

**CHANNELSEA GORGE, PLANNING DELIVERY ZONE 6 (PDZ6)**

**An Archaeological Evaluation Report**

**NGR: TQ 537750 185300**

**On behalf of the Olympic Delivery Authority**

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## SUMMARY (NON-TECHNICAL)

*This report presents the results of an archaeological evaluation carried out by RPS Planning and Development and AOC Archaeology Group within the Channelsea Gorge, in Construction Zone 6a (CZ6a), in the southwestern extent of Planning Delivery Zone 6 (PDZ6) of the Olympic Park, Stratford, London Borough of Newham (NGR TQ 537750 185300). The report was commissioned by the Olympic Delivery Authority.*

*Following the recommendations of the PDZ6 Detailed Desk Based Assessment and Channelsea Gorge, PDZ 6 Method Statement for Archaeological Evaluation, four evaluation trenches were excavated across the length of the existing Channelsea Gorge. The trenches were set perpendicular to the gorge, through the course of the current Channelsea River.*

*The stratigraphic sequence exposed has illustrated that a significant depth of alluvial deposits and gravels survive within the south of the gorge and made ground and part naturally formed sediments within the north of the gorge, both cut by a former late 19<sup>th</sup> or early 20<sup>th</sup> century river channel. The full extent of the channel was only revealed within the southernmost trench, PDZ6.CG.04. Only the eastern extent of the river channel was found within the trenches (PDZ6.CG.01, PDZ6.CG.02 and PDZ6.CG.03).*

*The cut of the channel changed along its course, having moderately sloping, rounded sides within the south of the gorge (PDZ6.CG.04), which became steeper and straighter to the north. As the gradient of the cut increased, wooden revetments, used to support the sides of the channel, were found. Within the northernmost trench (PDZ6.CG.01) the vertical side of the river channel was supported by a continuous line of vertical timbers secured by a single cross beam, attached by iron nails. To the south of PDZ6.CG.01, within trench PDZ6.CG.02 the river channel was supported by fewer, evenly spaced vertical timbers, supported by a line of three horizontal planks. Further to the south, within PDZ6.CG.03, only sporadically placed posts and a single cross beam were found supporting the edge of the channel. The wooden structures probably represent wooden piling bank supports shown on a 1908 plan of the gorge.*

*A total of fourteen 50cm long column samples and a single bulk sample were collected from the trenches. These environmental samples revealed that within the south of the gorge sediments were laid within an active early Holocene river channel, in a similar way to within trenches PDZ6.07, PDZ6.08, PDZ6.09 and PDZ6.48 further to the west. The north of the gorge was away from the active river channels and comprised part naturally formed sediments and clay made ground overlying the untouched pre-Holocene gravels.*

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## SECTION 1: INTRODUCTION

- 1.1 This document is a report for an Archaeological Evaluation undertaken within the Channelsea Gorge, at Construction Zone 6a (CZ6a) in the north of Planning Delivery Zone 6 (PDZ6) of the Olympic Park, Stratford, London Borough of Newham.
- 1.2 Professional archaeological services were provided by AOC Archaeology Group (hereafter AOC) and RPS Planning and Development (RPS) to the Olympic Delivery Authority (ODA) in respect of the Olympic Park North Central Parkland Spine Application (REF. 08/90310/FULODA).
- 1.3 The site is centred on National Grid Reference (NGR) 537750 185300. The PDZ6a area lies within the London Borough of Newham (Figure 1). The overall area of Zone 6 is approximately 133,170m<sup>2</sup>. The site is located in the northern part of Planning Delivery Zone 6 (PDZ 6) and is bounded by the Clays Lane estate to the east and south, the northern part of the cycle circuit to the north, and the north-south alignment of Henniker's Ditch to the west.
- 1.4 Planning Delivery Zone 6a is a sub zone within one of 15 zones within the Olympic, Paralympic and Legacy Transformation Planning Applications development area. Major structures to be constructed within this zone include a velodrome, BMX venue, fencing venue and buildings associated with the athlete's village. Other works include drainage, roadways, bridges and cycle paths.
- 1.5 A Desk based Assessment was produced as the initial form of Archaeological investigation for PDZ 6 in 2007 (MoLAS-PCA 2007a). The work detailed within this report followed the methodology set out in a method statement addendum produced for PDZ 6 (Atkins 2008 / RPS-AOC 2008), which followed a general zone wide methodology set out in the original method statement (MoLAS-PCA 2007a), but specifically focussed upon the work to be carried out in the Channelsea Gorge, known as Zone 6a. A team of professional archaeologists undertook all works.
- 1.6 This report conforms to the requirements of Planning Policy Guidance: Archaeology and Planning (DoE, 1990) (PPG 16). It has been prepared in accordance with current best archaeological practice and local and national standards and guidelines:

- English Heritage – Management of Archaeological Projects (EH 1991)
- Institute of Field Archaeologists – Standards and Guidance for Archaeological Field Evaluations (IFA 1994)
- Institute of Field Archaeologists – Code of Conduct (IFA 1997).

