programme of investigation commensurate with the evidence discovered.

### 1.6.4 Preservation by record

- 1.6.4.1 Where preservation in situ is not practicable, disturbance of archaeological sites or material will be offset by appropriate and satisfactory measures, also known as 'preservation by record'. In these circumstances, the effects of Morgan Generation Assets will be offset by carrying out excavation and recording prior to the impact occurring (Wessex Archaeology for The Crown Estate, 2021).
- 1.6.4.2 The Offshore Renewables Protocol for Archaeological Discoveries (The Crown Estate, 2014) will be followed, which will involve the reporting of archaeological discoveries made during the lifetime of Morgan Generation Assets. The PAD (see section 2 below) covers the reporting and investigating of unexpected archaeological discoveries encountered during construction, operations and maintenance and decommissioning activities, informed by the guidance of a marine archaeologist specialised in working with PADs for offshore wind farm projects. The PAD further makes provision for the implementation of TAEZs around areas of possible archaeological interest, for prompt archaeological advice and, if necessary, for archaeological inspection of important

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features prior to further construction, maintenance or decommissioning activities in the vicinity. It complies with the Merchant Shipping Act 1995, including notification to the Receiver of Wreck, in accordance with the Code of Practice for Seabed Developers (JNAPC, 2006).

- 1.6.4.3 In view of the potential for the presence of palaeolandscapes, associated prehistoric sites and unidentified wrecks, archaeological monitoring is deemed as appropriate where seabed material is brought to the surface. These proposals may be refined on the basis of the results of any further marine geophysical, geotechnical or diver/ROV+ surveys (section 1.7).

### 1.6.5 Protocol for Archaeological Discoveries

- 1.6.5.1 During the course of seabed preparation, construction and future activities associated with Morgan Generation Assets, archaeological finds and deposits may be encountered, and records may need to be produced. This situation may arise under a number of different circumstances, for example during watching brief activities.
- 1.6.5.2 A protocol for reporting finds of archaeological interest will be implemented during all activities relating to construction, operations and maintenance and decommissioning. It will address the reporting of unexpected finds of archaeological material, recovered from the sea during these activities.
- 1.6.5.3 The protocol will largely follow the format laid down in the document Protocol for Archaeological Discoveries (PAD): Offshore Renewables Projects (The Crown Estate, 2014). The RA will operate to administer the PAD and provide initial advice to the Applicant and will liaise with the AC as necessary.
- 1.6.5.4 Once agreed by the Applicant and the AC, the PAD will be distributed in a form suitable for use on board construction vessels. The Applicant will ensure that the relevant staff on all construction vessels are informed of and have access to the PAD, including supporting material, detailing the find types that may be of archaeological interest, and the potential importance of any archaeological material encountered.
- 1.6.5.5 All finds of archaeological material will be reported by the Construction Contractor(s), to the RA/Nominated Contact who will inform the Applicant and then the AC. If the find is 'wreck' within the meaning of the Merchant Shipping Act 1995 then RA/Nominated Contact will also make a report to the Receiver of Wreck. Full contact details for all relevant parties are included in the PAD.
- 1.6.5.6 The response to reported finds will be implemented through the measures set out in the PAD, including further surveys or establishment of new AEZs if appropriate.
- 1.6.5.7 The PAD will be implemented by means of toolbox talks presented to the relevant vessel crews to ensure that all staff are made aware of what constitutes an appropriate find. The frequency and timing of these toolbox talks is determined in relation to ongoing activities. The PAD will be supported by a package of awareness training for the Applicant and its contractors' and sub-contractor's staff.
- 1.6.5.8 At the end of the construction phase, the RA will prepare a report on the results of the PAD (see section 2 below). The results will be included in the final archaeological report covering maritime sites and finds within the area affected by the Morgan Generation Assets.

### 1.7 Methodology for archaeological work

- 1.7.1.1 Archaeological involvement in further work is a key component in the ongoing process of assessing known and potential archaeological remains within the Morgan Array

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Area, to ensure robust and proportionate mitigation for archaeological receptors which may be impacted by Morgan Generation Assets.

- 1.7.1.2 A detailed MS will be produced by the RA, for agreement with and approval by the Applicant, and the AC in advance of each archaeological element discussed below. Approval by the AC will be assumed if no response is received within 30 working days of submission of individual MS. [The MSs will set out the aims and objectives, detailed methodology, and agreed outputs for each work package.](#) An overview of the proposed survey methods is provided in sections 1.7.3 to 1.7.5 below. These methods are in line with best practice guidance, set out within The Crown Estate (2021).

### 1.7.1 Survey overview

- 1.7.1.1 Any surveys conducted as part of the Morgan Generation Assets that may yield additional information on the marine archaeology of the area should be carried out to a single datum and coordinate system, preferably the ETRS 89 UTM Zone 30N.
- 1.7.1.2 Surveys that will require archaeological involvement include:
- Geophysical survey will require an archaeological assessment of the survey data
  - Diver/ROV obstruction surveys will require an archaeological assessment of the survey data (video and positional data)
  - Geotechnical investigations will require geoarchaeological assessment and, where necessary, analysis following the staged approach set out below.
- 1.7.1.3 Should archaeological material be encountered during any of these surveys, sufficient time and resources will be made available to ensure the archaeological assessment of such material. In areas where there are to be further impacts, no impacts will take place until the assessment has been conducted and mitigation actions agreed and implemented. The scope of any further assessment will be agreed with the AC and, where necessary, further suitable mitigation measures will be instigated in agreement with the AC.

### 1.7.2 Planning

- 1.7.2.1 When planning geophysical and geotechnical surveys, the Applicant will advise the RA well in advance and seek their input into the scope of work, where relevant. Archaeological input will take the form of advice from the RA on measures to optimise archaeological results from the planned geotechnical, geophysical and other surveys or work (such as benthic grabs, for example). Areas to be considered will include:
- The available details on previously identified sites and/or anomalies and areas of heightened archaeological potential
  - The archaeological potential of areas where no existing sites and/or anomalies are yet known
  - The equipment, equipment settings, survey methodology(s) and data collection points that will optimise the recovery of archaeological information
  - The requirements for data analysis, interpretation and archiving.
- 1.7.2.2 The required response to elements of archaeological input may include:
- Altering vibrocore/borehole positions in order to maximise the potential for the collection of archaeological data

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- 'Boxing' wreck sites in order to provide the best possible images and positional data
- Altering grab sample positions in order to maximise the potential for the collection of archaeological data.

### 1.7.3 Geophysical survey

- 1.7.3.1 Any future geophysical survey data acquired for Morgan Generation Assets will be archaeologically assessed and recommendations for mitigation, including any necessary AEZs, will be made.
- 1.7.3.2 Additionally, new marine geophysical data that covers areas of development impact and AEZs will be subject to analysis by a suitably qualified Archaeological Geophysical Contractor (the RA, if suitable). Any such assessment will be preceded by an MS which will set out in detail the methods to be used, along with the aims and objectives of the work. The MS will be submitted to the AC prior to the work being conducted. Approval by the AC will be assumed if no response is received within 30 working days of submission of individual MSs.
- 1.7.3.3 In order to maximise the potential benefits of any geophysical survey, the Applicant will seek archaeological advice at the planning stage of any such works.
- 1.7.3.4 Surveys will be carried out to a single datum and co-ordinate system. All survey data, including navigation (position, heading and velocity) will be acquired digitally in industry-standard formats. Care will be taken to maintain the orientation and altitude of sensors online. Track plots will be corrected for layback (including catenary effects) and made available in digital (geographical information system (GIS)) form.
- 1.7.3.5 Once the surveys have been processed to meet their primary objectives, the survey data, together with factual reports, will be made available in digital formats to the Applicant's RA, or a suitably qualified Archaeological Contractor for archaeological analysis and interpretation.
- 1.7.3.6 Archaeological interpretation may include:
- Examination of side SSS, magnetometer, MBES and seismic data, where acquired, for areas within the vicinity of known wreck sites and previously identified geophysical anomalies
  - Examination of SSS, magnetometer, MBES and seismic data, where acquired, within areas that will be subject to development to identify any as yet unknown wreck remains
  - The assessment of seismic data and the Ground Investigation Report (GIR) in order to plot the general trend of the subsurface sediments with archaeological potential.
- 1.7.3.7 An example of the criteria that has been used for the assessment of archaeological potential of contacts to date on Morgan Generation Assets is presented in Table 1.8.

