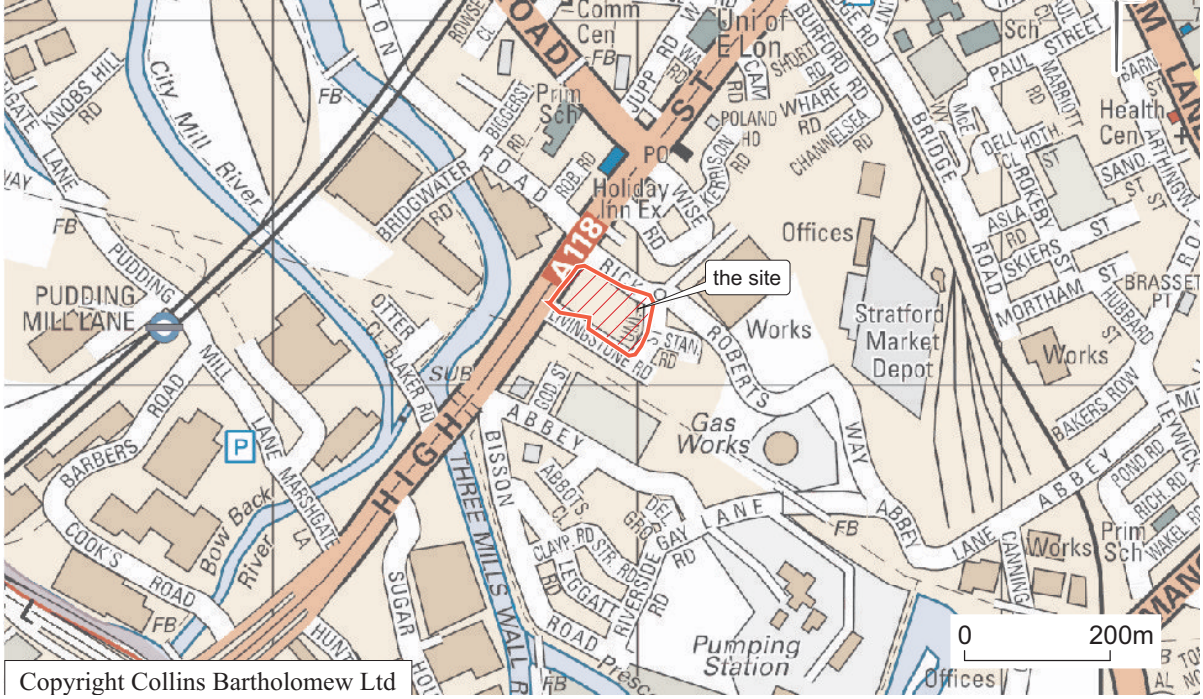

PLANNING DELIVERY ZONE 12
Work Packages 1 and 2
Trenches PDZ12.01
PDZ5.42

E15

London Borough of Newham

An archaeological evaluation report

April 2008

REGISTERED IFA ORGANISATION

MUSEUM OF LONDON Archaeology Service
PRE-CONSTRUCT ARCHAEOLOGY

PLANNING DELIVERY ZONE 12
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An archaeological evaluation report

Site Code: OL-08707&OL-08507
National Grid Reference: 538425 183635

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Summary (non-technical)

This report presents the results of the archaeological evaluations undertaken in two trenches by the Museum of London Archaeology Service and Pre-Construct Archaeology (MoLAS-PCA) on the sites of Work Packages 1 and 2 within the Olympic, Paralympic and Legacy Transformations Planning Applications: Planning Delivery Zone 12, London Borough of Newham E15. The report was commissioned from MoLAS-PCA by Capita Symonds Limited on behalf of the client the Olympic Delivery Authority (ODA).

Following the recommendations of the previous Detailed Desk-Based Assessment compiled for the Planning Delivery Zone, and subsequent consultation with the Greater London Archaeology Advisory Service (GLAAS), a single evaluation trench was excavated within each of the two work package areas.

The results of the field evaluation have helped to refine the initial assessment of the archaeological potential of the Planning Delivery Zone. The trenches appear to lie within an area of prehistoric stream channels. Trench PDZ5.42(C) (Work Package 2 – site code OL-08507) lay within the river and Trench PDZ12.01 (Work Package 1 – site code OL-08707) spanned the margins of the river and the adjacent dry ground of the lowest river terrace, which lies below the modern floodplain in the Stratford area. Several phases of the river regime were recorded, some associated with prehistoric and later activity.

Interbedded sands, clays and gravels of likely prehistoric date were recorded at the base of trench PDZ12.01 but were only reached by augering through the base of trench PDZ5.42(C). These deposits accumulated on channel bars within an area of shifting stream channels (probably forming the eastern margins of the contemporary River Lea).

Contained within the channel bar deposits in PDZ12.01 was a gravel horizon, which produced flint debitage and a number of unabraded sherds of Neolithic pottery, representing activity within the area of shifting stream channels or on dry land directly adjacent to it. Associated with these deposits was an assemblage of animal remains, including horse, and another possible wooden stake structure which was left in situ following the completion of the evaluation. Potentially contemporary deposits in the southern part of the trench contained evidence of tree growth and the accumulation of tufa, generally associated with the issuing of springs. Although it is likely that a spring emerged onto the riverbed in this area, further fieldwork is needed to be certain that the tufa and trees are in-situ and not derived from upstream and washed-up by the river. If in-situ the deposits suggest a pool of water surrounded by trees existed at the margins of the river here. It is possible that such a pool and spring may have been a focus for the local prehistoric activity.

Cutting through these deposits in trench PDZ12.01 was a channel containing a possible dislodged/disaggregated wooden structure comprising of the remnants of at least four roundwood timbers. There was also one possibly contemporary stake hole in the vicinity. At present the timbers are still undergoing specialist analysis, although on-site inspection of the tool marks has indicated that they do not predate the Iron-Age, due to lack of facets from stone axes (Neolithic) and fluting from bronze tools (Bronze Age).

It is probable that the abandoned channel identified in trench PDZ5.42(C) is a continuation of this channel and here evidence for tree growth on the silty banks of the channel was recorded.

Evidence for a severe flooding event was recorded in trench PDZ12.01, where a bed of sand and gravel with redeposited tufa and wood was recorded across its southern part and a thin bed of gravel left as a lag deposit continued up the river bank and onto the drier ground in the north of the trench. A strandline deposit recorded on the northern side of PDZ5.42(C) may relate to the same flood event and it is likely that a hiatus exists in the sequence of both trenches as a result of the erosion associated with this event. Interbedded sand and clay overlying the more gravelly deposits in the south of PDZ12.01 suggest that subsequently a different river regime was in operation. It is possible that the scour was associated with the incursion of tidal water into the area, but further sample examination is needed to test and, crucially, date this.

The active channel deposits across the base of the trenches were overlain by a sequence of organic clays and peats, which are likely to represent a channel marginal backwater environment that gradually silted-up, becoming a marshy hollow dipping down towards the river in the west. Occasional evidence of small brush-wood revetments were recorded in these deposits in PDZ12.01. Preliminary results suggest that the southern area of this trench remained a boggy environment up until the post-medieval period and thus has great potential for the retention and analysis of environmental indicators.

The alluvial deposits of archaeological interest were examined and provisionally sampled by geoarchaeologists. Preliminary evaluation of the samples has indicated that a rich and diverse assemblage of environmental remains, including snails, ostracods and plant remains exists, with organic material suitable for radiocarbon dating and potential for the survival of microfossils, such as diatoms and pollen.

Substantial dumps of gravels were laid down to consolidate the ground prior to the post-medieval building sequence which, characterised by a range of wells, cess pits, brick walls and drains, was present in the upper levels of each trench. A number of walls recorded in section at the northern end of PDZ12.01 were clearly Victorian in origin and are likely to relate to the former Christ Church known to have been located in this part of PDZ12.

In the light of revised understanding of the archaeological potential of the site the report concludes that further archaeological and geoarchaeological fieldwork is necessary to examine and record the nature and extent of the prehistoric and later activity identified in the PDZ12.01 evaluation trench and its inter-relationship with the changing environment and river characteristics. This work should involve an extension of the trench eastwards, to examine whether occupation activity exists on the dryland identified in this area and whether earlier phases of the river regime exist. It should also extend the base of the trench in the south-west, where tufa deposits, associated with a spring and likely to be of significance for local prehistoric activity were identified during the evaluation and evidence for the later evolution of the river might be found.

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1 Introduction

1.1 Site background

Two evaluation trenches were excavated within Work Packages 1 and 2 of Planning Delivery Zone 12 (PDZ12) of the Olympic, Paralympic and Legacy Transformations Planning Applications, in the London Borough of Newham, hereafter called 'the site'. The site is bounded on the north by Stratford High Street; to the west by Livingstone Road; to the east by Rick Roberts Way and to the south by Union Street (Fig 1).

Ground level immediately adjacent to the site lies at *c* 6.9m OD at the junction between Livingstone Road and the High Street at the north-west of the site, sloping down to 3.4m OD along the south of the site at Livingstone Road and Union Street junction.

The OS National Grid Reference for the site centre of Work Package 1 (Trench PDZ12.01) is 538425 183635. The site code is OL-08707.

Trench PDZ5.42(C) is also reported on here, and is located within the confines of PDZ12 work package 2. This trench was excavated to the immediate south of PDZ12.01 under the site code OL-08507.

The OS National Grid Reference for the site centre is 538480 183595. Trench PDZ5.42(C) was excavated from 5 November to 19 December 2007 and Trench PDZ12.01 was excavated from 10 January to 6 February 2008.

Finds were present in Trench PDZ12.01 (OL-08707) only (see Appendix 4: OL-08707, finds assessment and Appendix 5: OL-08707, the worked wood.

MoLAS-PCA considers it appropriate to report on the trenches together, due to their proximity, archaeological similarities and the fact that they were excavated concurrently.

The proposed development of the PDZ12 primarily comprises construction of Temporary Bridge T12; the introduction of new services, the creation of a coach parking area in the centre of PDZ12 and insertion of surface water drainage pipes. These were the focus of two evaluation trenches. A Method Statement (MS) was prepared for PDZ12 (MoLAS-PCA 2007b), which formed the project design for the evaluation. A desk-based assessment was undertaken for PDZ12 (MoLAS-PCA, 2007a), and should be referred to for information on the natural geology, archaeological and historical background of the site, and the initial interpretation of its archaeological potential.

1.2 Planning and legislative framework

The legislative and planning framework in which the archaeological exercises took place was summarised in the *Desk Based Assessment* and *Method Statement* which formed the project design for the evaluation (MoLAS-PCA 2007a and b respectively).

1.3 Planning background

In accordance with local and national policies, archaeological evaluation PDZ12 in advance of its redevelopment was required as part of the planning process. Evaluation is intended to define the archaeological potential and significance of any deposits present on the site, so that the Local Planning Authority can formulate responses appropriate to any identified archaeological resource.

The evaluation of the subject site, PDZ12, was undertaken in support of a condition required by English Heritage and attached to the consent granted by the Olympic Delivery Authority Planning Decisions Team with respect to Olympic, Paralympic and Legacy Transformation Planning Application Reference 07/90010/OUMODA. Condition OD. 12.01 of planning permission 07/90010/OUMODA states:

> *Development shall not be commenced in Planning Delivery Zone 12 until a Written Scheme of Investigation for Archaeological Works has been submitted to and approved by the Local Planning Authority. This shall be in accordance with the Generic Method Statement for Archaeology, the Written Scheme of Investigation for Archaeological Field Evaluation and the relevant Detailed Desk-Based Assessment. The archaeological work shall be undertaken in accordance with the approved Written Scheme of Investigation. If significant archaeological finds are encountered, further archaeological works or design measures may be required to mitigate the impact of development on those remains.*
>
> *Reason: To ensure that archaeological remains are properly investigated and recorded.*

1.4 Origin and scope of the report

This report was commissioned by Capita Symonds Ltd on behalf of the Olympic Delivery Authority and produced by the Museum of London Archaeology Service and Pre-Construct Archaeology Ltd (MoLAS-PCA). The report has been prepared within the terms of the relevant Standard specified by the Institute of Field Archaeologists (IFA, 2001).

Field evaluation, and the *Evaluation report* which comments on the results of that exercise, are defined in the most recent English Heritage guidelines (English Heritage, 1998) as intended to provide information about the archaeological resource in order to contribute to the:

- formulation of a strategy for the preservation or management of those remains; and/or
- formulation of an appropriate response or mitigation strategy to planning applications or other proposals which may adversely affect such archaeological remains, or enhance them; and/or
- formulation of a proposal for further archaeological investigations within a programme of research

1.5 Aims and objectives

The following research aims and objectives for PDZ12 were established in the Method Statement for the evaluation (MoLAS-PCA 2007b) and in the Desk Based

Assessment for PDZ12 (MoLAS-PCA, 2007a) and are intended to address the research priorities established in the Museum of London's *A research framework for London Archaeology* (2002).

- What is the potential for Late Glacial environment reconstruction and/or Late Upper Palaeolithic activity in the Pleistocene deposits on the site?
- What evidence exists for past river channels on the site and how does this contribute to our understanding of the origin of the modern and historic River Lea and Channelsea Rivers?
- Can channel migration be identified on the site, how does it compare with the evidence from Carpenters Road and can episodes of channel activity and abandonment be dated?
- What potential is there for reconstructing the evolving river regime from environmental samples taken from the site?
- Is there evidence of past human activity associated with river exploitation or management?
- Is there evidence for past wetland exploitation?
- What environmental evidence suitable for past landscape reconstruction and indirect evidence of past human activity exists within deposits associated with ancient river channels and other wetland areas?
- Is there any evidence of Roman wetland or dryland occupation and other activity within the area of the site? If so, how does it relate to what is known of the sites to the east on the other side of the Channelsea River?
- Is there any evidence of a medieval road and/or occupation activity, including industrial and agricultural evidence, within the area of the site?
- Is there any surviving evidence for the church recorded in the north corner of the site?
- How extensive is modern truncation and how thick is modern made ground across the site and what is the level of disturbance and truncation associated with the construction of the Gas Depot?

2 Topographical and historical background

The following summary of the geological and archaeological background to the site is based upon the desk based assessment for PDZ12 (MoLAS-PCA 2007a).

2.1 Modern topography and drainage

PDZ12 is located in the centre of the former River Lea valley floor, between the Waterworks / Three Mills Wall River and Channelsea River, *c* 3km north of the Lea's modern confluence with the River Thames. The site lies just south-east of the grid–like network of river channels known as the Bow Back Rivers. Modern ground level at the north-west corner of the site, at the junction of Livingstone Road and the High Street is 6.9m OD, and there is a steady decline to the south-east, with the ground level at the junction of Livingstone Road and Union Street, towards the south of the site being 3.4m OD.

