

Mona and Morgan OWF

2023 Survey

Method Statement

Prepared for:

Morgan Offshore Wind Limited and Mona Offshore Wind Limited

Chertsey Road

Sunbury on Thames

Middlesex

TW16 7BP

By:

Coastal and Offshore Archaeological Research Services (COARS)

Ocean and Earth Science

National Oceanography Centre Southampton

University of Southampton

European Way

Southampton

SO14 3ZH

United Kingdom

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www.southampton.ac.uk/coars

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<i>prepared by date</i>	Michael Grant COARS, University of Southampton December 2022
<i>approved by signed date</i>	Steve Cousins BP Exploration Operating Company Limited December 2022
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Executive Summary

bp and Energie Baden-Württemberg AG (EnBW) (“Company” hereafter) have been awarded preferred bidder status for two offshore wind leases in the Irish Sea as part of The Crown Estate Offshore Wind Leasing Round 4, named Morgan and Mona. To inform the development of the projects, the Company carried out a survey campaign commencing in Spring 2022. In 2023 additional surveys will be undertaken, including a series of shallow and deep geotechnical boreholes / CPTs, and suction bucket foundation trials. Each of these site investigation techniques has the potential to impacts upon maritime archaeological assets and the submerged palaeolandscape features within the proposed array sites. To support the survey planning, the existing site Written Scheme of Investigation (WSI) will be adopted for the 2023 offshore survey. The WSI lays out the methodology that will be adopted during the 2023 campaign, consisting of the following components: 1) methodology for the assessment of the proposed coring locations using the aquired marine geophysical datasets; 2) development and implementation of Archaeological Exclusion Zones (AEZs); 3) Method Statement for the collection and retention of geoarchaeological material; and 4) a Protocol for Archaeological Discoveries (PAD).

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GLOSSARY

AEZ – Archaeological Exclusion Zone imposed to protect known archaeological sites or geophysical anomalies of high, medium or low archaeological potential

ARCHAEOLOGICAL CONSULTANT – The nominated Archaeological Consultant is Dr Michael Grant, Lead Marine Consultant at COARS, who approved this document for the project

BATHYMETRIC SURVEY – A non-intrusive, remote-sensing investigative survey, using a multibeam echosounder, that measures the depth and topography of the seabed

COMPANY – BP Alternative Energy Investments Limited (bp or BP) and Ebergie Baden-Württemberg (EnBW)

DBA – Desk-Based Assessment

GEOPHYSICAL SURVEY – A non-intrusive, remote-sensing investigative survey including side scan sonar, magnetometer and sub-bottom profiler, to detect or measure features on and below the seabed

GEOTECHNICAL INVESTIGATIONS – An intrusive survey method that penetrates the seabed recovering material samples for analysis

HISTORIC ASSETS – Elements of the historic environment that have local, regional or national significance, such as protected wrecks or submerged palaeo-landscapes

HISTORIC ENGLAND (HE) – the government’s Statutory Heritage advisor and The Historic Buildings and Monuments commission for England or their successor function. HE’s general powers under section 33 of the National Heritage Act 1983 were extended (via the National Heritage Act 2002) to modify their functions to include securing the preservation of monuments in, on, or under the seabed within the seaward limits of the UK Territorial Sea adjacent to England. They also provide advice in recognition of the English marine plan areas (inshore and offshore) as defined by the Marine and Coastal Access Act 2009 and the objectives and policies of published Marine Plans. HE is an executive non-departmental public body, sponsored by the Department for Digital, Culture, Media & Sport.

MMO – the Marine Management Organisation is responsible for licensing and regulating marine activities in the seas around England and Wales

MHWS – Mean High Water Springs, highest average tide

NOMINATED CONTACT – The shore-based representative from the developer who will be responsible for liaison between the Archaeological Consultant and the vessel-based Site Champion

PAD – The Protocol for Archaeological Discoveries sets out the procedures that must be followed in the event of unexpected archaeological discoveries either on the seabed or on the deck of working vessels and identifies the personnel with responsibility for ensuring that the PAD is followed

PROPOSED DEVELOPMENT – the two offshore wind leases in the Irish Sea awarded as part of The Crown Estate Offshore Wind Leasing Round 4, named Morgan and Mona, along with their proposed Export Cable Routes

ROYAL COMMISSION ON THE ANCIENT AND HISTORICAL MONUMENTS OF WALES (RCAHMW) - the statutory body for archaeology and cultural heritage within Welsh waters including marine

archaeology in the Welsh area of the UK Territorial Sea and territorial waters adjacent to the Welsh coast up to the mean high-water mark with responsibility for marine planning, the application of policy and the identification of Welsh National Marine Planning Areas

RECEIVER OF WRECK – The Receiver of Wreck, the wreck administration within the MCA/UKHO, deals with all reports of wreckage from around the UK including Northern Ireland. It is based in the Maritime and Coastguard Agency headquarters in Southampton, with assistance from Coastguard personnel around the coast

RECEPTOR – Any environmental or other defined feature that is sensitive to, or has the potential to be affected by, an impact

RELEVANT NATIONAL AUTHORITIES – The Relevant National Authorities for this project are Historic England (HE) and the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW) respectively.