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**Table 1.8: Criteria for the assessment of archaeological potential.**

| Potential | Characterisation                                                                                                                                                                                                                                                                                                        |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Low       | An anomaly potentially of anthropogenic origin but that is unlikely to be of archaeological significance. Examples may include discarded modern debris such as rope, cable, chain or fishing gear, small isolated anomalies with no wider context or small boulder-like features with associated magnetometer readings. |
| Medium    | An anomaly believed to be of anthropogenic origin but that would require further investigation to establish its archaeological significance. Examples may include larger unidentifiable debris or clusters of debris, unidentifiable structures or significant magnetic anomalies                                       |
| High      | An anomaly almost certainly of anthropogenic origin and with a high potential of being of archaeological significance. High potential anomalies tend to be the remains of wrecks, the suspected remains of wrecks or known structures of archaeological significance                                                    |

1.7.3.8 The archaeological interpretation or results of any further geophysical surveys will be compiled as a report by the Archaeological Contractor and will include likely requirements (if any) for further work or any required changes to mitigation including the addition, removal or alteration of AEZs. The report will be submitted to the Applicant by the RA and to the AC. The scope of any further work will be agreed by the Applicant and the AC.

### 1.7.4 Diver/ROV Survey

1.7.4.1 Seabed photography and video footage will be subject to archaeological assessment and analysis by a suitably qualified Archaeological Contractor. Any such assessment will be preceded by an MS which will set out in detail the methods to be used, along with the aims and objectives of the work. The MS will be submitted to the AC prior to the work being conducted. Approval by the AC will be assumed if no response is received within 30 working days of submission of individual MSs.

1.7.4.2 In order to maximise the potential benefits of any proposed diver/ROV surveys, the Applicant will seek archaeological input at the planning stage of any such works.

1.7.4.3 Archaeological input will take the form of advice from the RA on measures to optimise archaeological results from the planned survey. Advice will include:

- The available details of sites and/or anomalies identified in the desk-based assessment
- The archaeological potential of areas where no existing sites and/or anomalies are yet known
- The type and level of diver/ROV positioning, voice recording and video/still recording to be utilised
- The provision of clear guidance on the types of sites and finds that are to be reported and recorded
- Wherever possible input into the scope of works to include potential archaeological sites/AEZs where more detailed mitigation planning is required
- Other specific advice will be given depending on the nature and purpose of the investigations. All such areas would be outlined within the MS for the work.

1.7.4.4 Consideration will be given to having an Archaeological Contractor during any diver or ROV surveys, either as an observer(s) or participating diver(s) to optimise archaeological results and thereby reduce the need for repeat survey. However,

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operational constraints, as well as the relevance and scope of the operation, will have to be taken into account when trying to accommodate archaeologists aboard.

- 1.7.4.5 Following the completion of the diver/ROV survey all data, including video footage, will be reviewed by the Archaeological Contractor. This review will identify any anomalies or sites that are potentially of archaeological interest. A report will identify those sites and/or geophysical anomalies that are of sufficient archaeological interest to warrant further investigation and/or mitigation. It will also identify those sites that are no longer of archaeological interest, and hence may be removed from the list of AEZs.
- 1.7.4.6 The archaeological results of any diver/ROV survey will be compiled in a report by the Archaeological Contractor. The report will include a statement of the likely requirements (if any) for further archaeological work and mitigation.
- 1.7.4.7 The report will be forwarded to the RA, who will submit it to the Applicant and the AC for a decision on the scope of any further work where required.

### 1.7.5 Geotechnical survey

- 1.7.5.1 The results of geotechnical works undertaken for the Morgan Generation Assets to date are summarised in section 1.4.2. This work was and all future geotechnical work will be undertaken in accordance with COWRIE's Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector (Gribble and Leather, 2011):
- 'Investigate the deposition sequence of sediments within the area represented by the cores to identify, as far as possible, the environments within which this deposition took place
  - Evaluate the potential for past human exploitation and occupation of these past environments
  - Produce an overview of the geological stratigraphy to provide an indication of the prehistoric archaeological potential for the area
  - Comment on the archaeological importance of the identified deposits, within the context of the wider palaeoenvironmental history of the region and the UK'.
- 1.7.5.2 In accordance with this guidance, future geotechnical surveys will be subject to archaeological input. Following best practice guidance this input should begin prior to core collection and should proceed to a staged process of assessment and analysis (The Crown Estate, 2021).
- 1.7.5.3 Early input should seek to determine methods and specifications for geotechnical sampling (e.g. vibrocores, boreholes) and engagement with the Applicant and their geotechnical team should aim to find ways to ensure archaeological aims and sampling can be conducted alongside any other requirements. Following these discussions, an MS for Core Collection, Transport, Retention and Storage should be produced, ensuring that cores are stored in a way which facilitates later assessment or analysis, if required. This MS may also include methods for the Stage 1 and 2 geoarchaeological assessment (see below).
- 1.7.5.4 Where relevant, early input should also include recommendations on core locations from a geoarchaeologist. Typically, this process involves close collaboration with the SI team. Archaeological input into geotechnical core locations can allow for the greatest insights into the palaeolandscape. Round-table discussions and the review of seismic profiles tends to be a conducive method of allowing engineering and

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archaeological requirements to be taken into consideration when micro-siting geotechnical cores.

### 1.7.5.5

Following the collection of geotechnical cores, it is recommended that they undergo a staged program of geoarchaeological assessment and analysis as required. This is the primary means of ground-truthing the potential identified in this report, and of mitigating impacts to remains. The requirement for each stage of geoarchaeological assessment is determined by the results of the previous stage. In brief the process is as follows:

- Stage 1: Geoarchaeological review of core logs: This stage involves a desk-based assessment of the geotechnical core logs performed by a professional geoarchaeologist in order to determine which cores may be of interest. The selected cores will then be recommended for further study (Stage 2). Stage 1 assessment requires all cores to be recorded such that sediments that may be of archaeological interest can be identified. The scope of any further work will be agreed by the Applicant and the AC before proceeding to the next stage of assessment. If no further work is recommended a final report will be produced by the Archaeological Contractor
- Stage 2: Geoarchaeological recording: This stage involves further study of the cores that may be of archaeological interest identified in Stage 1 in order to identify archaeological potential. The cores will be physically assessed by a geoarchaeologist who will confirm the sediments present within the cores and determine their archaeological potential and make recommendations for any suitable cores to be assessed further (Stage 3). At this point a report will be produced presenting the results of the Stage 1 and 2 analyses, recommending further study if necessary, and methodologies for any further work. The scope of further work will be agreed by the Applicant and the AC. If no further work is recommended, a final report will be produced by the Archaeological Contractor
- Stage 3: Geoarchaeological assessment: This stage involves taking samples from the cores with archaeological potential identified in Stage 2. The samples will be analysed to determine the age and the value surviving palaeoenvironmental material contained within the samples. The aims for the palaeoenvironmental analysis included establishing the preservation, diversity, and quantity of palaeoenvironmental material for the purpose of better characterising its origin environment. Any suitable material can be recommended for further study (Stage 4) if necessary. A report for the results of the Stage 3 analysis will be produced, it will also outline whether further analysis is necessary or will state if no further work is recommended
- Stage 4 and 5: Geoarchaeological analysis and publication: This stage involves further, more detailed analysis of core samples. A report will be produced after this Stage including the results of all previous work, core location maps, sediment sequences, 2D and 3D images of the cores where necessary. The report will discuss the interpretation of palaeoenvironments in detail based on analysis of the cores and present all relevant information gathered during the desk-based assessments. The work will be undertaken to publication standard. The report will be forwarded to the RA, who will submit it to the Applicant and the AC.