The modern topography and drainage of the area has been much modified by man and bears little resemblance to the landscape of the site in historic and prehistoric times. Several metres of modern ground raising masks the natural landsurface; similarly, very little of the natural course of the Lea remains in the modern landscape, which today flows through a series of mostly man-made canalised and culverted channels, such as those bounding and crossing the site itself.

2.2 Natural topography and past landscape setting

The site lies on alluvium, which represents a range of different wetland and dryland environments existing on the valley floor (floodplain) of the Lea from the Mesolithic period onwards. The alluvium is underlain by the Lea Valley Gravels, deposited following the scouring–out of the valley floor during the Palaeolithic period (the Pleistocene). The gravels are the most recent in a series of Pleistocene river terrace deposits, which today form an irregular flight of steps in the valley side. The Kempton Park Gravels and older Taplow Gravels form the lowest of these river terraces, at the edge of the valley. Tertiary bedrock, variably London Clay and Woolwich and Reading Beds, underlies the gravels. The bedrock pre–dates the period of human evolution and its surface acts as the bottom line for deposits of archaeological interest.

A summary of the buried landscape characteristics of the site and its archaeological implications is given here:

- The site is located in the central part of the valley floor, with the valley side immediately to the east. It is likely to have been a low-lying wetland area. The top of *in situ* alluvium probably lies at *c* 2-2.5m OD.
- A relatively deep channel existed in the central part of the site and it is possible that the channel relates to an earlier natural course of the Channelsea River. A meander of the Lea formerly also crossed the site and was likely to have migrated across the site in the past.
- Most of the site would have been a low-lying wetland area for most of the prehistoric period and later, while the low gravel surface (+1m to –2m OD) slopes upwards towards the Low Terrace (which has been recorded down the eastern part

of the valley floor).

- The Low Terrace to the east remained as dry ground throughout the prehistoric period and into historic times and much evidence for occupation of prehistoric, Roman and medieval date has been found on it in the Stratford area.
- The site has the potential for Late Glacial beds and pockets of clay, silt and organic sediment within the gravels, and may contain important environmental remains. Such remains would be deeply buried, at –3m OD (*c* 7m below modern ground level).

2.3 Prehistoric

The surface of the Lea Valley Gravel, together with any exposed bedrock and earlier gravel surfaces approximates the land surface at the start of the Holocene, about 10,000 years ago, at the start of the Mesolithic. At this time the study area was likely to have been within dry land, crossed by a network of watercourses. Residual finds from the Mesolithic found at the site of Stratford Langthorne Abbey, on the opposite side of the Channelsea to the site, attest to landuse in the area at this time.

As river levels rose during the Holocene the dry landsurfaces would have become waterlogged at progressively higher elevations through time. As a result, wetland areas are likely to have developed across much of the lower-lying parts of the site during the prehistoric period. Evidence for late prehistoric cultural activity has been found close to the site and there is potential for this settlement having influenced the nature of the site's use during the late prehistoric period. At the site of Stratford Langthorne Abbey, archaeological excavations revealed a horse burial close to a crouched human inhumation, suggestive of ritual or religious activity dating from the middle Iron Age to Roman periods. Also in this area was a dense concentration of pits, postholes and hut circles cut into the clay subsoil, covering an area of at least 1.5 acres. This has been interpreted as a multi-phase settlement, which was occupied from the Late Bronze Age through to the 4th century AD. Residual finds from the Mesolithic attest to earlier landuse in this area.

The location of the site in the wetland and close to/within both a deep watercourse and the higher land of the river terrace suggests that characteristic prehistoric timber structures, particularly trackways and platforms might exist, particularly as prehistoric occupation is known from the Low Terrace to the north and east of the site.

2.4 Roman

The Lea was likely to have been an important route in the Roman period. It may have been used to supply the London area both with agricultural produce and, in the late period, with pottery from Much Hadham, via the River Stort. Excavations have established that a Roman settlement existed in an area north–west of the study site close to Old Ford, which fronted onto the Roman road that stretched from *Londinium* to the Roman Colonia of *Camulodunum* (Colchester). The road was used for the transportation of food from Essex and East Anglia to Londinium. A network of yards and fields were laid out behind the road. The projected line of this road passes roughly east–west, *c* 500m north of the site., Roman activity has been recorded close to the site at Abbey Road during excavations of Stratford Langthorne Abbey on the opposite bank of the Channelsea River; the evidence included burials (both human

and animal). If seasonally a dryland area, the site may have been exploited in a similar fashion.

With evidence for Roman activity both to the west and east of the site, it is possible that the site was subject to some level of Roman-period cultural impact/exploitation.

2.5 Saxon

Several place names in the Lea Valley have Saxon origins. Hackney derives from a Saxon reference to the well–watered meadows by the marshes of the River Lea. Clapton means the farm on the hill, while Leyton derives from settlement on the Lea.

Saxon pottery and burials recorded during archaeological excavations at Stratford Market Depot indicate that this period saw use of both the river and the land to its east in the site vicinity. Further, it is likely that the Roman crossing at Old Ford and the course of the Roman road/causeway across the marshes and east side of the valley remained in use during much of the Saxon period.

The Saxon–period Lea, flowing south through Stratford, appears to have branched into several channels, collectively called the Stratford Back Rivers. Although the pattern of channels has been associated with King Alfred, who in 895 AD apparently obstructed the river to strand the Danish fleet, the evidence is inconclusive and they are more likely to be man-made channels modifying earlier streams in order to create mill leats to work the mills associated with the Bow Back Rivers on historic maps. Saxon remains within PDZ12, if present, are most likely to comprise disassociated finds and riverside structures, similar to that found in the Stratford Box site to the north, which may also have been associated with a former channel of the Channelsea River or a meander of the Lea.

2.6 Medieval

PDZ12 lies adjacent to Stratford Langthorne Abbey and its precinct. There is the possibility for field structures and buildings associated with the Abbey, as well as waterfront features associated with the Cistercians alteration and control of the river system of the Channelsea. PDZ12 also crosses the Channelsea in the vicinity of the medieval Abbey Mill. Any medieval remains are likely to be of local to regional significance. The medieval road running along the north edge of the site (Stratford High Street) also raises the possibility of buildings having stood along the line of the road.

2.7 Post-medieval

The use of the local waterways as a raw material for industry, a means of transport and as a source of power for the operation of mills was a major theme in the later development of the Lea Valley; Abbey Mills, immediately adjacent to the northern edge of PDZ12, survived into the 20th century

The 18th century brings the first evidence for the nature of activity at the study site. The John Rocque map of 1746 is the earliest representation of the study showing the

majority of the site area to have been used as fields, with the High Road (present day Stratford High Street) encapsulating a couple of roadside houses and their attendant gardens. By the beginning of the 19th century the north edge of PDZ12 was occupied with terraced housing fronting onto the Bow Causeway road, while towards the south of the zone an osier bed is present in the Channelsea River adjacent to the crossing of Abbey Lane by the Abbey Mill precinct. By the time of Stanford's map in 1862 the area is again parcelled up into fields. Stanford's map also shows the Northern Outfall Sewer, which provides the south–western boundary of PDZ12. Between 1882 and 1896 the area around the site in the north of PDZ12 became increasingly built up, with buildings occupying the northern half of the site and two new roads having been founded: Livingstone Road and Stanley Road. A church (Christ Church with attendant charity school) was present on the northern corner of the High Street and Union Street, in the northern most corner of the site. The layout for the site remained relatively unchanged until the latter half of the 20th century; between 1955 and 1965 Stanley Road was removed and a large office building erected along the north side of Livingstone Road with Union Street running down to join Livingstone Road.

3 The evaluation

3.1 Methodology

All archaeological excavation and monitoring during the evaluation were carried out by a joint MoLAS-PCA team in accordance with the preceding *Method Statement* (MoLAS-PCA 2007b) and the MoLAS *Archaeological Site Manual* (MoLAS, 1994).

An evaluation trench (PDZ12.01) was excavated under the site code OL-08707 targeting the locations of the impacts from construction of the proposed Temporary Bridge T12 (Stratford High Street over bridge).

Compensatory trench PDZ5.42(C) was relocated into PDZ12 from PDZ5, under the site code OL-08507. This trench, measuring 30 x 3m, which previously targeted the International Broadcast Centre (IBC), was relocated because the depth of the made ground at PDZ5 is too deep for a trench to be constructed.

Each trench was excavated to the base of the alluvial sequence of archaeological interest, with machining of trenches done in stages in cases where archaeological features were encountered within the sequence. A mechanical excavator using a flat bladed ditching bucket undertook the bulk excavation, monitored by an archaeologist, a banksman and a site foreman at all times.

Geoarchaeologists visited the trenches as required to examine the sediments, interpret their environment of deposition, take bulk, monolith and auger samples and advise on the archaeological significance of the natural deposit sequence. Both trenches were visited by Dr Jen Heathcote, the EH Archaeological Science advisor for Greater London, who discussed the deposit sequence and the sampling strategy with the geoarchaeologists and senior archaeologist.

The trenches were located by the MoLAS-PCA surveyor using an EDM. This information was electronically collated and plotted onto the OS grid. Levels were calculated from benchmarks established by the attending contactors within the adjacent roads.

A written and drawn record of all archaeological deposits encountered was made in accordance with the principles set out in the MoLAS site recording manual (MoLAS, 1994).

Trench PDZ12.01 produced: 1 trench plans at 1:50 scale; 250 context records; 25 sections at a scale of 1:20. The site records will be deposited under the site code OL-08707 for in the LAARC.

Trench PDZ5.42(C) produced: 1 trench plan at 1:50 scale; 30 context records; 8 sections at 1:20. The site records of the trench will be deposited under the site code OL-08507 in the LAARC.

3.2 Results of the evaluation

(See Fig 2 for trench locations).

3.2.1 OL-08707: Trench PDZ12.01

Location	South Eastern corner of Area 12
Dimensions	12.7m x *c* 9m at base; c 7m depth
Modern ground level	c. 6m OD
Base of modern fill	c. 4.25m OD
Depth of archaeological deposits seen (including alluvium)	c. 5m
Level of base of deposits observed and/or base of trench	-0.96m OD (north end of trench)
Natural observed	Archaeology within natural deposit sequence below *c* 1.25m OD. Natural deposits pre-dating archaeological interest not observed.

Table 1 Trench PDZ12.01 deposit summary

The ground surface around the trench was recorded at between 5.18m and 6.23m OD.

3.2.1.1 Phase 1: Dry landsurface and overbank flood sequence

The earliest deposits in the trench consisted of what are currently interpreted as Pleistocene river terrace gravels [63], overlain by brickearth-like fine-grained deposits [193], in which a landsurface had subsequently developed. The gravels were identified at a maximum height of -0.2m OD. It is possible, however, that these gravels, which appear to be banked-up in the north east corner of the trench, and the overlying fine-grained deposit, are not Pleistocene but of very early Holocene (i.e. Mesolithic) date and accumulated by channel flow and subsequent overbank flooding in a similar way to the overlying deposit sequence. Optically Stimulated Luminescence (OSL) dating of sand bed [195] might be able to test this. The date and environment of deposition of these deposits is significant, for Late Upper Palaeolithic and Mesolithic scatters have elsewhere (in the Colne valley, for example) been found within fine grained deposits overlying gravels in similar landscape positions as this. An associated deposit, [192], included field and burnt flint.

The landsurface developed in [193] was truncated by a thin bed of sand and gravel [178], no more than 0.05m thick, which may relate to a severe flood event during the accumulation of the channel fills to the south. The overlying deposits in the north of the trench, [194], [247], [218] and [219] the top of which was recorded at *c* 2.10m OD, represent alluvium, accumulated by episodic flooding beyond the confines of the river channel during the prehistoric and historic period. Following deposition these sandy clay deposits were weathered and bioturbated. It is possible they represent a similar environment to [193]. Context [219] yielded two small flint flakes (debitage).

Further information from samples and from further fieldwork is needed to clarify the environment of deposition and to correlate these deposits with the phases of fluvial activity to the south. No anthropogenic material was observed or retrieved in this part of the alluvial sequence.

3.2.1.2 Phase 2: Active stream channels and human activity (4500-800 BC)

The dry landsurface and underlying gravels recorded in the north east of the trench may have been cut by a channel [62]. Alternatively, the bank ('cut' [62]) may be the surface of an earlier channel bar. The full extent and nature of [62] is not known as only one edge of this feature, located at the northern end of the trench and aligned east to west, was identified in the investigation. It is likely that channel [62] represents the margins of the riverbed of the Lea. The main and deeper part of the river is likely to have existed beyond the south west boundary of the trench. The interbedded clays, sands, gravels and organics recorded as the fills of [62] are the streambed deposits of a network of shifting channels that existed at the margins of the wide and shallow prehistoric river.

These interbedded deposits comprised lenses of sand [198], silt [223], sandy silt [222], organic/peat [221] and a silty clay [197], overlain by a gravel horizon [55].

Partially sampled through dry sieving, [55] produced flint knapping debitage and unabraded Neolithic pottery. The unabraded nature of the material suggests that the position from where they were found was not far from their original location of deposition.. Also associated with this horizon was an assemblage of animal remains, including horse, and a wooden stake structure. Four vertical worked timbers/stakes ([73][74][75][77]) forming a possible small square structure were identified and left *in-situ*. The top of these survived to between -0.36m and -0.43m OD. It is thought that these stakes are at least contemporary with [55] although it is possible that they have been driven in from a higher level. It is not possible to further define the nature and function of these timbers until full archaeological investigation has taken place.

3.2.1.3 Phase 3: Active stream channels and human activity (800BC +)

A later channel was identified, aligned roughly east to west, along the known edge of [62]. This channel was at least 2m wide and is thought to have cut through deposits [198], [223], [222], [221] and [197]. At its northern limit a sand bank, [187]/[60] had accumulated. The relationship of this sand bank to the sand lenses within the alluvial overbank flood sequence in the north east part of the trench (and in particular [195]) needs clarification. A relatively small worked stake [181] had been driven into the channel at the edge of the sand bank and channel fills (mid-grey sandy silt [185]/[59]) appeared to have accumulated around it. At least four worked timbers ([66], [68], [69] [70]), possibly the remnants of a dislodged wooden structure, were identified within the channel fills, surviving to a maximum height of -0.51m OD. Preliminary inspection of the large roundwood stakes suggests they do not pre-date the Iron age (*c* 800 BC +) and may possibly represent further evidence of riverside revetment activity (Damian Goodburn *pers comm*.). An ephemeral stake-hole, [212], in the vicinity may also be associated with these timbers. The silty channel fills [185] also overlay the sand bank [187] and formed a bar across the central area of the trench.

Woody roots were observed penetrating the silts of [185] and what may be its lateral equivalent [184] in the south of the trench. The roots were especially frequent in this southern part of the trench. It is likely that they relate to a period of channel stability, when the main flow of the river was beyond the western limits of the trench and only the stream channel skirting the higher ground to the north east continued to flow in this area. Samples of the roots were collected for radiocarbon dating and species identification.

