

London Gateway Port: Channel Clearance and Dredging
IN-WATER ARCHAEOLOGICAL OBSERVATION AND RECORDING

Method Statement

Draft 19/05/08



IN-WATER ARCHAEOLOGICAL OBSERVATION AND RECORDING

Method Statement

1. INTRODUCTION

1.1. BACKGROUND

- 1.1.1. As part of the London Gateway Port archaeological mitigation strategy two wrecks that require clearance have been identified for in-water archaeological observation and recording, as defined in the LG Archaeological Methods and Procedures document under Mitigation H. A description of Mitigation H has been appended to this document for convenience.
- 1.1.2. The Port of London Authority (PLA) will undertake the work with Wessex Archaeology (WA) providing archaeological support.
- 1.1.3. This document outlines the methods and procedures that will be implemented for in-water archaeological observation and recording.
- 1.1.4. Two sites have been identified as appropriate for this method of mitigation, these, are the 'Pottery Wreck' (5204) and 'the Unknown Wreck/Old Timbers and Concrete' (5051).
- 1.1.5. In-water archaeological observation and recording was agreed with English Heritage in October 2007 as the appropriate mitigation for the Pottery Wreck (5204), and the wreck was identified as the only site requiring this form of mitigation in the LG Archaeological Methods and Procedures document.
- 1.1.6. Following a diving investigation undertaken in April 2008 on 'the Unknown Wreck/Old Timbers and Concrete' (5051) site, a dive report was submitted to EH and ROW. As a result EH have agreed that in-water archaeological observation and recording is also the appropriate form of mitigation for this site.
- 1.1.7. Details of the locations, site histories, investigations to date, and the full mitigation strategies adopted for these sites is documented in the Clearance Mitigation Statements (CMS).

2. AIM AND OBJECTIVES

- 2.1. The aim of in-water archaeological observation and recording is to achieve a record that informs knowledge of the character, date and extent of the sites.
- 2.2. The archaeological objectives are:
 - to establish the overall components, layout (form/distribution) and sequences of the site;
 - to recover and retain diagnostic structural elements, large finds and/or a representative assemblage of small finds from the site;
 - to record (describe, draw, sketch, photograph) structural elements, large finds and small finds that are not retained.



3. METHODOLOGY

3.1. INTRODUCTION

- 3.1.1. In water archaeological observation and recording will be achieved by embedding diving archaeologists equipped with acoustic positioning within the Port of London Authority (PLA) dive team.
- 3.1.2. In summary the mitigation will consist of removing the sediment overburden and recovering artefactual material from within the ships hulls using an airlift; as much of the hull structures as is practicable will be exposed. The extent of the hulls will be mapped in outline before they are recovered to the surface by mechanical means. Once recovered the intact structural elements will undergo limited archaeological recording and will then be discarded. All finds will be recorded on the surface.
- 3.1.3. All recording of the hull structures will be undertaken in accordance with Appendix I: Archaeological Recording of the London Gateway Port: Channel Clearance and Dredging Archaeological Methods and Procedures. Appendix I has been attached to this document for convenience.
- 3.1.4. All finds that are recovered from the sites will be dealt with in accordance with Appendix IV: Finds Management of the London Gateway Port: Channel Clearance and Dredging Archaeological Methods and Procedures. Appendix IV has been attached to this document for convenience.

3.2. DIVING TEAM AND RESPONSIBILITIES

- 3.2.1. The Port of London Authority will be the diving contractor. Two Wessex Archaeology diving archaeologists will form part of the PLA team and work to the PLA Diving Project Plan (DPP) and Risk Assessment (RA). WA will provide a DPP and RA which will be appended to, and form part of, the PLA DPP and RA.
- 3.2.2. One additional archaeologist will be on board the vessel to record artefacts recovered from the sites. They will not form part of the PLA diving team.
- 3.2.3. The WA team structure will comprise:

Diving archaeologist on the river bed	Undertaking underwater work
Archaeological recorder	Responsible for archaeological direction of the diving operation
Finds processor	Post-dive finds processing and processing finds recovered from the airlift.