### 1.7.5.6

This work should be undertaken by a trained geoarchaeologist. Each stage should inform the scope of the next, and work may cease at any point where no recommendations for further work are made. This would be the case if, for example, cores were determined to hold no geoarchaeological potential at the end of Stage 2.

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1.7.5.7 Pre-application geotechnical data was subject to stage 1 analysis (COARS, 2023) and three cores were recommended for stage 2 analysis (Document Reference F4.8.1, section 1.4.2).

1.7.5.8 A geological ground model for Morgan Generation Assets has already been produced and will continue to be updated post-consent (Wood, 2022; bp/EnBW, 2023).

1.7.5.9 This geoarchaeological assessment and analysis should aim to deliver conclusions on the prehistoric archaeological and palaeoenvironmental remains within the area. In particular, the identified research frameworks (section 1.4.6) will be used to inform the design of further geoarchaeological analysis. The staged analysis of geotechnical data gathered through the agreed campaign of works will also be planned and undertaken with reference to the Morgan Generation Assets geological ground model (Wood, 2022; bp/EnBW, 2023), in order tie any identified palaeolandscapes into a wider regional context and answer specific research questions such as the timing of the marine transgression and of the Devensian ice retreat in the East Irish Sea, and identifying drowned early Mesolithic sites (NWRRF, PH24).

~~1.7.5.7~~1.7.5.10 Further mitigation may be required based on the results of this assessment. The geoarchaeological work should follow guidance set out within Gribble and Leather (2011).

~~1.7.5.8~~1.7.5.11 The use of an appropriate PAD such as the Crown Estates Protocol for Archaeological Discoveries: Offshore Renewables Projects also provides mitigation for prehistoric and palaeoenvironmental remains.

### 1.7.6 Finds and conservation

1.7.6.1 Material of anthropogenic origin that may be identified in the course of Morgan Generation Assets will be recovered by the Archaeological Contractor or, where recovery is impracticable, recorded. All finds will be recorded and significant objects ('special finds') in three dimensions using a sequence of unique numbers.

1.7.6.2 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 all human remains and items that are 'wreck' for the purposes of the Merchant Shipping Act 1995. The Applicant will seek permission from the landowner to donate finds to an appropriate Museums Service prior to depositing the archive.

1.7.6.3 In the event of the discovery of items that fall under the Treasure Act 1996 (as amended), the Contractor will immediately notify the RA, who will notify the District Coroner within 14 days. The Developer and the Archaeological Curator will be notified as soon as possible. Items falling under the Treasure Act (as amended) will be removed from the site by the Archaeological Contractor and stored in a secure location, pending a decision by the Coroner.

1.7.6.4 Subject to these legal requirements and to the agreement reached with the Museum regarding selection, retention and disposal of material, the Archaeological Contractor will retain all recovered objects unless they are undoubtedly of modern or recent origin. The presence of modern objects will, however, be noted.

1.7.6.5 Any finds and environmental samples will be processed according to professional standards for finds analysis, environmental sampling and archive preparation, and in accordance with the Chartered Institute of Archaeologists' Standard and Guidance for the collection, documentation, conservation and research of archaeological materials (CifA, 2014b).

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- 1.7.6.6 Finds will be primarily conserved, bagged and boxed in accordance with guidelines set out in the United Kingdom's Institute for Conservation's (ICON) Conservation Guidelines No 2 (ICON, 1984). In consultation with the Applicant and the AC, the RA will advise on the implementation of passive conservation for smaller objects pending more detailed conservation strategies. The Applicant will also make provision for a professional conservator to undertake a conservation assessment of assemblages, including recommendations and timescales for the conservation of the object.
- 1.7.6.7 Specialist work approved by the Applicant and the AC on metalwork, bone (including worked bone, human remains and other organic remains), industrial waste, ceramic material, glass and lithic material will be carried out by suitable Archaeological Contractors, monitored by the RA.
- 1.7.6.8 In the event of the discovery of unexpected, unusual or extremely fragile and delicate objects and deposits, such as waterlogged wood, the RA, the Applicant and the AC will be notified immediately. Additional work required to recover, record, analyse, conserve and archive such objects and deposits will be agreed with the AC.

### Human remains

- 1.7.6.9 In the event of the discovery of any confirmed human remains, the Construction Contractor or Archaeological Contractor will immediately inform the RA. The RA will inform the Applicant, the AC, and where appropriate the Coroner and the Police.
- 1.7.6.10 It is proposed that any such remains will be left in situ until the Applicant, the Coroner and the AC have been informed. Where development will unavoidably disturb them they will be fully recorded, excavated and removed from the site subject to compliance with the relevant Ministry of Justice Licence for such activities which will be obtained by the RA.
- 1.7.6.11 The final placing of human remains following analysis will be subject to the requirements of the Ministry of Justice Licence.

### Aviation material

- 1.7.6.12 The majority of aircraft wrecks are military and so fall under the legal protection of the Protection of Military Remains Act 1986. Archaeological Contractors should refer to guidance:
- COWRIE Historic Environment Guidance (Wessex Archaeology, 2007)
  - Draft Interim Guidance on the use of the Protocol for Reporting Finds of Archaeological Interest in relation to Aircraft Crash Sites at Sea (Wessex Archaeology, 2008)
  - Military Aircraft Crash Sites: Archaeological guidance on their significance and future management (English Heritage, 2002).
- 1.7.6.13 Any finds that are suspected of being military aircraft will be reported immediately to the RA. The Applicant will be informed as well as the Service Personnel and Veterans Agency (SPVA): Joint Casualty and Compassionate Centre [JCCC] – SO3 Historic Casualty Casework). The RA should seek specialist advice for the identification of aircraft remains where necessary.
- 1.7.6.14 Any subsequent actions will be guided by Ministry of Defence (MOD) guidance, namely Crashed Military Aircraft of Historical Interest: Licensing of Excavations in the UK – Guidance Notes for Recovery Groups (MOD and SPVA, 2007) and by advice received from SPVA. In the case of a military aircraft being investigated under licence, any

human remains will be reported immediately in accordance with paragraph 14 of Guidance Notes for Recovery Groups.

## 1.8 Reporting and archiving

1.8.1.1 The Marine Policy Statement (MPS) states that ‘opportunities should be taken to contribute to our knowledge and understanding of our past by capturing evidence from the historic environment and making this publicly available, particularly if a heritage asset is to be lost’ (paragraph 2.6.6.3 of MPS). The project recognises that any future geophysical and geotechnical surveys undertaken will produce new archaeological data and understandings of the historic marine environment of the area. The results of these investigations will ultimately be made publicly available. This commitment (set out within Volume 2, chapter 8: Marine archaeology and cultural heritage of the Environmental Statement (Document Reference F2.8)) will be satisfied by reporting, deposition of reports through the OASIS system and archiving of the project. In addition, should the results warrant it, publication will be undertaken.

### 1.8.1 OASIS

1.8.1.1 In 2020 the OASIS version V was launched by the Archaeological Data Service (ADS). OASIS is an online form which allows for archaeological investigations to be reported to regional Historic Environment Records (HERs) and national heritage bodies. The system also allows for reports to be shared for public release through the ADS library. Reporting through OASIS has been incorporated within this Offshore WSI, in line with best practice.