SITE CHAMPION – The Site Champion is usually the most senior representative on board the works vessel

STUDY AREA – an area used to gather data to provide sufficient contextual information about the proposed route and its environs from which to assess known and potential impacts on the heritage resource

TEZ – a Temporary Exclusion Zone imposed, under the terms of the PAD, in the event of an unexpected archaeological discovery until initial investigations have been completed. It may then either be removed or converted into an AEZ

THE CROWN ESTATE (TCE) – the body responsible for managing the seabed and foreshore in England, Wales and Northern Ireland, including offshore energy, aggregates, and cables and pipelines

UKHO – United Kingdom Hydrographic Office

WSI – The Written Scheme of Investigation forms an umbrella document for all survey, investigation and assessment required for a project and is supported by activity-specific Method Statements.

List of Acronyms used in the text

AEZ	Archaeological Exclusion Zone
BP	BP Alternative Energy Investments Limited
COARS	Coastal and Offshore Archaeological Services
CPT	Cone Penetration Tests
DBA	Desk based assessment
EMODnet	European Marine Observation and Data Network
EnBW	Energie Baden-Württemberg
GIS	Geographic Information System
GPS	Global Positioning System
HE	Historic England
HER	Historic Environment Record
ISB	Irish Sea Basin
LAT	Lowest Astronomical Tide
MMO	Marine Management Organisation
nm	Nautical miles
NMRW	National Monuments Record of Wales
NRHE	National Record of the Historic Environment
OSGB	Ordnance Survey Great Britain
OSL	Optically Stimulated Luminescence
OWF	Offshore Wind Farm
PAD	Protocol for Archaeological Discoveries
RCAHMW	Royal Commission on the Ancient and Historical Monuments of Wales
SA	Study Area
TEZ	Temporary Exclusion Zone
UKHO	United Kingdom Hydrographic Office
UTM	Universal Transverse Mercator
WGS	World Geodetic System
WSA	Wider Study Area
WSI	Written Scheme of Investigation

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1 Introduction

1.1 Outline

- 1.1.1.1 BP Alternative Energy Investments Limited (hereafter bp or BP) and Ebergie Baden-Württemberg (EnBW) (“Company” hereafter) have been awarded preferred bidder status for two offshore wind leases in the Irish Sea as part of The Crown Estate Offshore Wind Leasing Round 4, named Morgan and Mona (henceforth ‘the Proposed Development’). To inform the development of the projects, the Company has carried out a series of survey campaign in 2021 and 2022. These focused on the Proposed Development bidding areas, bidding area zone of influence and the potential export cable routes, and consisted of the collection of geophysical, geotechnical and environmental survey data acquisition in the Irish Sea, in both English and Welsh waters.
- 1.1.1.2 The planned development is to install two fixed bottom 1.5 GW capacity offshore wind farms on the lease sites. The Project has applied for grid connection for both sites, with the base case assumption that the Mona Project will make landfall and connect to grid in north Wales, and Morgan will make landfall and connect to grid in north-west England.
- 1.1.1.3 In 2023, the Company will undertake additional survey of the Proposed Development bidding areas. This survey will consist of four components:
- Site specific geophysical 3D survey;
 - Seabed UXO survey (this does not include any UXO clearance);
 - Shallow and deep geotechnical survey; and
 - Suction bucket foundation trials.
- 1.1.1.4 The first two surveys are deemed to be non-intrusive upon any marine archaeology within the Proposed Development bidding area, and will therefore not require any archaeological conditions. The geotechnical survey and suction bucket foundations trials will, however, have an impact upon the seabed and therefore have the potential to impact upon marine archaeology. For this reason, a method statement

will be utilised to consider the potential archaeological impact from these site investigations, and any mitigation measures that need to be implemented.

- 1.1.1.5 The shallow and deep geotechnical survey will consist of a large number of boreholes, up to 80m deep, and deep CPTs. The Suction bucket foundation trials survey will involve instrumented caissons, circa 6-12m diameter, with wall thicknesses of 40-80 mm, which will be inserted into the seafloor by pumping the water out of them and then removed by pumping water into them at a maximum of 30 locations in each of the Mona and Morgan array areas.
- 1.1.1.6 Coastal and Offshore Archaeological Research Services (COARS) were commissioned by the Company to provide archaeological consultant support for survey planning during the 2021 and 2022. This included the preparation of a Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) for the Proposed Development (COARS 2022b; see **Appendix 1**). The site survey methodology being utilised for the 2023 survey is compatible with the procedures outlined within the existing WSI, including the adoption of the PAD. As a consequence, the existing agreed WSI will be utilised, with this document providing a sign-post to the relevant sections of the WSI for the archaeological methodologies that will be adopted.