- 3.2.4. The PLA will provide the airlift and diving support, and WA will provide the underwater positioning system.



3.3. POSITIONING

- 3.3.1. Underwater positioning will be achieved using the Sonardyne Prospector long baseline acoustic navigation system, referenced to the UTM zone 31 (WGS84) real world coordinate system and interfaced to the WA recording system, DIVA.
- 3.3.2. Four beacons will be placed on the riverbed around the sites to form a network within which all diving operation will take place. The network will be calibrated by steaming around the individual beacons and the network as a whole. The calibration will reference each beacon to the real world coordinate system using the global satellite navigation system GPS.
- 3.3.3. A transponder will be attached to the airlift or diver, which will relay positions, derived from the network on the riverbed, to the archaeological recorder on the Diving Support Vessel (DSV).

3.4. HULL RECORDING

Underwater

- 3.4.1. The exposed hull structure will be investigated to clarify the extent and character of each site once the overburden and artefactual material has been cleared from within the wrecks with an airlift.
- 3.4.2. A review of progress will be made after four hours of overburden removal, which will include an assessment of exposed structural elements.
- 3.4.3. If after consultation with PLA and DPWALO it is decided that it is necessary to continue the removal of the overburden a fixed period of continuation will be agreed.
- 3.4.4. Once a reasonable volume of overburden has been removed the diver will record the exposed hull structure using the acoustic navigation system, and tape measurements where and if appropriate.

Above water

- 3.4.5. The hull remains will be transported to a suitable location where limited archaeological recording will be undertaken.
- 3.4.6. A programme of surface recording will be decided upon when the volume and nature of material recovered from the site is assessed.
- 3.4.7. The hull remains will be discarded after they have been recorded, subject to agreement with the Receiver of Wreck.

3.5. FINDS RECOVERY AND RECORDING

- 3.5.1. Finds will be recovered to the surface using an airlift which will deposit material in a basket where the finds will be labelled and put into an appropriate container.
- 3.5.2. Finds that are identified on the riverbed will be placed in a basket or suitable container by the diver for recovery to the surface.
- 3.5.3. The sites will be zoned into appropriately sized spits. The finds will be positioned by reference to the spits from which they are recovered.



- 3.5.4. Suitable facilities for the storage of finds will be provided onboard the diving support vessel.
- 3.5.5. Finds will be initially assessed by WA's on board staff. Finds that are considered to require further analysis will be transported to WA's Salisbury base, where specialist find staff will assess the assemblage as a whole and propose an analysis programme to be agreed with the PLA.
- 3.5.6. The finds will be subject to a passive holding at the point of recovery from the seabed and on arrival at WAs Salisbury base they will be subject to a conservation assessment. Recommendations for special measures of conservation if required will be agreed with the PLA.
- 3.5.7. For the purposes of Appendix IV the finds will be regarded as of archaeological interest, and as being 'wreck', and will therefore be reported to the RoW.

4. REPORTING

- 4.1. An illustrated report for each site detailing methods, the results of the fieldwork and the interpretation of the archaeological material will be submitted after an agreed period following the completion of the fieldwork. The report will be a stand alone document and be referenced in the site CMS.
- 4.2. The report will detail the artefact assemblage, and the individual finds analysis reports, if undertaken, will be appended.
- 4.3. The plans of the hull structure will be incorporated into the report as figures.

5. TIMETABLE

5.1. OPERATIONS

- 5.1.1. Recovery operations will commence in June 2008.