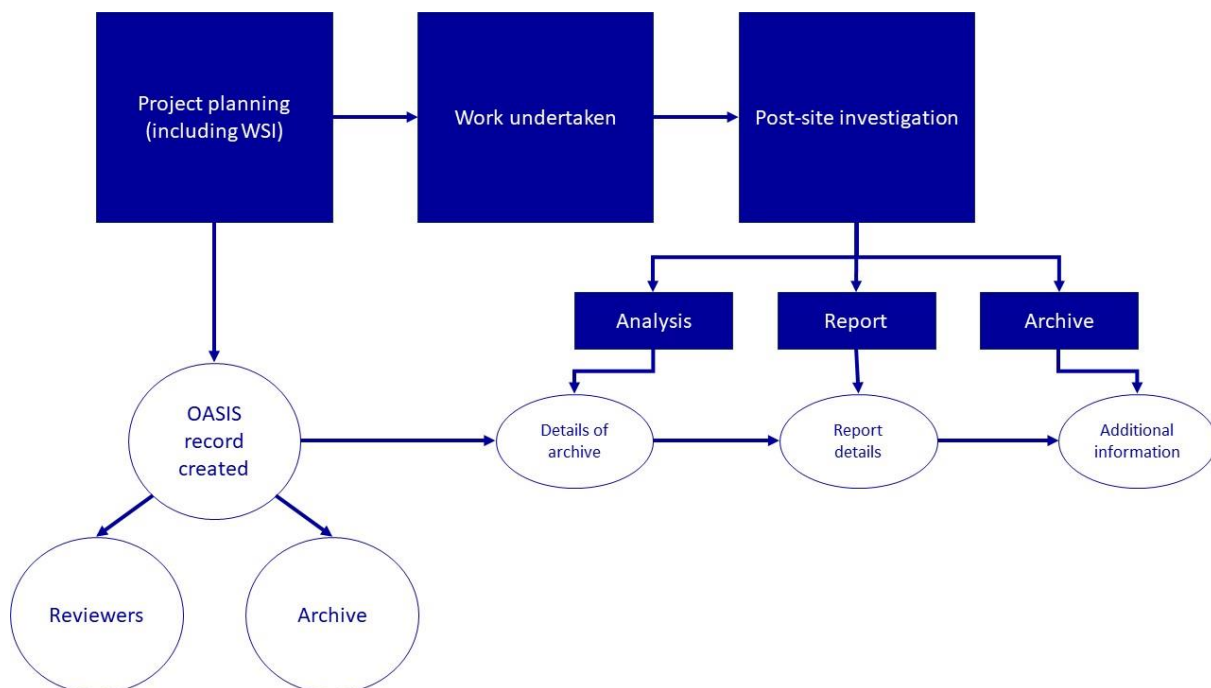


Figure 1.7: OASIS procedure.

1.8.1.2 In contrast to previous iterations of OASIS, OASIS V is a new, flexible system that is kept live throughout the course of a project. An overview of the new system is set out in Figure 1.7. The new system recommends that an overarching OASIS record be established at project inception (for example on receipt of marine licenses and production of an Offshore WSI).

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1.8.1.3 An OASIS record will therefore be set up following consent, to notify the relevant authorities of future work that is taking place. The Applicant must then ensure that an archaeological report is submitted to the MMO and HE and following completion of any survey and subsequent investigation. The contents of this report must be agreed and accepted by the AC and the MMO. The Applicant must then ensure that a copy of the agreed archaeological report is submitted through the OASIS form within two weeks of acceptance by the relevant AC and the MMO. Sign off on the OASIS record will be by the AC who is responsible for administering the OASIS reporting system. The Applicant should notify the MMO that the OASIS report has been submitted within two weeks of the submission.

### 1.8.2 Reporting

1.8.2.1 Reports will be prepared in accordance with the guidance provided in the relevant ClfA Standard and Guidance available on the ClfA website [REDACTED] and with reference to any other activity or analysis specific guidance. Reports will also satisfy all requirements set out within the relevant MS covering the work package.

1.8.2.2 The timetable for depositing archives with the receiving institution after completion of the post- marine fieldwork programme will be set out in the relevant MS.

1.8.2.3 In the event that little of significance is found during the course of the scheme construction, a final report on the investigative work will be prepared by the Archaeological Contractor within six weeks of completion of all construction.

1.8.2.4 If significant archaeological sites and finds are recorded then this final report will be preceded by the submission to the RA by the Archaeological Contractor(s) of investigation reports following the completion of marine fieldwork.

1.8.2.5 The Archaeological Contractor will also be required to produce an assessment report which will establish the value of the recorded archaeology and provide a costing for the post-excavation analysis, publication and archiving (including deposition of archive).

1.8.2.6 Reports are expected to detail the work undertaken and the archaeological evidence encountered. They should discuss the importance of the results including their potential contribution to archaeological knowledge and understanding, including relevant research frameworks.

1.8.2.7 In accordance with guidance issued by the Crown Estate (2021), a report will typically include:

- 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
- An explanation of how this work is relevant to the objectives and research agendas from applicable local and national archaeological research frameworks
- Proposals for further analysis and publication
- Illustrations and appendices to support the report.

1.8.2.8 Where appropriate the report should provide recommendations for further assessment and/or analysis requirements.

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- 1.8.2.9 The Applicant will provide a digital (pdf) copy of each report to the AC and the MMO (as appropriate) following survey completion.
- 1.8.2.10 Decisions regarding the level of post-excavation work, if required, will be taken following submission of investigation reports and consultation by the Developer and the RA with the AC.
- 1.8.2.11 Following the production and acceptance of archaeological reports they will be deposited with the relevant repositories, including the NRHE, by submitting an OASIS form with a digital copy of the report.

### 1.8.3 Publication

- 1.8.3.1 In consultation with the Applicant and the AC, the RA will ensure that the results of important archaeological investigations undertaken in connection with the project will be published in an integrated manner, where relevant. Publication media and all publication matters will be discussed and agreed in advance with the Applicant and AC.

### 1.8.4 Archiving

- 1.8.4.1 Archive planning will be included within detailed MSs for each activity undertaken. Archiving will follow best practice as laid out within:
- Brown, D. 2011. Archaeological Archives: A guide to best practice in creation, compilation, transfer and curation. Archaeological Archives Forum
  - ClfA. 2020. Standard and Guidance for the Creation, Compilation, Transfer and Deposition of Archaeological Archives
  - The Crown Estate. 2021. Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects (section 13.5: Archiving).
- 1.8.4.2 The AC will be notified of any archaeological investigation in advance of marine fieldwork and any specific requirements relating to the preparation and deposition of project archives will be accommodated as appropriate.
- 1.8.4.3 Where there is the likelihood of any marine archaeological fieldwork, the RA will contact an appropriate receiving institution to discuss the intended marine fieldwork and seek its agreement to accept the site archive for long-term storage and curation. The RA will consult the receiving institution with regard to its policy on the selection, retention and disposal of excavated material, and to confirm the requirements in respect of the format, presentation and packaging of archive records and materials. A museum Accession Number will also be sought on each occasion. For offshore digital data, it may be appropriate to archive this with a Marine Environment Data and Information Network Data Archive Centre.
- 1.8.4.4 Project archives, including written, drawn, photographic and material elements (together with a summary of the contents of the archive) will be prepared and deposited by the RA in accordance with the requirements of the receiving museum, repository or digital archive.
- 1.8.4.5 Written, drawn and photographic archives will be compiled to a standard that allows for the publication of a summary report. Written archives will be on clean, stable materials, and will be suitable for photocopying. The materials used will be of the standard recommended in Guidelines for the Preparation of Excavation Archives for Long-term Storage (Walker, 1990).

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- 1.8.4.6 Born-digital records, including digital photographs, will be stored and deposited in accordance with guidelines issued by the receiving repository, ClfA (2023), HE (2015), and the ADS (2023).
- 1.8.4.7 The timetable for depositing archives with the receiving repository after completion of the post-marine fieldwork programme will be agreed with the Applicant and AC.
- 1.8.4.8 On completion of the scheme, an OASIS form will be produced, and copies of all archaeological reports will be attached as data files. Notification of the completion of the OASIS form will be sent to the AC and the MMO (where appropriate).
- 1.8.4.9 The costs of archiving (whether digital, paper or object) will be met by the Applicant. Tenders or costings by contractors for work packages should include provision for the preparation and deposition of the expected archive.