The silty channel deposits were sealed by a mixed organic deposit of gravel, wood, mollusc shell, bone and tufa [183], which extended across the entire trench, thickening from south to north and continuing across the sand bank and alluvial sequence in the north east of the trench as a gravel lag deposit [178]. This deposit probably represents a severe storm or flood event, which scoured and redeposited local riverbed deposits. In the south east corner of the trench this deposit was tufa rich, containing a large lens of tufa nearly 2m across and 0.50m thick [191] and tree stumps. It is not yet certain whether these remains are more or less *in situ* or are locally redeposited and washed up against the margins of the river. Tufa is typically associated with water issuing from freshwater springs in well vegetated surroundings. It is commonly of later Mesolithic or Neolithic date in the Lea Valley, as it needs a sediment free river and warm climate to form and is frequently associated with the 'climatic optimum'. Thus the accumulation of tufa is likely to be roughly contemporary with the Phase 2 active stream channel deposits, as opposed to those of Phase 3. It would seem likely that either the tufaceous deposits and tree stumps in the south of the trench are *in situ* and have been eroded out from here to form [183] in the north of the trench, or all of these deposits have been locally redeposited during a scour and erosion event and are derived from a nearby spring. Further excavation of these deposits are needed to address this issue, as it is likely that the spring, which probably fed a pool surrounded by trees at the margins of the river, would have been a focal point for local prehistoric activity.

3.2.1.4 Phase 4: Wetland development

The scour event that deposited [183] appears to have heralded a different river regime and the overlying sequence of interbedded sands and clays [182] may represent an intertidal environment. However, it is likely that PDZ12.01 lay at the landwards extent of this estuarine environment, as the characteristics of [182] change towards the north of the trench. It is likely that in the lower-lying area of the former stream, a pool of water formed [177] perhaps fed by the wash of the tide over the mudflats from time to time, which silted up as a boggy hollow [172]. In contrast, the southern part of the trench was more directly influenced by the (probably tidal) river and in this area intertidal mud (mudflats) accumulated [182] and [210].

The humic and more organic nature of the overlying deposits [208], [170] and [172] suggest that the river migrated westwards away from the locality of PDZ12.01, which became a wetland area, marshland peripheral to the river and less directly influenced by it. The organic nature of these deposits means they are suitable for radiocarbon dating. Furthermore bulk samples taken from them preserve a good range of environmental indicators, suggesting they contain good evidence for past environment reconstruction. The overlying pale grey clay [169], [207] would have settled out of standing water. Although it may represent a rise in river levels and pooling of water, it is more likely that this deposit, which has a surface at about 1.2m OD in the area of the former stream channel and 1m OD in the southern part of the trench, represents a build up of clay as a result of prolonged perhaps seasonal flooding. In contrast with the overbank flood deposits, which have a similar origin, in the north of the trench [218] and [219], it is less weathered and lies at a lower elevation. Although not yet dated it is likely that these uppermost alluvial clay deposits it represents the medieval / post medieval landsurface, which appears to have dipped down towards the river from east (c 2.10m OD) to west (c 1.10m OD) across the trench and to have become wetter and more prone to flooding westwards.

A turf line / landsurface [168] buried by gravel consolidation dumps was recorded at *c* 1.1 m OD in the southern part of the site. A single pointed wooden stake, the top of which was located at 1.35m OD, and driven through layers [170], [169], [168], [167], is thought to derive from later historic activity on the site, contemporary or preceding the ground consolidation activities mentioned below.

3.2.1.5 Phase 5: Post Medieval consolidation and construction (AD 1550-present)

At *c* 2.1m OD in the northern end of the trench and at 1.1m OD further south (overlying the boggy/marshy area of the site) substantial consolidation dumps, predominantly consisting of gravels, were deposited. The earliest deposits contained pottery: [141], [142] and [131] had redeposited [131] medieval pottery.

Later deposits [215] [216], [202], [201], [199], [200], [203], [204], [168], [167] and [161], some of which were contained within cuts [147] and [153] are not thought to predate the mid-18th century, the period in which limited ribbon development began along modern day Stratford High Street.

Finds from the consolidation dumps included redeposited medieval building material and pottery (context [149]) and post-medieval peg roofing tile (contexts [149], [154], [158] and [217]). Post-medieval glass (18th- or 19th- century) was recovered from two contexts: [40] and [145]. Contexts [116] and [150] included undiagnostic fragments of tobacco pipe, only datable within the broad range *c* 1580-1910. Post-medieval pottery was found in contexts [129], [135], [145] and [150]. Redeposited Roman pottery was found in [158] and [154].

This post-medieval urbanisation of the site consisted of a range of features cut into the consolidation dumps and included a well [16], pits ([9], [85], [97], [115], [119], [157], [229]), culverts and drains ([42], [205]) as well as structural building remains consisting of walls and foundations/footings, ([27], [44], [89], [94], [100], [101], [103], [108], [233]) and [235]. Finds from pit fills included redeposited iron that may be Roman (fill [154] in pit [157]) and a probable 19th-century military button (fill [8] in pit [9]).

Due to the nature of the evaluation these deposits and structures were mostly recorded in section. Despite this, the information gleaned from the evaluation has shown that the buildings date from at least the mid 19th century and continued up until the later Victorian period, evident by the yellow stock-brick footings located predominantly in the northern end of the trench ([82], [248]). These scant remains may relate to the Christ Church and later school building, which was known from documentary and cartographic sources. The post medieval building remains survived to a maximum height of 4.27m OD.

3.2.2 OL-08507: Trench PDZ5.42(C)

Location	South eastern corner of Area 12, adjacent to Livingstone Road
Dimensions	30m x 12.70m
Modern ground level	*c* 3.10 to 3.50m OD
Base of modern fill	*c* 1.50m OD
Depth of archaeological deposits seen (alluvium)	*c* 2.5m in section + 1m in auger holes
Level of base of deposits observed	*c* –0.4m OD

and/or base of trench	
Natural observed	Natural deposits of archaeological interest were recorded below *c* 1.50m OD. Deposits pre-dating archaeological interest were not observed.

Table 2 Trench PDZ5.42(C) deposit summary

The trench was stepped down four times in 1m intervals to provide safe conditions for recording and investigation within. No anthropogenic materials, features or deposits were found although an alluvial sequence of archaeological interest was recorded in the trench sections and in two geoarchaeological auger holes drilled down from the lowest step above the base of the trench.

3.2.2.1 Phase 1: Dry landsurface and overbank flood sequence

No Pleistocene gravels or prehistoric landsurface developed in Pleistocene or early Holocene deposits, similar to that recorded in the north east of PDZ12.01, were recorded in PDZ5.42(C). The trench is likely to have lain within the prehistoric river.

3.2.2.2 Phase 2: Active stream channels (early phase)

Gravel interbedded with sand, clay and organic deposits was recorded in two auger holes drilled below the base of the trench. These interbedded deposits are likely to correspond with the prehistoric channel bars recorded across the base of PDZ12.01. Their surface dipped from –0.5m OD in AH1 to –1.2m OD in AH2 and they were recorded to –1.65m OD in AH1 and to –1.55m OD in AH2. Samples of organics were taken from these gravelly deposits for radiocarbon dating, from both auger holes.

3.2.2.3 Phase 3: Active stream channels (later phase)

The earliest deposits exposed in the base of the trench were firm, yellow clay silts [1], [9] (sampled with bulk {8}) and [19], which appear to be the banks of a stream channel. The top of the silts was recorded at about 0.30m OD and they dipped below the base of the trench. AH2 was drilled through the primary channel fills, which comprised interbedded sands, clays silts and organics from about –0.9m to about –1.2m OD. Organics were sampled from the top and base of the bedded silts for radiocarbon dating and grab samples were taken for microfossils.

3.2.2.4 Phase 4: Wetland development

The channel fills, as exposed in section and across the base of the trench, comprised peaty deposits [2], [12] and [29], suggesting the channel had become abandoned and subsequently formed a marshy depression. The base of the peat deposits was recorded at about –0.9m OD in AH2. The peaty fills were sampled with monolith {1} and bulk {7} in Section 4 and grab samples for microfossils and dating were taken at 0.10m intervals throughout the AH2 sequence, which extended the sampled profile below the base of the trench.

The peat deposit extended over the former silt banks, suggesting that the entire area had become removed from the influence of the active river channel and had become a wetland. The surface of the peat dipped from about 0.4m OD to 0m OD in the trench

sections. It was disturbed at the edge of the silty riverbank by a tree throw, which may be contemporary with the abandoned channel or later.

The peat was overlain by a sequence of alluvial clay deposits, with a surface at about 1.4m OD. In the south west facing section a peaty bed [5] about 0.5m thick containing much detrital wood and with a surface at *c* 0.8m OD separated the alluvial clay into a lower ([3], [4], [6]) and upper ([21], [22], [24]) part. Bulk samples {3}, {4} and {6} were taken through the alluvial clay sequence in the south west facing section. The peaty deposit may be a shoreline / strandline with organic material washed up to the furthest extent of a flood or the tide. It was sampled with bulk {5}. In the north east facing section the organic bed was not observed (emphasising that the main river lay to the west of the trench) and the alluvial clay [30], [16], [28], [27], [26] was about 1.5m thick. The alluvial deposits all dipped down towards the west into the area of the former channel, or towards the contemporary river. The depositional environment of the alluvial clay is not yet clear. It is likely to represent standing water, but whether this was as a permanent pool, seasonal flooding or part of the daily rhythm of the tide needs further clarification. The overlapping monoliths (sample {1}) and adjacent bulk samples taken in the area of the former channel, from the south west facing section, should be able to shed more light on the evolving environment and tie it in to that recorded in PDZ12.01.

A loamy soil deposit [23], [25] about 0.30m thick formed the top of the alluvial sequence, with a surface at around 1.5m OD.

3.2.2.5 Phase 5: Post Medieval consolidation and construction (AD 1550-present)

The loamy deposit noted above represented the landsurface prior to the build up of Victorian and modern made ground / groundraising, which was approximately 2m thick.

3.3 Synthetic stratigraphic interpretation of the site

The below represents a synthetic summary of the findings at both trenches: PDZ5.42(C) (OL-08507) and PDZ12.01 (OL-08707).

3.3.1 Phase 1: Dry landsurface and overbank flood sequence and Phase 2: Active stream channels and human activity (4500-800 BC)

The earliest deposits recorded in the trenches were gravels [63] overlain by brickearth-like weathered alluvial deposits [193] recorded in the north east corner of PDZ12.01, which may be of Pleistocene or Holocene date and have been grouped as Phase 1. These and the Phase 2 interbedded gravels with organics, sands, silts and clays seen at the base of PDZ12.01 and in the auger holes drilled below the base of PDZ5.42(C), represent an environment of channel bars and shifting channels across the riverbed. At this stage the river would have been wide and shallow, a mosaic of gravelly islands, some vegetated some active and newly formed, within a network of shallow streams. It is not yet clear whether the Phase 1 deposits recorded at the north eastern end of PDZ12.01 are an early stage of this environment, left as dry ground except for episodic flooding, as the main flow along the channel migrated westwards, or whether these deposits are of Late Pleistocene date and relate to the arctic river. Further on- and off-site work and dating (OSL) is needed to clarify this.

The interbedded gravels with organics, sand, silt and clay recorded in the base of PDZ12.01 and in the auger holes drilled below the base of PDZ5.42(C) are of prehistoric date. Neolithic pottery and animal bone were found within the upper part of these gravels [55] in PDZ12.01, but whether these finds were discarded on a channel bar or have been eroded and transported (a short distance as unabraded) by the river and deposited with the gravels on the channel bar is presently unclear. The relationship of four wooden stakes to the Neolithic finds is also currently unknown. The stakes ([73][74][75][77]) were recorded at the same level and surrounded by the artefact bearing gravels. These stakes and the gravel bar deposits below [55] have been left *in situ* to be examined during the proposed excavation. Samples for radiocarbon dating have been taken from the channel bar deposits from the auger holes in PDZ5.42(C) and they have been provisionally sampled in PDZ12.01, where sample [10} from [198] produced snails, insects and wood fragments. Further sampling will be undertaken in this trench during excavation.

It is as yet unclear how the gravel bar deposits (at roughly –2 to 0.5m OD), which accumulated on the riverbed, relate chronologically and spatially to the much deeper gravels and other deposits recorded in the area previously mapped as the 'main channel' of the Lea. The profile and extent of the prehistoric and later channels of the Lea have still to be defined. It appears, however, that this part of PDZ12 would have lain at the extreme eastern margins of a wide shallow river, a mosaic of stream channels and low islands or vegetated bars, which are likely to have been part of the River Lea.

3.3.2 Phase 3: Active stream channels and human activity (800BC +)

The Phase 1 channel bar deposits are likely to represent clear fresh water, deposited by a river with relatively little suspended sediment (i.e.: prior to estuarine encroachment or landscape disturbance). In contrast, the silty channel banks [1], [9], and [19] and the interbedded silty fills of the palaeochannel that crossed PDZ5.42(C) suggest a greater sediment load was carried by the later stream channel that crossed the site. Similar silty deposits [185] were associated with a channel that cut across the north eastern part of PDZ12.01 and which was probably the same channel as that seen in PDZ5.42(C). A thin wooden stake, [181], was driven into the edge of this channel in PDZ12.01 and a cluster of stakes, probably transported a short distance by the river or discarded, or fallen into the channel, came from its fills. Preliminary inspection indicates that the stakes do not pre-date the Iron Age (*c* 800 BC +) and may possibly represent evidence of riverside revetment activity.

3.3.3 Phase 4: Wetland development

A period of landscape stability and isolation from the active river appears to have followed and, as a result, the stream channel in PDZ5.42(C) became infilled with peat ([2], [12] and [29]). Trees may have also become established over the former silty banks in this trench. In PDZ12.01 woody roots truncated by the overlying deposits were also recorded extending into the Phase 3 silts. The peat from PDZ5.42(C) and roots from PDZ12.01 have been sampled for radiocarbon dating, which should enable the chronology of this evidence for landscape stabilisation to be compared. Sample {7} processed from [2] produced predominantly wood fragments, confirming that in this period scrub and woodland probably developed across this part of the former riverbed. In addition, the peat from PDZ5.42 should preserve evidence of the contemporary environment from pollen and the seeds preserved within it, which have been recovered from the bulk sample.

Evidence for a severe scour event, which deposited a bed of gravel mixed with tufa wood and bone [183] all probably locally derived, across PDZ12.01 was not recorded in PDZ5.42(C), suggesting that PDZ12.01 may have lain closer to the contemporary river channel. The scour event truncated the landsurface associated with the woody roots in PDZ12.01 and eroded earlier deposits to a level of roughly –0.5m in the south west of PDZ12.01 to 0m OD in the north east. A possible shoreline of organic material [5] and containing a rich assemblage of seeds and insects, as seen in bulk sample {5} was recorded at around 1m OD in PDZ5.42(C) and could be related to this flooding, although dating would be needed to confirm this.

