

# Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects

July 2021

The Written Scheme of Investigation forms an umbrella document for all archaeological survey, investigation and assessment required for an offshore wind farm project.



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# Glossary of acronyms

ACOP	Approved Code of Practice
ADS	Archaeological Data Service
AEZ	Archaeological Exclusion Zone
AMED	Approved Medical Examiners of Divers
CES	Crown Estate Scotland
CIfA	Chartered Institute for Archaeologists
DCO	Development Consent Order
EIA	Environmental Impact Assessment
GIS	Geographic Information System
HER	Historic Environment Record
JCCC	Joint Casualty and Compassionate Centre
JNAPC	Joint Nautical Archaeology Policy Committee
MCAA	Marine and Coastal Access Act
MEDIN	Marine Environment Data and Information Network
MoD	Ministry of Defence
NMHR	National Marine Heritage Record
NRHE	National Record of the Historic Environment
NRW	National Resources Wales
NSIP	Nationally Significant Infrastructure Project
O&M	Operations & Maintenance
OWF	Offshore Wind Farm
PPS	Planning Policy Statement
ROV	Remotely Operated Vehicle
RTK	Real Time Kinematic
SPPS	Strategic Planning Policy Statement
TCE	The Crown Estate
TEZ	Temporary Exclusion Zone
UKHO	United Kingdom Hydrographic Office
UXO	Unexploded Ordnance
WSI	Written Scheme of Investigation

# 1

# Introduction



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# Introduction

## 1.1 Background

**1.1.1** The Crown Estate recognises the importance of dealing with the historic environment where it may be affected by Offshore Wind Farm (OWF) developments and their associated infrastructure and activities. The Crown Estate has supported the production of this updated guidance document to help ensure that all those involved in the planning and delivery of Offshore Wind Farm projects are aware of the latest requirements and responsibilities for the historic environment. The Crown Estate encourages developers to use this guidance when developing their projects, as doing so will support the protection and enhancement of the historic environment alongside the sustainable development and growth of the offshore wind industry.

**1.1.2** In the course of developing applications for consent, the historic environment has to be addressed through the process of Environmental Impact Assessment (EIA), which includes the identification of mitigation measures where significant effects are anticipated. As on land, these mitigation measures are secured through planning conditions requiring the implementation of a Written Scheme of Investigation (WSI). The WSI enables Developers to meet and discharge licence conditions. However, it is important to note that it is the implementation of the procedures detailed in the WSI, rather than its production, that discharges the condition.

**1.1.3** This document supersedes *Model Clauses for Archaeological Written Schemes of Investigation: Offshore Renewables Projects* (Wessex Archaeology 2010) which was produced 10 years ago to provide a framework of methodologies to assist in the production of WSIs. Since the production of the 'Model Clauses' document, there have been numerous changes to the OWF industry, guidance, processes and procedures. This document draws on experience from projects developed as part of Offshore Wind Leasing Rounds 1 to 3, to provide robust, relevant guidance for Round 4 and beyond<sup>1</sup>. The Guidance should be seen as applicable not only to existing construction methods, but also takes into account new technologies, such as floating turbines.

## 1.2 Purpose and content of a written scheme of investigation

**1.2.1** The WSI is created during the pre-consent process and applies through the subsequent lifecycle of the OWF project - from planning through to decommissioning. This document is intended to ensure that everyone in the process, including the OWF Project Team (Developers, Construction Teams, Operation & Maintenance (O&M) Teams, and Decommissioning Teams), and all of the associated Contractors, are aware of and understand archaeological mitigation measures, and how and when to apply them.

**1.2.2** The concept of the WSI can be used through all stages of project preparation, and begins during the EIA process. At this stage, the WSI demonstrates how data acquisition can be designed to support archaeological objectives. During the EIA process, data are gathered through desk-based assessment, intertidal walkover surveys, geophysical surveys, and geotechnical surveys to inform understanding of the known and potential historic environment that could exist in a proposed development area. The results of these surveys inform the assessment of impact in the Environmental Statement (ES). Following the identification of any significant effects, mitigation measures are set out in the ES, comprising actions to be taken to reduce potential impacts to the historic environment and risk to the OWF project. The WSI draws upon the information in the ES and provides specific, proportionate mitigation based on the level of archaeological potential and assessment of risk. The WSI supports the examination process and the subsequent project delivery once consent has been obtained.

**1.2.3** For all OWF projects, there is a wealth of guidance available from Archaeological Curators: Historic England, Cadw, Historic Environment Scotland and the Historic Environment Division in Northern Ireland. This document does not seek to replace and repeat the detail of existing technical guidance but provides a high-level introduction to the topics that may constitute the archaeological mitigation applied to an OWF Project. Further signposting of existing guidance is provided in the various chapters and a list of further reading sources is provided in Chapter 14.

This document sets out high level guidance on a range of archaeological methodologies that may be required in the production of WSIs and Method Statements.

<sup>1</sup> The UK's first offshore wind lease was signed in 2000. Round 1 comprised a demonstration leasing round of small scale projects of up to 30 turbines. Round 2 saw the UK's first commercial-scale OWF projects. In 2010, Round 3 brought larger scale development, transforming and industrialising the UK offshore wind sector. Round 4 in England and Wales, and ScotWind in Scottish waters, builds on the significant advances over the last 20 years.

## What is a Written Schemes of Investigation (WSI)?

The WSI forms an umbrella document, for all survey, investigation and assessment required for an OWF project and is supported by activity-specific Method Statements (e.g., Unexploded Ordnance (UXO) investigation, boulder clearance, geotechnical vibrocore surveys).

### A WSI:

- sets out the roles and respective responsibilities of the OWF Project Team; Contractors, and Retained Archaeologist and Archaeological Contractor(s) and formal lines of communication between the parties and with Archaeological Curator(s);
- outlines the known and potential archaeological receptors that could be impacted by the scheme;
- outlines the agreed mitigation and archaeological actions that are to take place in various circumstances;
- sets out the importance of research frameworks in setting objectives that are delivered through realisation of the work; and,
- provides summarised details on methodologies for these archaeological actions, which will be clarified in more detail in subsequent activity-specific Method Statements.

**1.2.4** This document has been written to apply, as relevant, to archaeological investigations at sea and in intertidal areas. However, as archaeological potential does not stop at the high or low tide mark but continues into the terrestrial zone, the WSI produced for the OWF project must provide consideration and discussion for the seamless application of mitigation for offshore and onshore components, in agreement with Archaeological Curator(s). Depending on the project design, this may mean that the intertidal cable area is covered in one WSI (either onshore or offshore but reflecting issues pertinent to both) with the relevant consenting authorities having an approval role over that section. Mitigation may be captured in both WSIs, but clearly identifying who is responsible for undertaking the work and how results will be communicated.

**1.2.5** The primary point of referral for Developers and Consultants at the earliest stage of project planning remains the *Historic Environment Guidance for the Offshore Renewable Energy Sector* (Wessex Archaeology and COWRIE 2007), which provides guidance on survey, appraisal and monitoring of the historic environment during the development of OWF projects in the UK. In designing mitigation



measures, reference should be made to the opinions provided by Archaeological Curator(s) during scoping and EIA. It is advisable to discuss the content of a WSI through consultation with the relevant Archaeological Curator(s) in the course of its preparation.

**1.2.6** In England OWF projects are undertaken as Nationally Significant Infrastructure Projects (NSIPs), and the *National Policy Statements* (EN-1 and EN-3) apply. The production and implementation of a WSI is linked to stages of a Development Consent Order (DCO) application and the discharge of conditions. In fact, EN-1 specifically mentions that work is carried out in a timely manner in accordance with a WSI (Department of Energy & Climate Change 2011: 93), while EN-3 recommends mitigation such as Archaeological Exclusion Zones (AEZs) (discussed further in Chapter 5) and micrositing (discussed further in Chapter 6).

**1.2.7** In Wales, since the passing of the *Wales Act 2017*, projects between 1-350 MW are determined by National Resources Wales (NRW) and Welsh Ministers under the *Marine and Coastal Access Act* (MCAA) 2009 and S36 Consent under the *Electricity Act 1989*. Projects 350 MW and over are considered NSIPs under the DCO Planning Act 2008 process, as discussed above.

**1.2.8** For Scottish projects, the *National Marine Plan* (Marine Scotland 2015) while not specifically mentioning WSIs, notes that adverse impacts should be avoided or if not possible, minimised and mitigated.

**1.2.9** Although there is no equivalent policy statement for Northern Ireland, the *Marine Policy Statement 2011* and the *Draft Marine Plan for Northern Ireland 2018* are relevant, but it should be noted that *Planning Policy Statement (PPS) 18* and *Strategic Planning Policy Statement (SPPS)* only apply above Low Water.

**1.2.10** An example illustrative timeline for English and Welsh OWF projects can be found in Table 1 (on page 10). For these OWF projects, an Outline WSI will be produced for project consent during the EIA and examination process, at a high level before the OWF design may be finalised. The WSI is fundamental to the EIA process as it sets out the proposed mitigation strategies to be taken forward which are then used in the impact assessment. The assumption that they will be incorporated into the post-consent process allows any anticipated significant effects to be reduced to a consentable level. The WSI sets out agreed principles and actions based on pre-consent survey data review and, for instance, delineated archaeological exclusion zones which help to demonstrate how the developer will keep anticipated effects to acceptable levels.

**1.2.11** When an OWF project is successful in securing the relevant consent, provision is made to ensure that survey works conducted in support of delivery of a consented project are informed by a WSI. The consent will also

specify the requirement for formal project documentation to be produced, for example, a WSI in reference to commencement of the project (as defined with the consent). A Draft WSI should then be prepared, in accordance with the Outline WSI but building on it, containing, for instance, additional details on project design, activities and their methodologies, appropriate data review. The WSI produced to inform the defined construction period of the consented project will include all information and data derived from the archaeological surveys conducted, in accordance with agreed Method Statements, for phases of activities occurring post-consent and pre-commencement, which involve intrusive seabed works. The Draft WSI will be submitted to the Regulator and will receive approval in writing, becoming the Agreed WSI.

**1.2.12** An Agreed WSI, and thereby agreement to subsequent demonstration of adherence to it, is required as part of Marine Licence conditions, before licensed activities can take place.

**1.2.13** Prior to decommissioning, and depending on the proportion of the scale of decommissioning activities and the potential risks to the environment, an updated EIA will be undertaken, including an assessment of likely impacts on archaeological features, which may lead to an updated WSI and further Method Statements, if required.



**Table 1: Indicative example timeline (based on projects in England and Wales, but generally applicable for projects in Scotland and Northern Ireland as well)**

Phase of development	Document type
PRE-CONSENT	Concept of WSI to apply to data gathered as part of EIA process
	Outline WSI developed during the EIA process and forming the framework for the assumed mitigation that will be submitted with DCO application
	Pre-commencement survey Draft WSI (based on the Outline WSI) to be agreed with the Regulator prior to surveys taking place to ensure archaeological objectives are taken into account
POST-CONSENT	Final Agreed WSI (based on the Draft WSI) to set out overarching approach to survey and archaeological investigations agreed by Regulator prior to pre-construction works commencing. Outlines when supporting archaeological methodologies will be required, and to who and how they are to be submitted for approval prior to work commencing
PRE-CONSTRUCTION PHASE	Specific details of methodologies to be set out in Method Statements to agree the approach to each survey or work package undertaken under the WSI and the archaeological deliverables that result
CONSTRUCTION PHASE	At this stage, the WSI datasets are updated to include results from any pre-construction surveys. A Construction Method Statement sets out archaeological mitigation during construction
POST-CONSTRUCTION	Method Statement for post-construction monitoring
O&M	Method Statement for O&M activities
DECOMMISSIONING	Updated EIA, leading to updated WSI and further Method Statements

**1.2.14** It should be noted that the Regulator or its advisors will want to satisfy themselves that the competence of the Retained Archaeologist implementing the WSI, and any Archaeological Contractor(s) undertaking specific packages of work, has been sufficiently demonstrated. Competence is indicated by relevant professional experience as well as by membership of the Chartered Institute for Archaeologists (CIfA), or in Northern Ireland of the Institute of Archaeologists of Ireland (IAI); at the appropriate grade, or registration with the Institute as an organisation holding itself out as capable of carrying out the work in question.

**1.2.15** This document refers to CIfA guidance throughout, however it should be noted that the IAI has comparable standards, guidance and codes of conduct (<https://www.iai.ie/>) that should be applied by members of this Institute.

### 1.3 Recommended archaeological methodologies for WSIs

**1.3.1** This document sets out high level guidance on a range of archaeological methodologies that may be required in the production of WSIs and Method Statements. Not all techniques or methodologies will be appropriate for every scheme: the agreement of the methodologies that should be applied to a specific OWF project should be captured within any project specific WSIs or Method Statements and be agreed between the OWF Project Team, the Retained Archaeologist, the Regulator, and the relevant Archaeological Curators. The Retained Archaeologist will prepare WSIs and Method Statements for archaeological mitigation and these will be assessed by the Regulator, on advice of the Archaeological Curator(s) based on their appropriateness for the scheme.

**1.3.2** The WSI is intended to help meet the consents requirements placed on the OWF Project Team with respect to the historic environment.

**1.3.3** The aims of this document are:

- to facilitate the consenting process, EIA, discussions about post-consent conditions, and determination. Common agreement of methodologies in advance provides increased certainty about the detail of mitigation actions and promotes greater confidence in determining the residual effects of impacts 'with mitigation';
- to inform the preparation of a WSI during the EIA process applicable to pre- and post- consent surveys; and, Method Statements. Survey and works package specific details to be used to inform project delivery;

- to be used as an approach to how WSIs can be applied both pre- and post-consent to ensure that everyone involved in the process is aware of the mitigation processes likely to be required and that pre-consent archaeological mitigation may be required to enact post-consent Curator requirements;
- to provide greater certainty for the OWF Project Team so that they know what to accommodate in their post-consent plans for site investigations and construction; and
- to encourage an open and level playing field for the provision of archaeological services by contractors.

### 1.4 Roles and responsibilities

**1.4.1** Table 2 (on page 12) details the roles and responsibilities of organisations in relation to the historic environment

**1.4.2** Archaeological work will be undertaken by the Retained Archaeologist, where appropriate. However, should the Retained Archaeologist not have sufficient expertise and/or capacity for delivery of specific work packages, the Retained Archaeologist will ensure a suitably qualified and experienced Archaeological Contractor is appointed to undertake the work.



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**Table 2: Roles and Responsibilities**

Organisation	Terminology used in document	Responsibility
<b>OWF Project Team</b> Developers	Developer	Developers involved in OWF schemes will commission EIAs, WSIs and Method Statements at strategic points in the planning process
<b>OWF Project Team</b> Construction Team	Construction Team	Construction Teams will be responsible for implementing the WSI, and the existing mitigation measures, such as AEZs. and will commission archaeological Method Statements prior to works being undertaken that may impact the seabed
<b>OWF Project Team</b> O&M Team	O&M Team	O&M Teams will be responsible for implementing the WSI, and the existing mitigation measures such as AEZs, and will commission archaeological Method Statements as required
<b>OWF Project Team</b> Decommissioning Teams	Decommissioning Team	Decommissioning Teams will be responsible for implementing the WSI, and the existing measures such as AEZs and will commission archaeological Method Statements as required
The Crown Estate	TCE	Owners/Managers of the Seabed, Leasing Authorities for OW
Crown Estate Scotland	CES	The Crown Estate/Crown Estate Scotland
The Planning Inspectorate	The Planning Inspectorate	Deals with national infrastructure planning applications, examinations of local plans and other planning-related and specialist casework in England and Wales
Regulatory Authority	Regulator	Responsible for the approval of OWF WSIs and Method Statements
England: Marine Management Organisation		The Marine Management Organisation licences, regulates and plans marine activities in the seas around England, to ensure they are carried out in a sustainable way
Wales: Natural Resources Wales		Natural Resources Wales acts on behalf of Welsh Ministers to administer marine licence applications
Scotland: the Scottish Ministers and the Marine Scotland Licencing Operations Team on behalf of the Scottish Ministers		Marine Scotland is a directorate of the Scottish Government and is responsible for managing Scotland's seas for prosperity and environmental sustainability
Northern Ireland: the Department of Agriculture, Environment and Rural Affairs (DAERA), Marine and Fisheries Division (Northern Ireland)		DAERA and the Marine and Fisheries Division (Northern Ireland) are responsible for protecting Northern Ireland's coastal and marine environment via legislation, licensing and permits, and conservation activities
National Curatorial Body	Archaeological Curator(s)	Provide guidance and advice to the Regulator pre- and post-consent and provide advice regarding the approval of OWF WSIs and Method Statements
Historic England		
Historic Environment Scotland		
Cadw		
Historic Environment Division of the Department for Communities in Northern Ireland		
Local Curatorial Body (Local Planning Authority)	Archaeological Curator(s)	Provides local authority advice to the Regulator relevant to intertidal aspects of the project

Organisation	Terminology used in document	Responsibility
Multidisciplinary consultant	Consultant	Consultants advise developers on compliance with planning and marine licence conditions and coordinate development works
Archaeologists	Retained Archaeologist	The Retained Archaeologist is the archaeological contractor or consultant appointed by the OWF Project Team to implement the WSI
Archaeologists	Archaeological Contractor	Archaeological Contractor appointed by the OWF Project Team or Retained Archaeologist to carry out specific packages of archaeological work
Sub-Contractors	Contractor	Contractors and Sub-contractors appointed by the OWF Project Team to deliver aspects of the OWF project (pre- and post-construction surveys, construction works, O&M, decommissioning works)
Archaeological Geophysicist	Archaeological Geophysicist	Archaeologist with suitable geophysics expertise or geophysicist with suitable archaeological expertise
Geoarchaeologist	Geoarchaeologist	Archaeologist with suitable geotechnical expertise

## 1.5 Communication

**1.5.1** Communication is key to the successful preparation and implementation of the WSI, and the subsequent Method Statements. There must be clear communication between the OWF Project Team, Contractors, the Retained Archaeologist, any appointed Archaeological Contractors, and the Archaeological Curator(s). The communication between the OWF Project Team and the Retained Archaeologist is particularly important, especially with regard to the project's timescales, plans and requirements. Sharing this information as soon as it becomes available, through regular discussions, access to data, and reporting can minimise potential risks of delays to the project.