## MORGAN OFFSHORE WIND PROJECT GENERATION ASSETS

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### A.1. Appendix A: Gazetteer of potential anomalies within the Morgan marine archaeology study area.

| Name                        | Potential | Easting  | Northing | UKHO | NRHE   | NMRW   | Description          | Location   | L (m) | W (m) | H (m) |
|-----------------------------|-----------|----------|----------|------|--------|--------|----------------------|------------|-------|-------|-------|
| Ben Rein (Morgan_0096)      | High      | 441193.3 | 5986904  | 5462 | 909472 | -      | Wreck                | Buffer     | 34.53 | 7.61  | 2.77  |
| Flying Meteor (Morgan_0017) | High      | 443932.9 | 5981222  | 8250 | 909493 | -      | Wreck                | Array Area | 28.85 | 9.87  | 1.69  |
| Hibernian (Morgan_0097)     | High      | 433829.1 | 5978665  | 7458 | 909402 | 506875 | Wreck                | Array Area | 48.9  | 19.7  | 3.67  |
| Limesfield (Morgan_0008)    | High      | 438011.8 | 5987431  | 5463 | 909403 | -      | Wreck                | Buffer     | 48.75 | 9.04  | 4.76  |
| Lucy (Morgan_0098)          | High      | 431230.2 | 5980514  | 7459 | -      | 506874 | Wreck                | Array Area | 24.73 | 8.92  | 5.81  |
| Morgan_0002                 | Low       | 431726.2 | 5993474  | -    | -      | -      | Potential debris     | Buffer     | 6.32  | 1.62  | 0.39  |
| Morgan_0004                 | Low       | 431264.4 | 5993280  | -    | -      | -      | Chain, cable or rope | Array Area | 16.85 | 15.46 | 0.19  |
| Morgan_0005                 | Medium    | 428856.5 | 5994556  | -    | -      | -      | Seabed disturbance   | Array Area | 33.72 | 16.2  | 0.22  |
| Morgan_0006                 | Low       | 433383.7 | 5991079  | -    | -      | -      | Likely geological    | Array Area | 59.47 | 14.55 | 0     |
| Morgan_0010                 | Low       | 436720.8 | 5986970  | -    | -      | -      | Potential debris     | Array Area | 8.79  | 6.04  | 1.17  |
| Morgan_0012                 | Low       | 437057.8 | 5986980  | -    | -      | -      | Potential debris     | Array Area | 9.85  | 6.34  | 1.21  |
| Morgan_0013                 | Low       | 437021.4 | 5986788  | -    | -      | -      | Potential debris     | Array Area | 7.63  | 6.3   | 0.86  |
| Morgan_0014                 | Low       | 437270.6 | 5986868  | -    | -      | -      | Linear feature       | Array Area | 14.63 | 0.4   | 0     |
| Morgan_0015                 | Medium    | 440592.8 | 5984185  | -    | -      | -      | Unidentified debris  | Array Area | 12.55 | 7.34  | 0.39  |
| Morgan_0016                 | Low       | 430815.2 | 5991084  | -    | -      | -      | Linear feature       | Array Area | 13    | 0.39  | 0.22  |
| Morgan_0018                 | Low       | 439679.7 | 5983879  | -    | -      | -      | Debris               | Array Area | 3.24  | 2.75  | 0.51  |
| Morgan_0019                 | Low       | 438957.1 | 5984251  | -    | -      | -      | Likely geological    | Array Area | 3.14  | 0.53  | 1.16  |
| Morgan_0020                 | Low       | 428434.9 | 5991489  | -    | -      | -      | Likely geological    | Array Area | 4.42  | 1.57  | 0.23  |
| Morgan_0021                 | Low       | 437751.6 | 5983211  | -    | -      | -      | Potential debris     | Array Area | 3.74  | 0.75  | 0.29  |

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| Name        | Potential | Easting  | Northing | UKHO | NRHE | NMRW | Description          | Location   | L (m)  | W (m) | H (m) |
|-------------|-----------|----------|----------|------|------|------|----------------------|------------|--------|-------|-------|
| Morgan_0022 | Low       | 444923.1 | 5978390  | -    | -    | -    | Chain, cable or rope | Array Area | 23.39  | 0.88  | 0     |
| Morgan_0023 | Low       | 436488.2 | 5982903  | -    | -    | -    | Potential debris     | Array Area | 7.24   | 2.22  | 0     |
| Morgan_0024 | Low       | 440377.8 | 5977691  | -    | -    | -    | Likely geological    | Array Area | 35.99  | 0.56  | 0.26  |
| Morgan_0025 | Medium    | 431565.5 | 5983703  | -    | -    | -    | Potential debris     | Array Area | 23.2   | 8.71  | 1.17  |
| Morgan_0026 | Low       | 429097.6 | 5984725  | -    | -    | -    | Debris               | Array Area | 4.48   | 0.87  | 0.38  |
| Morgan_0027 | Low       | 441016.5 | 5976030  | -    | -    | -    | Potential debris     | Array Area | 3.53   | 1.59  | 0.45  |
| Morgan_0028 | Low       | 423776.6 | 5987800  | -    | -    | -    | Debris               | Array Area | 5.24   | 1.57  | 1.84  |
| Morgan_0029 | Low       | 439342.4 | 5977091  | -    | -    | -    | Linear feature       | Array Area | 7.41   | 0.56  | 0.17  |
| Morgan_0030 | Medium    | 427532.8 | 5984192  | -    | -    | -    | Unidentified debris  | Array Area | 13.86  | 3.22  | 0.41  |
| Morgan_0031 | Low       | 426909.3 | 5984696  | -    | -    | -    | Potential debris     | Array Area | 31.27  | 4.55  | 0.92  |
| Morgan_0032 | Low       | 430908   | 5981869  | -    | -    | -    | Chain, cable or rope | Array Area | 40.12  | 0.47  | 0.2   |
| Morgan_0033 | Low       | 423940.6 | 5986633  | -    | -    | -    | Potential debris     | Array Area | 2.64   | 1.22  | 0.81  |
| Morgan_0034 | Low       | 433270.5 | 5979528  | -    | -    | -    | Fishing gear         | Array Area | 190.82 | 0.39  | 0     |
| Morgan_0035 | Low       | 437304.6 | 5974904  | -    | -    | -    | Likely geological    | Array Area | 12.63  | 2.75  | 0.57  |
| Morgan_0036 | Low       | 428192.5 | 5981034  | -    | -    | -    | Potential debris     | Array Area | 4.67   | 0.74  | 0.44  |
| Morgan_0037 | Low       | 428660.5 | 5980302  | -    | -    | -    | Potential debris     | Array Area | 4.5    | 0.56  | 0.51  |
| Morgan_0038 | Low       | 422857.2 | 5984137  | -    | -    | -    | Chain, cable or rope | Array Area | 11.42  | 0.06  | 0.16  |
| Morgan_0039 | Low       | 430254.2 | 5978691  | -    | -    | -    | Potential debris     | Array Area | 3.7    | 3     | 0     |
| Morgan_0040 | Low       | 436645.5 | 5974091  | -    | -    | -    | Chain, cable or rope | Array Area | 107.64 | 0.23  | 0.2   |
| Morgan_0041 | Low       | 432153.4 | 5977221  | -    | -    | -    | Debris               | Array Area | 3.18   | 2.48  | 1.38  |
| Morgan_0042 | Low       | 420313.3 | 5985573  | -    | -    | -    | Unidentified debris  | Buffer     | 4.64   | 0.39  | 0.67  |
| Morgan_0043 | Low       | 436516.5 | 5973643  | -    | -    | -    | Debris               | Buffer     | 5.03   | 1.57  | 0.4   |
| Morgan_0045 | Low       | 426841.8 | 5980082  | -    | -    | -    | Seabed disturbance   | Array Area | 11.43  | 6.77  | 0     |