It is not yet clear whether the deposit of tufa {191} and tree stumps recorded in the south east of PDZ12.01 are *in situ* or locally redeposited. They are at present recorded as a thicker / deeper part of [183], but it is possible they are *in situ* and that [183] is the reworked upper part of these *in situ* tufaceous deposits, eroded and washed towards the margins of the river. Tufa is made up of carbonate concretions typically encrusting plants growing around a spring. It needs clear (non sediment laden) water and a warm climate to form and for these reasons is generally associated with the Later Mesolithic and Neolithic (the 'Climatic Optimum') in Greater London. It has been found *in situ* on several Olympics sites and further up the Lea Valley. A focus of the proposed excavation will be to determine whether the tufa deposits are *in situ* and to establish the environment of this part of the river when they accumulated. Charcoal and mammal bone found within the tufa sample also suggests people and animals

were utilising the spring. The excavation will also aim to find out whether the spring, which is likely to have emerged onto a wooded part of the riverbed to feed a pool, existed in the area of the trench and whether it was associated with prehistoric activity. If *in situ* tufa is found within the trench it is likely to be associated with an earlier phase of the site sequence (Phase 2), whereas the redeposited tufa would occur within later fluvial deposits (as included here).

The scour event was followed by a renewed period of fluvial deposition in this part of PDZ12 and the characteristics of these deposits in PDZ12.01, suggests that the river may by this period have become tidal. In particular the interbedded sands and clays [182] might represent intertidal mud. Their environment of deposition might be clarified if diatoms are preserved in the monolith samples taken through these deposits and by work on the mollusc assemblage recorded in bulk sample {21}, which also had good assemblages of waterlogged seeds and insect remains. Evidence for direct river influence seems to decrease from west to east across PDZ12.01 and between PDZ12.01 and PDZ5.42(C) suggesting that the river lay beyond the western boundary of the trench. Peat accumulated in marshy wetland environments peripheral to the river was recorded towards the eastern end of PDZ12.01 and weathered alluvial clay in the extreme east. River influence also decreases upwards through the PDZ12.01 sequence, implying that river influence receded in this location through time. However, further work on the monolith and bulk samples taken through these deposits is needed to clarify the environments they represent and when they accumulated.

3.3.4 Phase 5: Post Medieval consolidation and construction (1550-present)

A buried landsurface was recorded below the made ground in both trenches. In PDZ12.01 it appears to have dipped down towards the river from east (c 2.10m OD) to west (c 1.10m OD) across the trench. It was probably wetter and more prone to flooding westwards, where a wet, probably boggy landsurface that showed signs of trampling [168] and buried by gravel consolidation dumps was recorded at *c* 1.1 m OD. A good assemblage of seeds and insects from the bulk sample taken from this context holds good potential for reconstructing the historic environment. In PDZ5.42 a loamy soil deposit [23], [25] about 0.30m thick formed the top of the alluvial sequence, with a surface at around 1.5m OD, which is also likely to represent the landsurface prior to the build up of Victorian and modern made ground / groundraising.

A single pointed wooden stake, the top of which was located at 1.35m OD, and driven through layers [170], [169], [168], [167], is thought to derive from later historic activity on the site, contemporary or preceding the ground consolidation activities mentioned below.

The made ground sequence in PDZ5.42(C) was approximately 2m thick and was thicker still in PDZ12.01, where substantial consolidation dumps, predominantly consisting of gravels, were deposited. These deposits prepared the area for post-medieval development of which a range of features including a well, pits, culverts and drains survive, as well as structural building remains consisting of walls and foundations/footings. Due to the nature of the evaluation these deposits and structures were mostly recorded in section. Despite this, the information gleaned from the evaluation has shown that the buildings date from at least the mid 19th century and continued up until the later Victorian period, evident by the yellow stock-brick

footings located predominantly in the northern end of PDZ12.01. These scant remains are thought to relate to the Christ Church, which was known from documentary and cartographic sources. The post medieval building remains survived to a maximum height of 4.27m OD in PDZ12.01.

3.4 Evaluation of environmental evidence

3.4.1 Introduction

Several visits were made by a MoLAS-PCA geoarchaeologist to examine, record and sample the natural sequence exposed within the evaluation trenches. The geoarchaeologist's description and interpretation of the deposits form part of the trench results and stratigraphic interpretation in sections 3.2 and 3.3 above.

The stratigraphy recorded in a representative profile of the trench sequence, as drawn and described by the geoarchaeologist, will be entered into the MoLAS-PCA geoarchaeological stratigraphic database of the Lower Lea as part of the assessment. This database will be used in post excavation stages of the project, to reconstruct the evolving past environment of the Olympics site and to target samples and locations for analysis.

3.4.2 Sediment characteristics

Monolith samples were taken through the natural deposit sequence, as exposed in both trenches. These samples provide undisturbed columns of sediment, as revealed in the trench sections, for off-site examination. Representative profiles were selected for sampling, intended to gain a better understanding of the changing environments represented by the Holocene gravels and alluvial deposits. The samples will be suitable for sedimentary techniques such as loss on ignition, magnetic susceptibility and soil micromorphology, as well as microfossil examination. The monoliths will be retained until environmental assessment is undertaken (following the proposed excavation), when sub-samples for pollen and diatoms will be examined to determine their potential for past environment reconstruction (see below). Further retention until the analysis stage of the project is likely to subsequently be required, as this is when more detailed sedimentary techniques will be carried out.

3.4.3 Microfossils

The fills of the stream channels and stream bed pool, abandoned channel fills, wetland deposits and alluvial clay may preserve microfossils, in particular pollen and diatoms, but also cladocera, chironomids and other remains. Such evidence can provide valuable information about the evolving past environment (for example, vegetation, water characteristics, and indirect evidence for human activity, in particular landscape clearance, cultivation and other disturbance), which is likely to be complimentary to the macro-remains from bulk samples.

Preservation in the alluvial clay may be poor, as a result of oxidation and weathering, however. The survival and potential of microfossils in the deposits needs to be assessed as a further stage of work.

3.4.4 Bulk sample processing

During the evaluation of OL-08507 and OL-08707, environmental bulk soil samples were collected for the potential recovery of macro-biological remains for information on the character of the local environment and possible evidence of human activities in the area. Any such information could compliment the potential ecological data from micro-biological material contained within monoliths sampled through sedimentary sequences at both sites and establish possible spatial and temporal changes in environment on both a local and regional scale. The aim of the evaluation was simply to establish the presence and/or absence of biological remains and whether a full assessment of any materials within the samples should be carried out.

A total of 13 bulk soil samples were processed for the evaluation. These were collected from a range of natural deposits from peats and sandy silty gravels. The size of the samples ranged from five to 20 litres with five litre samples from each deposit being processed for the purpose of the evaluation. Soil was retained from nine of the samples. The samples for processing were floated onto a 0.25mm sieve with the residue being wet-sieved through an internal 0.5mm mesh for the potential recovery of plant, molluscan and insect remains. All fractions, however, could contain all these and other biological remains. The flots were stored wet to prevent possible deterioration of any fragile organic material while any wet-sieved fractions were dried and sorted.

A visual examination of part of the flots and residues was then carried out to establish the potential for the survival of different forms of biological evidence. Small fractions of the wet flots were rapidly scanned using a binocular microscope although it was not a detailed assessment and thus only general comments can be made on item frequency and species diversity. Context [22] sample 3 (OL-08507) also produced other finds, with a fairly large amount of very fragmented clinker and occasional fragments of slag, CBM and pot.

A summary of the processing techniques and the frequency and range of biological materials in each sample and any other finds is presented in Table 3. This information has been used to determine the most appropriate strategy for assessment (see below).

3.4.4.1 Plant and insect remains

Thirteen samples (wet flots) produced organic plant remains although most of this material consisted of varying amounts of very fragmented wood and roots/rootlets. There were occasional flecks and very small fragments of charcoal in two of the flots from OL-08707 from contexts [191] sample 20, and [207] sample 16. Identifiable fruits and seeds were present in 11 samples with large seed numbers in six samples; two samples from OL-08507, contexts [5] sample 5, and [169] sample 17; and four samples from OL-08707, contexts [182] sample 21, [191] sample 20, [207] sample 16, and [208] sample 15.

There were occasional seeds in the other five samples from OL-08507 from contexts [3], [4], [21], [22] and [238].

A wide range of wetland species were noted in the rich samples including aquatics, bankside and marshland species, for example stoneworts (*Chara* spp.), water plantain (*Alisma* spp.), bogbean (*Menayanthes trifoliata*), branched bur-reed (*Sparganium erectum*), sedges (*Carex* spp.), crowfoots (*Ranunculus Batrachium*), celery-leaved crowfoot (*R. sceleratus*), spike-rushes (*Eleocharis* spp.), gypsy-wort (*Lycopus*

europaeus) and mints (*Mentha* spp.). There were a few records of disturbed/waste ground plants, e.g. docks (*Rumex* spp.), knotgrass (*Polygonum aviculare*), thistles (*Carduus/Cirsium* spp.), stinging nettle (*Urtica dioica*), buttercups (*Ranunculus* spp.), and woodland/hedgerow/scrub plants, e.g. elder (*Sambucus nigra*), and alder (*Alnus glutinosa*), the latter represented by both catkins and seeds.

3.4.4.2 Insect remains

Ten samples produced insect (beetle) remains with large amounts in three samples from contexts [5] sample 5, and [22] sample 3 (both OL-08507), and from context [182], sample 21 (OL-08707); there were moderate amounts in another four samples from [169] sample 17 (OL-08507); and from [198] sample 10, [207] sample 16, and [208] sample 15 (all from OL-08707). Occasional remains were noted in the other three contexts [4] sample 6, [9] sample 8, and [21] sample 4, all from Site OL-08707.

3.4.4.3 Molluscs and ostracods

Molluscan remains were present in five samples with large numbers in three samples from contexts [21] sample 4 (OL-08507), and [182] sample [21] and [191] sample 20 (both OL-08707). There were moderate amounts in two samples from [22] (OL-08507), and [198] (OL-08707). The molluscs included both freshwater and terrestrial species and in some cases large numbers of operculae.

3.4.4.4 Other faunal remains

Single large mammal bones were found in two contexts from [22] sample 3 (OL-08507) and [191] sample 20 (OL-08707).

3.4.5 Scientific dating

Although some idea of the date of the deposits excavated has been inferred from their characteristics and level and the pottery from the fluvial gravels in the lower part of PDZ12.01 has been tentatively dated to the Neolithic, no reliable date has yet been obtained for the sequences examined. Environmental evidence, unlike artefacts, is not intrinsically dateable and the information about the past landscape preserved in the deposit sequence means little unless it is tied in to an archaeological timeframe.

In general, few artefacts suitable for spot dating were recovered from the alluvial sequence (excepting the uppermost part of the alluvial clay). However, the deposits excavated contained twigs and other plant remains, from which radiocarbon dates might be obtained. Some samples specifically for radiocarbon dating were taken. In addition, the sequence of bulk samples (and the monoliths if necessary) should provide sufficient material for the extraction of single entity organic remains suitable for radiocarbon dating by AMS (Accelerator Mass Spectrometry).

It is likely that Optically Stimulated Luminescence dating (OSL) if carried out as part of the proposed excavation of PDZ12.01 would help date the fine grained fluvial deposits, where no suitable organic remains are available within them.

Site	context	sample	soil processed (l)	soil retained (l)	Vol residue (l)	Vol washed material (ml)	wood	Seeds/ fruits	insects	molluscs	residue sorts	Potential
OL-08507	2	7	5	-	0.01	500	>roots;>fragmented wood	+				Mainly roots, wood frags
OL-08507	3	6	5	-	-	60	>roots	+	+			Mainly roots
OL-08507	5	5	5	-	-	1050	>roots;>fragmented wood	+++	+++			Moderate wl seeds & insects
OL-08507	9	8	5	5	-	700	>roots;>fragmented wood		+			Mainly roots, wood frags
OL-08507	21	4	5	5	0.01	30	>roots	+	+	+++		Good molluscs
OL-08507	22	3	5	5	0.1	120	>roots;>v fragmented wood	+	+++	++	clinker+++; slag fragment; CBM+, small pot frag; large mammal bone	Moderate insects
OL-08507	238	51	5	-	-	20	>roots	+				Virtually all roots
OL-08707	169	17	5	5	0.01	500	>roots;>fragmented wood	+++	++			Good wl seeds & insects
OL-08707	182	21	5	15	0.01	150	>roots;>fragmented wood	+++	+++	+++		Good wl seeds & insects; poss molluscs (fw)
OL-08707	191	20	5	15	-	1000	>roots;>fragmented wood (inc large fragments) ; occasional charcoal	+++		+++	large mammal bone	Good wl seeds & molluscs
OL-08707	198	10	5	5	0.5	200	>roots;>fragmented wood		++	+(+)		Mainly wood & rootlets
OL-08707	207	16	5	5	0.01	125	>roots;>fragmented wood; occ charcoal	+++	++			Good wl seeds; Moderate insects
OL-08707	208	15	5	5	-	300	>roots;>fragmented wood	+++	++			Moderate wl seeds & insects

Table 3 Evaluation of environmental evidence

3.5 Assessment of the evaluation

GLAAS guidelines (English Heritage, 1998) require an assessment of the success of the evaluation 'in order to illustrate what level of confidence can be placed on the information which will provide the basis of the mitigation strategy'.

In the case of this site, the evaluation trenches lay at the eastern margins of the prehistoric river and exposed gravels of late Pleistocene/early Holocene date, overlain by prehistoric and historic alluvial sequences containing evidence for human activity. The alluvium was sealed by substantial depths of made ground. These deposits were examined by a team of archaeologists and geoarchaeologists in plan and in section and samples were taken for off-site examination. Although no firm idea of the date of the deposits has been obtained, finds for spot dating and samples of organic materials for radiocarbon dating have been collected from the deposit sequence and the site sequence can potentially be tied in with the evidence for archaeology and landscape change known from the wider area.

Although the full sequence of alluvial deposits of archaeological interest were not observed in section in PDZ5.42(C), two auger holes drilled from the lowest step have informed on the sequence of deposits below the base of the trench and enabled the PDZ5.42 sequence to be compared with that in PDZ12.01.

The trenches satisfy the original requirements of the evaluation as stated in the Written Scheme of Investigation (MoLAS-PCA 2007b).

4 Archaeological potential

4.1 Realisation of original research aims

The extent to which the evaluation has been able to address the individual research objectives established in the Method Statement for the evaluation is discussed below:

What is the potential for Late Glacial environment reconstruction and/or Late Upper Palaeolithic activity in the Pleistocene deposits on the site?