## SECTION 2: GENERAL OBJECTIVES

- 2.1 The Institute of Field Archaeologists (IFA 2001) states that the purpose of an Archaeological Evaluation is to:

**Determine, as far as is reasonably possible, the nature of the archaeological resource within a specified area using appropriate methods and practices. These will satisfy the stated aims of the project, and comply with the Code of Conduct, Code of Approved Practice for the Regulation of Contractual Arrangements in Field Archaeology, and other relevant by-laws of the IFA.**

- 2.2 Furthermore the purpose of the investigation is detailed as being:

**To gain information about the archaeological resource within a given area or site (including presence or absence, character, extent, date, integrity, state of preservation and quality), in order to make an assessment of its merit in the appropriate context, leading to one or more of the following:**

- **the formulation of a strategy to ensure the recording, preservation or management of the resource;**
- **the formulation of a proposal for further archaeological investigation within a programme of research.**

- 2.3 The protection of archaeological sites forms a significant planning consideration. English Heritage Greater London Archaeology Advisory Service noted (1998) that:

**“In the case of evaluation work the planning applicant should be aware that this is only the initial stage of investigation, carried out in support of a planning application to enable an informed decision. Evaluation will seek to define and characterise the archaeological remains on a site. Should significant archaeological remains be discovered and the proposed scheme has an impact on those remains, further archaeological work will be necessary, in the form of either a mitigation strategy for preservation *in situ*, full excavation or a combination of the two.”**

- 2.4 A field evaluation will thus augment any previous desk-based assessment, and provide all parties, particularly the LPA, with sufficient material information upon which to base informed decisions incorporating adequate heritage safeguards.

- 2.5 A field evaluation will result in a detailed archive of information that can be used to answer archaeological research questions concerning the buried archaeological heritage of the area or site being investigated, either in support of a planning application or to discharge the relevant archaeological planning condition.
- 2.6 The evaluation will provide an assessment of the damage already done to archaeological deposits by previous developments and will also provide an evaluation of the potential effect of the new proposals outlined in the planning application. The evaluation methodology will be in accordance with the advice set out in the Department of the Environment, *Planning Policy Guidance 16, Archaeology and Planning* (November, 1990) and will conform to the advice given in the English Heritage (London Region) *Archaeological Guidance Papers 1-5* (English Heritage, GLAAS, June 1998).
- 2.7 Finally, it should be noted that, as defined by English Heritage Greater London Archaeology Advisory Service (1998):

**The objective [of field evaluations] is to define remains rather than totally remove them. Full excavation will therefore be confined to those deposits which have been agreed with the local Planning Authority archaeological advisor through a project design or site meeting. Within significant levels partial excavation, half-sectioning, the recovery of dating evidence, sampling and the cleaning and recording of structures will be preferable to full excavation.**

- 2.8 Such excavation as takes place will not be at expense of any structures, features or finds which might reasonably be considered to merit preservation in situ.



## SECTION 3: GEOLOGY AND TOPOGRAPHY

- 3.1 A full background description of the local geology and topography has been covered in the Desk Based Assessments produced by MoLAS-PCA for PDZ6 (MoLAS-PCA 2007a). The main points are summarised below:
- 3.2 The British Geological Survey Sheet 256, North London indicates that Zone 6 lies on alluvium, which represents a range of different wetland and dryland environments existing on the floodplain of the River Lea. The alluvium is underlain by the Lea Valley Gravels, deposited during the Palaeolithic period. Below this initial deposit of gravel, lie two further gravel horizons namely the Kempton Park Gravels and the Taplow gravels. Tertiary Bedrock in this area is London Clay and Woolwich and Reading Beds.
- 3.3 The modern ground level varies greatly; between 5m OD and 20m OD, as a result of modern ground raising. In the area of the Eastway Cycle Circuit and the former allotments it rises to over 16m OD, whereas adjacent to the rivers and where little ground raising has taken place, the modern land surface lies at around 5m OD.