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| Name        | Potential | Easting  | Northing | UKHO | NRHE | NMRW | Description          | Location   | L (m) | W (m) | H (m) |
|-------------|-----------|----------|----------|------|------|------|----------------------|------------|-------|-------|-------|
| Morgan_0046 | Low       | 430106.7 | 5977432  | -    | -    | -    | Potential debris     | Buffer     | 5.71  | 3.16  | 0.57  |
| Morgan_0047 | Low       | 432566.7 | 5975583  | -    | -    | -    | Linear feature       | Buffer     | 18.08 | 3.87  | 1.24  |
| Morgan_0048 | Low       | 432388.9 | 5974904  | -    | -    | -    | Chain, cable or rope | Buffer     | 30.58 | 0.15  | 0.16  |
| Morgan_0049 | Low       | 434092.2 | 5973434  | -    | -    | -    | Potential debris     | Buffer     | 2.01  | 0     | 0.51  |
| Morgan_0095 | Low       | 430011.1 | 5980005  | -    | -    | -    | Potential debris     | Array Area | 2.13  | 0.26  | 0.3   |
| Morgan_0099 | Low       | 421916.5 | 5987244  | -    | -    | -    | Chain, cable or rope | Buffer     | 23.27 | 0.34  | 0.08  |
| Morgan_0104 | Low       | 430580   | 5980092  | -    | -    | -    | Likely geological    | Array Area | 1.19  | 0.6   | 0.43  |
| Morgan_0107 | Low       | 426564.9 | 5982806  | -    | -    | -    | Unidentified debris  | Array Area | 2.2   | 0.12  | 0.2   |
| Morgan_0116 | Medium    | 440109.5 | 5982030  | -    | -    | -    | Unidentified debris  | Array Area | 16.4  | 6.35  | 2.3   |

## 2 Protocol for Archaeological Discoveries

### 2.1 Introduction

- 2.1.1.1 This Protocol for Archaeological Discoveries (PAD) sets out the procedure for reporting discoveries of potential archaeological interest made during the course of construction, operations and maintenance, and decommissioning activities associated with Morgan Generation Assets.

### 2.2 Aims

#### 2.2.1 Overview

- 2.2.1.1 The aim of the PAD is to reduce any adverse effects of Morgan Generation Assets upon the historic environment by enabling people working on the project to report their finds in a manner that is both convenient to their every-day work and effective with regard to curatorial requirements.
- 2.2.1.2 The archaeological finds made during these works are important because they shed light on past human use of the landscape, sea and seabed. The information that such discoveries bring to light can help archaeologists to better understand what happened in the past, and therefore to better protect those aspects of our history and pre-history that should be conserved on behalf of future generations.
- 2.2.1.3 The Protocol that will be used is based on the PAD for Offshore Renewables Projects introduced by The Crown Estate (The Crown Estate, 2014).
- 2.2.1.4 The Developer will employ a Retained Archaeologist (RA) to provide archaeological consultancy and to liaise with and report as appropriate to the Contractors, the Developer and the Archaeological Curator (AC).

#### 2.2.2 Roles and responsibilities within the PAD

- 2.2.2.1 For a full description of roles and responsibilities in relation to the Morgan Generation Assets and marine archaeology see section 1. Roles that are specific to the PAD only are described below.

##### Site champion

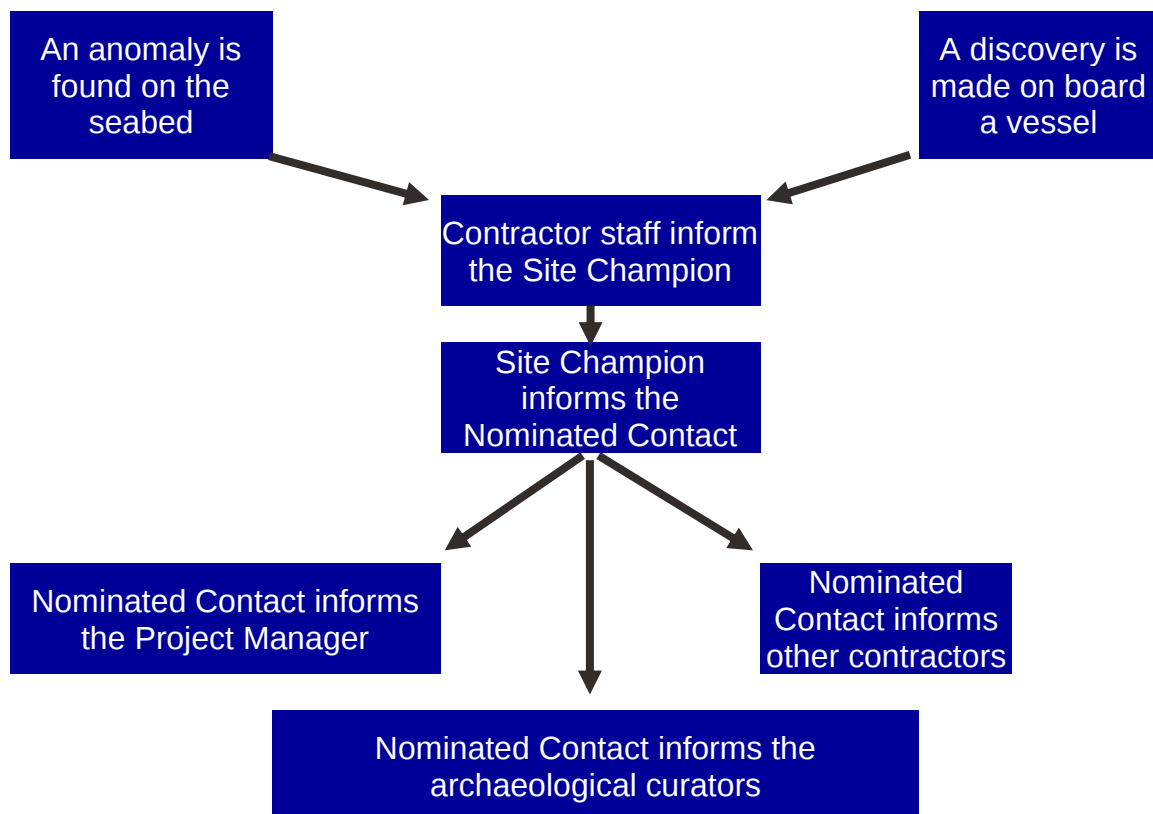
- 2.2.2.2 The Site Champion is the person formally appointed by the Developer to be directly responsible for implementation of the PAD and producing reports arising from a particular activity location. The Site Champion could be a Vessel Master, a Construction Foreperson or any other person in a position to control the immediate works.

##### Nominated contact

- 2.2.2.3 The Developer's Nominated Contact is the formal point of contact for all matters relating to the PAD between the Developer, its subcontractors, the Site Champions, RA, the AC, and the Regulator. The Nominated Contact could be Morgan Generation Assets' Environmental Manager, Project Manager or any other coordinator that the Developer feels is appropriate and effective in acting in this role. It is critical that all parties hold the Nominated Contact's full contact details and that any changes to the Nominated Contact's details are circulated as soon as possible.

## 2.3 Reporting structure

- 2.3.1 The PAD has been designed to allow developers to report unexpected finds of archaeological interest made on the seabed during the course of development works.
- 2.3.2 The PAD anticipates that discoveries made by project staff are reported to the Site Champion (e.g. Vessel Master or Site Foreman) on their vessel or site, who then reports to the Nominated Contact (the RA is the recommended Nominated Contact).
- 2.3.2.1 The RA will liaise with the Developer and the AC, along with any additional relevant stakeholders depending on the nature and significance of the find, and planned activities within the area. Additional mitigation may be recommended depending on the nature of the find.
- 2.3.2.2 Key steps and a summary of the key roles and steps in the reporting process of the PAD are shown in Figure 2.1.



**Figure 2.1: Reporting process of the PAD.**

- 2.3.2.3 On the vessel or site, the person responsible for reporting anomalies or finds will be the Site Champion. Anomalies or finds will be brought to the attention of the Site Champion by the Contractors or project staff. The Site Champion will inform the Nominated Contact (who can be the RA).
- 2.3.2.4 The Developer's RA can provide specialist advice on finds identification, assessments of significance, and technical support services relating to the mitigation of the impacts of the project on the historic environment.
- 2.3.2.5 Protocol for Archaeological Discoveries (The Crown Estate, 2014) includes an additional step whereby the report is passed to the Implementation Service who

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provide additional support on identification and input into mitigation. This Service is run by an archaeological contractor. The RA, who has access to all project datasets and typically has a strong understanding of the archaeological potential of the area, along with specialists in maritime archaeology, is best placed to give this advice. As such there is no need for the inclusion of the additional step of corresponding with the Implementation Service. The 2021 Crown Estate guidance on Archaeological Written Schemes of Investigation, which post-dates the 2014 PAD guidance, indicates that although the 2014 guidance sets out one PAD, others can also be used and further states that the 2014 guidance can be used to 'support the development of a PAD for any offshore wind project (The Crown Estate, 2014). The approach set out here is therefore in line with existing guidance.