5.2. TASK LIST FOR EACH SITE

Item No.	item	Time allocation		Note
1	Mobilisation	10	hours	
2	Calibration of acoustic navigation system	5	hours	(from arrival at location)
3	Clearance of overburden and recovery of artefactual material	4	hours	(on site dive time)
4	Diver assessment of exposed structural remains	1	hour	A review of progress to date will be made, which will include an assessment of exposed structural elements.
5	Continuation of clearance of overburden and recovery of artefactual material	TBA		If after consultation with PLA and DPWALO it is decided that it is necessary to continue the removal of the overburden a fixed period of continuation will be agreed.
6	Exposed structural recording	TBA		Between 1 – 4 hours will be allowed for exposed structural recording.
7	Surface recording	TBA		A programme of surface recording will be decided upon when the volume and nature of material recovered from the site can be assessed.
8	Demobilisation	10	hours	

6. REFERENCES

London Gateway Port: Channel Clearance and Dredging: Archaeological Methods and Procedures. (Draft 31/10/07)



London Gateway Port: Channel Clearance and Dredging

ARCHAEOLOGICAL METHODS AND PROCEDURES

Mitigation H

In-Water Archaeological Observation and Recording



7.5 CONTROLLED CLEARANCE (MITIGATION H)

In-Water Archaeological Observation and Recording

- 7.5.1 Provision has been made to carry out in-water archaeological observation and recording in the course of clearance carried out by the PLA.
- 7.5.2 In-water archaeological observation and recording will be achieved by embedding diving archaeologists equipped with acoustic positioning within the PLA diving team.
- 7.5.3 The overall objectives of clearance will be non-archaeological and operations will be directed by the PLA. Clearance will be accompanied by such archaeological observations and recording as are practicable within the PLA's operation.
- 7.5.4 Insofar as is practicable, in-water archaeological observation and recording will seek to achieve a Level 3a record of the site. Generally, the archaeological objectives will be:
- To establish the overall components, layout (form/distribution) and sequences of the site;
 - To recover and retain diagnostic structural elements, large finds and/or a representative assemblage of small finds from the site;
 - To record (describe, draw, sketch, photograph) structural elements, large finds and small finds that are not retained.
- 7.5.5 Where practicable, the position of material on the seabed will be recorded prior to recovery. Other records may be made following recovery.
- 7.5.6 At present only one site, the Pottery Wreck (5204), has been earmarked for clearance accompanied by in-water archaeological observation and recording.
- 7.5.7 Subject to the results of Archaeological Inspection in the first tranche of diving, a number of other sites may be subject to accompanied by in-water archaeological observation and recording.



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Appendices: Method Statements



APPENDIX I ARCHAEOLOGICAL RECORDING

BASICS

1. All recording will be based on the WA unique site identifiers used in the ES and subsequently.
2. All archaeological finds and deposits will be recorded using a pro forma recording system, based on a running matrix of assigned contexts for each site. Numbers will be allocated in blocks that are unique to that site. A number log will be maintained.
3. The spot height of all principal features and levels will be calculated in metres relative to Ordnance Datum, correct to two decimal places. Plans, sections and elevations will be annotated with spot heights as appropriate. The maximum level of principal features and of the seabed will be converted to metres relative to Chart Datum.
4. Plans of each investigation will be prepared at a scale of 1:1250 or larger, showing all investigation areas and their relation to more permanent topographical features. Each plan will show the location of contexts observed and recorded in the course of the investigation.
5. Plans, sections and elevations of archaeological features and deposits will be drawn as necessary at 1:10, 1:20 and 1:50 as appropriate. Drawings will be made in pencil on permanent drafting film, or in an accessible digital format.
6. A full photographic record will be maintained using digital video and stills photography. Recovered material will be subject to photographic recording by monochrome prints and colour transparencies. Additional illustrative photographs will be taken as appropriate.
7. Surveys will be carried out to a single datum and co-ordinate system, namely UTM Zone 31N projected from WGS84.

ACOUSTIC TRACKING

8. 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, and character of features recorded.
9. An Ultra Short Baseline (USBL) acoustic tracking system SCOUT manufactured by Sonardyne International will be used for acoustic tracking.
10. 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.
11. The position of the diver is calculated by measuring range and bearing from the vessel mounted transceiver to the transponder mounted on the diver's umbilical, using the signal properties of the acoustic energy emitted from the transceiver.