The earliest part of the deposit sequence encountered comprised gravels overlain by weather sandy clays (brickearth-like alluvium), which may represent seasonally flooded landsurfaces adjacent to the river. It is probable that these deposits are of Late Glacial or early Holocene date. Late Upper Palaeolithic and Mesolithic archaeology have been recovered from similar deposit sequences from other river valleys, such as the Colne.

Optically Stimulated Luminescent dating (OSL) will be undertaken, if suitable deposits are found during the proposed excavation to date these deposits, and if necessary blocks of undisturbed sediment for soil micromorphology will be taken through them to clarify the environment they represent. Apart from this, however, environmental evidence is unlikely to survive in the weathered clays and gravels.

What evidence exists for past river channels on the site and how does this contribute to our understanding of the origin of the modern and historic River Lea and Channelsea Rivers?

Several phases of river channel evolution was recorded in the alluvial deposits on the site and these will be investigated further by dating and examination of the samples collected and by the proposed excavation in PDZ12.01, which should contribute to our understanding of the origin of the modern and historic River Lea and Channelsea Rivers.

The earliest phase consisted of gravelly channel bars, which were deposited at a time when the river was wide and shallow and a mosaic of gravelly islands and shifting channels. It appears that Neolithic people may have utilised the channels and islands in the river at this time.

Subsequently, the river seems to have carried a greater sediment load, perhaps a result of disturbance within the catchment or the influence of tidal water and silt banks and bars were deposited in both trenches. In PDZ12.01 they were associated with Iron Age or later activity. Following a period of landscape stability and tree or shrub growth across the former riverbed a scour event occurred, depositing gravels, wood and tufa, eroded from the river bed to the west, across the trench. The relationship of the tufa and associated tree stumps to this flood deposit will be investigated during the proposed excavation, as it would have originated around a spring fed pool, which is likely to have been a focus for prehistoric activity and its location may have been within the trench itself.

The encroachment of estuarine environments into PDZ12 may be linked with the flood deposit and the overlying deposits may be intertidal muds – further examination of samples taken from them may elucidate their origin. These estuarine muds merged laterally into peats, probably accumulated between the margins of the river and the drier land to the east. Subsequently, the direct influence of the river appears to have abated and a sequence of overbank flood deposits imply a landsurface that was only episodically perhaps seasonally inundated. The pre-ground consolidation landsurface dipped down towards the west across this part of PDZ12, reflecting the location of the river beyond the western limit of excavation.

Can channel migration be identified on the site, how does it compare with the evidence from Carpenters Road and can episodes of channel activity and abandonment be dated?

In general the river channel activity recorded in PDZ12.01 was migrating westwards, with the oldest deposits in the east. It is not characterised by the thick sands and successive point bars with intervening swales that were recorded in Carpenters Road, however, but by a series of different types of deposits influencing the area through time, as discussed above.

Finds and organic material were recovered from the channel deposits and should provide a dating framework for the changing river regime.

What potential is there for reconstructing the evolving river regime from environmental samples taken from the site?

A range of monolith (undisturbed blocks of sediment for microfossils and sedimentary techniques), bulk (in particular for snails, seeds and insects) and grab (for microfossils, radiocarbon dating and species identification) samples were taken from the alluvial deposits.

The samples already taken together with those that will be taken during the proposed excavation hold good potential for reconstructing the evolving river regime, especially as OSL, radiocarbon and finds dating of the channel deposits is likely to be possible.

Is there evidence of past human activity associated with river exploitation or management or/and wetland exploitation?

Evidence for past human activity associated with river exploitation and management was found in evaluation trench PDZ12.01. Evidence for human occupation/activity was attested by the presence of flint working debitage and several sherds of Neolithic pottery from gravel layer [55]. These deposits originated from a gravel horizon and are thought to have been in-situ on account of their fresh and unabraded nature.

Gravel outcrops would have provided a resource for the procurement of flint pebbles which would have provided the only available raw material for the production of durable cutting, hunting and processing implements prior to the development of metal working technologies in the Bronze Age (*c* 2500BC). Evidence for river management within the same trench was attested by the presence of a dislodged timber structure, thought to have been the remnants of a possible revetment, within channel fill [185].

The nature of the four timbers' [67] [68] [69] [70] deposition and the presence of an ephemeral stake-hole nearby suggests that they may have been dislodged in situ. These timbers may also be broadly contemporary with a significantly smaller wooden stake [181] that survived in-situ in the south west facing section. As yet the nature of the timber structure ([73], [74], [75], [76]) left in situ is as yet not defined.

What environmental evidence suitable for past landscape reconstruction and indirect evidence of past human activity exists within deposits associated with ancient river channels and other wetland areas?

Bulk samples taken from the sequence of channel and alluvial deposits were processed and scanned. Large assemblages of seeds, insects and snails, together with animal bone from some of the deposits were noted and it is likely that the samples already obtained and those that will be taken during the excavation have good potential for past environment reconstruction and indirect evidence of past human activity (see section 3.4).

Pollen, diatoms and other microfossils may also be preserved in the undisturbed blocks of sediment collected as monolith samples.

The alluvial sequence at the north eastern end of PDZ12.01 also has potential for soil mocromorphology and sedimentary techniques such as loss on ignition and magnetic susceptibility to identify episodes of stability and soil development and faster sedimentation.

Is there any evidence of Roman wetland or dryland occupation and other activity within the area of the site? If so, how does it relate to what is known of the sites to the east on the other side of the Channelsea River?

At present no direct datable evidence of Roman wetland or dryland occupation and other activities within the areas investigated during the course of the evaluation were identified.

It is possible that some of the worked wood may have its origins in the Roman period although this cannot be substantiated by solid dating evidence due to the homogeneity of wood working tool mark signatures from the Iron Age to the present day.

Is there any evidence of a medieval road and/or occupation activity, including industrial and agricultural evidence, within the area of the site?

No evidence of a medieval road or occupation activity, industrial or agricultural in nature, was found during the course of the evaluation within the areas targeted by trenches PDZ 5.42 (c) and PDZ12.01.

Is there any surviving evidence for the church recorded in the north corner of the site?

A number of Victorian walls located in the northern end of trench PDZ12.01 may relate to the structure and structures contemporary with the former Christ Church that was located on the site. Cartographic investigation would allow for the exact relationship to be ascertained.

How extensive is modern truncation and how thick is modern made ground across the site and what is the level of disturbance and truncation associated with the construction of the Gas Depot?

The pre-modern landsurface seems to be preserved at the top of the alluvial sequence, between 1.1m OD in the west of PDZ12.01, 1.5m OD in PDZ5.42(C) and 2.1m OD in the north east of PDZ12.01. This suggests that within the footprint of the trenches relatively little disturbance and truncation has taken place, although piling and other modern cut features has locally truncated the alluvial sequence of archaeological interest.

4.2 General discussion of potential

The trenches are located at the eastern margin of the prehistoric and later river. The main body of the river would have existed beyond the western limits of excavation and at every stage of river evolution recorded in the trenches the deposits suggest a location that would have been peripheral to the main channel of the river itself. Such a location is likely to have been attractive for prehistoric and later exploitation, as suggested by the archaeological finds recovered from PDZ12.01 and further evidence of the prehistoric use of the river in the vicinity of PDZ12 may be recovered from the proposed excavation.

The alluvial deposit sequence present on the site records several phases of channel activity. Further work on the samples already taken from the site and from samples yet to be taken during the excavation has very good potential to shed light on the evolving environment and river regime of the Lower Lea, particularly as there is good potential for dating the deposit sequence. Finds were present in the deposits for spot dating, organic material was present for radiocarbon dating and there is potential for OSL dating of the fluvial silts and sands. Good assemblages of snails, insects, seeds and also animal bone were recovered from the alluvial deposits and pollen, diatoms and other microfossils may be preserved in the monolith samples. Data from the trenches and the further observations and records obtained from the proposed excavation will update the current landscape reconstruction models for this area and add significant information to our understanding of the environments existing between the main river channels and the dryland of the river terraces and of the low terrace in particular, which may lie just to the east of PDZ12.01.

4.3 Significance

The archaeology and geoarchaeological evidence seen on the site and potentially still to be recorded during excavation, will provide a significant amount of information that should aid in the understanding of the past environment of the site and its surrounds, and associated human activity. The information will assist in landscape reconstruction models being developed for the Lower Lea Valley and in considerations of the relationship between the changing environment and human activity. It is certainly of local significance and collectively when integrated with similar information from other sites on the Olympics as a whole, would be regionally significant.

Whilst the archaeo-environmental remains and evidence preserved on the site are undoubtedly of local to regional significance, however, there is nothing to suggest that they are of national importance.

5 Assessment by EH criteria

The recommendations of the GLAAS 1998 guidelines on *Evaluation reports* suggest that:

'Assessment of results against original expectations (using criteria for assessing national importance of period, relative completeness, condition, rarity and group value) .....' (Guidance Paper V, 4 7)
A set of guide lines was published by the Department of the Environment with criteria by which to measure the importance of individual monuments for possible Scheduling. These criteria are as follows: *Period*; *Rarity*; *Documentation*; *Survival/Condition*; *Fragility/Vulnerability*; *Diversity*; and *Potential*. The guide lines stresses that 'these criteria should not...be regarded as definitive; rather they are indicators which contribute to a wider judgement based on the individual circumstances of a case' (Annex 4, DOE, Planning and Policy Guidance 16, 1990). For detailed definition of the criteria see that document. Reference has also been made to Darvill, Saunders & Startin, (1987); and McGill, (1995)

In the following passages the potential archaeological survival described in the initial Assessment document and Section 0 above will be assessed against these criteria.

Criterion 1: period
The Evaluation indicates a multi period site. Taken as a whole, archaeology of the site is characteristic of the prehistoric and post-medieval periods.

Criterion 2: rarity
There is nothing to suggest that any of the likely archaeological deposits are rare either in a national or regional context.

Criterion 3: documentation
There may be considerable contemporary documentation for the post-medieval period of the site and there may be some possibility that some of this could be specific enough to relate to individual features.

Criterion 4: group value
The prehistoric landscape features relate to and are part of the wider pattern seen within the Olympic Park and elsewhere in the Lea Valley. Full interpretation is only possible in that context. The location of this site, close to the former confluence of the Lea and the Thames, has a bearing on the understanding of the past environment of the Thames' floodplain. The post-medieval survival is remnants of part of the spread eastwards from the City of London and the urbanisation of the site area, combined with the linking of the former villages of Stratford and Mile End.

Criterion 5: survival/condition
The evaluation results have demonstrated that prehistoric/geoarchaeological remains were preserved beneath several metres of modern made ground.

Criterion 6: fragility
Experience from other sites has shown that isolated and exposed blocks of stratigraphy can be vulnerable to damage during construction work.

Criterion 7: diversity
Clearly, taken as a whole, the deposits at the site do not represent a diverse and heterogeneous group of archaeological remains of all types and periods. However, this diversity is in itself the product of a random process of vertical and horizontal truncation and separation. There is no reason to suggest that the diversity *per se* has any particular value which ought to be protected.

Criterion 8: potential
(the term Potential in this context appears to mean that though the nature of the site, usually below-ground resources, cannot be specified precisely, it is possible to document reasons predicting its existence and importance)

The evaluation has shown that deposits of alluvium overlying early Holocene gravels are likely to exist elsewhere in the vicinity. Further examination of the site and of samples already taken from the alluvial deposits hold the potential to enhance current understanding of the natural and manmade environment of this part of the Lea Valley from the early prehistoric to modern periods.

6 Proposed development impact and recommendations

The proposed development for the site primarily comprises the introduction of new services and the creation of a coach parking area in the centre of the zone and construction of Temporary Bridge T12. Laying of surface water drainage pipes are also proposed. The construction methods for these works will disturb, and have the potential to destroy, archaeological deposits within their footprints. Other construction works are planned, though these have been assessed as not impacting upon the archaeological resource (MoLAS-PCA, 2007b).

The assessment above (Section 5) does not suggest that preservation *in situ* would be an appropriate mitigation strategy. MoLAS-PCA considers that the evaluation has demonstrated that alluvial deposits of archaeological significance survive beneath 19th and 20th century made ground deposits. These deposits are likely to be of importance for archaeological finds and features as well as having good palaeoenvironmental potential.

It is considered that further archaeological and geoarchaeological fieldwork is necessary to examine and record the nature and extent of the prehistoric and later activity identified in PDZ12.01 evaluation trench and its inter-relationship with the changing environment and river characteristics. This work should involve an extension of the trench eastwards, to examine whether occupation activity exists on the dryland identified in this area and whether earlier phases of the river regime exist. It should also extend the base of the trench in the south west, where tufa deposits, associated with a spring and likely to be of significance for local prehistoric activity were identified during the evaluation and evidence for the later evolution of the river might be found.

Following this further excavation it is recommended that the samples already collected from PDZ5.42(C) and PDZ12.01 are assessed alongside those taken as part of the excavation.

As identified in the DDBA (MoLAS-PCA 2007) the objectives of this further fieldwork would be:

- To identify evidence for settlement of prehistoric and historic date;
- To identify wetland and channel marginal activity of prehistoric date and riverside structures of historic date;
- To identify evidence for the nature and/or date of past land management and exploitation.

In addition, the evaluation has identified further specific objectives:

- Is there potential for ritual activities associated with the streams and spring?
- What further information can be obtained from the four posted structure and associated features (if any);
- The interaction between wetland and dryland activities, particularly in the early prehistoric period;

- The interaction between human activity and the changing environment;
- Evidence for medieval land consolidation and occupation.

The decision on the appropriate archaeological response to the deposits existing on the site rests with the Local Planning Authority and their designated archaeological advisor.

7 Acknowledgements

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The authors would like to thank Gary Brown for his project management, and Josephine Brown for her work on the illustrations; Raoul Bull and Kieron Tyler for project management and editing. MoLAS-PCA geoarchaeologists Jane Corcoran, Graham Spurr and Tom Hoyle carried out the onsite sampling and reporting on the site and Jane Corcoran contributed to the text of this report. In addition, thanks are due to the attending contactors for their cooperation and assistance during the project. Thanks also to the following: MoLAS archaeologists who were Vicky Donnelly, Tina Dolan, Lucy Garnsworthy, George Loffman, Michael Tetreau, Kirk Roberts; to the MoLAS geomatics department, Neville Constantine and Catherine Drew; and to the PCA surveyor Jem Rogers.