**1.5.2** It is also important for the Retained Archaeologist (or appointed Archaeological Contractor), to communicate directly with the Contractors undertaking specific work packages. This can include discussing survey specifications during the production of Method Statements, but may also include providing toolbox talks in advance of the commencement of works, to ensure that staff involved are aware of archaeological objectives and the protocol for archaeological discoveries ([Chapter 10](#)).

## 1.6 Scope and content of a WSI

**1.6.1** This guidance document can be read in a number of ways. When read from beginning to end, it follows the lifecycle of an OWF project from the initial planning stages all the way through to decommissioning. It captures the archaeological input that may be required at each stage. Further details are set out in Table 3 below.

**1.6.2** There is also a more circular way of reading the document. Following the example of an Remotely Operated Vehicle (ROV) survey undertaken for Unexploded Ordnance (UXO) assessment, for this type of non-archaeological survey there may be a requirement for archaeological input (Chapter 7), where the survey can contribute to mitigation, such as assisting in refining Archaeological Exclusion Zones (AEZs) (Chapter 5) and characterising geophysical anomalies of archaeological potential (Chapter 6). A Method Statement should be developed for the work (Chapter 2), an archaeological reporting protocol (Chapter 10) should be in place, and any recoveries of unexpected material managed in line with the recommendations in Chapter 12. The production of a report and distribution of results may also refer to recommendations in Chapter 13. The results of the archaeological assessment of survey data could ultimately result in the implementation of new AEZs (Chapter 5) or recommendations for an archaeological diver survey (Chapter 8).

Table 3: Scope of this document

■ All archaeological works   
 ■ Surveys/Investigations   
 ■ Mitigation

Title	Contents
<b>2</b> Method Statements	Details about the production of Method Statements prior to each package of construction or monitoring works with archaeological relevance
<b>3</b> Marine Geophysical Investigations	Where geophysical surveys are to include archaeological objectives, detail on survey planning, acquisition procedures, processing and archaeological interpretation
<b>4</b> Marine Geoarchaeological Investigations	Archaeological involvement in planning geotechnical surveys such as vibrocoring and boreholes, on site recording and sampling, assessment of logs, laboratory recording and sub-sampling, sample assessment, scientific dating, analysis and reporting
<b>5</b> Archaeological Exclusion Zones	Design and monitoring of exclusion zones, including review and modification in light of additional data
<b>6</b> Avoidance or Further Mitigation	Further assessment of seabed anomalies and potential for micro-siting of development
<b>7</b> Non-archaeological Diver/ROV surveys	Inclusion of archaeological objectives in non-archaeological surveys, for example, for UXO inspection or debris clearance, and assessment of data
<b>8</b> Archaeological Investigations using Divers and/or ROVs	The conduct of underwater interventions for archaeological purposes
<b>9</b> Archaeological Watching Briefs	Circumstances where archaeologists may be required to be present during construction activities, such as pre-lay grapnel runs and intertidal cable-laying in an excavated trench
<b>10</b> Protocols for Archaeological Discoveries (PAD)	Details on the development and implementation of protocols for reporting unexpected discoveries of archaeological interest as a safety net for unexpected finds
<b>11</b> Operations & Maintenance (O&M) and Decommissioning	Archaeological mitigation for O&M and decommissioning activities
<b>12</b> Archaeological Recording, Samples and Artefacts	Generic recommendations for handling, labelling, packaging and storing samples and artefacts, to include reference to legal and other requirements in respect of wreck, aircraft, human remains, ordnance
<b>13</b> Archaeological Reporting, Data Management and Archiving	Reporting, data management and archiving activities that relate to all of the above methodologies

# 2

## Archaeological method statements



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# Archaeological method statements

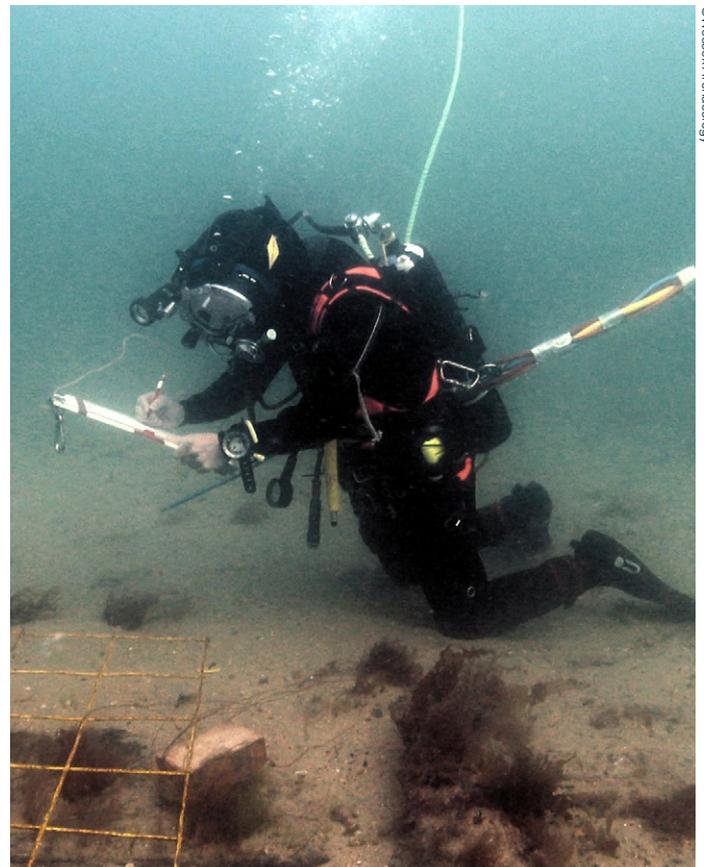
## 2.1 Production and implementation of archaeological method statements

**2.1.1** As noted above, the WSI provides a framework for archaeological investigations for OWF developments. In support of the WSI, detailed archaeological Method Statements will be produced prior to survey or construction work, in order to provide a detailed methodology for each package of development or survey works, as required. Therefore, it is likely that Method Statements will be required for each of the surveys/investigations listed in Table 3 above, and in some cases individual Method Statements will be needed for each phase of archaeological assessment (such as stages of geoarchaeological assessment). The Method Statements will be consistent with the WSI, applicable guidance and should reflect the recommended methodologies set out in this document.

**2.1.2** Method Statements are key for addressing project specific concerns and potential risks. They need to be coherent and logically prepared to address specific archaeological objectives which are particular to the project and the phase of work being undertaken, and they need to focus on the technical detail of the survey methodologies for the specific work packages. In addition, the Method Statement must identify applicable objectives from the relevant research frameworks (e.g., Ransley et al. 2013) that will be addressed through the delivery of the work.

**2.1.3** The Retained Archaeologist is responsible for the preparation of Method Statements for the OWF Project Team. The preparation of Method Statements must be led by those with experience to do so, and the Retained Archaeologist will ensure that it is clearly defined where archaeological specialists have provided input to the methods proposed. If the Retained Archaeologist does not have a sufficient level of experience with regards to the archaeological work required for a specific package of project works, they will appoint a suitably qualified and experienced Archaeological Contractor to contribute to or prepare the document and undertake the work.

**2.1.4** Method Statements will be developed in line with licence requirements and will also refer to any European Protected Species licensing requirements if applicable. This is to ensure that any licensable activities are notified to the correct regulatory authority and where necessary, any licences, consents, or permissions required will be applied for by the OWF Team. In order to carry out any licensable activity, the relevant Acts must be complied with (for example, the *Marine and Coastal Access Act, 2009*; or the *Marine (Scotland) Act, 2010*). In addition, Method Statements will refer to statutory requirements for wreck and aircraft crash site material (see Chapter 12, Sections 12.9 and 12.10), if applicable.



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**2.1.5** For surveys or development works that require moving or recovering material from the seabed, licence conditions will also apply, and there should be early engagement with the relevant licensing authorities to avoid unnecessary delays in obtaining a licence. There should also be discussions between the Retained Archaeologist, OWF Team, and Archaeological Curator(s) regarding the methodology, and this should be captured in the Method Statement, for agreement by the Regulator. The Receiver of Wreck should be informed.

**2.1.6** The OWF Project Team will submit each Method Statement (including generic and specific Method Statements and varied and updated Method Statements) to the Archaeological Curator(s) in advance of the archaeological works, in accordance with the timeframe agreed between the OWF Project Team and Archaeological Curator(s) in the WSI. The timeframe will ensure there is time for the Archaeological Curator(s) to review documents and provide advice before the next stage of works.

**2.1.7** The Archaeological Curator(s) will confirm that they have agreed each Method Statement in accordance with the timeframe agreed between the OWF Project Team and Archaeological Curator(s) in the WSI.

**2.1.8** Archaeological works will not commence unless the Archaeological Curator(s) have confirmed their agreement of the Method Statement, or if the timeframe agreed in the WSI has elapsed.

**2.1.9** Method Statements will include provision for Archaeological Curator(s) to monitor the conduct of the archaeological work as appropriate, including interim statements and/or meetings with the OWF Project Team and the Retained Archaeologist. Site visits may be considered appropriate for archaeological watching briefs, diver or ROV-based site assessment.

**2.1.10** Method Statements should directly reference the WSI, which provides the basis for their production in relation to the specific project and the potential risk to the historic environment. Method Statements should cover the following key matters, as relevant to each work package:

- specific objectives of archaeological works;
- extent of investigation;
- investigation methodology, to cover:
  - intrusive methods;
  - non-intrusive methods;
  - recording system;
  - finds, including the policy for selection, retention and disposal and provision for immediate conservation and storage;
- environmental sampling strategy;
- form of commission and contractual relationship with the OWF Project Team;
- relation between licence condition(s), WSI and the Method Statement;
- context in terms of relevant construction works;
- summary results of previous archaeological investigations in the vicinity;
- archaeological potential;
- anticipated post-investigation actions, including processing, assessment and analysis of finds and samples;
- reporting, including Intellectual Property Rights in the report and associated data, confidentiality and timescale for deposition of the report in a publicly accessible archive;
- timetable, to include investigation and post-investigation actions;
- monitoring arrangements, including monitoring by Archaeological Curator(s); and
- health, safety and welfare.

**2.1.11** In the course of developing Method Statements for archaeological investigations that are likely to result in artefacts being added to the project archive (see Chapter 13, Section 13.5), the Retained Archaeologist will ascertain whether there are museums whose collecting policy allows them to accept finds from marine fieldwork, wherever that fieldwork takes place in UK waters. Should a museum be confirmed, an Accession Number will be sought for the project archive.

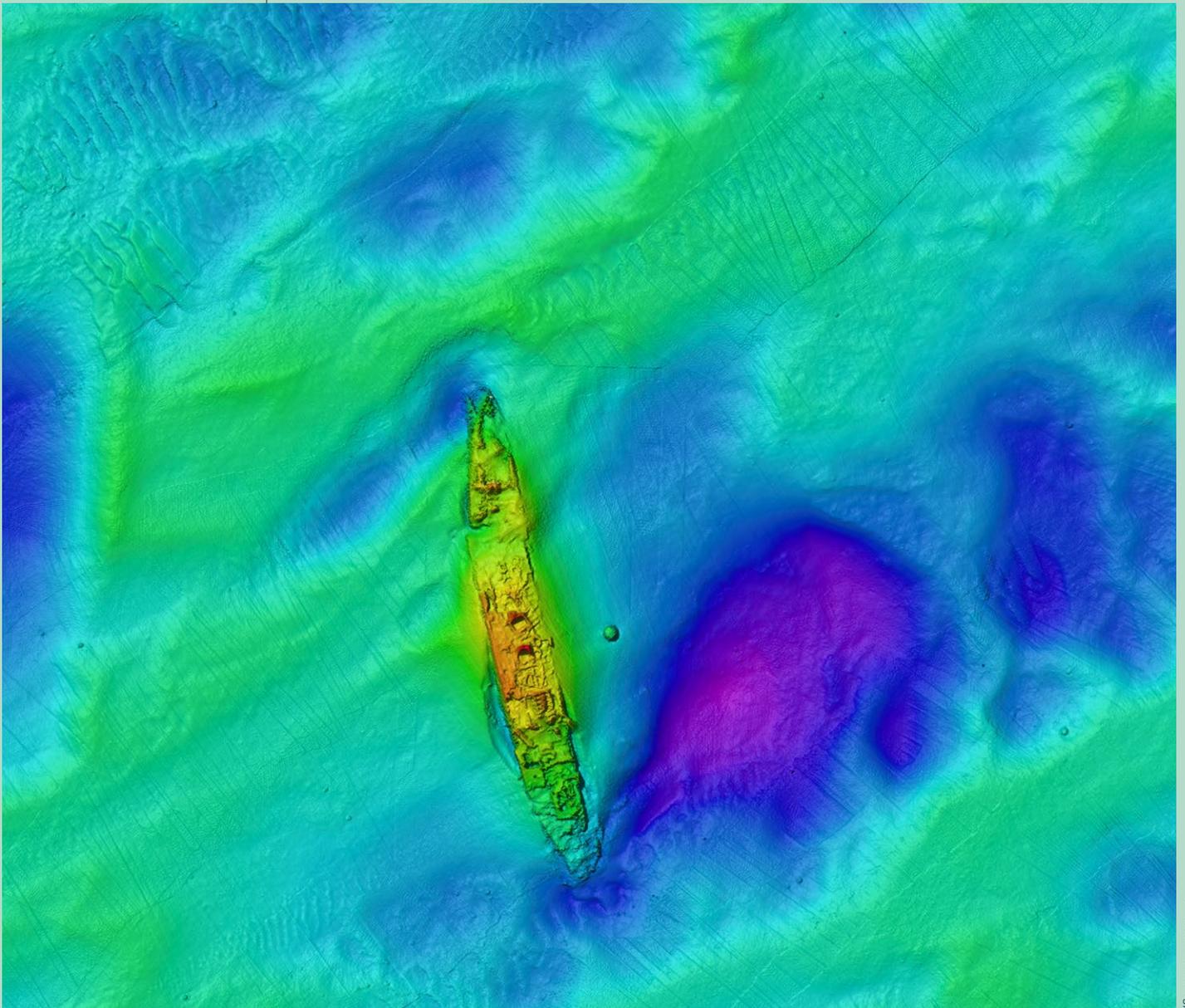
**2.1.12** For all projects, the Retained Archaeologist will confirm the custodianship for digital data derived from geophysical, geotechnical and visual survey activities.

**2.1.13** It is essential to report findings of investigations, as directed by the agreed Method Statements, in a timely way to accommodate discussions with the Archaeological Curator(s) and Regulator, prior to any additional actions and activities being undertaken – including the management of any unforeseen archaeological discoveries. The findings of the investigations could include unrecorded remains, additional material associated with existing features, an extensive archaeological assemblage or a significant isolated object.

Detailed Method Statements will be produced in order to provide a detailed methodology for each package of work, as required.

# 3

## Marine geophysical investigations



HMHS Anglia

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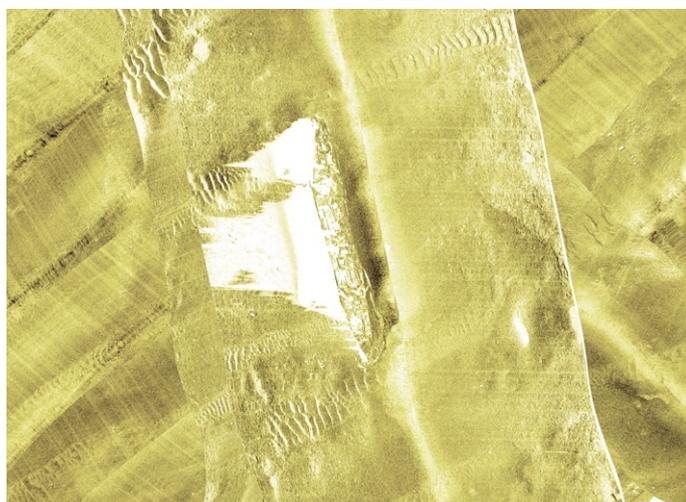
# Marine geophysical investigations

## 3.1 Geophysical surveys

**3.1.1** Geophysical data acquisition, and subsequent assessment, is undertaken throughout the life cycle of an OWF project. The surveys undertaken are commonly multi-purpose, such as for design and layout purposes, UXO and obstruction clearance, understanding environmental impacts, including ecology and cultural heritage, and for discharging licence conditions including the historic environment. Broadly, acquisition of geophysical data is acquired in three phases:

- Pre-consent: geophysical data acquisition for planning purposes. Geophysical data assessment, along with geoarchaeological assessment of geotechnical data will be undertaken to supplement desk-based research to inform the EIA, ES and the draft WSI;
- Post-consent: during the pre-construction phase geophysical data is acquired to refine design of the development and is used by archaeological geophysicists to identify heritage assets that may be potentially impacted during construction;
- Post-construction: geophysical surveys may be designed for seabed stability, scour or other engineering purposes in addition to any prescribed archaeological monitoring surveys.

**3.1.2** The survey design and technical specifications will vary depending on the objectives of the survey, and typically the primary aim is non-archaeological. The Retained Archaeologist, or appropriately qualified Archaeological Contractor (if appointed) with appropriate relevant experience in the archaeological analysis of geophysical survey data, should be consulted at the planning stage to assess the appropriateness to undertake an archaeological assessment on the data, and ensure the surveys are able to serve archaeological purposes.



*Sidescan sonar data image of a shipwreck*

**3.1.3** The archaeological input will take the form of advice from an archaeological geophysicist on the following points:

- available details of sites, features and/or anomalies identified in previous studies;
- archaeological potential of areas where no existing sites, features and/or anomalies are yet known;
- geophysical survey specification including design, geophysical sources and acquisition methodology; and
- requirements for processing and interpreting of resulting data.