## SECTION 4: HISTORICAL/ARCHAEOLOGICAL BACKGROUND

4.1 The following summary of the historical and archaeological background for Construction Zone 6 complements the findings of the fieldwork undertaken within the Channelsea Gorge and surrounding area of PDZ6. For a more detailed description of local and regional themes please see Section 4 of the Desk Based Assessment (MoLAS-PCA 2007a, Atkins 2008).

### 4.2 Prehistoric

4.2.1 The eastern side of PDZ6 and islands of higher ground throughout the zone would have provided dry, fertile land suitable for settlement throughout Prehistory. The surrounding marshland would have provided food from hunting and fishing, clay for pottery manufacture, reeds for basketry and rough ground for animals to graze on.

4.2.2 The Lea Valley was well populated during the Bronze Age (1,800–600 BC) and Iron Age (600 BC–AD43). Well-preserved prehistoric timber structures and trackways have been found within the valley and would have allowed inhabitants of the region access across the frequently marshy landscape. It is possible that similar structures were constructed across PDZ6.

4.2.3 Within the Upper Lea Valley, to the north of PDZ6, there is evidence that settlements existed in which the dwellings, named crannogs, were constructed upon stilts driven into the marshland.

4.2.4 The GLSMR documents a cluster of Palaeolithic and Neolithic finds discovered within the northwest border of PDZ6, although they are contextually indeterminable. Additionally spot finds have been recovered from throughout PDZ6, including two Palaeolithic hand axes found within low-lying gravels (c.6.1m OD) in the central part of the zone, a Neolithic stone axe discovered to the north of the zone during gravel extraction work and prehistoric worked bone recovered from low-lying gravels during gravel extraction works in 1913.

4.2.5 Few archaeological excavations have taken place within the vicinity of PDZ5 and 6. A 1975 excavation on Temple Mills Lane, within the northern border of PDZ6, uncovered human remains and several undated timber structures, thought to possibly be of prehistoric date. In 2000, an archaeological evaluation and excavation took place to the south of the zone. It revealed a number of palaeochannels, a layer of wood chips dated to the late Iron Age (380-160BC) and a number of Bronze Age features. The most recent archaeological investigation took place in 2005. It comprised an archaeological evaluation that formed part of the Olympics development at Carpenters Road, c. 400m south of PDZ6. It revealed a peaty land surface of Neolithic date, containing butchered animal bone and worked wood.

#### 4.3 Roman

4.3.1 The Roman town of *Londinium* (London) was well established by AD53, located within the area currently occupied by the modern City of London, c. 6km to the southwest of PDZ6. The settlement and land use within the Greater London region would have been strongly influenced by the development of the city as a major trading post, port and provincial capital by the 2<sup>nd</sup> century AD. Small, nucleated settlements and larger villa estates located along the major roads, acted both as markets and as producers supplying the city, particularly with agricultural produce (MoLAS 2000, 150). The fortunes of these nucleated settlements followed general trends, becoming highly prosperous during the early 2<sup>nd</sup> century, generally going into decline in the late 2<sup>nd</sup> and early 3<sup>rd</sup> centuries, and becoming briefly revived within the 4<sup>th</sup> century (*ibid.* 151).

4.3.2 The Lea is likely to have been used to supply the London area with agricultural produce and during the later Roman period pottery from Much Hadham, via the River Stort. Archaeological investigations have established that Roman settlement existed both at Old Ford and in the areas of Stratford and Leyton, representing established habitations on both sides of the Lea Valley.

4.3.3 The eastern side of PDZ6 and islands of higher ground found throughout PDZ5 would have provided dry and fertile land suitable for settlement, as it had throughout the prehistoric period. Similarly the marshlands would have been exploited as an agricultural, hunting and material resource. Therefore the potential for Roman waterfront installations, channels and mills is significant.

