

LONDON GATEWAY PORT

ARCHAEOLOGICAL DIVING PHASE I

METHOD STATEMENT

Ref: 66892

1. METHODOLOGY

1.1. RECORDING METHODS

- 1.1.1. The position of the diver will be derived using an acoustic navigation system. The position will be integrated into a diver tracking and recording system where the position of objects on the seabed can be compared to the geophysical data, and the extent, nature and character of sites recorded.

The Acoustic Tracking System

- 1.1.2. The Ultra Short Baseline (USBL) acoustic tracking system SCOUT manufactured by Sonardyne International will be used during the fieldwork sessions to track the diver.
- 1.1.3. The SCOUT system consists of three main components: the vessel mounted acoustic transceiver, the diver mounted transponder and the surface command module running the control software.
- 1.1.4. The position of the diver is calculated by measuring range and bearing from the vessel mounted transceiver to the transponder mounted on the divers umbilical, using the signal properties of the acoustic energy emitted from the transceiver.
- 1.1.5. The range is calculated from the signal travel time and the bearing is calculated from the phase difference of the return signal across the transducer array within the surface transceiver.
- 1.1.6. The transponder work on frequencies between 35kHz and 55kHz. The stated operating range for the system is 500m and the acoustic coverage is +/- 90 degrees below the transceiver.
- 1.1.7. The SCOUT USBL Transceiver will be mounted on a pole over the side of the diving support vessel.
- 1.1.8. Periphery sensors will be integrated with the SCOUT USBL system to provide accurate positioning these are:

- GPS receiver operating with either RTK or differential corrections (Leica 500 system);
- Gyro compass (TSS Meridian Surveyor);
- Heave Compensator providing data for Heave Pitch and Roll (TSS HRP-10 MRU).

1.1.9. Prior to the fieldwork, all instruments will be surveyed in on the vessel to achieve the highest possible positioning accuracy. The offset values will be configured into the SCOUT software. All external instruments were connected to the SCOUT surface command module. Both external and internal sensors will be calibrated before use

The Recording System

1.1.10. All archaeological recording will undertaken using Wessex Archaeology's bespoke digital recording system 'DIVA'. Diva is a real time recording system working with three-dimensional position information. It comprises a Microsoft Access database working in conjunction with ESRI ArcGIS 9.0. The data base is used to store the information and the GIS is used to provide a graphic display and georeference information.

1.1.11. The position of the tracked diver is output from the Sonardyne SCOUT surface command module in real world co-ordinates into the DIVA system and displayed in real time with geophysical data stored in the GIS system. The diver track can also be displayed and saved separately on the SCOUT system.

1.1.12. All positions will be related to UTM zone 31 coordinate system projected from WGS 84.

1.1.13. Observations made by divers will be entered into the database by the archaeological recorder on board the vessel. These observations, stored in the DIVA database, include the three-dimensional position, comments typed in by the recorder and mapping labels for display in the GIS system.

1.1.14. Diver observations can be displayed as different layers in ArcGIS, grouped for example by mapping labels, observation type, etc.

1.2. DIVING PROCEDURES

1.2.1. This section deals with the Health and Safety and Archaeological methodologies to be employed during the project.

1.2.2. The objectives of the methodologies used are:

- to undertake all field operations in a manner that preserves the health, safety and welfare of all people engaged in those operations;
- to establish safe and efficient working practices that enable fieldwork objectives to be met effectively.

Management

- 1.2.3. Diving will be carried out under the Diving at Work Regulations 1997.
- 1.2.4. For the purposes of the Contract, Wessex Archaeology will be the Diving Contractor and will meet its obligations as such under the applicable regulations.
- 1.2.5. For the purposes of the Contract, Wessex Archaeology understands that the Port of London Authority will be the Client, and will meet their obligations under the applicable regulations.
- 1.2.6. Wessex Archaeology's operations will be subject to periodic inspection by its Health and Safety Co-ordinator, and by its health and safety consultants.

Risk Assessment

- 1.2.7. Risk assessment is central to the implementation of all Wessex Archaeology projects. Risk assessments will be carried out in respect of all aspects of the Contract, including:
 - diving operations;
 - general boat-based activities;
 - general activities (incl. driving).
- 1.2.8. Risk assessments will cover Wessex Archaeology staff, others employed by Wessex Archaeology, and others involved in Wessex Archaeology operations including vessel crews contracted by Wessex Archaeology.
- 1.2.9. Risk assessments will be copied to relevant staff and others, and to the Health and Safety Co-ordinator. Risk assessments will also be copied to the client, for information.
- 1.2.10. Diving operations will be subject to preparation of a diving project plan (DPP) based on a risk assessment, as provided for in the Diving at Work Regulations 1997. Wessex Archaeology prepares its DPP in three parts:
 - Part I (DPP I) is the *Generic Risk Assessment and Standard Operating Rules*.
 - Part II (DPP II) is the *Project Risk Assessment and Diving Project Plan*. A DPP II is prepared for each diving project by the Project Manager, and copied to the Supervisor(s), other members of the diving team, other relevant people (boat crew, client etc.) and to Wessex Archaeology's Health and Safety Co-ordinator.
 - Part III (DPP III) is the *Operation Risk Assessment and Diving Project Plan* for each diving operation, which takes the form of a checklist in the diving operation record. It is to be compiled by the Supervisor at the start of each diving operation. DPP III constitutes an on-site review of the risk assessment and diving project plan.