**3.1.4** The purpose of the survey, details on the required geophysical sensors and appropriate specifications to meet the archaeological objectives will require consultation with the client and the Archaeological Curator(s) prior to any formal agreement. This is likely to include the acquisition of sidescan sonar, magnetometer, multibeam bathymetry and sub-bottom profiler data. Survey specifications may reference existing guidance (Plets *et al.* 2013).

**3.1.5** During the pre-consent phase details will be presented and subject to consultation with the Archaeological Curator(s) prior to the start of the archaeological assessment of the data, and in the post-consent phases of the project through Method Statement(s) prepared by the Retained Archaeologist or nominated Archaeological Contractor in response to the WSI.

**3.1.6** Where survey planning and acquisition are undertaken prior to retention of an archaeologist on a project, such as may happen during the pre-consent phase, the archaeological geophysicist will advise the client and Archaeological Curator(s) on any potential limitations or risks associated with the survey design and specifications relating to the assessment of cultural heritage.

**3.1.7** Where a survey is carried out primarily to meet archaeological objectives, the survey should be designed by an archaeological geophysicist, and consideration should be made for including suitable expertise onboard, for example, when undertaking targeted investigation of a particular site of archaeological interest or an area of high archaeological potential.

**3.1.8** Once acquired, the survey data – together with operational reports – will be made available in appropriate industry standard digital formats, as defined during the survey planning stage and as detailed in the Method Statement.

**3.1.9** The archaeological geophysicist will then undertake an audit of the data to ensure the acquisition specifications were met, prior to any interpretation.

## 3.2 Archaeological assessment of geophysical data

**3.2.1** The archaeological assessment approach and methodologies (relating to data quality, processing, interpretation, mitigation, reporting and digital deliverables) will be developed by the Retained Archaeologist, agreed with the client and then presented in draft to the Archaeological Curator(s) for review and comment. This will usually be in the form of a Method Statement (or alternative format for pre-consent surveys undertaken before the creation of the WSI), and will reference existing guidance (i.e.: Plets *et al.* 2013), where appropriate.

**3.2.2** The level or volume of data assessment will depend on the objectives of the survey and subsequent interpretation, and may vary between different phases

of the project, for example, high level assessment providing context for EIA compared to more detailed assessment prior to the construction phase where impacts associated with the intended engineering design of the development are better known.

**3.2.3** Geophysical survey data, supplied to an agreed technical standard and specification, at the same level of fidelity as recorded, (full-fidelity – see definition box below for detail) should be interpreted by an archaeological geophysicist with an appropriate level of expertise. Survey data, together with operational reports and trackplots, should be made available in digital formats to the archaeological geophysicist. Where possible full-fidelity data unreduced in range, frequency, sampling and dimensionality from that recorded must be used as the input for archaeological interpretation.

### Data processing stage definitions

**Raw data:** or raw sensor measurements, those data from the original physical sensor with meta data from the attached digital recording instrument. They may include real-time but un-quality-controlled navigation data. Data delivery is in industry standard file types with defined datum and projection, as agreed between the client and archaeological geophysicist.

**Pre-processed data:** Raw data that have been quality controlled and had reversible signal modifications computed from meta-data applied. These may include irreversible removal of system and environmental noise (de-spiking and tidal corrections), manual or corrected navigation merge, as long as signal separation and preservation is achieved. Data delivery is typically in the following file types.

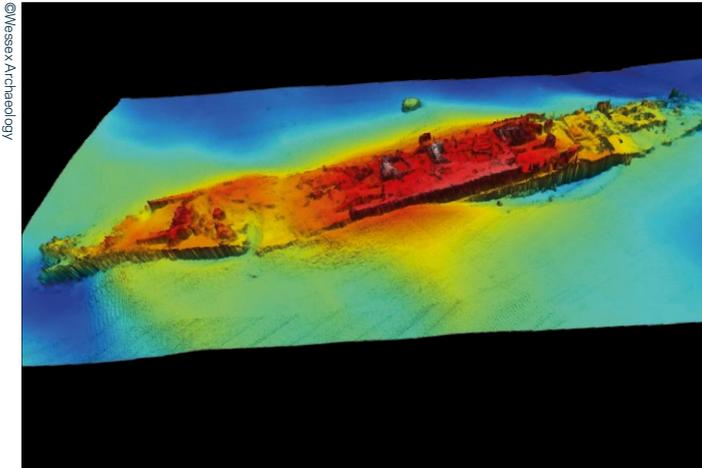
- Bathymetry (ASCII XYZ)
- Sidescan Sonar (\*.xtf, or equivalent)
- Magnetics (ASCII)
- Sub-Bottom Profiler (SEG-Y)
- Shallow Seismic (SEG-D or Y)

**Processed data:** Data converted to graphical display or other formats for purposes other than archaeological interpretation. This includes manual target picking undertaken by the survey contractor, or, increasingly, interpretational meta data such as automatic boulder detection or sea-bed characterisation. Processing may, and in some cases must, reduce fidelity or information available to the interpreter this may include bin size, dimensionality (flattening of depth), temporal and/or spatial frequencies, Sonar range and loss of illumination

direction. Fidelity is typically systematically lost to computational efficiency and I/O requirements by processing systems on-board or during post-processing towards image products. Processing may include irreversible modifications to the data that inhibit archaeological interpretation such as filtering (frequency band modification), gridding (modifying spatial sampling), smoothing (modifying sampling and amplitudes). Processing may reduce the size of the smallest discernible anomaly interpretable by the archaeological geophysicist.

**Full-Fidelity data:** Raw or processed data, but more usually and preferably pre-processed data that contains all the information (signal) of the acquisition specification and supplied in the specified datum and projection. Data that is not reduced in sampling (spatial or temporal), frequency content, range or dimensionality. Examples of loss of fidelity to be avoided:

- Multi-beam echosounder data in GeoTIFF format; reduction in dimensionality (water-depth) or sampling (increased bin-size);
- Sidescan sonar data in GeoTIFF format; reduction in dimensionality (overlapped passes and anomaly height) or frequency (down-sampling lossy-compression) or reduced range;
- Magnetometer data in GeoTIFF format; reduction in spatial frequency (increased bin-size and gridding); and
- Sub-bottom profiler or shallow seismic data as report pdf; spatial or temporal sub-sampling.



*Bathymetric results displaying the HMHS Anglia*

### 3.2.4 Archaeological interpretation will include:

- examination of the geophysical data and meta data for qualitative signal to noise levels (both coherent and random) and positional integrity including coordinate transformation allowing an assessment of the data quality and its appropriateness for archaeological interpretation;
- examination of geophysical data (sidescan sonar, magnetometer, multibeam data and sub-bottom profiler data (where appropriate) within areas that will be subject to scheme impacts in order to identify as yet unknown anomalies of potential archaeology; and
- assessment of sub-bottom profiler data in order to assess the archaeological potential of the sub-surface sediments, if a requirement of the conditions or to enhance the mitigation measures associated with the geoarchaeological investigations.

**3.2.5** Each data assessment undertaken after the EIA will take into account previous interpretations and integrate relevant results as appropriate.

**3.2.6** Sidescan sonar data will be interpreted on the basis of line-by-line review using data in an un-mosaicked format, as preference, although other methodologies may be considered where appropriate steps are taken to ensure a comprehensive review is able to be undertaken. The interpretation of the gridded multi-beam echosounder data will include reference to original point-cloud data where available or warranted, and not be limited only to post-processed surfaces. The magnetometer data will be interpreted using a combination of the individual data profiles and the resulting processed magnetic grids, as appropriate. Sub-bottom profiler data will be interpreted on a line-by-line review, proportionate to the features or deposits being assessed.

## 3.3 Geophysical reporting and digital deliverables

**3.3.1** The results of further geophysical interpretation will be compiled as an Archaeological Technical Report consistent with the methodologies for reporting (Chapter 13). This report should identify new features or deposits (if any) that warrant additional mitigation measures or further investigation. Archaeological Technical Reports on geophysical surveys will set out the methods used in processing and interpreting the geophysical data. Draft reports will be supplied to the Archaeological Curator(s) in a timeframe which optimises curatorial advice, particularly during the post-consent phase relating to implementation of AEZs and other mitigation measures.

**3.3.2** The resulting spatial interpretation data, such as the locations and extents of identified features and/or deposits of archaeological potential, will be provided alongside the compiled report in a suitable digital format, such as Geographic Information System (GIS) shapefiles or CAD drawing files (Chapter 13) as agreed with the client and, where appropriate, the Archaeological Curator(s).

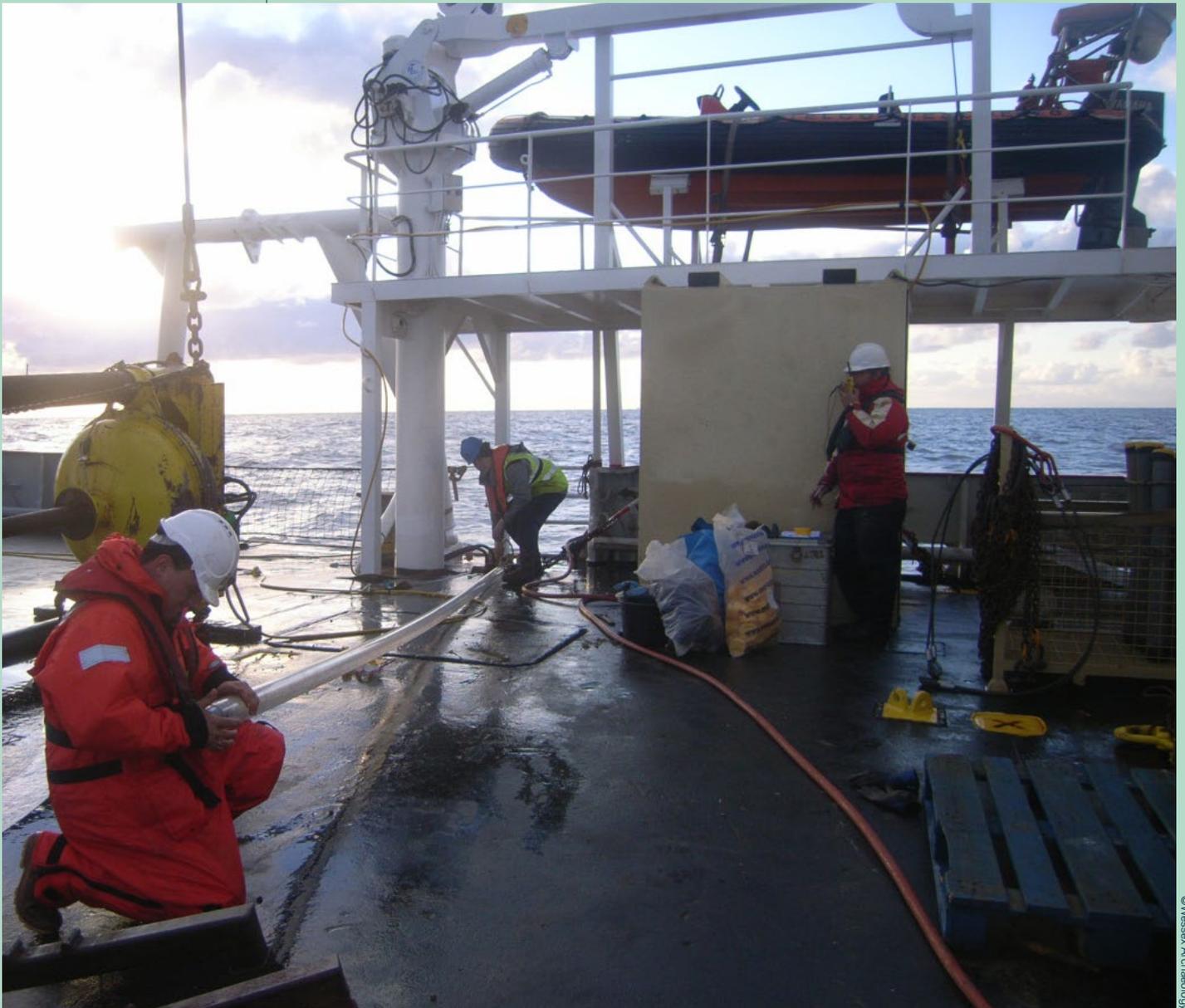
**3.3.3** All reports and digital deliverables relating to the assessment should be available for subsequent data interpretations within the life cycle of the project.



*Archaeological geophysicist on-board with sidescan sonar*

# 4

## Marine geoarchaeological investigations



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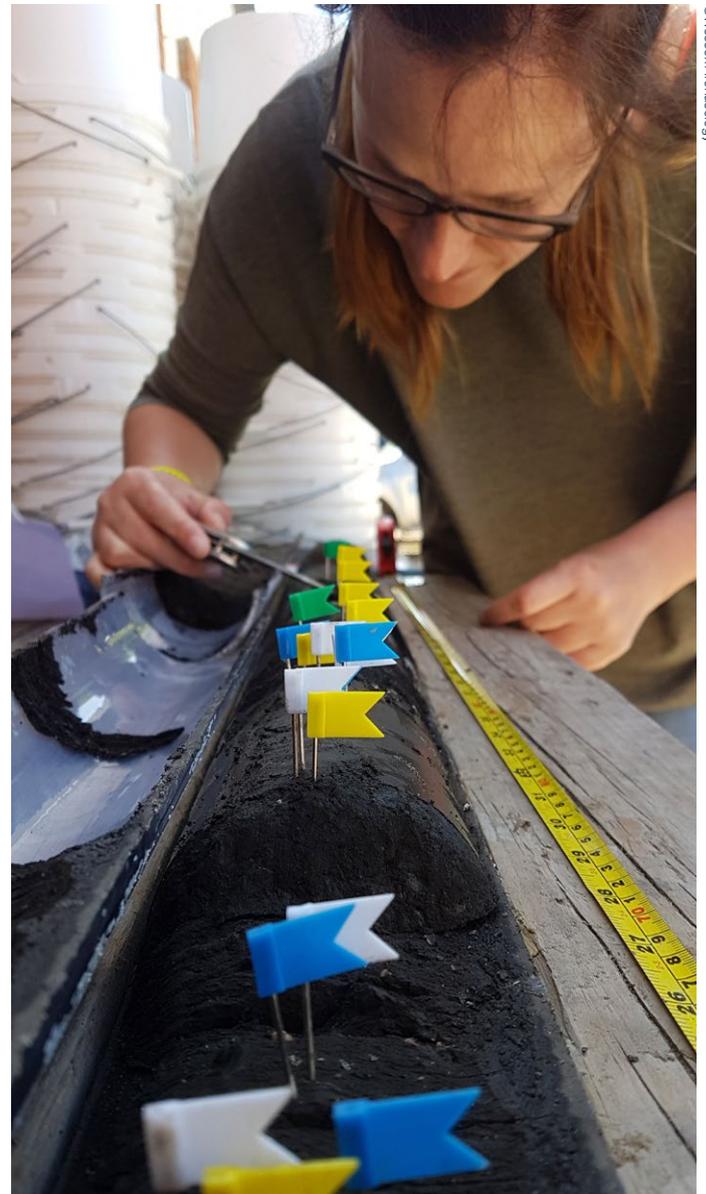
# Marine geoarchaeological investigations

## 4.1 Planning geoarchaeological involvement in geotechnical surveys

**4.1.1** As part of the EIA process a desk-based assessment outlining the extent and depth of key deposits and their archaeological significance will be undertaken drawing upon geological maps, published literature and any relevant previous site investigation or archaeological works. This provides a baseline geoarchaeological framework for the project and identifies gaps in data/knowledge that can be addressed through further marine geoarchaeological investigations.

**4.1.2** During the pre- and post-consent phases of the OWF project, geotechnical surveys will likely be undertaken and are generally multi-purpose, such as for refining design, layout, and for discharging licence conditions including the historic environment. Surveys should be planned with reference to the applicable licensing requirements and receive the necessary licences, consents or permissions before being undertaken.

**4.1.3** It is the responsibility of the OWF Project Team to ensure that the specification of any proposed geotechnical surveys is subject to advice from the Retained Archaeologist (and/or an appropriately qualified and experienced Archaeological Contractor), with support from a suitably qualified and experienced geoarchaeologist, to ensure full understanding of the archaeological objectives. The advice on the proposed geotechnical surveys will ensure that archaeological input is provided at the planning stage and to enable archaeological considerations to be taken into account. This may include recommendations for the acquisition of targeted archaeology-specific continuous cores to provide undisturbed sediments suitable for dating and palaeoenvironmental analysis. This approach offers considerable benefits to a project as a means of mitigation, thereby minimising the risk of interference, contamination or loss of deposits of archaeological interest amongst wider geotechnical testing regimes.



*Core sampling*

**4.1.4** The geotechnical specification will also be informed by any previous stages of work, for example archaeological interpretation of geophysical data (e.g., sub-bottom profiler data assessment of sub-seabed geomorphology to identify submerged palaeolandscapes features and enhance baseline understanding of early prehistoric archaeological potential).

**4.1.5** During the pre-consent phase, details of how the geoarchaeological objectives will be incorporated into geotechnical surveys will be presented and agreed with the Archaeological Curator(s) prior to the start of the archaeological assessment of the data, and in the post-consent phases of the project through Method Statement(s) in response to the WSI.

The advice on the proposed geotechnical surveys will ensure that archaeological input is provided at the planning stage.