12. 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.
13. 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.
14. The SCOUT USBL Transceiver will be mounted on a pole over the side of the diving support vessel.
15. The following peripheral sensors will be integrated with the SCOUT USBL system to provide accurate absolute positioning:
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).
16. Prior to fieldwork, all instruments will be surveyed on the vessel to calculate offsets. 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
17. In the event of system failure, diver position will be determined by taped measurements from a shotline (positioned by GPS) and/or features mapped from geophysical data.

RECORDING SYSTEM

18. 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 database is used to store the information and the GIS is used to provide a graphic display and to georeference information.
19. 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.
20. 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.
21. Diver observations can be displayed as different layers in ArcGIS, grouped for example by mapping labels, observation type, etc.
22. Diver observations will be used to correlate separate records for contexts, finds, samples, photographs and so on.



23. The Diva system can operate independent of acoustic tracking, though positions have to be recorded manually instead of being provided automatically. In the event that Diva fails, paper records will be maintained.



APPENDIX IV FINDS MANAGEMENT

DEFINITIONS AND PRINCIPLES

24. The finds anticipated in the course of the London Gateway Wreck Clearance fall into two principal categories
Finds that are of archaeological, historical or cultural interest.
Finds that are of no archaeological, historical or cultural interest.
25. All finds that are of archaeological etc. interest will form the material archive of the project. Decisions regarding recording, handling, treatment, disposal etc. will be informed by archaeological and archival standards. Records and photographs etc. of such finds will be incorporated within the project archive.
26. Finds that are not of archaeological etc. interest will be discarded by WA and handed to the PLA as soon as is convenient. Any records or photographs obtained by WA will be incorporated within the project archive, noting that the material was discarded.
27. Both categories – finds of archaeological etc. interest and finds of no archaeological interest – are also likely to fall within one or more other categories to which additional legal provisions apply, namely:
 - 'Wreck'
 - Ordnance
 - Military aircraft
 - Human remains
28. Ordnance, military aircraft and human remains all warrant special procedures, which are detailed below.
29. 'Wreck' includes all forms of material lost or deposited from a vessel, including (elements of) hull, propulsion, fittings, cargo, personal possessions etc. 'Wreck' also includes material lost or deposited from aircraft.
30. It has been agreed that wreck that is not of archaeological etc. interest will be subject to the PLA's powers to dispose of wreck as set out in Section 120 of the Port of London Act 1968.
31. Wreck that is of archaeological etc. interest will be subject to the procedures relating to wreck in the Merchant Shipping Act 1995.
32. Finds that are not wreck include items deposited other than by a vessel or aircraft, including prehistoric finds deposited at the coast or on former landsurfaces, and (elements of) coastal, navigational and military infrastructure constructed on the shore or seabed.
33. For the purposes of these procedures, 'disposal' is taken to mean the handover of finds to the organisation or individual that is taking responsibility for their subsequent curation or care, which may be the owner or another party. 'Discard' is taken to mean that finds will not be subject to further curation or care. WA regards itself as



being responsible for any finds that it discovers up until the point of disposal or discard.

34. It is anticipated that the archive (finds; paper; digital) arising from LG Wreck Clearance will be deposited on the basis of agreement prior to fieldwork between the PLA and a recognised archival institution. WA will observe the requirements of the archival institution in numbering and ordering project finds and documentation in the course of fieldwork. It is anticipated that the archive will be deposited following implementation of the proposals for analysis and publication made in the post-excavation assessment.
35. Procedures for finds and samples will be guided by the IFA *Standard and Guidance for the collection, documentation, conservation and research of archaeological materials*, 2001, and guidance provided by the archival institution.