Approved Code of Practice (ACOP)

- 1.2.11. In its diving operations, Wessex Archaeology normally applies the *Commercial Diving Projects Inland/Inshore ACOP* (HSC 1998).
- 1.2.12. Wessex Archaeology intends to adhere to the *Commercial Diving Projects Inland/Inshore ACOP* in implementing the Contract, on the grounds that the Contract is for a commercial service. Further, it is Wessex Archaeology's view that the *Inland/Inshore ACOP* provides a consistent framework for safe diving practice that is also conducive to efficient archaeological work as envisaged by the Contract.

Team Size and Structure

- 1.2.13. The diving team used by Wessex Archaeology in implementing the Contract will be no less than four. All will be qualified to HSE III or above and in First Aid at Work, and will have a valid and in-date medical certificate. The four will alternate, subject to competence, in the following roles: Supervisor; Diver; Standby Diver; Tender. Supervisors will be appointed in writing.
- 1.2.14. The vessel crew will not be counted as part of the diving team. However, as the vessel will be moored during diving operations, the crew will be on hand to render assistance if required.

Diving Procedures

- 1.2.15. Wessex Archaeology diving operations will be conducted using Surface Supplied Diving Equipment (SSDE). Both diver and standby will be equipped with SSDE. The breathing gas will be air, supplied to the diver via an umbilical from a high-pressure bank on the surface. In addition to the bank there will be a HP reserve on the surface, and the diver/standby will be equipped with a bailout cylinder. The high pressure bank will be recharged with compressed breathing air on the diving vessel between diving operations. Umbilicals will include lifeline, hard wire communications and pneumo.
- 1.2.16. Every dive will be recorded on miniDV tape using a colourwatch digital video system with hat mounted camera.

1.3. NAVIGATION, SEAMANSHIP AND MARINE SAFETY

- 1.3.1. Wessex Archaeology proposes to contract the 2.3 metre vessel the *Flat Holm* for the duration of the diving work. The crew and diving team will be accommodated on board the vessel.
- 1.3.2. The vessel is equipped with 2 x 5KVA generators supplying 240V AC. The vessel is managed by Gardline Environmental and registered in Lowestoft, Norfolk, UK.

- 1.3.3. The vessel is MCA CoP Category 2 (60 miles) and is licensed to carry 12 passengers plus two crew. As indicated above, Wessex Archaeology will prepare a specific risk assessment in respect of general boat-based activities. Overall responsibility for navigation, seamanship and marine safety will rest with the vessel Master. The relationship between the Master and crew, Wessex Archaeology's staff and the diving supervisor will be set out explicitly in the DPP II, and in risk assessments for general boat-based activities. Diving operations will be conducted from the starboard side of the vessel.
- 1.3.4. In addition to their previous general experience of marine operations, Wessex Archaeology Coastal and Marine staff receive training in sea survival, VHF operation and navigation/small boat handling. Non- Coastal and Marine staff visiting the diving vessel will be subject to specific health and safety induction. Wessex Archaeology provides its staff with suitable marine PPE, including wet-weather gear, auto-inflating lifejackets and safety footwear.

2. PROJECT TIMETABLE

- 2.1. Diving operations will take place in November 2007.

3. STAFFING: TEAM STRUCTURE, ROLES AND RESPONSIBILITIES

- 3.1. Wessex Archaeology expertise in inland, coastal and marine archaeology is fully integrated with its terrestrial services. The coastal and marine team comprises 18 specialist marine archaeologists at all grades from Section Head to Project Supervisor.
- 3.2. Wessex Archaeology has provided specialist advice in the preparation of numerous Environmental Statements for marine aggregate extraction, offshore wind farms, and port developments. More details of recent projects and clients are included in the attached document.
- 3.3. Wessex Archaeology operates a project management system. Projects are undertaken under the direction of Project Managers who are responsible for the successful completion of all aspects of the project. The Project Manager will act as the single point of contact between WA and the client.
- 3.4. Their performance is monitored by the relevant Section Head who, in turn, is responsible to the Operations Director and Chief Executive.
- 3.5. All nominated WA staff are appropriately qualified and experienced for their project role. Wessex Archaeology reserves the right to vary project staff according to the operational demands of its overall programme.
- 3.6. Wessex Archaeology's staff matrix provides for project teams to be supported by a range of specialist services. Notwithstanding the variety of staff likely to contribute to the project, the core project team is likely to comprise the following staff:

- Head of Coastal and Marine Projects
- Project Manager
- Project Officer (who is also part of the dive team)
- Three archaeological divers

3.7. All nominated WA staff are appropriately qualified and experienced for their project role. Details of the team proposed for the undertaking of this project are available on request.

4. STANDARDS

4.1. Wessex Archaeology is an IFA Registered Archaeological Organisation. All work will be carried out in accordance with the Codes of the IFA.

4.2. The assessment will be informed by the Joint Nautical Archaeology Policy Committee's *Code of Practice for Seabed Developers* (1995).