**Table 4: Geoarchaeological investigations**

Task	Aim	Action	Outcome
Geoarchaeological input into EIA	Provide a baseline understanding of key deposits and their archaeological significance	A desk-based assessment of published geological maps and literature	Identify the extent and depth of key deposits, and gaps in data/knowledge
Geoarchaeological input into geotechnical survey planning	Ensure archaeological objectives are considered in the planning stage of the geotechnical survey	Review survey design (including geotechnical locations). Advise on the positioning of any geoarchaeology boreholes/vibrocores. Specify specialist core handling or storage (e.g., for luminescence dating). Toolbox talks and training for geotechnical contractors	Acquisition of material of archaeological interest
Review of geotechnical logs	To establish the likely presence and depth of deposits of archaeological interest and provide a broad characterisation of the site	A desk-based archaeological review of the borehole, vibrocore and CPT logs generated by geotechnical contractors	Recommendations for archaeological recoding of the cores
Recording of geotechnical cores	Preservation by record of individual core or borehole samples of potential archaeological interest	Archaeological recording of selected retained or new borehole or vibrocore samples to establish nature of sediments	Recommendations indicating whether sampling and laboratory assessment of core samples is warranted to produce an appropriate representation of the area subject to development
Archaeological sampling	Retain adequate samples (quantity and quality) for palaeoenvironmental assessment and analysis, and dating	Collection of small samples from selected points within the sedimentary sequence. Samples for scientific dating will be taken in the appropriate manner to satisfy type of dating proposed	Appropriate samples ready for assessment and analysis
Assessment and analysis	To provide a chronostratigraphic and palaeoenvironmental understanding of the area, to inform interpretation of geophysical datasets and ground model	Laboratory assessment of the samples to a level sufficient to enable the value of the palaeoenvironmental material surviving within the cores to be identified. Appropriate scientific dating will be undertaken. Full analysis of samples will be undertaken where appropriate	An account of the successive environments within the coring area, a model of environmental change over time, and an outline of the archaeological implications of the analysis

**4.1.6** The Retained Archaeologist (with advice from a geoarchaeologist) should determine the proposed locations of geotechnical work and set these out in the Method Statement that will be subject to consultation with Archaeological Curator(s). The Retained Archaeologist will provide the OWF Project Team and the Archaeological Curator(s) with the results of each stage of investigation (see below).

**4.1.7** It is recommended that a timetable and policy for the storage, retention and disposal of offshore samples including access to the geotechnical material by archaeologists, is agreed and set out in a Method Statement, at the outset of the geotechnical investigation, between the OWF Project Team, Archaeological Curator(s) and any receiving institutions (e.g., the geotechnical testing laboratory).

## 4.2 Geoarchaeological investigations

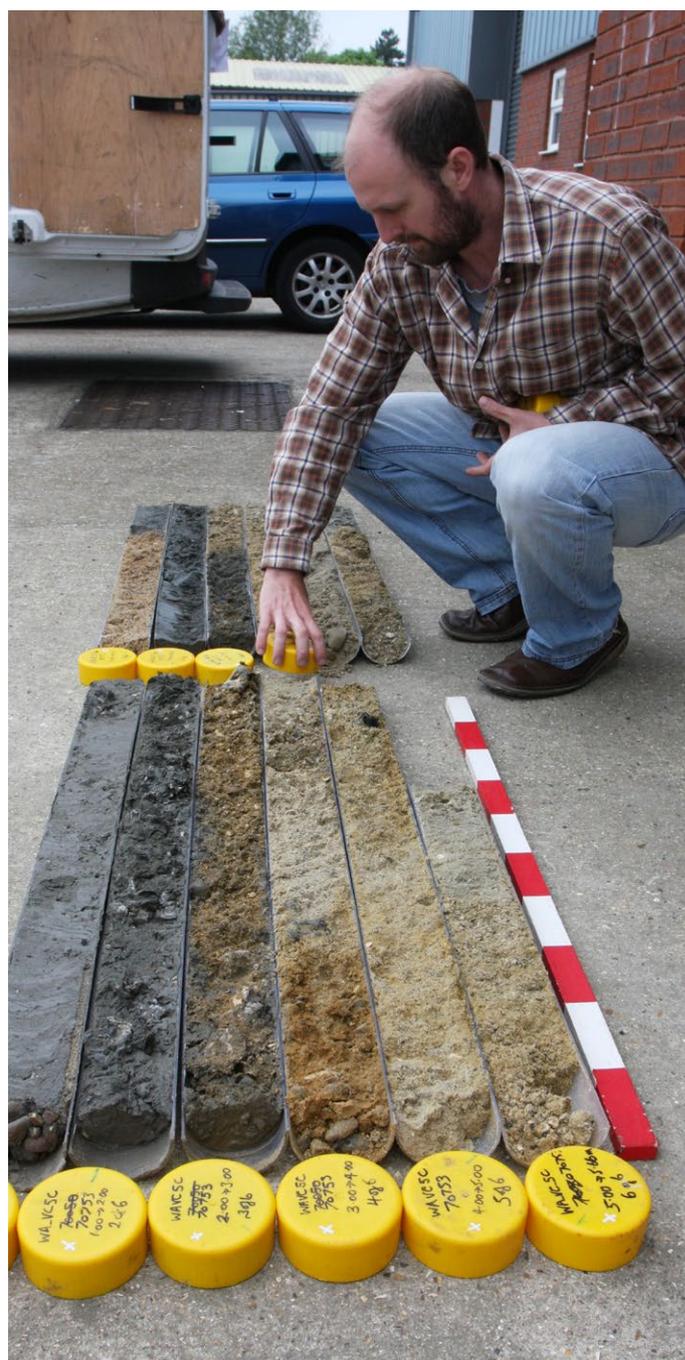
**4.2.1** A structured, staged approach will be taken to any necessary archaeological analysis of the material obtained as appropriate to satisfy the requirements of the Archaeological Curator(s) for the delivery of the required mitigation measures (Gribble and Leather 2011; Historic England 2015).

**4.2.2** Table 4 (on page 24) summarises the key tasks associated with the marine archaeological investigations (after Gribble and Leather 2011). Each task should be undertaken in consultation with Archaeological Curator(s), and some tasks may require individual Method Statements.

## 4.3 Geoarchaeological report

**4.3.1** The Retained Archaeologist will be responsible for ensuring that any Archaeological Contractor commissioned to conduct geo-archaeological analysis, produces the necessary reports to comply with an agreed phased programme of analysis. The guiding principle should be that before analysis starts, it is discussed and agreed by all parties, and that the overall objective will be the production of a sedimentary deposit model. The production of this model will comprise a final deliverable at the end of the last agreed stage of the geo-archaeological investigation.

**4.3.2** To the extent available, the final report will integrate the results of review, recording, assessment, analysis and dating. The report will address the palaeoenvironment, prehistory and any other historical periods as relevant (for example, remains of Roman or medieval settlements now on the seabed) of the area affected by the development, including relevant data generated by desk-based assessment and other field investigations, including geophysical surveys. Where



*Vibrocores*

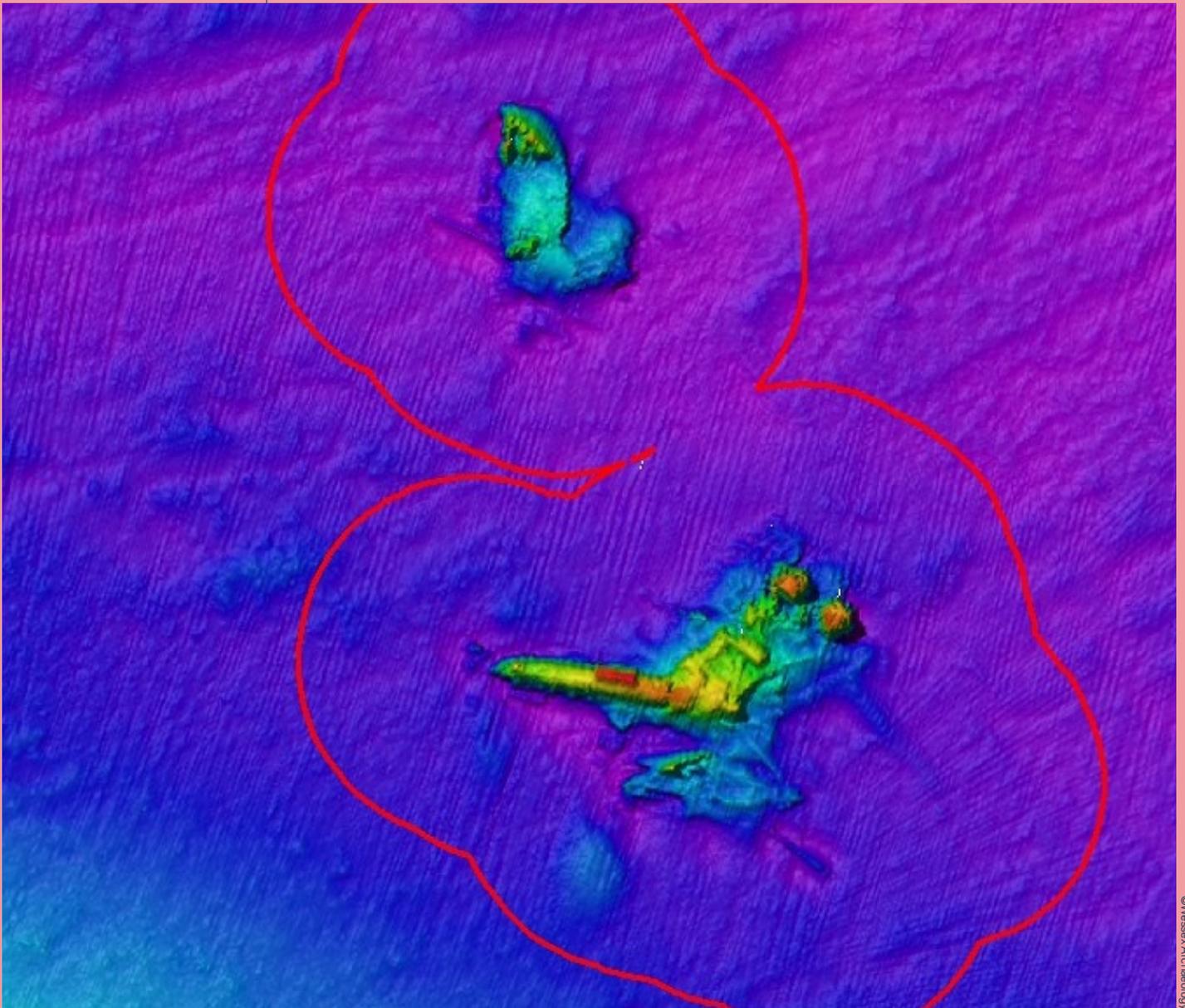
necessary, the geophysical data interpretation may need to be re-assessed depending on the findings of the geotechnical assessment.

**4.3.3** The geoarchaeological report will be prepared in a manner consistent with the methodologies for reporting (Chapter 13).

**4.3.4** If warranted, publication of the findings will need to be considered depending on the results of the assessment (Gribble and Leather 2011).

# 5

## Archaeological exclusion zones



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# Archaeological exclusion zones

## 5.1 Introduction

**5.1.1** *In situ* preservation is favoured by government policy and international best practice as the principle means to preserve any features of archaeological interest. The principal means of preserving *in situ* any features or geophysical anomalies of known or potential archaeological interest should be through the use of AEZs.

**5.1.2** During the EIA process, the desk-based assessment will identify known sites recorded in national and local heritage datasets, which are combined with an archaeological assessment of geophysical survey data (Chapter 3) to determine the known sites and geophysical anomalies of archaeological potential that are recommended for protection by AEZs.

**5.1.3** AEZs agreed through the Developer and Archaeological Curator(s) during the EIA process form the principal means of embedded mitigation. Therefore, before any licensed construction activities can occur, AEZs should be factored into the design of OWF projects, and those geophysical anomalies of archaeological potential that pose a constraint to the project's delivery should be investigated (see Chapter 6). Such investigation may also lead to the identification of additional sites of archaeological significance and the establishment of additional AEZs. Geophysical anomalies of archaeological potential may not require AEZs but should be addressed in a manner consistent with the methodologies outlined in Chapter 6.

**5.1.4** The Retained Archaeologist will be responsible for the implementation of AEZs, in consultation with Archaeological Curator(s). The OWF Project Team is responsible for the observance of AEZs by their Contractors.

**5.1.5** For any discoveries of potential archaeological sites made at any stage in the project, a Temporary Exclusion Zone (TEZ) should be introduced until further investigation can be undertaken to ascertain the character of the discovery. TEZs may be lifted following further investigation and in consultation with the Archaeological Curator(s) if the feature proves to be non-archaeological, or it may form the basis of an AEZ in the event that further disturbance should be avoided. However, if the site can be avoided, the TEZ may be retained and become an AEZ, and no further investigation may be required.

**5.1.6** The OWF Project Team will require its Contractors to conduct all construction activity in such a way as to prevent any impacts by construction or related works within any AEZs, including impacts from plant and equipment not directly engaged in construction. The avoidance of AEZs must also consider that the use of anchors and lines, which could impact upstanding features, are adequately taken into account in the planning of operations.

**5.1.7** Although AEZs are fixed, provision is made below for their alteration, following appropriate archaeological investigation and consultation, should this become necessary before, during, or after construction.

**5.1.8** The design, alteration and removal of AEZs will be subject to agreement with the Regulator, following receipt of advice from the Archaeological Curator(s).

**5.1.9** The OWF Project Team will notify its Contractors of AEZs and of any alteration or removal of AEZs.

## 5.2 Location and extent of archaeological exclusion zones

**5.2.1** Provision will be made for AEZs around confirmed archaeological sites and geophysical anomalies of high archaeological potential that can be safeguarded *in situ*.

**5.2.2** For confirmed sites where the extents are not known, for example, if they are recorded in a dataset but are located beyond the extent of existing geophysical survey data, AEZs should provide a buffer around the recorded location.

**5.2.3** Wherever possible, AEZs should be formed by establishing a buffer around the known extents of individual sites of archaeological material present on the seabed, or around geophysical anomalies for which the available evidence suggests that there could be archaeological material present on the seabed. The size of the AEZ should be evidence-based and of sufficient size to protect the site from the nature of impact, including direct and indirect impacts.



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The principal means of preserving in situ any features or geophysical anomalies of known or potential archaeological interest should be through the use of AEZs (archaeological exclusion zones).

**5.2.4** AEZs can either comprise a blanket exclusion distance applied across the entire scheme or be appropriately sized for each site. A combination of these two approaches may also be appropriate depending on the assessment of the significance of the site, confidence of the feature extents and any outlying material, and the environment. Detailed guidance for the development of individual AEZs has been developed for the aggregate industry (Dix, 2008) and can also be applied to OWF projects.

**5.2.5** The baseline data used to establish the AEZ will be incorporated within the details of the AEZ. This baseline data will form the basis for subsequent monitoring of the AEZ, supplemented by such other data that becomes available. The list of AEZs is 'live' and will be held in the project GIS maintained by the Retained Archaeologist.

**5.2.6** For sites and anomalies for which there is insufficient detailed information available to ascertain the site's archaeological significance, a TEZ can be implemented based on the potential apparent to the Retained Archaeologist through assessment, or if an Archaeological Contractor has been appointed to undertake the work, the Retained Archaeologist will review their recommendations. The precautionary principle should be applied in these instances.

**5.2.7** Details of individual AEZs should be appended to the ES, WSI and Method Statements in gazetteer format, and they should be included on relevant figures. However, as most AEZs will not be a standard shape (i.e., they comprise a buffer around the known extents of the site rather than a circle consisting of a centre-point with a radius distance), the AEZs agreed during the EIA process must be supplied

to the OWF Team as a GIS shapefile. In turn, when the OWF project is commissioned, and/or when it transitions from construction to O&M or decommissioning, the OWF Team should supply the Retained Archaeologist (if different from the previous process) and all Contractors with the agreed AEZs as shapefile data. All documentation required for OWF project delivery provided to Contractors should include the lists and illustrated locations of AEZs.

### 5.3 Establishing temporary and new archaeological exclusion zones

**5.3.1** If new finds of potential archaeological significance come to light during pre-construction surveys, during the course of construction, or during O&M or decommissioning work, for example, as reported through the Protocol for Archaeological Discoveries (Chapter 10), they may be subject to the implementation of a TEZ. The TEZ will prevent impact to the seabed within their extents but allow activities in other areas to continue.

**5.3.2** The need for and the design (position, extent) and implementation of any new Exclusion Zones (TEZs or conversion to AEZs) will be subject to discussions between the Retained Archaeologist and the OWF Team, and where relevant in consultation with Archaeological Curator(s), and confirmed with a formal response.

**5.3.3** The Retained Archaeologist will add the location and extents of the TEZ to the archaeological project GIS.

**5.3.4** Additionally, any further AEZs or TEZs recommended during the project by the Retained Archaeologist through discussions with the Archaeological Curator(s) and agreed with the Regulator must be supplied to the OWF Team as shapefiles (with appropriate metadata (Chapter 13)). The OWF Team must supply updated shapefiles to all Contractors.

**5.3.5** Following ground-truthing or new information, if material on the seabed is confirmed to be of archaeological interest, these TEZs could then be converted to AEZs.

### 5.4 Altering archaeological exclusion zones

**5.4.1** AEZs may be altered (enlarged, reduced, moved or removed) as a result of further data assessment or archaeological field evaluation covering those areas that are subject to AEZs. Further data assessment could include a formal archaeological analysis of new geophysical data, and archaeological field evaluation could include suitable high-resolution geophysical survey and/or diver or ROV survey.

**5.4.2** The alteration of AEZs will only be undertaken following consultation with the Archaeological Curator(s). Following alteration, a new plan giving details of the AEZs will be drawn up and issued to each relevant party.

## 5.5 Monitoring of archaeological exclusion zones

**5.5.1** Provision for monitoring AEZs will be set out in a Method Statement agreed between the OWF Project Team and the Regulator in reference to any relevant regulatory consent. Monitoring will take place relative to the baseline data used to establish the AEZ and continue for the duration agreed between the OWF Project Team and the Archaeological Curators, as set out in the WSI and subsequent Method Statements. This may include, for example, monitoring following the construction or decommissioning phase, and/or periodically during the O&M phase, if required. Monitoring post-construction could comprise an archaeological assessment of post-construction geophysical survey data and review of the final layout of turbine foundations or anchors, foundations for associated infrastructure (such as the offshore substation platform and any met masts), cables and positioning records of vessel jack up legs or anchors. Further details about monitoring can be found in Chapter 11.