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9 Appendix 1: NMR OASIS archaeological report form

OASIS ID: molas1-40627

Project details	
Project name	Olympics Delivery Zone 12, Work Packages 1 and 2, Trenches PDZ12.01 and PDZ 5.42 (c)
Short description of the project	An archaeological evaluation of the proposed construction impacts of the London 2012 Olympics Site designated Planning Delivery Zone 7.
Project dates	Start: 05-11-2007 End: 06-02-2008
Previous/future work	No / No
Any associated project reference codes	OL-08507 - Sitecode
Any associated project reference codes	OL-08707 - Sitecode
Type of project	Field evaluation
Site status	None
Current Land use	Industry and Commerce 2 - Offices
Monument type	WOOD STAKES Uncertain
Monument type	POTTERY Neolithic
Monument type	CULVERT Post Medieval
Monument type	WELL Post Medieval
Monument type	TIMBER STRUCTURE Uncertain
Monument type	RIVER CHANNEL Uncertain

Monument type	FLINT DEBITAGE Uncertain
Significant Finds	POTTERY Neolithic
Significant Finds	HORSE BONES Uncertain
Methods & techniques	'Targeted Trenches'
Development type	Car park (flat)
Prompt	Planning condition
Position in the planning process	Pre-application

Project location

Country	England
Site location	GREATER LONDON NEWHAM STRATFORD Olympics Planning Delivery Zone 12
Postcode	E15
Study area	9800.00 Square metres
Site coordinates	TQ 38425 83635 51.5341279407 -0.00399460956357 51 32 02 N 000 00 14 W Point
Height OD	Min: -0.20m Max: 1.50m

Project creators

Name of Organisation	MoLAS/PCA
Project brief originator	ODA
Project design originator	MoLAS/PCA

Project director/manager	Gary Brown
Project supervisor	Aaron Birchenough
Type of sponsor/funding body	ODA
Name of sponsor/funding body	Olympic Delivery Authority

Project archives

Physical Archive recipient	LAARC
Physical Contents	'Animal Bones','Ceramics','Environmental','Wood','Worked stone/lithics'
Digital Archive recipient	LAARC
Digital Contents	'other'
Paper Archive recipient	LAARC
Paper Contents	'other'

Entered by	Elaine Eastbury (eeastbury@molas.org.uk)
Entered on	14 April 2008

10 Appendix 2: Context index

10.1 Trench PDZ12.01

Context No.	Plan	Section/ Elevation	Type	Description	Date
1	n/a	1;2;3	Layer	**Made ground**	Modern
2	n/a	10	Layer	**consolidation layer..**	Post-medieval
3	n/a	10	Layer	**consolidation layer.**	Post-medieval
4	n/a	10	Layer	**consolidation layer.**	Post-medieval
5	n/a	10	Layer	**Consolidation layer.**	Post-medieval
6	n/a	10	Layer	**consolidation layer.**	Post-medieval
7	n/a	10	Layer	**consolidation layer.**	Post-medieval
8	n/a	10	Fill	Fill of oak lined **pit** [9].	Post-medieval
9	12.01	10	Cut	Probable **industrial pit** Oak lined at base.	Post-medieval
10	n/a	10	Fill	Fill of small pit [11].	Post-medieval
11	n/a	10	Cut	Irregular shaped **pit**.	Post-medieval
12	n/a	10	Layer	**consolidation layer**	Post-medieval
13	n/a	10	Fill	Concrete drain [14].	Modern
14	n/a	10	Cut	**Construction cut** for drain [14].	modern
15	n/a	10	Fill	Backfill of well [17].	Post-medieval
16	12.01	10	Masonry	Red brick **well** [17].	Post-medieval
17	12.01	10	Cut	well **construction cut**.	Post-medieval
18	n/a	10	Layer	**consolidation layer.**	Post-medieval
19	n/a	10	Layer	**consolidation layer.**	Post-medieval
20	n/a	10	Layer	Firm grey-orange sand dump (trample?)	Post-medieval
21		10	Layer	Sandy dump/trample (open area activity)	Post-medieval
22		10	Layer	Sandy dump/trample (open area activity)	Post-medieval
23		10	Layer	Sandy dump/trample (open area activity)	Post-medieval
24		10	Layer	Sandy dump/trample (open area activity)	Post-medieval
25		10	Layer	Sandy dump/trample (open area activity)	Post-medieval
26		10	Fill	Fill of [29]	Post-medieval
27		10	Masonry	**Brick Wall**	Post-medieval
28		10	Timber	Timber base plate supporting wall [27]	Post-medieval
29		10	Cut	Construction cut for [27]	Post-medieval
30		10	Layer	Sand layer (floor make up?)	Post-medieval
31		10	Layer	Sand layer (floor make up?)	Post-medieval
32		10	Layer	Sand layer (floor make up?)	Post-medieval
33		10	Layer	Sand layer (floor make up?)	Post-medieval
34		10	Layer	Sand layer (floor make up?)	Post-medieval
35		10	Layer	Sand and paving (**floor**)	Post-medieval
36		10	Layer	Sand layer (floor make up?)	Post-medieval
37		10	Layer	Burnt deposit (undefined)	
38		10	Layer	Sand layer	Post-medieval
39		10	Layer	Sandy clay	Post-medieval

40		10	Layer	Alluvial? clay	
41		10	Layer	Silty sand (undefined)	Post-medieval
42		10	Masonry	**Culvert** pipe	Post medieval–Modern
43		10	Cut	**Construction cut** for [42]	Post medieval–Modern
44		10	Fill	Rubble backfill of cut [44] **Foundation**	Post medieval
45		10	Cut	**Construction cut**	Post medieval
46		10	Layer	Sand layer (poss. construction deposit?)	Post-medieval
47		10	Layer	Sand layer (poss. construction deposit?)	Post-medieval
48		10	Layer	Sand layer (poss. construction deposit?)	Post-medieval
49		10	Layer	Sand layer (poss. construction deposit?)	Post-medieval
50		10	Layer	Sand and gravel (consolidation/hardstanding?)	Post-medieval
51		10	Cut	Undefiend cut	
52		10	Fill	Fill of [51]	
53		10	Layer	Clay sand layer	
54		10	Layer	Mad ground	Post-medieval
55	63		Layer	Gravel horizon	E. Neolithic
56	63		Layer	Alluvial clay	
57	63		Layer	Alluvial clay	
58	63		Layer	Alluvial clay	
59	63		Layer	Channel fill	
60	63		Layer	Sand bank	
61	63		Layer	Alluvial clay	
62	63		Cut	**Channel** cut/**bank**	Prehistoric
63	63		Layer	**Terrace gravels** / Lea Valley Gravels	Late Pleistocene
64	63		Layer	Alluvial/fluvial sand-channel fill	
65	63		Layer	Alluvial fill-channel fill	
66	63		Timber	Worked wood	Post LIA
67	63		Timber	Worked wood	
68	63		Timber	Worked wood	Post LIA
69	63		Timber	Worked wood	Post LIA
70	63		Timber	Worked wood	Post LIA
71	63		Timber	Worked wood	
72	63		Timber	Worked wood	
73	73		Timber	**Stake**	E. Neolithic
74	73		Timber	**Stake**	E. Neolithic
75	73		Timber	**Stake**	E. Neolithic
76	73		Fill	Fill of [76]	
77	73		Cut	Stakehole/**Stake**	E. Neolithic
78	**VOID**				
79		6	Fill	Fill of [80]	Post-med?
80		6	Cut	Not defined	
81		6	Layer	Construction deposit	Post medieval
82		6	Masonry	**Wall/foundation**	Post medieval
83		6	Cut	**Construction cut** for [82]	Post medieval
84		6	Fill	Fill of [85]	Post medieval
85		6	Cut	Not defined (**prob. pit0**	Post medieval
86		6	Layer	Sandy deposit	Post medieval
87		6	Layer	Sand and rubble	Post medieval
88		6	Layer	Sand and rubble	Post medieval

89		6	Masonry	**Wall/foundation**	Post medieval
90		6	Cut	**Construction cut** for [89]	Post medieval
91		6	Fill	Fill of [92]	Post medieval/modern
92		6	Cut	Sewerage pipe cut	Post medieval/modern
93		6	Layer	Sand lens	
94		6	Masonry	Brick **foundation**	Post medieval
95		6	Cut	Construction cut of [94]	Post medieval
96		6	Fill	Fill of [97]	Post medieval
97		6	Cut	Cut-undefined (poss. pit)	Post medieval
98		6	Fill	Fill of [99]	Post medieval
99		6	Cut	Sewerage pipe cut	Post medieval
100		7	Masonry	Brick wall foundation	Post medieval
101		7	Masonry	Brick wall foundation	Post-medieval
102		6	Layer	Made ground dump	Modern
103		6	Masonry	Brick wall foundation	Post-medieval
104		6	Cut	construction cut for Wall [103]	Post-medieval
105		6	Cut	construction cut for Wall [100]	Post-medieval
106		6	Cut	construction cut for Wall [101]	Post-medieval
107		6	Layer	Gravel sand layer	
108		6	Masonry	Brick and chalk foundation	Post medieval
109		6	Cut	Construction cut for [108]	Post-medieval
110		6	Layer	Silty sand with chalk	Post medieval
111		6	Layer	Coarse sand	
112		6	Layer	Scorched soil/industrial waste horizon	Post medieval
113		14	Fill	Fill of [115]	Post medieval
114		14	Fill	Fill of [115]	Post medieval
115		14	Cut	Possible pit	Post medieval
116		14	Layer	Made ground	Post-medieval
117		14	Fill	Fill of [119]	Post-medieval
118		14	Fill	Fill of [119]	Post-medieval
119		14	Cut	Probable pit	Post-medieval
120		14	Layer	Consolidation/ground raising deposit	Post-medieval
121		14	Layer	Consolidation/ground raising deposit	Post-medieval
122		14	Layer	Consolidation/ground raising deposit	Post-medieval
123		14	Layer	Consolidation/ground raising deposit	Post-medieval
124		14	Layer	Consolidation/ground raising deposit	Post-medieval
125		14	Layer	Consolidation/ground raising deposit	Post-medieval
126		14	Layer	Consolidation/ground raising deposit	Post-medieval
127		14	Layer	Consolidation/ground raising deposit	Post-medieval
128		14	Layer	Consolidation/ground raising deposit	Post-medieval
129		14	Layer	Consolidation/ground raising deposit	Post-medieval
130		14	Layer	Consolidation/ground raising deposit	Post-medieval
131		14	Layer	Consolidation/ground raising deposit	Post-medieval

132		14	Layer	Consolidation/ground raising deposit	Post-medieval
133		14	Layer	Consolidation/ground raising deposit	Post-medieval
134		14	Layer	Consolidation/ground raising deposit	Post-medieval
135		14	Layer	Consolidation/ground raising deposit (rubble)	Post-medieval
136		14	Layer	Consolidation/ground raising deposit	Post-medieval
137		14	Layer	Consolidation/ground raising deposit	Post-medieval
138		14	Layer	Consolidation/ground raising deposit	Post-medieval
139		14	Layer	Consolidation/ground raising deposit	Post-medieval
140		14	Layer	Consolidation/ground raising deposit	Post-medieval
141		14	Layer	Consolidation/ground raising deposit	Post-medieval
142		14	Layer	Clay	Post-medieval
143		14	Layer	Iron panned 'surface' deposit	Post-medieval
144		14	Layer	Consolidation/ground raising deposit	Post-medieval
145		14	Layer	Rubble dump layer	Post-medieval
146		14	Layer	Clay layer	
147		14	Cut	Large cut for ground consolidation prior to construction	Post-medieval
148		14	Layer	Consolidation fill	Post-medieval
149		14	Layer	Consolidation fill	Post-medieval
150		14	Layer	Consolidation fill	Post-medieval
151		14	Layer	Consolidation fill	Post-medieval
152		14	Layer	Consolidation fill	Post-medieval
153		14	Cut	Large cut to allow ground consolidation	Post-medieval
154		14	Fill	Fill of [157]	Post-medieval
155		14	Fill	Fill of [157]	Post-medieval
156		14	Fill	Fill of [157]	Post-medieval
157		14	Cut	Pit	Post-medieval
158		14	Layer	Made ground/	Post-medieval
159		14	Layer	Alluvial clay	
160		14	Layer	Alluvial clay	
161	73		Layer	Comsolidation layer	Post-medieval
162			Layer		
163			Masonry	Well	
164			Cut	Erosional cut (assoc. [192]	
165		19	Masonry	Brick soakaway	
166			Layer		
167		18	Layer	Made ground consolidation	Post-medieval
168		18	Layer	Made ground consolidation-landsurface	
169		18	Layer	Alluvial clay	
170		18	Layer	Alluvial clay	
171		18	Layer	Alluvial silt	
172		18	Layer	Alluvial clay	
173		18	Layer	Alluvial clay	
174		18	Layer	Alluvial clay	
175		18	Layer	Alluvial clay	

176		18	Layer	Alluvial clay	
177		22	Fill	Waterlain fill of [179]	
178		22	Fill	Basal fill of [179] (flood event deposit)	
179		22	Cut	Probable channel feature	
180	UNUSED				
181		22	Timber	Small worked stake	
182		22	Layer	Freshwater deposit	
183		22	Layer	waterlain peaty silt **Tufa**	
184		22	Layer	Allluvial/fluvial Silt	
185		22	Layer	Allluvial/fluvial silt channel fill	
186		22	Layer	Gravel horizon (same as [63])	Late Pleistocene
187		22	Layer	Sandy **bank** deposit	Prehistoric
188		18	Timber		
189		22	Layer	Silty **bank** deposit	Prehistoric
190		18	Wood	Root	
191		21	Layer	**Tufa deposits**	Prehistoric
192		23	Layer	Organic rich alluvial clay	
193		23	Layer	Buried land surface	
194		23	Layer	Weathered alluvium	
195		23	Layer	Rooty sands	
196		25	Layer	Waterlain silt and clay	
197		25	Layer	Channel activity deposit	
198		25; 26	Layer	Stream bed deposit	
199		11	Layer	Consolidation deposit	Post-medieval
200		11	Layer	Consolidation deposit	Post-medieval
201		11	Layer	Consolidation deposit	Post-medieval
202		11	Layer	Consolidation deposit	Post-medieval
203		11	Layer	Consolidation deposit	Post-medieval
204		11	Layer	Consolidation deposit	Post-medieval
205		11	Masonry	Brick drain	Post-medieval
206		11	Cut	Construction cut for [205]	
207		17	Layer	Alluvial clay: standing water deposit	
208		17	Layer	Organic alluvium	
209		17	Layer	Organic silt	
210		17	Layer	Channel bed deposit/mudflat	
211			Fill	Fill of [212]	
212			Cut	Stakehole	
213		15	Layer		
214		15	Layer	Construction debris layer	Post medieval
215		15	Layer	Consolidation layer	Post medieval
216		15	Layer	Consolidation layer	Post medieval
217		15; 19	Fill	Fill of [165]	
218		15	Layer	Alluvium-flood episode deposit	
219		15; 19	Layer	Alluvium-flood episode deposit	
220		19	Nat	Tree bowl	
221		26	Layer	Peaty silt alluvium	
222		26	Layer	Alluvial silt	
223		26	Layer	Alluvial/fluvial silt	
224		26	Layer	Streambed gravel	
225		15	Nat	Tree bowl	
226		15	Layer	Construction/consolidation dump	Post medieval
227		15	Layer	Construction/consolidation dump	Post medieval
228		6	Fill	Fill of [229]	Post medieval
229		6	Cut	Pit	Post medieval
230		6	Fill	Fill of [229]	Post medieval
231		6	Fill	Fill of [232]	Modern