- 2.3.2.6 The RA, along with the Developer and their contractors shall draw to the attention of all relevant staff the potential for archaeological material to be found in the course of survey and inform them of the possible importance of such finds.

## 2.4 Approach to finds

### 2.4.1 Legislation

- 2.4.1.1 It should be noted that if the wreck of an aircraft is encountered it may be automatically protected as a protected place under the terms of the Protection of Military Remains Act 1986 and it is an offence to tamper with, damage, or move the wreck or to remove items.
- 2.4.1.2 Furthermore, all items of 'wreck' are reportable to the Receiver of Wreck under the terms of the Merchant Shipping Act 1995. Appropriate finds will be reported to the Receiver of Wreck within the required timescales (28 days) by the RA, thereby satisfying this legal requirement.
- 2.4.1.3 The following guidelines can be used to identify any discovered material and must be referred to when planning appropriate handling and storage. Advice on the identification of finds has been provided following the accepted advice provided by The Crown Estate 2014. Further advice on finds can be sought from the RA.
- 2.4.1.4 Archaeological material can come in a variety of sizes, shapes and materials. Materials can degrade in different ways so it is important that they are handled with care and that the appropriate handling and storage techniques are applied.
- 2.4.1.5 Finds are vulnerable to deterioration at all times, whether they are recovered or not. Fragile material, such as wood, can be damaged by the force of passing machinery. It is crucial that all finds be treated carefully and interfered with as little as possible.
- 2.4.1.6 Leaving finds in situ is the best way to manage them. Once a find is recovered to the surface, it requires conservation which can be difficult and expensive to administer.

### 2.4.2 Handling and conservation procedures

- 2.4.2.1 Handling and conservation procedures are:
- Handle all finds carefully
  - Photograph all sides of a find with a scale
  - Take close up photographs of any markings, glazing, or imagery
  - Keep finds wet and ensure the water is changed regularly if biological growth is detected

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- Keep finds cool and ideally in the dark
- Keep finds in protective containers where possible
- Label any finds
- Follow the information below on finds storage and contact the RA if further advice is required
- Do not attempt to clean the find by removing any sediment build up, concretion, or marine life
- Do not allow finds to dry out
- Do not handle finds more than necessary.

### 2.4.3 Advice for specific materials

2.4.3.1 The following materials may be encountered on the seabed or onboard the vessel and as such the following sections provide advice as per The Crown Estate 2014 for the handling and storage of these.

#### Metal

2.4.3.2 Metal is likely to survive in marine environment, though it may corrode when in water or form concretions of material (a hard mass of material which typically has a mineral matrix, commonly formed around ferrous objects in particular). Typical metal finds might include ingots, ballast, coins, ornaments, tools, weapons, aircraft or ship parts, and personal items. The Crown Estate Guidance for the identification of metals is as follows:

- Iron and steel: The potential range and date of iron and steel objects is so wide that it is difficult to provide general guidance. In broad terms, iron and steel objects which are covered by a thick amorphous concrete-like coating ('concretion') are likely to be of archaeological interest and should be reported. Pieces of metal sheet and structure may indicate a wreck and should be reported. Specific operational measures are likely to apply in respect of ordnance (cannonballs, bullets, shells) which should take precedence over archaeological requirements. However, discoveries of ordnance may be of archaeological interest, and they should be reported
- Other metals: Items made of thin, tinned or painted metal sheet are unlikely to be of archaeological interest. Aluminium objects may indicate aircraft wreckage from World War Two, especially if two or more pieces of aluminium are fixed together by rivets. All occurrences should be reported' and remains of this nature may be subject to the Protection of Military Remains Act 1986. *'Copper and copper alloy (bronze, brass) objects might indicate a wreck, or they may be very old. All occurrences should be reported. Precious metal objects and coins are definitely of archaeological interest because they are relatively easy to date. All occurrences should be reported'* (The Crown Estate, 2014).

2.4.3.3 If possible, do not recover metal. It can be difficult and expensive to conserve and some types of site, such as aircraft, are covered by specific legislation which prohibits recovery without appropriate licences.

2.4.3.4 For metals which are lifted, lifting should be carried out carefully and the find should be photographed. All metals should be stored in cool seawater. Different metals should not be stored together. The shape of the concretion can be used to identify the item

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and as such concretions should not be removed. If the find is too large to cover in seawater, wrap it in soaked material and keep wet. Some metal products (e.g. lead, pewter and copper salts can be toxic, so handle with gloves or wash hands thoroughly after contact).

- 2.4.3.5 Metals can sometimes be identified from the colour of their corrosion. Table 2.1 provides some guidance for the identification of metal.

**Table 2.1: Identification of metal.**

| Metal                           | Corrosion                                            |
|---------------------------------|------------------------------------------------------|
| Gold                            | No corrosion.                                        |
| Silver                          | White, waxy layers that turn lilac in the light.     |
| Copper/Copper Alloy e.g. Bronze | Dark red/purple/green/blue.                          |
| Iron/Steel                      | Black or rusty with a crust of concretion.           |
| Lead                            | Grey or white crystals.                              |
| Pewter/Tin/Lead Alloy           | Grey surface, possibly crystalline, soft or friable. |
| Aluminium                       | Little corrosion.                                    |

### Ceramics

- 2.4.3.6 Pottery can be made from china, porcelain, terracotta, earthenware and other clay-based materials. Typical finds might include crockery, ornaments, clay pipes, lamps, containers and tableware. Any fragment of pottery is potentially of interest, especially if it is a large fragment. Items which look like modern crockery can be discarded, but if the item has an unusual shape, glaze or fabric it should be reported (The Crown Estate, 2014: 19). Additionally, clay pipes should be reported.
- 2.4.3.7 Actions to take include photographing finds with a scale, especially if they have any glazing or markings. Store in saltwater.

### Ceramic building material

- 2.4.3.8 Ceramic building material can be in the form of bricks, building blocks, mudbricks, and tile. Bricks and tile can appear unusually shaped. Ceramic building material can be evidence of a ship, or submerged settlement.
- 2.4.3.9 Bricks with modern proportions and v-shaped hollows ('frogs') are of no archaeological interest. Unfrogged, 'small', 'thin' or otherwise unusual bricks may date back to Medieval or even Roman times and should be reported (The Crown Estate, 2014). Occurrences of tile should also be reported.
- 2.4.3.10 Actions to take include photographing finds with a scale, especially if they have any glazing or markings on them. Store in saltwater.

### Stone

- 2.4.3.11 Stone has been used by humans for thousands of years and it very durable underwater, making it a common find. There are different types of stone; quartz, limestone, marble, granite, obsidian, slate, sandstone and flint. Typical finds might include ballast, anchors, millstones building material, shot, carvings, tools, sculptures, whetstones, flint or stone tools and other personal items.

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- 2.4.3.12 Small to medium size stones that are shaped, polished and/or pierced may be prehistoric axes. All occurrences should be reported. Objects such as axe heads or knife blades made from flint are likely to be of prehistoric date and should be reported. Large blocks of stone that have been pierced or shaped may have been used as anchors or weights for fishing nets. All occurrences should be reported. The recovery of numerous stones may indicate the ballast mound of a wreck, or a navigational cairn. All occurrences should be reported (The Crown Estate, 2014).
- 2.4.3.13 Actions to take include photographing finds with a scale and then store in water or wrap in soaked towelling.