**5.5.2** Development-related activities must not be undertaken within an AEZ. If it becomes apparent that activities that could impact the seabed have taken place

within any AEZ or TEZ, the party responsible will obtain advice from the Retained Archaeologist in accordance with their obligations with respect to AEZs and the detail of the WSI as relevant to any identified AEZs.

## 5.6 Reporting

**5.6.1** An Archaeological Report should be prepared (in line with Chapter 13) for each stage of AEZ monitoring, as required, to review whether there are still archaeological grounds for maintaining each AEZ, and to report on any incursions into any of the AEZs. Archaeological Reports on AEZs should include recommendations regarding amendment of the extent, removal and/or creation of any new AEZs, and should provide information on the effectiveness of the AEZs (for example, whether AEZs were avoided as planned or whether there have been any incursions) and the results of the monitoring. In addition, reports may include recommendations for subsequent stages, for example, if methods used during construction or O&M could be adapted to ensure greater confidence in the protection, and to highlight methodologies that worked well.



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# 6

## Avoidance or further mitigation



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# Avoidance or further mitigation

## 6.1 Avoidance through micrositing

**6.1.1** For many OWF projects, it may be possible to microsite the components of the development to avoid AEZs and any other geophysical anomalies of archaeological potential. This would apply to turbine foundations, the anchors of floating turbine foundations, the foundations of associated infrastructure (such as the offshore substation platform and any met masts), cables, legs of jack-up crane vessels and/or anchors of other vessels.

**6.1.2** As discussed above in Chapter 5, details of established AEZs should be appended to the WSI. Details of geophysical anomalies will be available in the technical reports prepared to support the EIA/application process and supporting technical reports regarding the archaeological assessment of geophysical survey data. The OWF Project Team must ensure they have the most up to date data concerning AEZs and geophysical anomalies of archaeological potential, particularly when further survey works have been undertaken following the production of the WSI. The OWF Project Team will distribute information on the position of AEZs and geophysical anomalies to their Contractors.

**6.1.3** No Method Statement is required for micrositing development components, however the OWF Project Team should contact the Retained Archaeologist for advice, where appropriate.

## 6.2 Archaeological discrimination of geophysical anomalies

**6.2.1** The avoidance strategies set out in the statements on embedded mitigation within the EIA documentation should be understood by the OWF Project Team and communicated to all stakeholders. However, if post-consent it is not possible to avoid geophysical anomalies of archaeological potential, further assessment will need to be undertaken to confirm their character.

**6.2.2** The number of geophysical anomalies requiring assessment may differ depending on a multitude of factors. For some developments, there may be a limited number of geophysical anomalies to assess, whereas for others, numbers could be considerable. It is essential to assess (for example, through ROV or diver survey) an appropriate proportion of anomalies, for example, based on the size of the features or on their location within an area of archaeological potential, and this number needs to be determined based on the overall archaeological potential of the specific OWF project area, as set out in technical reports and the ES, and agreed through discussions with the Archaeological Curator(s). Early discussions, chaired

by the OWF Project Team and involving the Retained Archaeologist, will minimise project risk by developing a suitable approach and methodology, which will then be captured in the WSI and/or an associated Method Statement.

**6.2.3** In many cases, archaeological ground-truthing investigations can be undertaken in conjunction with other surveys, for example, UXO or obstruction survey, particularly if archaeological advice is sought at the outset to ensure archaeological objectives can be met. Chapter 7 provides further details on incorporation with non-archaeological surveys.

## 6.3 Further mitigation

**6.3.1** Once the archaeological character of the material on the seabed has been established through ground-truthing, any sites of archaeological significance that will be impacted will require further mitigation to be applied. This should be agreed through discussions between the Retained Archaeologist, OWF Team and Archaeological Curator(s). Any further work, from moving contacts of low archaeological significance to a safe location, through to full excavation of a highly significant site, such as an aircraft crash site or shipwreck, will require detailed methodologies to be set out in a Method Statement, to be agreed with the Archaeological Curator(s) and the Regulator. Discussions would need to include the Receiver of Wreck and if aircraft, the Ministry of Defence (see Chapter 12, Section 12.9). The appropriate marine licence(s) would need to be applied for and granted.

## 6.4 Further geoarchaeological assessment

**6.4.1** Palaeogeographic features such as palaeochannels do not require AEZs or avoidance, but rather potential impacts are mitigated and offset through further assessment of existing material or further investigation, and the creation of an appropriate record. For example, samples gathered during the EIA process that show potential can undergo further work post-consent, and/or further vibrocores may be gathered in areas of high archaeological potential (see Chapter 4).

# 7

## Non-archaeological diver/rov surveys



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# Non-archaeological diver/rov surveys

## 7.1 Introduction

**7.1.1** Prior to construction, Remotely Operated Vehicle (ROV) or diver surveys may be undertaken to refine design parameters/layout, for ecological assessment, UXO investigation, obstruction inspection and/or removal, or other non-archaeological purposes. At the O&M stage, surveys may be undertaken for repair or maintenance work. Surveys may also be taken prior to decommissioning.

**7.1.2** In order to maximise the potential value of any proposed ROV or diver surveys undertaken primarily for non-archaeological purposes, based on the collect once, use many times principle, the OWF Project Team should seek archaeological input at the planning stage of any such works. Any such survey specification will be informed by previous stages of work undertaken for the OWF project, including any documentary studies, as well as geophysical and geotechnical data analysis, so that archaeological considerations can be taken into account.

**7.1.3** The data gathered for other purposes could be used to ground-truth targets, for example, those that it may not be possible to avoid, allowing for their characterisation and assessment of archaeological significance. Such data may also be used to provide additional information on known shipwrecks or aircraft crash sites that have been provided with AEZs, to aid identification or to clarify significance.

**7.1.4** Archaeological input in such cases should take the form of advice from the Retained Archaeologist (or the Archaeological Contractor, if appointed), on measures to optimise archaeological results from the planned survey. Advice should be formalised in a Method Statement, and may include the following:

- the available details of sites identified in the desk-based assessment and/or anomalies identified through the archaeological assessment of geophysical survey data;
- 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 types of sites and finds that may be present;
- the provision of clear guidance on what to do if a feature of archaeological interest is encountered, how it should be recorded and reported to the Retained Archaeologist; and
- the process for further investigations for sites of potential archaeological significance (for example, video link to the ROV/diver feed to the Retained Archaeologist while still on site), and discussions with the Archaeological Curator(s) and agreement of Regulator should a more detailed archaeological assessment be required.



©MNT and Reach Surveys

ROV control room

**7.1.5** Where the primary objectives of ROV or diver survey are non-archaeological, but may also contribute to archaeological objectives, consideration may be given to having the Retained Archaeologist (or the Archaeological Contractor, if appointed), present during the surveys. For example, when surveying sites of archaeological interest or in areas of high archaeological potential. Their presence, either as an observer(s) or participating diver(s), could optimise archaeological results and thereby reduce the need for repeat survey. However, their inclusion would only occur when their input has been considered appropriate and proportionate, and has been agreed through consultation with the Archaeological Curators.

**7.1.6** If an archaeologist is not on-board, training can be provided during the kick off meeting. Any discoveries of unexpected archaeological material should be reported through the protocol for archaeological discoveries (Chapter 10), which would be discussed with survey staff during a toolbox talk prior to the survey commencing.

## 7.2 Review of data collected by non-archaeological diver/rov surveys

**7.2.1** All data, including the list of targets, target investigation reports and video footage, should be made available for review by the Retained Archaeologist (or an Archaeological Contractor with appropriate expertise). Although data may be reviewed following the completion of the non-archaeological survey, it is recommended that the daily reports and target investigation reports are

provided regularly during survey operations, to ensure timely archaeological advice. For example, should a site of archaeological interest be discovered, this may facilitate the possibility of the diver/ROV survey team returning to the site for further survey, without need for remobilisation.

**7.2.2** When the data is received, the Retained Archaeologist (or Archaeological Contractor, if appointed), should review any target investigation reports and associated photographs of each site. This review will identify, as accurately as possible, any features of known or possible archaeological interest. Should the material on the seabed appear to be of archaeological potential, or should the target investigation reports and photographs not provide sufficient data for assessment, the diver/ROV survey video will also be reviewed.

**7.2.3** If the review of data collected by diver/ROV survey identifies sites of archaeological significance that will be subject to impact during construction, then the Retained Archaeologist will propose the best way to move forwards, and will work with the OWF Project Team to discuss with the Archaeological Curator(s) the extent of further requirements.

In order to maximise the potential value of any proposed ROV or diver surveys... the OWF Project Team should seek archaeological input at the planning stage of any such works.

## 7.3 Reporting

**7.3.1** Should sites of archaeological interest be identified during the archaeological assessment of data, they should be reported to the Retained Archaeologist in a timely manner for assessment to determine whether referral to Archaeological Curator(s) is required. TEZs should be applied, if applicable (see Chapter 5). Provision should be made for interim reports, as required (see Chapter 13). The timescale for reporting should be set out in the Method Statement.

**7.3.2** In addition, the Retained Archaeologist (or the Archaeological Contractor, if appointed), will prepare an Archaeological Report to summarise the archaeological assessment of diver/ROV survey data. The report will identify those sites and/or geophysical anomalies that are potentially of archaeological interest significance and may warrant further investigation. It will also identify and characterise those sites that are no longer of archaeological interest, and hence may be removed from the list of AEZs, TEZs, or geophysical anomalies of possible archaeological interest, following consultation with the Archaeological Curator(s), and with the agreement of the Regulator. The applicable digital data will be updated by the Retained Archaeologist and reissued to the OWF Project Team and relevant Contractors.

**7.3.3** The report should be prepared in a manner consistent with the methodologies for reporting (Chapter 13) and subject to consultation with the Archaeological Curator(s) prior to finalisation. Data should be stored and archived as per the methodologies for data management (Chapter 13).



*Surveyor Interceptor being deployed*

# 8

## Archaeological diver/rov-based site assessment



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# Archaeological diver/rov-based site assessment

## 8.1 Introduction

**8.1.1** Archaeological diver or ROV-based investigations take place where the primary objectives are archaeological, and the diving is led by archaeologists.

**8.1.2** Archaeological diver and/or ROV surveys can be employed in order to gather archaeological data concerning wreck sites and geophysical anomalies to safeguard the archaeological record. For example, an archaeological diver or ROV-based assessment may be required where it is not possible to protect an archaeological site, through the implementation of an AEZ or where visual clarification is sought in order to confirm the archaeological significance of the site. The surveys can also be used to provide additional information to support existing AEZs or TEZs or to recommend their alteration (enlargement, reduction, movement or removal) in consultation with the Archaeological Curator(s) and in agreement with the Regulator.

**8.1.3** The survey methodology will be set out in a Method Statement, prepared by the Retained Archaeologist (or the Archaeological Contractor, if appointed), discussed with the OWF Team and Archaeological Curator(s), and agreed by the Regulator. The Archaeological diver/ROV Method Statement will comply with existing work specifications on the OWF project.

**8.1.4** Diver/ROV assessment for archaeological purposes will be directed by the Retained Archaeologist, or an Archaeological Contractor, with the appropriate expertise and experience of the environment/conditions likely to be encountered.



*Marine archaeologist using an ROV to survey a wreck site near Kinlochbervie*

**8.1.5** Following the characterisation of archaeological material on the seabed, if a site is determined to be of high archaeological significance and there is no possibility for avoidance, the Retained Archaeologist will develop a plan for further mitigation, such as the relocation of material and/or full excavation of a site. This work would require a Method Statement, developed by the Retained Archaeologist through discussions with the OWF Team and Archaeological Curator(s), agreed by the Regulator, and in compliance with marine licence conditions.

## 8.2 Diver survey

**8.2.1** Archaeological diving surveys will comply with relevant legislation. In England, Wales and Scotland, this is the *Diving at Work Regulations 1997* and with applicable HSE Approved Codes of Practice (ACOPs). In Northern Ireland, there is subordinate legislation: *The Diving at Work Regulations (Northern Ireland) 2005* which apply within the territorial sea.

**8.2.2** The dive team should be selected in order to maximise results, for example: it could comprise entirely of marine archaeological divers or an archaeological diver embedded in a Dive Contractor's team.

**8.2.3** As a minimum, work should be overseen by a competent and qualified archaeologist, however the use of an experienced and competent marine archaeological contractor with archaeological divers is preferable. Should work be undertaken with a suitably qualified marine archaeologist directing the work undertaken by a Dive Contractor, the Method Statement will clearly justify why marine archaeological divers were not employed.



*ROV preparing to dive*



©Masset Archaeology

*A surface supplied diver at work*

**8.2.4** Divers will have approved commercial diving certification for the work being undertaken, an appropriate level of experience and an in-date medical from an Approved Medical Examiner of Divers (AMED).

### 8.3 ROV survey

**8.3.1** ROV surveys for archaeological purposes may either be undertaken by a suitably qualified and experienced Archaeological Contractor with an ROV, or by an archaeologist directing an ROV Contractor.

### 8.4 Recording

**8.4.1** Every dive should be recorded using a digital video system with helmet-mounted camera or the ROV's onboard instrumentation, with capacity to provide imagery of sufficiently high resolution to support review and interpretation.

**8.4.2** If appropriate and dependant on the scope of the work being undertaken, the position of the diver/ROV will be determined using an acoustic navigation system. The position will be integrated into a diver tracking and recording system where the position of the objects on the seabed can be compared to the geophysical data, and the extent and character of the features recorded.

**8.4.3** Recording should be conducted to a level whereby a statement can be made as to the date, character, and extent of archaeology importance of the site, to inform

an assessment of archaeological potential and importance (see Chapter 13). Significant diagnostic features should be recorded by photography, backed up with written records and measurements. Limited documentary research may also be required to support the assessment of importance.

**8.4.4** Recommended details for levels of wreck recording are outlined in Appendix I, and the appropriate level of recording should be confirmed with the Archaeological Curator(s) through the Method Statement.

**8.4.5** Data storage should be managed as per recommendations set out in Chapter 13.

### 8.5 Reporting

**8.5.1** The archaeological results of any diver/ROV survey will be compiled in a report produced by the Retained Archaeologist, or the Archaeological Contractor (if appointed). The report should include any findings that may lead to the alteration of AEZs or TEZs, as well as a statement of the likely requirements (if any) for further archaeological work.

**8.5.2** The report should be prepared in a manner consistent with the methodologies for reporting (Chapter 13) and will be subject to consultation with the Archaeological Curator(s) prior to finalisation and deposit. Data should be stored and archived based on the methodologies for data management in Chapter 13.

# 9

## Archaeological watching briefs



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# Archaeological watching briefs

## 9.1 General

**9.1.1** A watching brief is a formal programme of archaeological monitoring that involves attendance by a suitably qualified and experienced archaeologist during groundworks or other site activities/interventions associated with the scheme in the terrestrial or inter-tidal zone, and/or marine activities such as during offshore obstruction clearance (where considered appropriate). The proposed methodology will be set out in a Method Statement prepared by the Retained Archaeologist (or Archaeological Contractor, if appointed), and agreed through consultation with the Archaeological Curator(s) and the Regulator.

**9.1.2** The work will be undertaken by the Retained Archaeologist (or an Archaeological Contractor, if appointed). All watching brief activities should be conducted in accordance with the standards outlined in the ClfA's *Standard and Guidance for an Archaeological Watching Brief* (ClfA, 2014 updated 2020), and the WSI and accompanying Method Statements, and should reflect the recommended methodologies set out in Chapters 12 and 13 of this document.

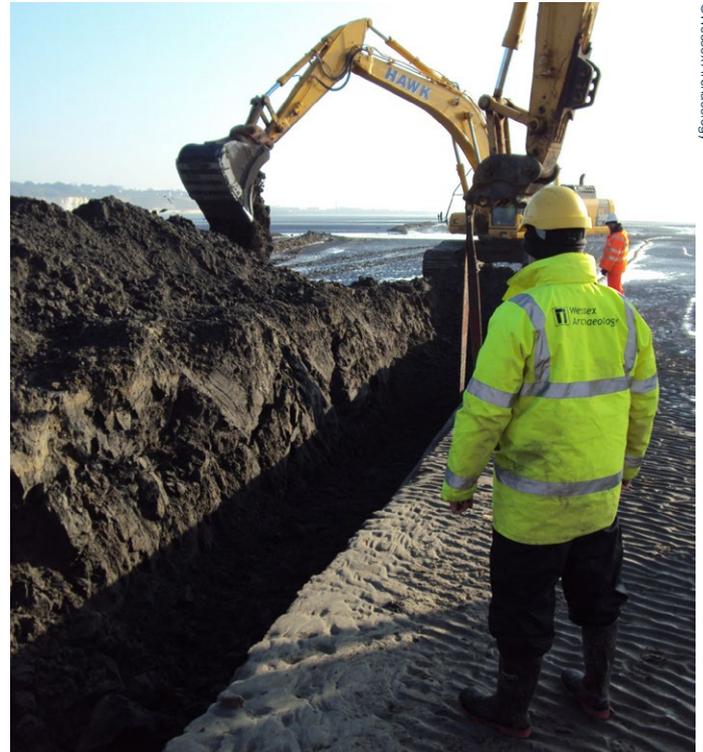
**9.1.3** As a general rule, in the terrestrial or inter-tidal zone, archaeologists should attend development activities that are operating in areas considered to be of medium or high archaeological potential as defined by the results of data assessment undertaken by the Retained Archaeologist and in consultation with the relevant Archaeological Curator(s). The watching brief should allow for either constant or intermittent monitoring as appropriate, based on the requirements of the WSI and Method Statements. In areas of low potential (where monitoring does not take place) a protocol for archaeological discoveries will be in operation (Chapter 10).

**9.1.4** The Retained Archaeologist should seek to minimise any impact on the OWF Project Team's programme caused by the archaeological investigation.