- 4.3.4 A burial vault containing several urns was found during the removal of old foundations at Temple Mills. One of the urns contained several Roman medals and Roman coins dating from Caesar to Constantine the Great. The vault was reportedly on the edge of the River Lea. Similarly, a Roman stone sarcophagus containing a sword, fragment of a helmet crest, spur, padlock and three coins was found c. 4–5 feet below the surface of the marsh according to newspaper reports in 1783. However, it is probable from the description of the find within the GLSMR that it was actually of a medieval date.
- 4.3.5 In 1830 a possible Roman leat was identified on the eastern side of Temple Mill Stream. However the dating of the structure is not certain and it may in fact have been constructed much later. It is described as ‘a trench running parallel with the Stream and banked up on either side with Roman bricks.’
- 4.3.6 The archaeological evaluation and subsequent excavation at Stratford Box, revealed a number of palaeochannels and Roman features.
- 4.3.7 A number of Roman crossing points over the river Lea have been identified to the north and south of the zones. A Roman road from Clapton to Great Dunmow (Essex) is thought to have crossed the Lea near Pond Lane Bridge (Margary 1955), c. 1.5km to the north.
- 4.3.8 The Roman road that stretched from London to Colchester is known to have linked the settlements at Old Ford and Stratford on either side of the Lea valley, within the region of what is currently east London. It is thought that it may have crossed the Lea c 1km to the south, yet it is possible that there was a crossing point within PDZ6.

4.3.9 A minor Roman road was identified by an antiquarian observation in 1797, when a causeway was reportedly discovered along with Roman finds during works at Temple Mills. It is thought to have been located on the northern border of PDZ6, yet its alignment is not known. It has been assumed that it forms part of a road that extended along Ridley Road and Homerton High Street to the east, and which may have extended to a crossing point at Temple Mills. However the evidence has previously been examined (Tyler 1998) and the conclusion made that the road's existence was unlikely. In 1722, the author Daniel Defoe mentions a great stone causeway that continued over by the present site of Temple Mills to Ruckholts. It is placed by the GLSMR approximately 750m to the north of PDZ6, although it's positioning is some distance from both Temple Mills (on the edge of the zone) and Ruckholt Manor, (c. 400m to the north-east).

4.3.10 A pattern of Roman occupation has been identified from recent excavations within the Church Road/Grange Park area of Leyton, c. 1.5km to the northeast of PDZ6. The occupation comprised a concentrated strip of Roman activity on a northeast - southwest alignment, suggesting activity along the course of a road. Archaeological investigations at Livingstone College Towers, Leyton (*ibid*), c. 3km to the north of PDZ6, have further suggested the presence of a road, illustrating that the axis of field patterns reflected the roads alignment. A recent archaeological site at Beaumont Road Estate in Leyton (Taylor 2004), situated c. 2km to the north of PDZ6, uncovered part of the road itself, consisting of a metalled surface c. 6m wide, with a north-south ditch on each side. However, no contemporary roadside activity was found.

#### 4.4 **Saxon**

4.4.1 PDZ6 was located within the ancient parishes of West Ham and Leyton that were most probably formed from the manors referred to within the Domesday Book (AD 1086) as Ham (meaning 'low-lying pasture') and Leyton (meaning 'settlement on the Lea'). Throughout the Saxon period much of Zone 6 was marshland, suggesting that it was used as little more than pasture or meadow.

4.4.2 During the Saxon period the River Lea had several channels collectively known as the Stratford Back rivers constructed extending from its course. Tradition dictates that after Danish marauders sailed up the River Lea to Hertford, King Alfred cut a series of channels in this part of the Lea, which sufficiently lowered the water level, leaving the ships aground and preventing their escape. However, it is perhaps more likely that the channels were used as millstreams (Barber *et al* 2004). A number of mills mentioned within the Domesday Book are situated along the Lea and its tributaries, although their precise locations are unknown. It is possible that the medieval Temple Mills was built on the site of a Domesday mill.

4.4.3 At Old Ford, c 1km to the southwest of the zones, and at Stratford, c 850m to the southeast, evidence of Saxon activity has been recorded. The place name Stratford means *fording place on the old street*, which may refer to the Roman road/causeway that crossed the marshes nearby. It is thought to have passed c 500m to the south of PDZ6. Although it is unlikely that the road was maintained, it would probably have continued to be used throughout the Saxon period (Vince 1990, 120).

4.4.4 Early medieval activity is represented within the area by a number of wooden structures, related to the use of the regions waterways. An early medieval revetment was uncovered at Gibbins Yard, located approximately 1km to the south-east of zone 6, and a log boat, dated to AD950–1000, at Springfield Park on the west bank of the Lea, c. 3km to the north-west. During excavations in 2000 the remains of a bridge or jetty structure, dating to the Mid - Late Saxon period, were discovered on the bank of a palaeochannel in the southwest corner of the Stratford Box site.