### Peat and clay

- 2.4.3.14 Peat is black or brown fibrous soil that formed when sea level was so low that the seabed formed marshy land, for example on the banks of a river or estuary. Peat is made up of plant remains, and also contains microscopic remains that can provide information about the environment at the time it was formed. This information helps us to understand the kind of landscape that our predecessors inhabited, and about how their landscape changed. It can also provide information about rising sea-level and coastline change, which are important to understanding processes that are affecting us today. Prehistoric structures (such as wooden trackways) and artefacts are often found within or near peat, because our predecessors used the many resources that these marshy areas contained. As these areas were waterlogged and have continued to be waterlogged because the sea has risen, 'organic' artefacts made of wood, leather, textile and so on often survive together with the stone and pottery which are found on 'dry' sites.
- 2.4.3.15 Fine-grained sediments such as silts and clays are often found at the same places as peat. These fine-grained sediments also contain the microscopic remains that can provide information about past environments and sea level change. Any discoveries of such material would be of archaeological interest, and their occurrence should be reported (The Crown Estate, 2014).
- 2.4.3.16 Actions to take include that all sediments collected should be stored in a sealed container with seawater and keep cool. Do not try to break apart the deposits.

### Faunal remains

- 2.4.3.17 Skeletal finds and faunal remains can come in the form of bone, ivory, tooth, antler, baleen, tortoiseshell, tusk, or shell. Typical finds might include human or animal remains, personal items such as combs or jewellery, carvings and tool handles.
- 2.4.3.18 Discoveries of animal bone, teeth and tusks are of archaeological interest because they may date to periods when the seabed formed dry land and should be reported. Such bones, teeth, tusks etc. may have signs of damage, breaking or cutting that can be directly attributed to human activity. Large quantities of animal bone may indicate a wreck (the remains of cargo or provisions) and should be reported. Human bone is definitely of archaeological interest, and may, if buried and found within territorial waters, be subject to the provisions of the Burial Act 1857. Alternatively, it may be subject to the Protection of Military Remains Act 1986. Any suspected human bone should be reported and treated with discretion and respect.
- 2.4.3.19 Objects made out of bone – such as combs, harpoon points or decorative items – can be very old and are definitely of archaeological interest. All occurrences should be reported (The Crown Estate, 2014).

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- 2.4.3.20 Actions to take are to consider that skeletal finds are vulnerable to environment change, so if any are recovered, ensure they are photographed with a scale and then immediately submerge in seawater and seal in a suitable container. Change the water if biological growth occurs e.g. algae mould.

### Wood

- 2.4.3.21 Wooden finds could be evidence of a wrecked vessel. Typical wooden finds might include small personal items e.g. tools and bottle corks, or larger finds e.g. ships timbers, furniture, chests, barrels, dwelling posts, and wattle panels.
- 2.4.3.22 Light coloured wood, or wood that floats easily, is probably modern and is unlikely to be of archaeological interest. 'Roundwood' with bark – such as branches – is unlikely to be of archaeological interest, although it may provide paleo-environmental evidence. However, roundwood that has clearly been shaped or made into a point should be reported. Pieces of wood that have been shaped or jointed may be of archaeological interest, especially if fixed with wooden pegs, bolts or nails – all occurrences should be reported. Objects made out of dark, waterlogged wood – such as bowls, handles, shafts and so on – can be very old and are definitely of archaeological interest. All occurrences should be reported (The Crown Estate, 2014).
- 2.4.3.23 Actions to take include:
- Lift with care - considering that timber finds are often very fragile
  - Photograph with a scale
  - Keep the find in a cool and dark area
  - Submerge in seawater - do not allow the wood to dry out
  - If the find is too large to store in water, try to keep it damp and in a cool in a darkened area
  - Ensure that it has sufficient support to stop it falling apart
  - Change the water if biological growth is detected e.g. algae or mould.

### Fibre and textiles

- 2.4.3.24 Fibrous finds are unlikely to survive in marine conditions, but occasionally they do. Typical fibrous finds might include ropes and rigging, weaving, sailcloth, sacks, clothing, basketry and fishing nets etc.
- 2.4.3.25 Due to the incredibly fragile nature, once any fibrous or textile find has been recovered it must be dealt with quickly. Take photographs with a scale, but do not use flash. Carefully place it in a sealed container. Try to keep it out of the light. If possible, keep the find in its original burial deposit e.g. the sediment it was found in, and seawater. This will help to protect the material.

### Plastic etc.

- 2.4.3.26 In most cases, rubber, plastic, Bakelite and similar modern materials are not of archaeological interest and can be disregarded. One exception is where such materials are found in the same area as aluminium objects and structures, which may indicate aircraft wreckage from World War Two. Such material should be reported (The Crown Estate, 2014).

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- 2.4.3.27 Actions to take include to not bend or clean any plastic or rubber finds. Photograph the find with a scale and then store in seawater in a cool and dark area.

### Resinous or Mineral Substance

- 2.4.3.28 These materials include amber, jet, coal, or bitumen. Typical finds might include ornaments, jewellery, beads, sealants or caulking materials, all of which would be of archaeological interest and should be reported.
- 2.4.3.29 Actions to undertake include photographing a find with a scale, and then keep stored in seawater. These finds might appear stable, but if they are not stored properly, they may begin to deteriorate.

### Glass

- 2.4.3.30 Glass artefacts are found on the seabed. Finds may include bottles, beads, panes of glass from ship's windows. Unless obviously modern (beer bottles etc) glass finds should be reported, particularly where it occurs alongside other finds as this may represent a wreck site.
- 2.4.3.31 Glass is likely to survive in marine conditions, but it does degrade; glass deterioration is usually categorised by leaching, which causes an iridescent pattern to form on the glass, it looks somewhat like an oil slick. It can also begin to flake away.
- 2.4.3.32 Actions to undertake include photographing a find with a scale before packing carefully to avoid breakage. Ensure it is covered in cool seawater in the dark.

## 2.5 References

The Crown Estate (2014). Offshore Renewables Protocol for Archaeological Discoveries. Available at: [REDACTED]

[REDACTED] Accessed January 2024.

## A.2. Appendix A2: Preliminary record form

### Protocol for Archaeological Discoveries

#### Preliminary Record Form: Discoveries on the seabed/on board

|                                                                                                |   |           |  |
|------------------------------------------------------------------------------------------------|---|-----------|--|
| Company name                                                                                   | x |           |  |
| Vessel/Team Name                                                                               |   |           |  |
| Sea Area Name                                                                                  |   |           |  |
| Date                                                                                           |   |           |  |
| Time of compiling information                                                                  |   |           |  |
| Name of compiler (Site Champion)                                                               |   |           |  |
| Name of finder<br>(if different from above)                                                    |   |           |  |
| Time at which discovery was encountered                                                        |   |           |  |
| Vessel position at time when anomaly was encountered                                           |   |           |  |
| Latitude                                                                                       |   | Longitude |  |
| Datum (if different from ETRS89)                                                               |   |           |  |
| Original position of the anomaly on the seabed, if known                                       |   |           |  |
| Notes on likely accuracy on position stated above:                                             |   |           |  |
| How accurate is the position?                                                                  |   |           |  |
| Is the position the original position or has the material been moved by operations?            |   |           |  |
| Details of circumstances that led to the discovery                                             |   |           |  |
| Description of the find / anomaly                                                              |   |           |  |
| Apparent size / extent of the anomaly                                                          |   |           |  |
| Details of any find(s) recovered                                                               |   |           |  |
| Details of any photographs, drawings of other records made of the find(s) e.g. location figure |   |           |  |
| Details of treatment or storage of find(s)                                                     |   |           |  |
| Date and time Nominated Contact informed                                                       |   |           |  |
| General notes if discovered on the seabed:                                                     |   |           |  |
| Derived from e.g. Obstacle Avoidance Sonar, Cable Tensiometer?                                 |   |           |  |
| Apparent size/ extent of anomaly (length, width, height above seabed)                          |   |           |  |
| Extent of deviation/ route development                                                         |   |           |  |
| Signed                                                                                         |   | Date      |  |