## 9.2 On-board watching briefs

**9.2.1** Whilst not common practice offshore, an on-board Watching Brief may take place where it is deemed appropriate (through consultation between the Retained Archaeologist, the OWF Project Team, and the Archaeological Curator) for an archaeologist to be on-board a vessel as an observer, for example during clearance operations where there is considered to be high risk to archaeological material. For geophysical, geotechnical and ROV or diver surveys, also refer to Chapters 3, 4, 7, 8 for more details.

**9.2.2** Any objects that are recovered during the works should be inspected by the archaeologist on site. Any finds of archaeological interest should be collected



*Thanet Wind Farm intertidal watching brief*

and allocated a record number, and their position, based on the ship's GPS, should be logged. Recording should be undertaken in line with the methodologies set out in Chapter 12 as conditions allow.

**9.2.3** If significant archaeological material or palaeoenvironmental deposits are encountered then the OWF Project Team, in consultation with the relevant Archaeological Curator(s), will make provision for the Retained Archaeologist (or the Archaeological Contractor, if appointed), to undertake a programme of investigation commensurate with the evidence discovered. Any further survey should be undertaken in line with Chapter 4, and sampling should be undertaken in line with Chapter 12.

**9.2.4** Where appropriate, sieving of bulk environmental samples should be undertaken to enhance levels of artefact recovery. Details of where and how the sieving will be undertaken and how residues will be contained should be included in the appropriate Method Statement, to ensure that any licensable activities are notified to the correct regulatory authority and the necessary licences/permits/consents are applied for. Bulk sediment samples may be taken specifically for artefact recovery.

**9.2.5** Where construction equipment is not capable of being observed (e.g., towed grapnels, spud feet etc.), the equipment should be periodically recovered to the surface and inspected for artefacts or other material of archaeological potential. All such material should be photographed, recorded and stored appropriately.



*Crane for recovering archaeological material following detailed survey*

### 9.3 Intertidal watching briefs

**9.3.1** Excavated surfaces, up-cast material and recovered objects should be inspected by the archaeologist on site. Any finds should be collected and allocated a record number and their position should be logged. A suitable metal detector may be used to enhance artefact recovery.

**9.3.2** Archaeological features or structures should be examined and/or excavated. A sufficient sample of each layer/feature type should be investigated in order to elucidate the date, character, relationships and function of the feature/structure.

**9.3.3** Any standing section of trench edge should be inspected by the archaeologist on site, where safe to do so.

**9.3.4** Development activities will include provision for sampling of features and deposits in order to recover artefacts, ecofacts and dating evidence, and in order to determine stratigraphic relationships, if appropriate. Recording should be undertaken in line with the methodologies set out in Chapter 12 as conditions allow.

**9.3.5** Where appropriate, sieving of bulk environmental samples should be undertaken to enhance levels of artefact recovery. Bulk sediment samples may be taken specifically for artefact recovery.

### 9.4 Recording and reporting

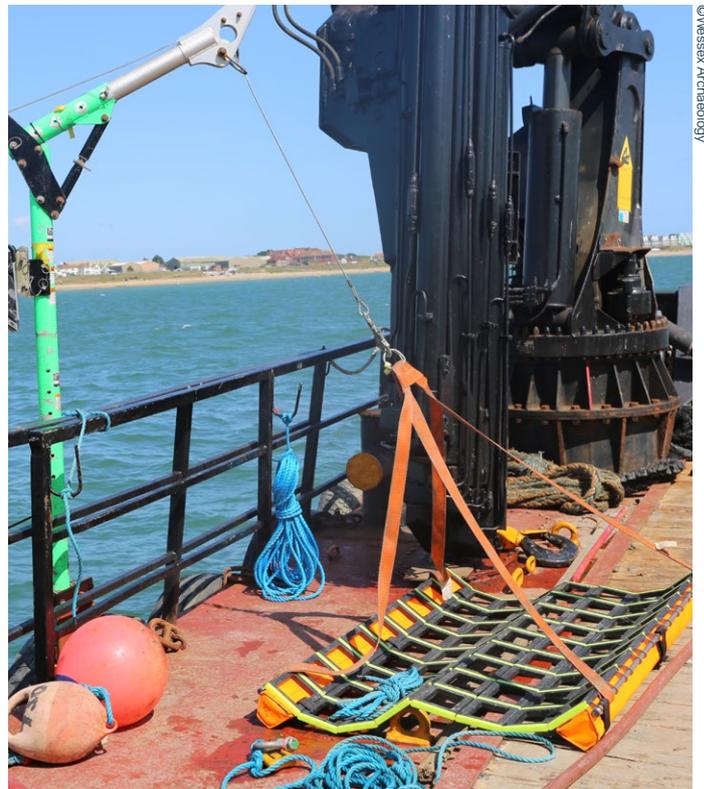
**9.4.1** The Retained Archaeologist should maintain a project GIS that will be updated with the position of the Watching Brief areas observed in relation to the development footprint. The GIS will show the location of features observed and recorded in the course of the investigations. The report should include a note of the position-fixing method and the accuracy achieved.

**9.4.2** The basic record of each feature/structure identified during the watching brief should include:

- a full photographic record;
- drawn record (plans and sections);
- position in three dimensions; and
- a written description including initial interpretation and contextual relationships.

**9.4.3** Recording should be undertaken in line with the methodologies in Chapter 12. The archaeological results will be compiled in a report by the Retained Archaeologist, or the Archaeological Contractor (if appointed), in accordance with the requirements outlined in Standard and Guidance for Archaeological Watching Briefs (CIfA, 2014 updated 2020) and with the methodologies in Chapter 13.

**9.4.4** Data should be stored and archived in line with the methodologies for data management in Chapter 13.



*Lifting frame for recovering archaeological material*

# 10

## Protocol for archaeological discoveries



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# Protocol for archaeological discoveries

## 10.1 Reporting of unexpected archaeological discoveries

**10.1.1** The development of mitigation measures during the EIA process includes consideration for the reporting and subsequent treatment of unexpected archaeological discoveries. These finds are addressed through the implementation of a protocol for archaeological discoveries, which is set out as a mitigation measure in the ES and WSI. A protocol does not replace the process of archaeological assessment and evaluation, but rather acts as a safety net in the event of unexpected discoveries during the course of works.

**10.1.2** The protocol can be implemented in conjunction with many types of proposed works and is designed to operate when it is not practical or safe for an archaeologist to be present.

**10.1.3** Works that may require an archaeological protocol include geotechnical surveys, UXO surveys, pre-lay grapnel runs, clearance works, construction, O&M, decommissioning, or any other works with the potential for the discovery of material on the seabed and/or recovery of material to the surface. Method Statements relating to these activities should include provision for reporting discoveries through a protocol.

**10.1.4** The Offshore Renewables Protocol for Archaeological Discoveries (ORPAD) (Wessex Archaeology, 2014) was developed to satisfy planning conditions relating



*Pewter jug*

to the reporting of unexpected archaeological discoveries across the offshore renewable energy industry. It can be used to support the development of a protocol for any OWF project or package of works. The methodologies set out in Chapters 12 and 13 can also inform the development of a protocol.

**10.1.5** The protocol provides a system for reporting unexpected finds of archaeological interest. The aim of a protocol is to reduce any adverse effects of the development on the historic environment by enabling people working on the development to report archaeological discoveries in a manner that is both convenient to their everyday work and effective with regard to the requirements of the Archaeological Curator(s).

**10.1.6** The key objective of a protocol is to ensure that any finds are managed in accordance with the recommendations in the WSI, and that the data gathered will become publicly available thereby supporting increased understanding of the marine historic environment.

**10.1.7** To ensure the effectiveness of the protocol, OWF project staff should receive protocol awareness training, in the form of a survey start-up briefing or a toolbox talk, in order to: understand their role in the process; recognise finds of archaeological potential; understand how to record them; and be aware of the reporting process.



*Diver surveying a cannonball*

## 11

# Post-construction monitoring, operations & maintenance and decommissioning activities



©Jason Hawkes

# Post-construction monitoring, operations & maintenance and decommissioning activities

## 11.1 Monitoring of archaeological exclusion zones

**11.1.1** As detailed in Chapter 5, the purpose of an AEZ is to ensure that direct effects from foundation or construction activities, and indirect effects such as those that might be attributable to changes to sedimentary dynamics due to placement of seabed infrastructure and construction, are avoided. Post-construction monitoring of AEZs should be carried out to confirm that no impact has occurred to the archaeological features within AEZs. Method Statements should be prepared for works covering the monitoring of AEZs, and work should be undertaken in line with licence requirements and the recommendations provided in Chapter 5.

**11.1.2** Post-construction monitoring of AEZs should be carried out in accordance with the methods and timescales set out in the final Agreed WSI. The duration of monitoring should be consistent with the timeframe for monitoring processes (e.g., sediment transport) that have been identified as having possible indirect archaeological effects.

**11.1.3** During the O&M phase, monitoring of AEZs should be undertaken if it becomes apparent that O&M activities that could impact the seabed have taken place within any AEZ. The party responsible will obtain advice from the Retained Archaeologist in accordance with their obligations with respect to AEZs.

**11.1.4** Monitoring of AEZs should also be undertaken post-decommissioning, in accordance with the methods and timescales set out in the WSI. This will ensure that archaeological features within AEZs have not been impacted, but may also enable the assessment of whether there have been any wider changes, for example, changes to bed levels, which may have exposed additional archaeological features not identified in previous assessments.

## 11.2 Post-construction monitoring

**11.2.1** An approach to post-construction monitoring should be set out in its own Method Statement prepared by the Retained Archaeologist, and agreed through discussions with the Archaeological Curator(s) and the Regulator. The work will likely include monitoring of AEZs (as discussed above), as well as areas of high archaeological potential, areas of scour, or other areas of interest as set out in the WSI.

## 11.3 Archaeological mitigation for operations & maintenance and decommissioning activities

**11.3.1** Activities undertaken as part of O&M and decommissioning works have the potential to impact marine archaeological receptors on and under the seabed. These impacts may include service or repair vessels anchoring or placing stud legs on the seabed in areas not previously impacted by construction activities, or changes to the cable route during maintenance or repair. A proportionate approach to risk is essential. Therefore, many of the mitigation measures implemented for the pre-construction and construction phases of the development will continue to apply during O&M and decommissioning.

**11.3.2** Mitigation measures such as AEZs (Chapter 5), avoidance or archaeological discrimination of anomalies (Chapter 6), and the protocol for unexpected discoveries (Chapter 10) will remain in place. The Developer/Operator must ensure that the O&M Team and any Contractors have received the latest data regarding AEZs and features of archaeological potential.

**11.3.3** The results of any surveys undertaken at the time of decommissioning which may impact on the approved Decommissioning Programme should be communicated to the relevant Regulator.

## 11.4 Further geophysical, geotechnical, diver or roV surveys

**11.4.1** Should further geophysical, geotechnical, diver or ROV surveys be planned, particularly where further works could impact on AEZs or geophysical anomalies of archaeological potential, or where work is being undertaken in areas that have not previously been archaeologically assessed, then archaeological advice from the Retained Archaeologist, and where necessary the Archaeological Curators, should be sought at the outset.

**11.4.2** Any further work should refer to the recommendations set out in the appropriate chapters of this document.

# 12

## Archaeological recording, samples and artefacts



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# Archaeological recording, samples and artefacts

## 12.1 Introduction

**12.1.1** Archaeological recording and assessment of samples and artefacts should be undertaken with the goal of addressing objectives set out in published research frameworks, for example, local research frameworks and research frameworks for specific periods or specialisms (see for example Ransley et al. 2013).

## 12.2 Indexing and recording systems

**12.2.1** Archaeological recording should be based on a series of unique site identifiers that are cross-referenced to the identifiers used in pre-consent investigations (e.g., EIA), and post-consent investigations (e.g., ROV surveys), as appropriate. The position of finds, along with any features and/or layers of archaeological potential, will be recorded in a database maintained by the Retained Archaeologist.

**12.2.2** Archaeological finds and deposits should be recorded using a pro forma recording system, based on a running matrix of assigned contexts for each site. Numbers should be allocated in blocks that are unique to that site. A number log will be maintained.

**12.2.3** Archaeological finds and deposits will be added, as appropriate, to a Geographic Information System (GIS) maintained by the Retained Archaeologist. Summary details and archaeological constraints (including AEZs) will be provided to the OWF Project Team by the Retained Archaeologist.

**12.2.4** A full photographic record should be maintained by the Retained Archaeologist using digital photography and video as appropriate. Recovered material will be subject to photographic recording by digital stills. For material of archaeological interest, sufficient photographs may be acquired to produce a photogrammetry model. Additional illustrative photographs should be taken as appropriate and a register of the photographic record will be maintained.

## 12.3 Position-fixing and levelling

**12.3.1** The Retained Archaeologist will ensure that actions are conducted correctly and will ensure that if an Archaeological Contractor has been nominated, that they are provided with specifications. The spot height of all principal features and levels will be calculated in metres relative to a datum agreed with the OWF Project Team and Archaeological Curator(s), correct to two decimal places. Plans, sections and elevations will be annotated with spot heights as appropriate.

**12.3.2** Levels of principal features and of the seabed/land surface will also be converted to metres relative to the Chart Datum agreed with the OWF Project Team and Archaeological Curator(s).

**12.3.3** Position-fixing will be related to the OWF project co-ordinate system identified by the OWF Project Team (for example, UTM WGS 84 datum in offshore use and British National Grid (BNG) in intertidal and terrestrial uses, or the Irish National Grid (ING) in Northern Ireland). Where positions have been acquired in another projection, details of the position in its original projection will be maintained including an audit trail for the conversion to BNG or WGS 84.

**12.3.4** Position-fixing will be by GPS, either by hand-held unit (on land or in intertidal areas); by reference to vessel navigation systems; or by dedicated survey equipment.

**12.3.5** On land and in intertidal areas, levels should be obtained by RTK (Real Time Kinematic) GPS.

**12.3.6** Sub surface position-fixing during diver or ROV-based investigations will be determined by acoustic tracking system linked to a survey-grade GPS receiver, unless a suitable alternative is proposed for specific reasons and agreed with the Archaeological Curator(s).

**12.3.7** The methods and likely accuracy of position-fixing and levelling will be stated in Archaeological Reports.

## 12.4 Environmental sampling strategies

**12.4.1** Deposits (i.e., sediments) of archaeological/historical/cultural potential that do not comprise artefactual remains will not be considered to be 'finds' but may be subject to sampling. Any artefactual material subsequently discovered in the course of processing such samples would be treated as finds thereafter.

**12.4.2** For each programme of archaeological work, environmental sampling strategies and methods – including methods for processing, assessing and/or analysing samples – will be set out in a Method Statement for the archaeological work prepared by the Retained Archaeologist through discussions with the Archaeological Curator(s) and agreed with the Regulator.

**12.4.3** Approaches and methods will be consistent with Environmental Archaeology: A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-excavation (English Heritage, 2011) and Geoarchaeology: Using Earth Sciences to Understand the Archaeological Record (Historic England 2015).



## 12.5 Environmental samples: handling, labelling, packaging and storage

**12.5.1** The Retained Archaeologist will be responsible for ensuring that all samples and other professional standards are maintained. All environmental samples will be satisfactorily and legibly labelled and recorded on a register of samples. Sample record sheets will provide information on type, reason for sampling, size, context and sample numbers, spatial location, date taken, and a brief description/interpretation.

**12.5.2** All environmental samples should be stored in appropriate conditions by the Retained Archaeologist, or nominated Archaeological Contractor, if applicable, pending any assessment and analysis.

**12.5.3** Geotechnical and geoarchaeological samples should also be handled, labelled, packaged and stored in accordance with guidelines set out in the documents in Chapter 12, Section 12.4.3.

**12.5.4** For geotechnical and geoarchaeological samples derived from developer-led sampling programmes, the OWF Team should ensure that samples are made available for geoarchaeological recording and sub-sampling, in accordance with the archaeological Method Statement, prior to any processes that may render the sample ineffective, such as strength testing.

## 12.6 Artefacts: handling, labelling, packaging and storage

**12.6.1** The WSI will confirm the responsibilities, methods of recording and ownership of the finds.

**12.6.2** All retained finds should be processed in accordance with the appropriate guidance for 'first aid for finds' (Leigh et al. 1998; Robinson 1998), and the ClfA's Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Material (2014). All finds should be recorded and labelled appropriately, and a full record should be kept of any treatment given.

**12.6.3** In the event of the discovery of unexpected, unusual or extremely fragile and delicate objects and deposits, the Retained Archaeologist should be notified immediately. The Retained Archaeologist will inform the OWF Team, and the discovery will be subsequently referred to the Archaeological Curator(s) or other relevant authorities (e.g., as per requirements of the Protection of Military Remains Act, 1986), as and when necessary as part of a defined decision-making process. Prompt reporting can be crucial for the further assessment of material such as newly exposed shipwrecks or aircraft remains which could degrade rapidly. Additional work will be discussed, and agreed, in consultation with the Archaeological Curator(s), and fully explained in the context of the project WSI. The Retained Archaeologist who is responsible for its implementation on behalf of the OWF Project Team will take the lead. Any work will be undertaken in line with the necessary licence, consents or permissions, and may comprise recording, analysing, recovery of material, conservation and archiving.

**12.6.4** In the event of the discovery of items that may be eligible for legal protection, the Retained Archaeologist will notify the relevant legal authority as soon as possible. The OWF Project Team and the Archaeological Curator(s) will be notified as soon as possible.

A full photographic record should be maintained by the Retained Archaeologist using digital photography and video as appropriate.

**12.6.5** Subject to the agreement reached with the receiving institution regarding selection, retention and disposal of material, the Retained Archaeologist, or the appointed Archaeological Contractor, will retain all recovered objects unless they are undoubtedly of modern or recent origin. The presence of discarded objects should, however, be noted on context records. In these circumstances sufficient material will be retained to characterise the date and function of the deposit from which it was recovered.