1.2 Location

- 1.2.1.1 The Proposed Development is located within the Irish Sea, covering license areas of approximately 320 km² for Morgan and 500km² for Mona. Morgan is situated to the north of Mona (**Figure 1**). The survey area associated with the license areas consist of two zones for each windfarm – a central Proposed Development Site (PDA) and a surrounding Wider Study Area (WSA) which includes the area for Benthic sampling. A range of options for the Export Cable Routes (ECR) and landfalls are currently being explored for the Proposed Development. For Mona, a southerly ECR towards the Bodelwyddan National Grid substation will be surveyed, while for Morgan a south-easterly ECR towards the Penwortham National Grid Substation will be surveyed, with landfalls near Blackpool (Lytham St Anne's) and Formby (Ainsdale).
- 1.2.1.2 The 2023 site investigations will focus on the Mona and Morgan Bidding Areas (Array Scoping boundary in **Figure 1**).

2 Method Statement

2.1.1.1 The method statement for the 2023 survey will adopt the agreed procedures outlined within the Written Scheme of Investigation (WSI) used for the 2022 offshore survey (COARS 2022b; see **Appendix 1**). These are summarised below, with reference to the relevant sections within the WSI.

2.1.2 Desk Based Assessment

2.1.2.1 A Desk Based Assessment was undertaken in advance of both the 2021 and 2022 offshore surveys (see COARS 2021; 2022a), and was completed in accordance with professional standards and guidance, following the methodology set out within the WSI Section 3 (see **Appendix 1**). This DBA has been superseded by Preliminary Environmental Information Report (PEIR) which has included an archaeological assessment of the geophysical datasets collected in 2021 for the Proposed Development Area. Based upon this review, a refined set of archaeological assets have been identified within the Proposed Development Areas, with Archaeological Exclusion Zones (AEZs) defined, following the methodology set out within the WSI Section 5 (see **Appendix 1**) (see **Figure 2** and **3**). These AEZs will apply to any activities that may disturb the seabed, within which all development-related activities will be prohibited.

2.1.3 Archaeological Exclusion Zones

2.1.3.1 In advance of the proposed intrusive 2023 site investigations, an assessment of the proposed geotechnical sampling locations will be undertaken, in accordance with Section 4 of the WSI (see **Appendix 1**). Each proposed borehole and suction bucket foundation trial location will subject to an archaeological assessment of the seabed using available datasets, including the 2021 geophysical survey data, to establish if any geophysical anomalies with archaeological potential are present. Any known and located historic assets, identified within the DBA, and geophysical anomalies identified as being of high, medium or low archaeological potential will be protected through the imposition of an AEZ (Section 3 of the WSI, see **Appendix 1**) around each asset considered at risk. The suggested extent of the AEZ will be based upon the available geophysical data for each anomaly, including the lateral distribution of visible features, extent and direction of scour, and likelihood for debris spread away from the site, as well as the size of the seabed impact from the investigation

technique (e.g. 0.20m diameter borehole vs 6-10m diameter suction bucket caisson. During site investigations, the effectiveness of any AEZs will be periodically monitored, following the methodology outlined in Section 5.2 of the WSI (see **Appendix 1**).

2.1.4 Collection and Retention of geoarchaeological material

2.1.4.1 During the borehole geotechnical investigations, the procedures outlined within the WSI for the collection and retention of geoarchaeological material (Section 6 of the WSI; see **Appendix 1**) will be adopted. The WSI outlines two workflows for the geoarchaeological assessment of geotechnical samples, with borehole sample extrusion expected to follow the Option 2 workflow. Prior to site investigations commencing, a toolbox talk will be provided to site operatives, including information on geoarchaeological requirements and identification of deposits of geoarchaeological interest. This will also include instruction on how to store cores/samples of interest (Section 6.4.2 of the WSI; see **Appendix 1**). The retained archaeologist will work with the geotechnical contractor to ensure core recording is carried out to an acceptable standard to facilitate geoarchaeological assessment, with the latter following the methodology outlines in Section 6.5 of the WSI (see **Appendix 1**). A report will be produced summarising the results of the Stage 1 geoarchaeological desk based assessment, with recommendations for any Stage 2 geoarchaeological recording, including recommendations for samples that might be suitable for Optically Stimulated Luminescence (OSL) dating.

2.1.5 Protocol for Archaeological Discoveries

2.1.5.1 The protocol for archaeological discoveries (PAD) sets out best practice in the reporting of unexpected finds of archaeological interest discovered during the proposed works. The PAD is set out within Section 7 of the WSI (see **Appendix 1**), which includes a definition of the terms and roles with responsibility for ensuring compliance with the PAD and how the PAD is to be implemented, including the Reporting Form within Appendix 3 of the WSI (see **Appendix 1**). Any changes in the nominated contacts will be updated within the WSI.

3 References

COARS, 2021 Yellow North and South OWF. DBA, WSI and PAD. Unpublished Report for BP Exploration Operating Company Limited. COARS, Southampton.

COARS, 2022a. Mona and Morgan OWF. 2022 Survey. Desk Based Assessment: Mona and Morgan Array Scoping Area and Marine Archaeology Wider Study Area. Unpublished Report for BP Exploration Operating Company Limited. COARS, Southampton.

COARS, 2022b. Mona and Morgan OWF. WSI and PAD. Unpublished Report for BP Exploration Operating Company Limited. COARS, Southampton.

4 Figures (overleaf)

5 Appendix 1 (overleaf): Mona and Morgan OWF. WSI and PAD