232		6	Cut	Pit	
233		6	Masonry	Brick wall/foundation	Post-medieval
234		6	Cut	Construction cut for [233]	Post medieval
235		6	Masonry	Brick wall	Post medieval
236		6	Cut	Construction cut for [235]	Post medieval
237		6	Layer	Made ground	Post med–modern
238		6	Layer	Poss. floor make up	Post medieval
239		6	Layer	Floor make/foundation	Post medieval
240		6	Layer	Mortar floor make up	Post medieval
241		6	Layer	Made ground	Post medieval
242		6	Layer	Sand deposit	Post medieval
243		6	Fill	Fill of [232]	Modern
244		6	Layer	Made ground	Post medieval
245		10	Layer	Made ground	Post medieval
246		10	Layer	Consolidation deposit	Post medieval
247		19	Layer	Alluvial clay	
248		6	Masonry	Brick wall/footings	Post medieval
249		6	Cut	Construction trench for [248]	Post medieval
250		11	Cut	Construction cut for [205]	Post medieval

10.2 Trench PDZ5.42(C)

Context No.	Section/ Elevation	Type	Description	Date
1	4	Layer	Channel bank deposit	
2	4	Layer	Peaty channel fill deposit	
3	4	Layer	Alluvial clay	
4	4; 3	Layer	Alluvial clay	
5	4	Layer	Peat bed	
6	4	Layer	Alluvial clay	
7	4	Layer	Peat lens	
8	4	Layer	Pile arising	Modern
9	4	Layer	Channel bank deposit	
10	4	Layer	Tree throw?	
11	4; 3	Layer	Alluvial clay	
12	8	Layer	Peaty Alluvial silt (channel fill)	
13	8	Layer	Organic alluvial silt	
14	8	Layer	Organic silt lens	
15	8	Layer	Alluvial clay lens	
16	8	Layer	Weathered alluvial silt	
17	8	Layer	Pile arising/fill	Modern
18	8	Layer	Pile arising/fill	Modern
19	8	Layer	Alluvial silt (channel bank deposit)	
20	8	Layer	Alluvial clay	
21	3	Layer	Alluvial clay	
22	3	Layer	Alluvial clay w. peat	
23	2	Layer	Buried land surface/soil	Post medieval
24	2	Layer	Alluvial clay	
25	6	Layer	Buried land surface/soil	Post medieval
26	6	Layer	Alluvial clay	
27	7	Layer	Weathered alluvial clay	
28	7	Layer	Weathered alluvial silt	
29	7	Layer	Peaty silt (alluvial)	
30	7	Layer	Alluvial silt	

11 Appendix 3: Glossary

Alluvium. Sediment laid down by a river, and usually well-sorted. Can range from sands and gravels deposited by fast flowing water and clays that settle out of suspension during overbank flooding. Other deposits found on a valley floor are usually included in the term alluvium. Peat develops when there is little mineral sediment deposition and impeded drainage, which limits biological decay; and tufa accumulates when springs rich in calcium carbonate discharge in damp well-vegetated situations.

Arctic Beds. Cold climate deposits, pre-dating the Last Glacial Maximum and sometimes found within the gravels of the Lower Lea. They may survive within parts of the floodplain not reworked by the river during the Late Glacial.

Ecotone. A zone that lies between areas of contrasting environment, such as on the wetland/dryland margins.

Holocene. The most recent epoch (part) of the Quaternary, covering the past 10,000 years during which time a warm interglacial climate has existed. Also referred to as the 'Postglacial' and (in Britain) as the 'Flandrian'.

Knickpoint. A fall in base level (such as the low sea level at the end of the Pleistocene) gives rise to a discontinuity in the longitudinal profile of a river i.e.: steepening of the downstream channel gradient. The river tends to adjust to such a change by increased flow, which leads to increased erosion in the steepened section of the river and this results in the steepened section (knickpoint) cutting back in an upstream direction.

Last Glacial Maximum. The height of the glaciation that took place at the end of the last cold stage, around 18,000 years ago.

Late Glacial. The period following the Last Glacial Maximum and lasting until the climatic warming at the start of the Holocene. In Britain this period is subdivided into a warm 'interstadial' episode the Windermere Interstadial, followed by a renewed cold ('stadial') episode, in which local ice advances occurred (the Loch Lomond Stadial).

Pleistocene. Used in this report to refer to the earliest part of the Quaternary, the period of time until the start of the Holocene, about 10,000 years ago. However, since the present Holocene epoch is almost certainly only a warm interglacial episode within the oscillating climate of the Quaternary, it is often seen as being part of the Pleistocene epoch, in which case the terms Pleistocene and Quaternary are interchangeable. As it is necessary, in this report, to differentiate between the events that took place at various times during the last cold stage and earlier in the Quaternary and those that took place during the Holocene, the Pleistocene is used to refer to the parts of the Quaternary pre-dating the climatic amelioration that took place at the start of the Holocene.

Quaternary. The most recent major sub-division (period) of the geological record, extending from around 2 million years ago to the present day and characterised by climatic oscillations from full glacial to warm episodes, when the temperate was as warm as if not warmer than today. To a large extent human evolution has taken place within the Quaternary period.

12 Appendix 4: OL-08707, finds assessment

12.1 Animal bone

Brian Connell
A total of eighteen bones were recovered from context [55].

These consisted of seven bones that were identifiably equid, presumably horse: L/R tibiae (from same individual), a left astragalus, a proximal phalanx, a distal phalanx, a right femoral shaft and a left tibial shaft. These bones represent a minimum of two horses.

There were also a number of other bones (eleven) that were either horse or cattle (*Equus* / *Bos*) and these consisted of a cervical vertebra, seven large rib sections, a right calcaneum and a left ulnar shaft which was identifiably *Bos*. In addition there was a single incisor tooth from a Red or Fallow deer (*Cervus elaphus* / *Dama dama*).

All of these bones and teeth are from adult animals and none showed any butchery or bone working marks. One of the right equid tibiae showed rodent gnawing marks on the anterior surface of the shaft.

Although if considered in isolation these bones are of no research value. However, their presence in a prehistoric context has a bearing on the understanding of the local environment and land use.

12.2 Building material

Ian Betts
All the building material has been recorded using the standard recording forms used by the Museum of London. This has involved fabric analysis undertaken with a x10 binocular microscope. The information on the recording forms has been added to an Oracle database.

Building material	One small crate of ceramic building material (all discarded after assessment). Total 1.51kg

Table 4 Building material: general summary

Material	**Count**	**Count as % of total**	**Weight (kg)**	**Weight as % of total**
Stone	1	10	0.040	2.7
Medieval ceramic	1	10	0.020	1.3
Post-med ceramic	7	70	1.450	96.0
Mortar	1	10	0.001	0.1
Total	10		1.511	

Table 5 Building material: breakdown

There was no Roman or Saxon building material present.

12.2.1 Medieval building material

Fabric: 2271

The only medieval building material present on the site is a small fragment of peg tile of broad 1180–1480 date (Context [149]).

12.2.2 Post-medieval stone and mortar

A small piece of chalk and a thin slither of mortar were found with post-medieval roofing tile in context [154]

12.2.3 Post-medieval ceramic building material

Fabric 2276

A small quantity of post-medieval peg roofing tile was found in contexts [149], [154], [158] and [217]. The later also contained a piece of ridge tile which would have been used on the same roof, or roofs. The peg tiles of two round nail hole type with nail holes between *c* 11mm and 14mm diameter.

12.2.4 Potential

The small size of the building material assemblage coupled with a lack of distinct well dated building material means that there is little potential for providing information to answer the research aims.

12.2.5 Significance

The building material is of only limited local significance. The post-medieval roofing tile presumably came from buildings located nearby. As for the medieval tile, its significance is less certain as it was found with post-medieval peg tile so may have come on to the site at a later date. It does not necessary imply medieval building activity.

12.3 Bulk glass

Beth Richardson
There are four pieces of post-medieval glass from two contexts: [40] and [145]. The three joining pieces from [145] are from a late 18th- or 19th- century green glass cylindrical wine bottle. The glass is light green and thin walled, suggesting French manufacture, possibly from a cylindrical 19th century Burgundy or cognac bottle. The single piece from [40], in a darker green glass, is from a domed base of an English wine bottle which could date from the late 16th to the 19th century.

No further work is necessary.

12.4 Clay tobacco pipe

Tony Grey

A total of two fragments was submitted from two contexts.

The clay tobacco pipes from OL-08707 were recorded in accordance with current MoLAS practice and entered onto the Oracle database. Pipe bowls, though not present here, would be classified and dated according to the Chronology of London Bowl Types (Atkinson and Oswald 1969). Quantification and recording follow guidelines set out by Higgins and Davey (1994; Davey 1997).

12.4.1 Forms

Both fragments (from contexts [116] and [150]) are stems so not diagnostic and only datable within the broad range *c* 1580-1910.

12.4.2 Discussion

No further work needs to be done on this tiny undiagnostic clay pipe assemblage

12.5 Struck/worked flint

Tony Grey
Twenty-three pieces of flint were submitted for analysis from four contexts, [55], [162], [192] and [219].

Of these, seven were regarded as field flint from contexts [55] and [192] and the remaining sixteen pieces as debitage (waste flakes from knapping).

Ctxt	Flakes	Blades, blade-like flakes	Cores, core fragments	Retouched forms	Wt	Comments
55	11					Small or tiny flakes Sq 1, field flint Sq 2
162	3					Small flakes SF 1,2,3
192						3 burnt flint 50g, 2 field flint
219	2					2 small flakes
Total	**16**					**16**

Table 6: Breakdown of struck/worked flint assemblage

12.5.1 Characterisation

Context [55] yielded an irregular uncertain flake, one secondary sieved flake and nine wet sieved secondary flakes from Square 1. Square 2 yielded only peat/riverine silt-blackened field flint. One flake is of medium size in mid-grey to black with 20-30% grey cortex while the other flakes are small to tiny in ochre coloured flint. Context [162] yielded three small irregular secondary flakes in mid- to dark grey and buff coloured flint listed as Small Finds 1, 2 and 3. Context [219] yielded two small flakes in orange-grey flint.

Context [192] yielded two small pieces of field flint and three pieces of burnt flint weighing 50g.

12.5.2 Discussion

The raw material is flint of poor quality in colours ranging from buff and ochre to various shades of grey to black. One bears cortex. None show any patina. The cortex on one flake indicates derivation from a chalk based environment. The small flakes were probably derived from gravel pebbles. Most of the small pieces of field flint are peat blackened. Hard hammer technology has been used and some flakes show a prominent bulb of percussion below the platform. A dating period from prehistory cannot be estimated from these undiagnostic pieces.

12.5.3 Significance

The flint assemblage indicates prehistoric activity at or in the vicinity of the site. The material is debitage from flint knapping. No period of prehistory can be assigned.

12.6 Medieval and later pottery

Nigel Jeffries

The medieval and later pottery was examined macroscopically, using a binocular microscope (x 20) where appropriate, and recorded on paper and computer, using standard Museum of London codes for fabrics, forms and decoration. The numerical data comprises sherd count, estimated number of vessels and weight and entered onto the ORACLE database. This assessment aims to evaluate the character and the date range of the assemblage, determine the research questions the material has the potential to address and identify any areas of further work.

12.6.1 Quantification and description

Filling the portion of one standard archive-sized box, this text considers the pottery retrieved from the archaeological evaluation at OL-08707 which comprised two trenches. Though some material recovered can be dated to the medieval period, Table 8 demonstrates that the vast majority of the pottery is mid 17th to early 18th century in date and was found within undisturbed landuse. Consequently this assemblage can be used to provide a solid platform for characterising the deposits it was recovered from and establishing a consistent chronology for the archaeological sequence.

Medieval pottery	4 sherds. Total 0.04 kg
Post-medieval pottery	12 sherds. Total 0.50 kg

Table 7 Finds and environmental archive general summary

12.6.2 Medieval pottery

The four sherds of medieval pottery are characterised by small-sized fragments (weighing a total of 40 grammes), with little in the way of identifiable characteristics present beyond fabric and basic form. Retrieved in two contexts [131] and [149], the four sherds are all the products of the London type-ware industry (fabric code LOND), one of the major suppliers of pottery into London during the medieval period (kilns have been found in Woolwich), and identified in jar and jug forms.

12.6.3 Post-medieval pottery

Comprising four small-sized groups (contexts yielding fewer than 30 sherds) the pottery dating to the post-medieval period was found in contexts [129], [135], [145] and [150]. Weighing 510 grammes (average weight per sherd of 72.8 grammes) this later material comprised 12 sherds from a minimum number of 7 vessels (Estimated number of vessels: ENV). This was recovered in a variable condition, and with up to 442 of the 510 grammes of this assemblage provided by one vessel alone (from [135]), the rest of the ceramics are therefore relatively poorly preserved, reflecting the nature of the landuse from which they were retrieved.

The pottery found from the site is largely either the well studied products of the Surrey-Hampshire border industry (fabric code BORDB, BORDG) or are locally produced coarse red earthenwares (fabric code PMR), made in production centres located on the south bank of the Thames, notably at Woolwich, Deptford and Lambeth. Both are identified in utilitarian bowl and dish forms.

12.6.4 Discussion

Despite being poorly preserved, the pottery assemblage from OL-08707 can provide enough information to answer some of the research aims for this site in addition to supplying a consistent chronology for the recorded landuse (see Table 8).

Count of context		TAQ			
	TPQ	1350	1700	1800	Grand Total
	1080	2			2
	1580		1	2	3
	1600		1		1
	Total	2	2	2	6

Table 8 Pottery by terminus post-quem and ante-quem dates and frequency of context

12.6.5 Potential

Though this site provided a small-sized pottery assemblage that can be considered as being representative of the condition and chronologies of the ceramics found in any future excavations within the footprint of this development (and in its immediate environs), this group has limited potential, reflecting the nature of the recorded landuse in this area, with these finds not apparently linked to structural evidence.

12.6.6 Significance

Representing common finds from London, the pottery assemblage furthers the understanding of the recorded landuse, characterises the deposits it was recovered from, and provides a consistent 17th to 18th century chronology for the site.

12.7 Registered finds

Beth Richardson

There is a large square-sectioned corroded iron nail and a smaller piece of iron (also from a nail?) from [154]. It may be Roman (the one sherd of pottery from this context is Roman, although possibly residual).

The one registered find from the site, a slightly convex copper alloy button (<1> [8]) is corroded and indistinct. It is decorated with a man's head (facing left) and possibly an inscription around the edge. It may be a 19th century military button (pers. comm. Geoff Egan).