**12.6.6** All finds and other items of archaeological interest have an owner, but the law regarding ownership varies according to the character of the material, the environment in which it was found, and national legislation. OWF Project Teams, via the Retained Archaeologist, will report recovered objects to the Receiver of Wreck (if applicable, see Chapter 12, Section 12.10). The Receiver of Wreck has the responsibility of determining ownership, and during this process all finds should be held securely by the Retained Archaeologist, or the appointed Archaeological Contractor, in appropriate conditions pending further recording, investigation, study or conservation.

**12.6.7** Once the Receiver has concluded ownership, if no owner has been found, the OWF Team will be offered title. In due course the objects will be selected, retained or disposed of in accordance with the policy agreed with the institution receiving the archive, and in consultation with the Archaeological Curator(s). Ownership will be transferred to the institution receiving the archive unless other arrangements are agreed with the Archaeological Curator(s) and the OWF Project Team.

**12.6.8** The relevant Method Statement will provide details regarding the proposed plans for the discard or disposal of material. This will include details about how the material can be disposed of, where it can be disposed of, and by whom. The Method Statement will also ensure, that should material be returned to the seabed, that any licensable activities are notified to the correct regulatory authority and that the correct licences, consents or permissions are applied for and received prior to re-deposition.

**12.6.9** The Retained Archaeologist will prepare and implement a finds monitoring and maintenance programme, which will cross-refer to finds management/monitoring systems maintained by the OWF Project Team, and their Contractor (for example, UXO Survey IDs).

**12.6.10** Contingency will be made for specialist advice and conservation needs on-site should unexpected, unusual or extremely fragile and delicate objects be recovered, and the advice and input from an appropriate Conservation Service will be sought through the Retained Archaeologist. A range of internal and external specialists will be consulted as appropriate.

## 12.7 Ordnance

**12.7.1** In the event that any item(s) of ordnance is discovered, the OWF Project Team and Contractors' Health & Safety procedures should be followed. Any ordnance should be treated with extreme care as it may not be inert. Industry guidelines provided by the OWF Project Team and/or their Contractors must be followed prior to any recording of items for archaeological purposes. The scheme-specific WSI will provide details of procedures and lines of communication for UXO related discoveries.

**12.7.2** Depending on the item's age, ordnance may be of archaeological interest, especially when discovered with other related material from a wreck, either shipwreck or aircraft, and should be recorded only where it is safe to do so.

**12.7.3** The relevant Method Statement will set out how to deal with the discovery of ordnance. It will set out whether for this stage of works the OWF Team has engaged a specialist UXO Contractor and will clearly explain the communication process between them and the Retained Archaeologist (and/or the Archaeological Contractor, if appointed). The Method Statement will also set out any potential licensing requirements.

**12.7.4** The steps to take depend on the work being undertaken at the time of discovery. For example:

- if ordnance is discovered on the seabed during an ROV survey undertaken for non-archaeological purposes, for example, as part of a UXO survey, any information about the ordnance, such as reports from the specialist UXO Contractor should be forwarded to the Retained Archaeologist undertaking the archaeological assessment of ROV survey data. This includes reports of when the ordnance has been disposed of;
- if ordnance is discovered on-board a vessel, for example, during debris clearance when there is no archaeologist on-board, the Contractor or specialist UXO Contractor will take the lead, and the item should be reported through the protocol for archaeological discoveries, if safe to do so;
- if ordnance is discovered on-board a vessel, for example, during an Archaeological Watching Brief during debris clearance, and there is a specialist UXO Contractor on-board, the specialist UXO Contractor will take the lead. If there is no UXO contractor on-board, the archaeologist will follow procedures set out in the Archaeological Watching Brief Method Statement; and
- if ordnance is discovered on the seabed during an archaeological diver/ROV survey, it should be reported to the dive supervisor, and the dive team will follow the procedures set out in the Method Statement;

**12.7.5** Any firearms and ammunition (e.g., from a crashed military aircraft) are likely to be subject to the Firearms Acts (various dates). Ammunition should be regarded as ordnance, irrespective of its size.

## 12.8 Human remains

**12.8.1** In the case of the discovery of human remains, at all times they should be treated with due decency and respect. A TEZ will be implemented, and all disturbance of the deposit(s) within the TEZ will cease, pending the Retained Archaeologist approaching the relevant authorities. Where practical the human remains will be left in situ, covered and protected.

**12.8.2** The Retained Archaeologist will inform the OWF Project Team who will immediately inform the local Police. If the Police do not propose to investigate the remains, they may be dealt with as follows:

**12.8.3** In England and Wales, the Retained Archaeologist will obtain a Ministry of Justice licence. In Scotland the relevant Procurator Fiscal will be contacted. In Northern Ireland the coroner should be informed.

**12.8.4** For human remains associated with aircraft, see Chapter 12, Section 12.9.

**12.8.5** Pending discussions regarding the need for excavation/removal or sampling, between the Retained Archaeologist, OWF Project Team, and the Archaeological

Curator(s), where this is deemed appropriate, as the remains cannot be left in situ, the human remains will be fully recorded, excavated and removed from site in compliance with the relevant licence. All archaeological work should be in accordance with established protocols and undertaken in line with ClfA standards (McKinley and Roberts, 1993). Appropriate guidance should be sought from a suitably qualified and experienced osteoarchaeologist, if required.

**12.8.6** The final deposition of human remains subsequent to the appropriate level of osteological analysis and other specialist sampling/examinations will follow the requirements set out in the relevant licence.

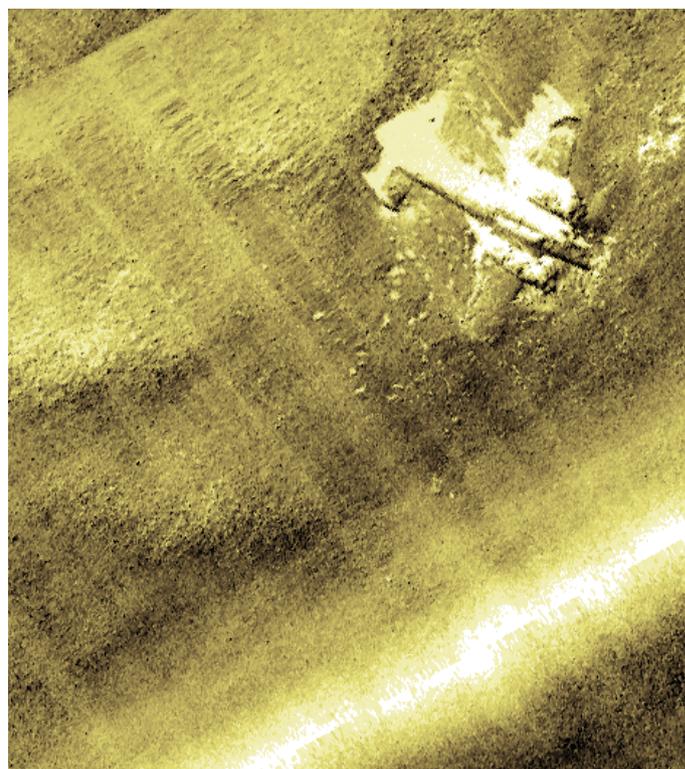
## 12.9 Aircraft

**12.9.1** Any finds that are suspected of being military aircraft will be reported immediately to the Retained Archaeologist. The OWF Project Team will be informed as well as the Joint Casualty and Compassionate Centre (JCCC) of the Ministry of Defence (MoD).

**12.9.2** The majority of aircraft wrecks are military and are thus automatically protected under the Protection of Military Remains Act 1986. Under this Act, it is an offence to tamper with, damage, move or unearth any items at such sites, unless the MoD has issued a licence authorising such activity. A licence is required irrespective of whether the aircraft was in the service of another nation's armed forces.



*Recovery of material from a Fairey Barracuda*



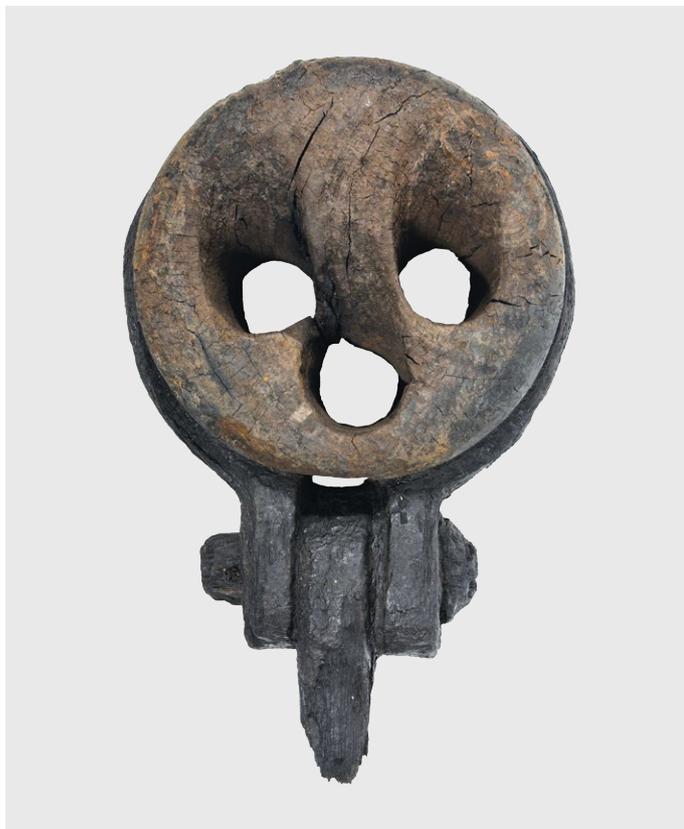
*Sidescan sonar image of a Dornier*

**12.9.3** Application for a licence, and any subsequent work, should be undertaken in line with the Ministry of Defence, Crashed Military Aircraft of Historical Interest: Licensing of Excavations in the UK: Notes for Guidance of Recovery Groups (Revised 2018). Should human remains be discovered, they should not be touched, but must be reported immediately to the Ministry of Defence (as per paragraph 15 of the guidance).

**12.9.4** For the archaeological assessment of aircraft remains, the Retained Archaeologist should refer to available guidance from Archaeological Curator(s), such as, in England, Military Aircraft Crash Sites: Archaeological Guidance on their significance and Future Management (English Heritage, 2002), and in Wales Caring for Military Sites of the Twentieth Century (Cadw, 2009).

## 12.10 Wreck

**12.10.1** Wrecks protected under the Protection of Wrecks Act 1973, the Protection of Military Remains Act 1986, the Ancient Monuments and Archaeological Areas Act 1979 or historic Marine Protected Areas (hMPAS) protected via the Marine (Scotland) Act 2010 will have been identified through the EIA process, and will have been provided with AEZs. However, it is possible that significant discoveries made during survey work could be protected under these Acts.



*Deadeye*



*Conservation work on the bell from the Carica Milica, recovered during work for Galloper Offshore Wind Farm*

**12.10.2** Archaeological artefacts that have come from a ship are classified as 'wreck' for the purposes of the Merchant Shipping Act 1995. The Receiver of Wreck must be notified within 28 days, for all items of wreck that have been recovered within UK waters or recovered and brought into UK waters. The Retained Archaeologist should prepare the reporting forms and submit them to the OWF Project Team for signature and submission to the Receiver of Wreck. Due to the legal responsibilities under the Merchant Shipping Act 1995; the responsibility for reporting ultimately rests with OWF Project Team.

**12.10.3** Any artefacts reported to the Receiver of Wreck must be stored in a secure location until a closure letter has been received for the droit, offering title for the material.

**12.10.4** All potential wreck material identified on the seabed, for example, through ROV survey, should also be reported to the Receiver of Wreck. During the production of the Method Statement, the Retained Archaeologist should contact the Receiver of Wreck to explain the activity and how material may be encountered on the seabed and to discuss procedures for reporting.

## 12.11 Materials conservation and storage

**12.11.1** All recovered materials, from land or underwater, should be subject to a Conservation Assessment to gauge whether special measures are required while the material is being held. In the case of material recovered from underwater or inter-tidal areas, the conservation assessment must take place no more than four weeks after recovery. If warranted,



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all or part of the Conservation Assessment will be carried out at an earlier stage (for example, in advance of recovery, or onboard immediately following recovery).

**12.11.2** This Conservation Assessment will be carried out by the Retained Archaeologist or an Archaeological Contractor with an appropriate level of expertise, with advice from appropriate specialists and following appropriate guidance, such as Historic England's *Waterlogged Organic Artefacts: Guidance on the Recovery, Analysis and Conservation* (2010).

**12.11.3** The Retained Archaeologist (or an Archaeological Contractor if appointed) with appropriate expertise, will implement recommendations arising from the Conservation Assessment.

**12.11.4** Objects that require immediate conservation treatment to prevent deterioration will be treated according to guidelines laid down in *First Aid for Finds* (Leigh et al. 1998) and/or *First Aid for Underwater Finds* (Robinson 1998). A full record of any treatment given will be made by the person applying the treatment and these records will form part of the archive.

**12.11.5** Specialist conservation work, based on the recommendations prepared by the Retained Archaeologist (or a specialist Archaeological Contractor if appointed), will require consultation with and approval from the

OWF Project Team and the Archaeological Curator(s). The Retained Archaeologist is responsible for all quality assurance and monitoring of works conducted. Specialist conservation work may be required for metalwork, bone (including worked bone), human remains, waterlogged timbers, and other organic remains, industrial waste, ceramic material, glass and lithic material.

**12.11.6** If required, metal work will be X-rayed, and along with other fragile and delicate materials, stored in a stable environment. The X-raying of objects will be undertaken by someone suitably qualified, and in line with relevant guidance, such as Historic England's *Guidelines on the X-radiography of Archaeological Metalwork* (English Heritage 2006).

**12.11.7** Where no special measures are recommended, finds will be conserved, bagged and boxed in accordance with relevant industry guidelines, such as the ClfA's *Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials* (2014). Materials conservation and storage will accord with the ClfA's guidance.

**12.11.8** Plans for the permanent storage of the finds and samples should be determined in line with relevant guidance, such as the ClfA's *Standard and Guidance for the Creation, Compilation, Transfer and Deposition of Archaeological Archives* (2014, updated 2020).

# 13

## Data management, reporting, publication and archiving



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# Data management, reporting, publication and archiving

## 13.1 Data management

**13.1.1** The Retained Archaeologist has overall responsibility for all matters related to archaeological data management. Issues regarding data storage and management, such as how long and in what format data should be stored, will be confirmed through discussions between the Retained Archaeologist and the OWF Project Team.

**13.1.2** Should a different Retained Archaeologist be appointed for different stages of a project (for example, following consent), the OWF Team should ensure that all relevant data is provided to the new Retained Archaeologist (for example, shapefiles of AEZs, geophysical anomalies of archaeological potential, areas of high archaeological potential, etc.).

**13.1.3** All data in digital formats will be considered part of the primary archive and will be prepared in accordance with the guidance in *Caring for Digital Data in Archaeology: a Guide to Good Practice* (Archaeological Data Service 2013) and for projects in Wales, with *The National Standard and Guidance for Collecting and Depositing Archaeological Archives in Wales* (2017 and 2019).

**13.1.4** All data will be stored on a suitable safe medium and protected from accidental or deliberate harm.

**13.1.5** Provisions for digital data should accord with procedures recommended by The Crown Estate (TCE), The Crown Estate Scotland (CES), The Welsh Archaeological Trusts, Marine Environment Data and Information Network (MEDIN), Archaeology Data Service (ADS) and the relevant Archaeological Curator(s). Digital material will be subject to managed quality control and curation processes which will embed appropriate metadata within the material and ensure its long-term accessibility.

**13.1.6** In England, summary data (such as gazetteers) will be compiled in a format suitable for submission of Monument, Event and Source records to the National Marine Heritage Record (NMHR), which will house the marine records derived from the National Record of the Historic Environment (NRHE), that are beyond terrestrial local authority jurisdiction. Data regarding intertidal works should be submitted to the relevant local Historic Environment Record (HER).

**13.1.7** For projects in Wales, the Welsh Archaeological Trusts have produced *Guidance for the Submission of Data to the Welsh Historic Environment Records* (2018).

**13.1.8** For projects in Scotland, all records should be in a format suitable for submission to Historic Environment Scotland.

**13.1.9** For fieldwork in Northern Ireland, summary data will be compiled in a manner suitable for deposition with the Historic Environment Division, Department for Communities, Northern Ireland.

**13.1.10** Survey data relating to updates on wrecks or new discoveries should be submitted to the United Kingdom Hydrographic Office (UKHO) using form H525. This will generally be undertaken by the geophysical survey contractor, however for archaeological surveys, the Retained Archaeologist is responsible.

**13.1.11** On completion of scheme construction (in England, Scotland, Northern Ireland, and Wales), the Retained Archaeologist will produce an OASIS form for the whole scheme, and copies of all archaeological reports should be attached. When the OASIS form is submitted, it is automatically sent to the relevant HERs, and notification is also sent to the relevant Archaeological Curator, so that they may advise the respective competent authority on compliance with relevant consent conditions.

## 13.2 Reports

**13.2.1** Each Archaeological Report prepared by an Archaeological Contractor will be submitted in draft to the Retained Archaeologist for submission to the OWF Project Team. If the report is prepared by the Retained Archaeologist, it will be submitted directly.

**13.2.2** Each archaeological survey or package of work outlined in the WSI will give rise to one or more Archaeological Reports, as set out in the Method Statement relating to the work. The number and type of reports will depend on the surveys and works undertaken.

**13.2.3** The Method Statement will also set out provision for the submission of interim reports to Archaeological Curator(s) should material or sites of archaeological interest be discovered during survey or construction works. The interim reports should be concise and must be provided in a form to be agreed with the Archaeological Curator. Their submission will ensure that there is sufficient time for Archaeological Curator(s) to review significant discoveries and provide advice before subsequent stages of work.

**13.2.4** Each Archaeological Report will satisfy the Method Statement for the investigation and will present the survey information in sufficient detail to allow interpretation without recourse to the project archive.

**13.2.5** Archaeological reports will be prepared in accordance with the guidance given in the relevant ClfA Standard and Guidance document. Reports 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; and
- illustrations and appendices to support the report.