GENERAL PROCEDURES

36. Except in the case of ordnance etc., military aircraft and human remains (see below), the procedures set out here will generally come into effect upon recovery of the find to the surface.
37. Finds will normally be held by WA. For extensive assemblages and large, unwieldy or otherwise sensitive finds, provision may be made – by prior agreement – for finds to be transferred to and held by an appropriate institution.
38. Finds that are not ‘wreck’ and which are of archaeological, historical or cultural interest will be held by WA pending decisions on ownership, disposal and/or discard. Normally, the owner of the seabed will be the owner of finds that are not wreck. The permission of the landowner to donate finds that are not wreck to the organisation curating the archive will be sought.
39. Finds that are ‘wreck’ and which are of archaeological, historical or cultural interest are subject to the Merchant Shipping Act 1995. It is the PLA’s responsibility to notify the Receiver about wreck that is of archaeological interest found or taken into possession of WA in the course of its services to PLA. WA will prepare a droit and a list of wreck on behalf of the PLA, to be signed and sent to the receiver by the PLA’s River Regime and Environment Manager. Such droits and lists will be prepared and submitted periodically (e.g. monthly or at the close of the relevant phase of site investigations) by WA to the PLA RREM. At the end of the project a list of finds will be provided to the RoW by the PLA.
40. It is noted that owners have up to one year to make a claim to the Receiver in respect of wreck and it is anticipated that the Receiver will not generally make a decision about disposal in less than one year. However, an earlier decision will be sought under Section 240 of the Merchant Shipping Act 1995 if the wreck is so perishable that early disposal (to a museum capable of providing active conservation, for example) will favour the survival of the find.
41. Pending the decision of the Receiver, wreck will be held by WA on behalf of the PLA. WA will, on behalf of PLA, comply with directions given by the Receiver. WA will inform the Receiver of any change in the location where the finds are held.



FINDS: ORDNANCE, MILITARY AIRCRAFT AND HUMAN REMAINS

42. Procedures for reporting ordnance, military aircraft and human remains will normally come into effect upon discovery, i.e. with the material still on the seabed, unless the character of the find only becomes apparent upon recovery.
43. Any finds that are suspected of being ordnance, firearms, explosives etc. will be reported immediately by WA to the PLA's River Regime and Environment Manager (PLA RREM). The PLA RREM will inform the Joint Services EOD Operations Centre. Any subsequent actions will be guided by advice received from JS EOD.
44. Any finds that are suspected of being military aircraft will be reported immediately to the PLA RREM. The PLA RREM will inform the Service Personnel and Veterans Agency (SPVA: Joint Casualty and Compassionate Centre – SO3 Historic Casualty Casework). Any subsequent actions will be guided by *Crashed Military Aircraft of Historical Interest: Licensing of Excavations in the UK – Guidance Notes for Recovery Groups*, April 2007, and by advice received from SPVA. In the case of a military aircraft being investigated under licence, any human remains will be reported immediately in accordance with paragraph 14 of *Guidance Notes for Recovery Groups*, April 2007.
45. In the case of any other human remains, as of 1st June 2007 the requirement for issuing and conditions attached to licences for the excavation of human remains is subject to legal review.
46. Until such time as the legal position has been clarified by the Ministry of Justice, WA will, in the event of discovery of human remains, immediately inform the PLA RREM. The PLA RREM will inform the Coroner, the Police and the Ministry of Justice via submission of the relevant application form.
47. The human remains will initially be left *in situ*, covered and protected. Where a licence for their excavation is issued by the Ministry of Justice, the requirements of that licence will be followed.
48. Where the Ministry of Justice is unable to issue a licence and it is reasonably determined that the remains are likely to be subject to further unavoidable disturbance or deterioration, the PLA RREM will advise the Ministry of Justice of their intention to excavate the remains with due decency and in accordance with the general conditions formerly attached to licences issued for excavation of human remains under similar circumstances.
49. Should human remains be excavated and recovered, all excavation and post-excavation will be in accordance with the standards set out in the IFA *Technical Paper No 7 Guidelines to the Standards for Recording Human Remains* (IFA 2004).
50. The final placing of human remains following analysis will be subject to the requirements of the Ministry of Justice Licence.
51. As ordnance, military aircraft and human remains may also be of archaeological etc. interest, and constitute or be immediately associated with 'wreck', then the general procedures set out below will also apply, insofar as they are compatible with the special procedures set out above.