12.8 Roman and earlier pottery

Beth Richardson and Jon Cotton
Context [55] included the rim of a Neolithic plain open bowl with a distinctive rolled rim and a poorly-sorted crushed burnt flint temper.

There are three pieces of Roman pottery: two from [158] and the other from [154]. They are small abraded body sherds, possibly re-deposited. The sherd from [154] is oxidised with a fine matrix containing abundant silt-sized white quartz and black iron ore (not unlike the matrix of Hertfordshire Much Hadham ware) with a few much larger pieces of angular white quartz and rounded red iron-rich pellets. The sherds from [158] consist of (1) a small oxidised fragment with a fine matrix containing mica and sub-angular quartz and (2) the base of a reduced patchy orange/grey-surfaced bowl or dish, highly-fired, fairly micaceous and tempered with abundant sub-rounded quartz. The pottery is Romano-British (c AD 40-400) but the kiln sources (probably Essex/North Kent/Herts) are not known.

No further work is recommended at this stage, but if more (*in situ* rather than redeposited) Roman and prehistoric pottery is found in further excavations on or near the site, the pottery could be amalgamated and studied as part of a larger assemblage.

13 Appendix 5: OL-08707, the worked wood

Damian Goodburn

The notes are intended as a brief pre-assessment report on the archaeological evaluation works at site, written to determine the significance of the assemblage. An extended one-day site visit was made to examine material in situ, and a rapid scan of a sample of lifted worked wood.

Neolithic pottery, flint work and horse bones were recovered from close to a small group of four roundwood stakes set in a roughly square setting c. 0.5m across. The latter was roughly in the centre of the trench which was excavated down with c. 6m deep stepped sides. During the visit other worked wood of apparently later date was found in the stepped sections.

The form of well preserved tool marks on larger roundwood and timber can often provide a broad date bracket for the working of the wood. Therefore a brief attempt was made to expose the tip of one of the four possibly Neolithic stakes to ascertain whether they had been cut by stone axes or later forms of metal bladed axe. Unfortunately the stake was very deeply driven and the effort was aborted after a depth of 0.75m was reached and the hole was carefully back filled to be exposed later.

13.1 Characterisation

Three groups of worked wood were present in the trench:

In the west section, in a later post-medieval dump, small fragments of building timbers could be seen, including oak lath fragments, mixed with brick rubble. In the third and fourth steps of the north section two small roundwood stake tips were seen. The approximate level of driving c. 2m OD, and the smoothly facetted, metal axe –cut tips suggests that they may be medieval or early post-medieval in date. However, neither were fully exposed.

In the bottom step of the north section, lying in a peaty deposit ([181]) was a small group of displaced stakes and small piles were found. When exposed they were found lying roughly horizontal, the south ends were cut by the machine excavator but the north ends were fairly intact. The level of the worked wood was c. 0m OD. This material was lifted at the end of the evaluation and is discussed in more detail below.

The group of four roundwood stakes in the base of the trench within context [55]: [73], [74], [75] and [77]. The exact height from which they were driven in was uncertain but could not have been very much higher than +0.5m OD. That OD level is typical for surviving Bronze Age woodwork in the east London flood plain, but the existence of a natural channel or scour hollow may possibly have allowed washed in later driven stakes and piles to occur at the same levels. The marks made by stone axes versus those of the Bronze Age can be clearly distinguished if well preserved, thus we should be able to provide broad dating in due course. These were left in situ and not examined further.

All the material from [181] comprises worked roundwood small stakes to those of a size we might term piles (all of them found dumped or displaced not in situ) the diameters varied between c.35mm and 130mm. All the tips had been cut to 'pencil points' mostly very neatly and the smooth flat axe facets showed that a metal bladed axe had been used. The larger pile tips and stakes were washed and rapidly examined in good daylight.

Both pile tips [69] and [70] (from [181]) were similar and had similar axe 'stop marks' and 'facets'. Pile tip [69] was the largest at *c* 130mm dia and survived 0.76m from the machine broken south end to the pencil form tip removed from the section. One of the piles/ stakes [68] (from [181]) was made from a cleft ½ log the others were used whole with the bark on. The species used for the various stakes is not one that can be clearly visually identified like oak or beech, but would appears to be one of less distinctive deciduous species such as willow or possibly alder. The material has no tree-ring dating potential.

13.2 Tool mark form and possible initial dating

The depth at which this material was found *c* 0m OD, and some associated rather fresh finds suggests that it is likely to be of prehistoric date. Prior to the use of C14 dating the nature of the tool marks can often provide broad dating within the prehistoric period. The best preserved axe marks occur on pile tip [69] (from [181]) where rather smooth flat facets with incomplete stop marks up to 65mm wide can be seen. The axe used had a fine metal blade at least 70mm wide or possibly wider than that. Axes with these characteristics are known to have been common from the early to middle Bronze Age and in the Iron Age but not in the late Bronze Age where the blades were much narrower and rather rounded. However, they are also known from later periods as well. The axe stop marks and facets are markedly flat and straight. This might just fit the form of the rather straight blades typical of Iron Age socketed axes rather than the more rounded blades typical in the early Bronze Age or even to a lesser degree in the middle Bronze Age. These axe marks stand out as rather straight and flat compared with those of dated Bronze Age woodwork from Greater London and elsewhere in Britain.

13.3 Further work

This small but well preserved assemblage of worked wood clearly requires full systematic recording with scale drawing. That should be followed by selective photography in raking light of at least two items. This would be followed by sampling for species ID and possibly C14 dating.

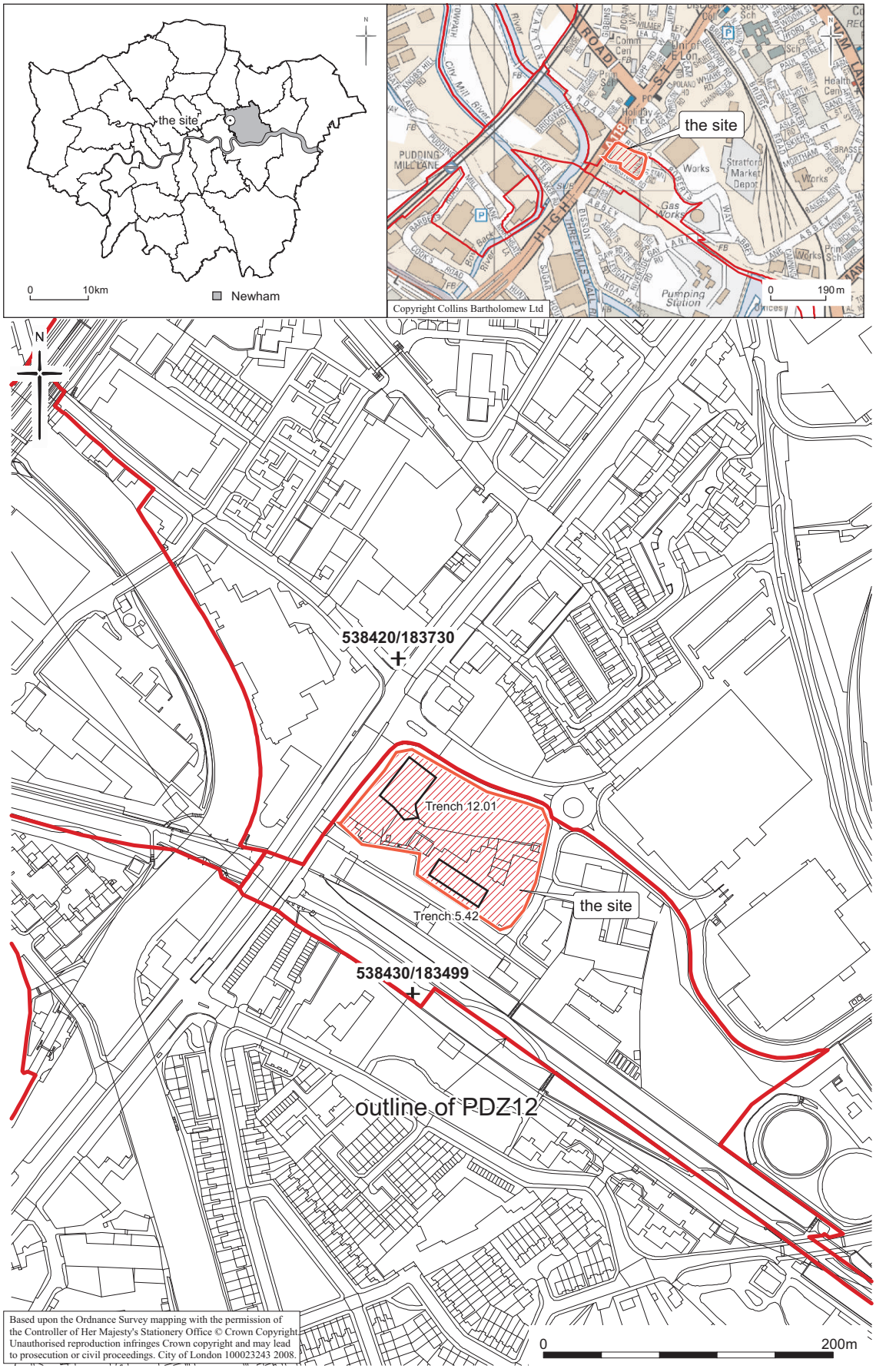

Fig 1 Location map

Fig 2 Location of evaluation trenches

Fig 3 Base plan of trench PDZ12.01

Fig 4 Base plan of trench PDZ5.42 (C)

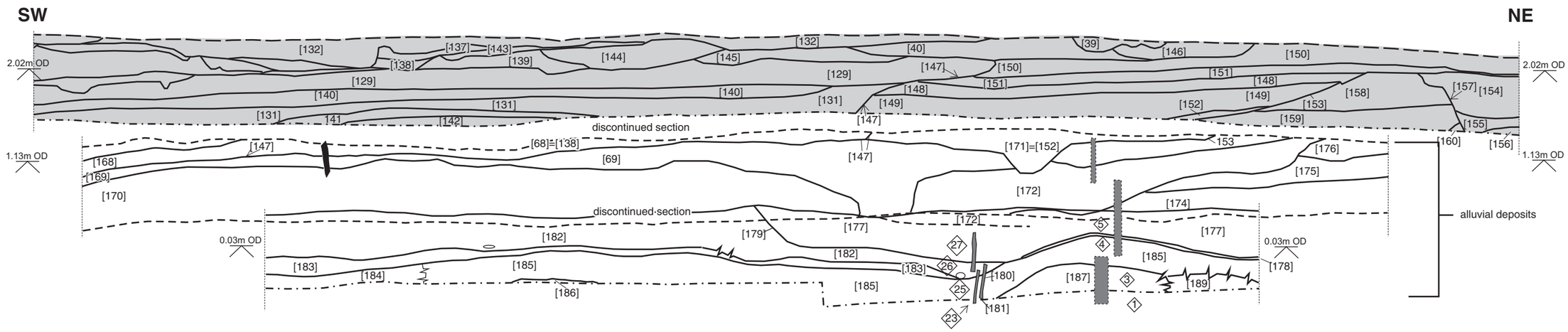

Fig 5 South-east facing section of trench PDZ12.01

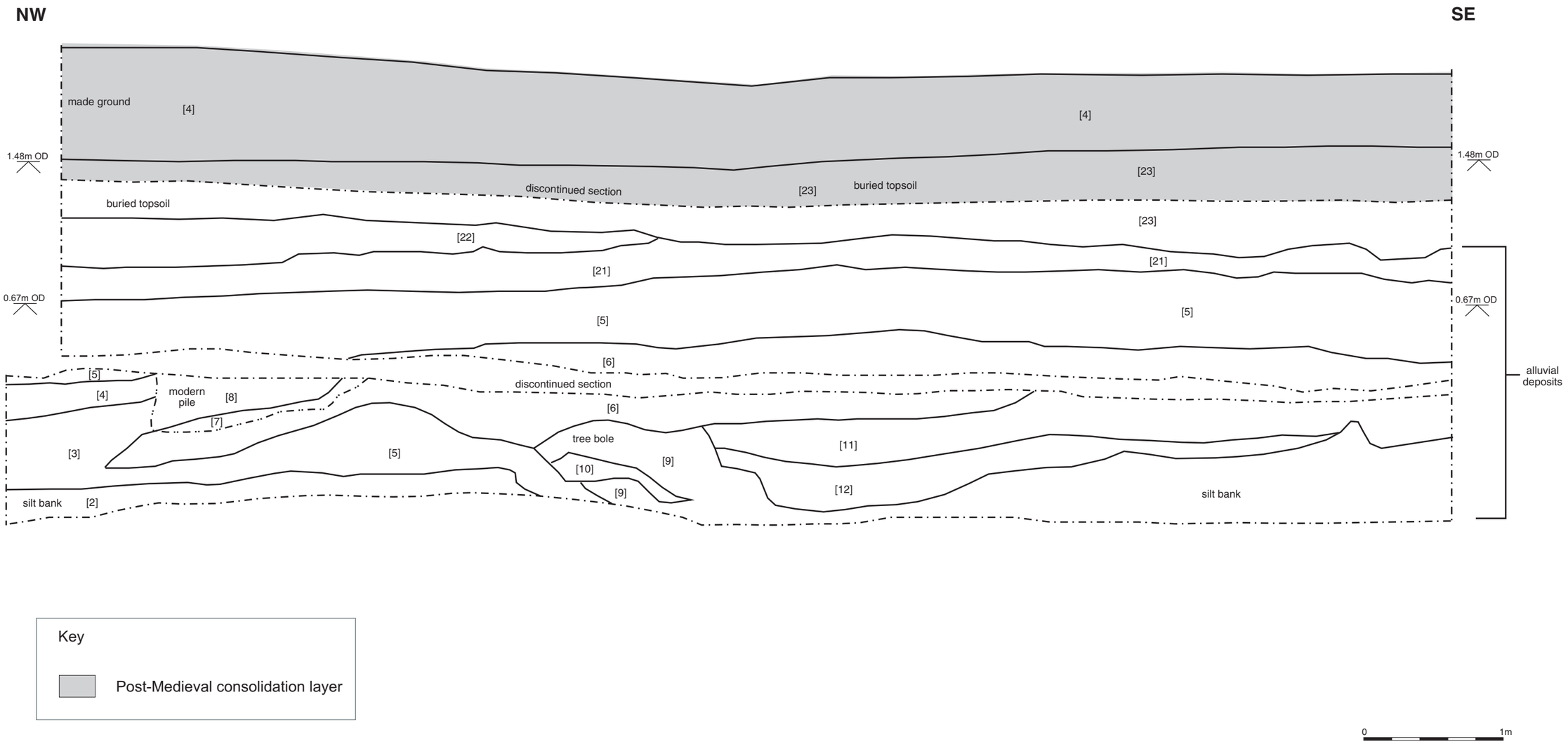

Fig 6 South-west facing section of trench PDZ5.42 (C)