**13.2.6** Illustrations will include a plan of the area subject to investigation in relation to the development scheme.

**13.2.7** Arrangements and timescales for submitting draft Archaeological Reports by the OWF Project Team to Archaeological Curator(s) will be set out in the WSI or Method Statement relating to the work. The timescales will ensure that the Archaeological Curator(s) have sufficient time to comment on findings prior to the next stage of archaeological work commencing.

**13.2.8** Where comments are received from the Archaeological Curator(s), Archaeological Reports will be returned by the OWF Project Team to the Retained Archaeologist, who will ensure that such amendments as might be required are undertaken by the report originator (either the Retained Archaeologist or the Archaeological Contractor).

**13.2.9** Arrangements and timescales for submitting final Archaeological Reports by the OWF Project Team to Archaeological Curator(s) will be set out in the Marine Licence, and reflected in the WSI or Method Statement relating to the work.

**13.2.10** On completion of archaeological works relating to construction of the scheme and to a timetable agreed with the OWF Project Team and Archaeological Curator(s), an overarching report on the archaeology of the scheme will be prepared in draft and final copies in accordance with the methods set out above. The overarching report need not repeat the details contained in each preceding report, but should serve as an index to, and summary of, the archaeological investigations as a whole.

**13.2.11** Draft and final Archaeological Reports will be submitted in a format to be agreed between the Client and Archaeological Curator(s).

**13.2.12** Copyright for reports will be confirmed in the WSI.

**13.2.13** Except where further analysis and publication are to take place (see Chapter 13, Section 13.4), a note based on the overarching report should be published in

at least one appropriate peer-reviewed local, national, thematic or period-based journal. The note will signpost the availability of further details of the investigations, including reports, records and archives.

### 13.3 Post-fieldwork assessment

**13.3.1** Post-fieldwork assessment will be undertaken by the Retained Archaeologist (or Archaeological Contractor, if appointed), and will address, where possible, the character and extent, date, integrity, state of preservation and relative quality of the archaeological features or remains of the recorded archaeology, and provide a costing for any further research, analysis, publication and archiving (including the costs of depositing the archive).

**13.3.2** Decisions regarding the scope of post-fieldwork assessment will be made by agreement between the OWF Project Team and Archaeological Curator(s) following submission of investigation reports, based on the possible importance of the results in terms of their contribution to archaeological knowledge, understanding or methodological development.

**13.3.3** As a minimum, a single post-fieldwork assessment may be carried out in respect of the investigations associated with the scheme as a whole. Such an assessment may be carried out by expanding the overarching archaeological report to include proposals in respect of analysis, publication and archiving.

**13.3.4** An assessment of the potential of the archive for further analysis will be undertaken. This may include (but is not limited to) consideration of the following elements:

- the dating and dendrochronological assessment of timbers;
- the conservation of appropriate materials, including the X-raying of metalwork;
- the spot-dating of all pottery from any investigation. This will be corroborated by scanning of other categories of material;
- the preparation of site matrices with supporting lists of contexts by type, by spot-dated phase and by structural grouping supported by appropriate scaled plans;
- an assessment statement will be prepared for each category of material, including reference to quantity, provenance, range and variety, condition and existence of other primary sources; and
- a statement of potential for each material category and for the data set as a whole will be prepared, including specific questions that can be answered and the potential value of the data to local, regional and national investigation priorities.

**13.3.5** Where warranted by, for example, the investigation of an important site, a discrete post-fieldwork assessment may be undertaken of the specific sites or investigations in advance of assessment of the investigations associated with the scheme as a whole.

**13.3.6** Post-fieldwork assessment reports will be prepared in a manner consistent with the methodologies on reporting (Chapter 13, Section 13.2).

## 13.4 Analysis and publication

**13.4.1** On the basis of post-fieldwork assessment, and as agreed by the relevant local or national Archaeological Curator(s), mitigation requirements will be satisfied by the Client (i.e. the OWF Project Team) commissioning the Retained Archaeologist to distribute important results. As discussed above, reports should be uploaded through OASIS to the ADS. For significant results, other forms of dissemination should also be considered, such as through open access publication, popular publications, web pages, and publication of data, photographs and video online.

**13.4.2** In some instances, results may warrant publication in a recognised peer-reviewed journal or as a monograph. The scope of any such publication will be informed by the post-fieldwork assessment and subject to agreement between the OWF Project Team and the relevant Archaeological Curator(s).

**13.4.3** The Retained Archaeologist should confirm the timeframe for the distribution and/or publishing of reports, in consultation with the Client and the Archaeological Curator(s), and this should be included in the WSI or Method Statement, as appropriate. The WSI or Method Statement should also indicate where reports should be published.

## 13.5 Archiving

**13.5.1** It is accepted practice to keep project archives, including written, drawn, photographic and artefactual elements (together with a summary of the contents of the archive), together wherever possible and to deposit them in appropriate receiving institutions once their contents are in the public domain.

**13.5.2** Best practice should be adhered to in line with Archaeology Archives Forum's Archaeological Archives: a Guide to Best Practice in Creation, Compilation, Transfer and Curation (Brown 2011) and ClfA's Standard and Guidance for the Creation, Compilation, Transfer and Deposition of Archaeological Archives (2014, updated 2020).

**13.5.3** Where appropriate, reference should also be made to: Museums and Galleries Commission's Standards in the Museum Care of Archaeological Collections (1992); Society of Museum Archaeologists' Retention and

Dispersal of Archaeological Collections; Guidelines for Use in England, Wales and Northern Ireland (1993); and Walker's Guidelines for the Preparation of Excavation Archives for Long-term Storage (1990). Projects in Wales should refer to The National Standard and Guidance to Best Practice for Collecting and Depositing Archaeological Archives in Wales (National Panel for Archaeological Archives in Wales, 2017 and 2019). Projects in Scotland should refer to Guidelines for Archiving of Archaeological Projects (2016).

**13.5.4** The relevant receiving institution will be notified by the Retained Archaeologist of any archaeological investigation in advance of fieldwork. An accession number will be sought for the project archive by the Retained Archaeologist and included in the Method Statement relating to fieldwork or recovery of artefacts. Any specific requirements relating to the preparation and deposition of project archives raised by the Retained Archaeologist will be accommodated as appropriate. The Retained Archaeologist, through the OWF Project Team, will inform the Archaeological Curator(s) of arrangements for archiving.

**13.5.5** The Retained Archaeologist will agree with the receiving institution a policy for the selection, retention and disposal of excavated material, and confirm requirements in respect of the format, presentation and packaging of archive records and materials, in accordance with professional standards.

**13.5.6** 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).

**13.5.7** The timetable for depositing archives with the receiving institution after completion of the post-fieldwork programme will be agreed based on a Method Statement prepared for the OWF Project Team by the Retained Archaeologist following fieldwork.

**13.5.8** In England, the NRHE is currently the repository for maritime fieldwork records, however the repository will soon be migrated to the NMHR.

**13.5.9** For Scotland, Historic Environment Scotland is the repository for all fieldwork records generated during archaeological fieldwork.

**13.5.10** For Wales, the Royal Commission on the Ancient and Historic Monuments of Wales (RCAHMW) acts as the repository for the deposition of all archaeological fieldwork records and archives.

**13.5.11** For Northern Ireland the Historic Environment Division, Department for Communities acts as the repository for the deposition of all fieldwork records.

# 14

## Sources of guidance and further reading by topic/chapter



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# Sources of guidance and further reading by topic/chapter

## 14.1 General guidance

Cadw, *Caring for Coastal Heritage* (1999)

Cadw, *Caring for Military Sites of the Twentieth Century* (2009)

Cadw, *Managing the Marine Historic Environment of Wales* (2019)

Cadw, *Conservation Principles for the Sustainable Management of the Historic Environment in Wales* (2011)

ClfA, *Standard and Guidance for Archaeological Advice by Historic Environment Services* (2020)

ClfA, *Code of Conduct* (2014, revised 2019)

ClfA, *Regulations for Professional Conduct* (2019)

Department for Communities, Northern Ireland, *Consultation Guide: a Guide to Consulting HED on Development Management Applications* (2016)

Department for Communities, Northern Ireland, Historic Environment Division: *Conserving the Marine Heritage: A Historic Environment Division Position Statement* (2019)

Department for Communities, Northern Ireland, Historic Environment Division: *Guidance on Setting and the Historic Environment* (2018)

Department for Communities, Northern Ireland, Historic Environment Division: *Guidance on Sustainability Appraisal and Strategic Environmental Assessment for the Historic Environment* (2018)

Department for Communities, Northern Ireland, Historic Environment Division: *Development and Archaeological Works in the Planning Process* (2019)

Department of Energy & Climate Change, *Overarching National Policy Statement for Energy (EN-1)*, London, TSO (2011)

Department of Trade and Industry, *Guidance on the Assessment of the Impact of Offshore Wind Farms: Seascape and Visual Impact Report* (2005)

English Heritage, *Military Aircraft Crash Sites - Archaeological Guidance on their Significance and Future Management* (2002)

Historic England, *Commercial renewable energy development and the historic environment*. Historic England Advice Note 15. Swindon. Historic England (2021)

Historic England, *Ships and Boats: Prehistory to Present: Designation Selection Guide*, Historic England, Swindon (2017)

Historic England, *Managing Significance in Decision-Taking in the Historic Environment* (2015)

Historic England, *Management of Research Projects in the Historic Environment: the MoRPHE Project Managers' Guide* (2015)

Historic England, *Preserving Archaeological Remains: Decision-Taking for Sites under Development* (2016)

Historic England, *The Setting of Heritage Assets - Historic Environment Good Practice Advice in Planning 3 (2nd Edition)* (2017)

Historic England *Deposit Modelling and Archaeology. Guidance for Mapping Buried Deposits*, Historic England, Swindon (2020)

Historic Environment Scotland, *Managing Change in the Historic Environment: Setting* (2016)

Historic Environment Scotland, *Historic Environment Policy for Scotland* (2019)

Historic Scotland, *Conserving the Underwater Heritage* (1999)

Joint Nautical Archaeology Policy Committee (JNAPC), *Code of Practice for Seabed Development* (2008)

Oxford Archaeology with George Lambrick Archaeology and Heritage, *Guidance for Assessment of Cumulative Impacts on the Historic Environment from Offshore Renewable Energy* (2008)

Renewable UK Cumulative Impact Assessment Guidelines: *Guiding Principles for Cumulative Impacts Assessment in Offshore Wind Farms* (2013)

Wessex Archaeology, *COWRIE Historic Environment Guidance for the Offshore Renewable Energy Sector* (2007)

Wessex Archaeology, *Draft Interim Guidance on the Use of the Protocol for Reporting Finds of Archaeological Interest in Relation to Aircraft Crash Sites at Sea* (2008)

## 14.2 Archaeological exclusion zones

Dix, J., *Modelling Exclusion Zones for Marine Aggregate Dredging* (2008)

Wessex Archaeology, *COWRIE Historic Environment Guidance for the Offshore Renewable Energy Sector* (2007)

### 14.3 Marine geophysical investigations

Plets, R., Dix, J., Bates, R., *Marine Geophysics Data Acquisition, Processing and Interpretation* (2013)

### 14.4 Marine geoarchaeological investigations

Gribble, J. and Leather, S., *Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector* (2011)

Historic England, *Geoarchaeology: Using Earth Sciences to Understand the Archaeological Record* (2015)

Ransley, J., Sturt, F, Dix, J., Adams, J., and Blue, L. (eds.) *2013 People and the Sea: A Maritime Archaeological Research Agenda for England* (Research Reports No 171). York, GB: Council for British Archaeology

### 14.5 Archaeological investigations using divers and/or rovs

HSE, *Commercial Diving Projects Offshore: Diving at Work Regulations 1997: Approved Code of Practice and Guidance* (2014)

HSE, *Commercial Diving Projects Inland/Inshore: Diving at Work Regulations 1997: Approved Code of Practice and Guidance* (2014)

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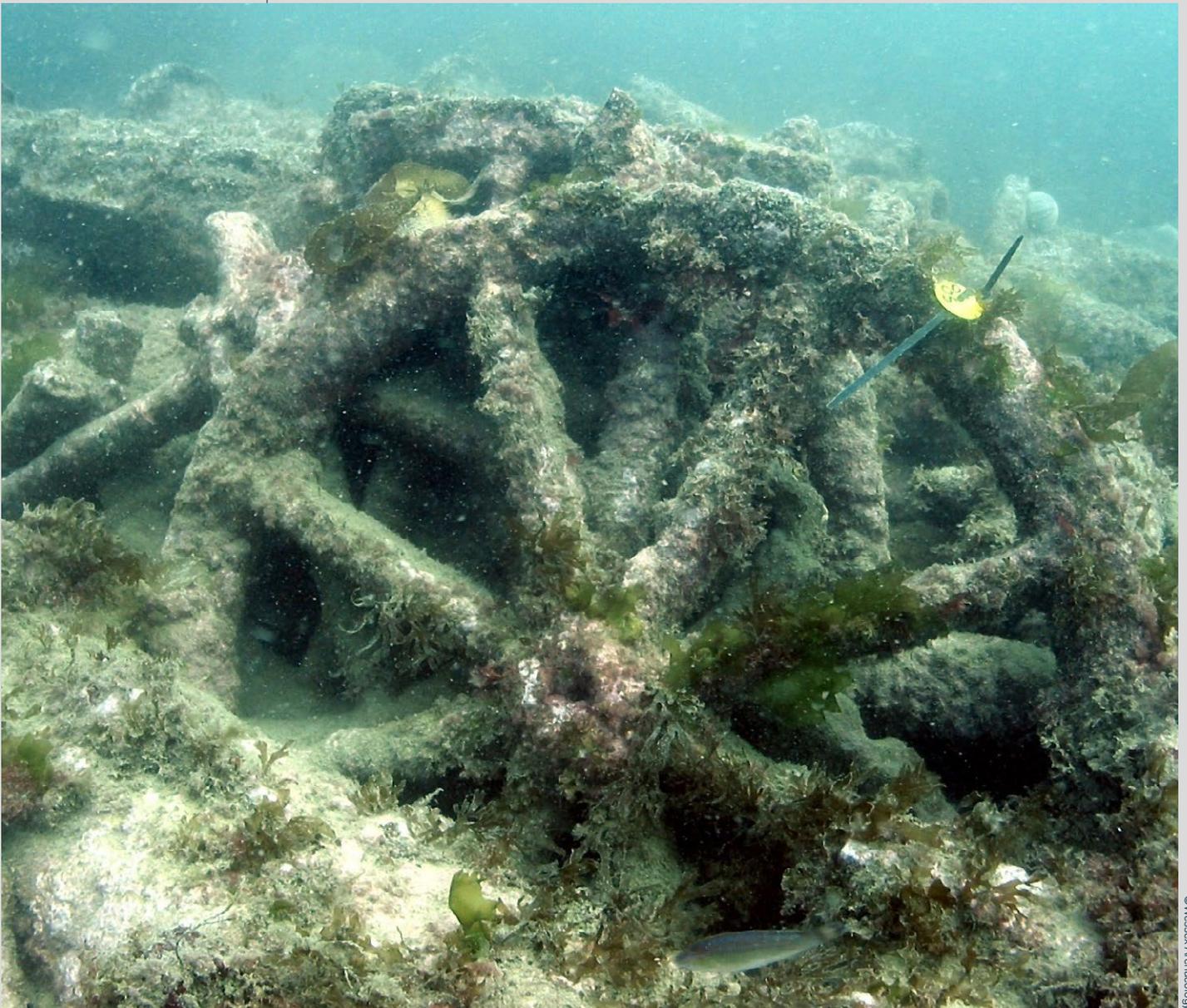
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# 15

## Appendix I: archaeological wreck recording levels



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# Appendix I: archaeological wreck recording levels

Level	Type	Objective	Sub-level	Character	Scope	Description
1	Assessment	A record sufficient to establish the presence, position and type of site	1a	Indirect (desk-based)	A basic record based on documentary, cartographic or graphic sources, including photographic (incl. AP), geotechnical and geophysical surveys commissioned for purposes other than archaeology	Documentary assessment / inventory of a site, compiled at the start of work on a site, and updated as work progresses
			1b	Direct (field)	A basic record based on field observation, walkover survey, diving inspection etc., including surveys commissioned specifically for archaeological purposes	Typically, a 1-2 dive visit to the site (to assess a geophysical anomaly, etc.)
2	Evaluation	A record that provides sufficient data to establish the extent, character, date and importance of the site	2a	Non-intrusive	A limited record based on investigations that might include light cleaning, probing and spot sampling, but without bulk removal of plant growth, soil, debris etc	Typically, a 2-4 dive visit to assess the site's archaeological potential, backed up by a sketch plan of the site with some key measurements included
			2b	Intrusive	A limited record based on investigations including vigorous cleaning, test pits and/or trenches. May also include recovery (following recording) of elements at immediate risk or disturbed by investigation	Either an assessment of the buried remains present on a site; the recovery of surface artefacts; or cleaning to inform, for example, a 2a investigation
3	In situ	A record that enables an archaeologist who has not seen the site to comprehend its components, layout and sequences	3a	Diagnostic	A detailed record of selected elements of the site	The first stage of a full record of the site. This would include a full measured sketch of the site and a database (or equivalent) entry for all surface artefacts
			3b	Unexcavated	A detailed record of all elements of the site visible without excavation	Full site plan (ie, planning frame or equivalent accuracy) with individual object drawings, and full photo record (possibly including a mosaic)
			3c	Excavated	A detailed record of all elements of the site exposed by open excavation of part or whole of the site	This may take the form of full or partial excavation of a site

Level	Type	Objective	Sub-level	Character	Scope	Description
4	Removal	A record sufficient to enable analytical reconstruction and/or reinterpretation of the site, its components and its matrix	-	-	A complete record of all elements of the site in the course of dismantling and/or excavation	
5	Intra-site	A record that places the site in the context of its landscape and other comparable sites	-	-	A complete record of all elements of the site, combined with selective recording of comparable sites and investigation of the surrounding area	

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