HOLDING AND TRANSPORTING FINDS

52. WA will provide and maintain suitable facilities onboard the diving vessel for a reasonable quantity of small and medium sized finds to be held passively. Generally, WA will keep finds onboard until there is a suitable opportunity to transport the material to its Salisbury base.
53. Where extensive recoveries are anticipated, additional onboard provision will be made.
54. If necessary, WA will set up a suitable temporary local facility onshore, within which the finds will remain the responsibility of WA.
55. WA will seek to transport finds between the diving vessel, any local facility, and WA's Salisbury base in the course of its normal operations. However, WA will arrange additional transport of finds if necessary due to volume, storage constraints, urgent treatment etc.
56. In the case of large, unwieldy or otherwise sensitive finds, special arrangements will be made for handling, storing, transporting etc. the find. Where possible, these arrangements will be made prior to the find being recovered from the seabed.
57. WA maintains facilities at its Salisbury base to hold passively a reasonable quantity of small and medium sized finds. This provision will be maintained for up to one year after recovery pending implementation of decisions on disposal/discard. WA may hold finds for more than one year after recovery if decisions and/or their implementation are delayed.

FINDS PROCESSING

58. All retained finds will be registered in WA's Finds Management database and any special requirements noted. A monitoring and maintenance programme will be prepared and implemented.
59. All retained finds will be processed in accordance with the Institute of Field Archaeologists' *Standard and guidance for the collection, documentation, conservation and research of archaeological material* (2005). All finds will be recorded and labelled appropriately.
60. Objects that require immediate conservation treatment to prevent deterioration will be treated according to guidelines laid down in *First Aid for Underwater Finds* (Robinson 1998). WA will make a full record of any treatment given and these records will form part of the archive.
61. Finds handling and initial processing will normally be carried out by WA's field staff, with telephone/email support from WA Finds Staff based in Salisbury. In the event that finds need to be assessed by WA Finds Staff onboard or at any local facility, or external advice is required onboard or at any local facility, WA will make appropriate provision.

CONSERVATION OF FINDS

62. All material held by WA will be subject to a Conservation Assessment within four weeks after recovery to gauge whether special measures are required while the material is being held. This Conservation Assessment will be carried out by WA with



advice from Wiltshire Conservation Centre and/or other appropriate specialists. In some cases it may be more appropriate to carry out all or part of the Conservation Assessment at an earlier stage - in advance of recovery, or onboard immediately following recovery, for example.

63. WA will implement recommendations arising from the Conservation Assessment for the duration that finds are held by WA.
64. Where no special measures are recommended, finds will be conserved, bagged and boxed in accordance with guidelines set out in the United Kingdom's Institute for Conservation's Conservation *Guidelines No 2* (UKIC 1984).

SAMPLES

65. Deposits (i.e. sediments) of archaeological/historical/cultural interest 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 will be treated as finds thereafter.
66. Selection of palaeoenvironmental samples for processing will be undertaken on the advice of WA's Environmental Staff. Between 50% and 100% of samples will be processed. Processing and assessment of samples shall follow the following guidelines:
 - Bulk samples selected for processing will be wet-sieved/floated and washed over a 500 μ mesh for the recovery of palaeobotanical and other organic remains, and refloated to maximise recovery;
 - Non-organic residues will be washed through a nest of sieves of 10mm, 5mm, 2mm and 1mm mesh to maximise finds recovery;
 - Both organic and non-organic residues will be dried under controlled conditions;
 - The dried inorganic residues will be sorted for small finds or any non-buoyant palaeoenvironmental remains and scanned with a magnet to recover ferrous debris such as hammerscale;
 - The dried organic fractions will be sorted under a light microscope to identify the range of species or other material on a presence/absence basis, the degree of preservation of the bio-archaeological material and the rough proportions of different categories of material present;
 - In the event that waterlogged deposits are sampled, further processing will undertaken as appropriate, including paraffin flotation to recover insect remains. Any such remains will be scanned to identify and assess their potential;
 - All organic residues will be stabilised and preserved for storage.