#### 4.5 **Medieval**

4.5.1 As within earlier periods the area of dry and fertile, higher ground only existed within the east of PDZ6, where any settlement is most likely to have been. Reclamation would have taken place slowly throughout the medieval period, in the form of a series of river walls/embankments constructed successively further out from the edge of the higher ground (Rippon 2000, 1). The process of reclamation is likely to have caused the silting up of natural creeks and channels, revealed in the braided and sinuous nature of the channels of the River Lea, as shown on Rocque's map, an early cartographic source for the area, dating to 1746. This shows the reclaimed former marshland divided by drainage ditches into uniform parcels of land.

- 4.5.2 Documentary sources indicate the presence of a medieval mill named Temple Mill in the northwestern corner of the zone and a manorial residence, the manor of Chobham in the southeastern corner of PDZ6. The construction of which would probably have involved some attempt to drain the surrounding marshland. Track or drove ways ('manor ways'), often following the line of the river reclamation embankments, would have provided access across the marsh from the settlements on the higher ground. Temple Mill Lane, which forms the northern and eastern border of the zone, was probably originally such a trackway.
- 4.5.3 Between 1185 and 1278, the Knights Templar, using land granted to them by William of Hastings, steward to Henry II, built a water mill at Temple Mills. In 1308, a second mill was built on the opposite side of the millstream, in the manor of Hackney, and the mills are described as being under the same roof. After the suppression of the Templars the mills passed to the Hospital of St. John of Jerusalem, Clerkenwell (the Knights Hospitaller) and following the Dissolution they passed back to the Crown and were leased to Clement Goldsmith in 1593. The Knights also constructed a bridge near Temple Mills in the 14<sup>th</sup> century, possibly a precursor to that shown on Rocque's map of 1746.
- 4.5.4 The medieval manor house of Cobhams, later owned by Lord Henniker, which survived at least into the 1860s, was formed in 1329-31 by John de Preston. He sold it in 1335 to John de Sutton of Wivenhoe, who in 1343 sold it to Thomas de Chobham, who only owned the manor until 1356 when Adam Fraunceys, a merchant who also bought Ruckholt to the north, bought it.
- 4.5.5 Within the area surrounding PDZ6 the main river crossing over the valley shifted further south between AD1110 – 1118, moving from the location of the old Roman road at Old Ford to the existing Stratford High Street, and in doing so linking the settlements at Bow and Stratford on either side of the valley (Vince 1990, 120).
- 4.5.6 The moated site of Ruckholt Manor was located approximately 400m northeast of PDZ6. Documentary evidence suggests that the Manor was in existence by 1066. It was forfeited to the crown in 1345, after which it was variously inherited and sold. A later manor house was built on the same site in 1592.

#### 4.6 Post-Medieval

- 4.6.1 During the post medieval period the Lea Valley developed from a rural area, predominantly composed of common pasture and meadow into an industrial region, encompassing factories, warehouses and docks. The River and its channels were valuable due to their proximity to the increasingly industrial city of London, with waterpower and water transport initially exploited by industries including gunpowder and milling (Smith and Carr 2004, 4). Towns along the valley increasingly became the milling centres for London (Crossley 1990, 88) and the lower parts of the valley became the cradle of the British Chemical Industry (Smith and Carr 2004, 4).
- 4.6.2 The expansion of the milling industry within the Lea Valley was evident within PDZ6 by the 17<sup>th</sup> century, when a number of mills were constructed and through into the 18<sup>th</sup> century when the process industries rapidly changed. In 1627, Temple Mill was enlarged and modernised in order to grind corn and rape. Two new mills were built on or beside the site in the 1630s. In 1720, the mills were used to manufacture brass items and then lead in 1757. There is documentary evidence, within the GLSMR for a number of mills within the vicinity of Temple Mill, comprising a leather mill, which may have medieval origins, and subsequent logwood, gunpowder and a cutter's mills. Another mill used for working brass, tin and lead sheets, is recorded here in the 1630s. This may have been an experimental foundry used for the production of toughened bronze.
- 4.6.3 John Rocque's map of 1746, shows the Lea Valley as extensive marshland divided by drainage ditches into fairly uniform parcels of land, while the River Lea is braided into several channels. However, modifications to the watercourses, the arrival of railway infrastructure in the mid 19<sup>th</sup> century and Victorian industrial developments have subsequently changed the topography of the area drastically.
- 4.6.4 A Plan of the Wike Meadow dated to 1763 (MoLAS/PCA 2007a) shows the site in an area of the marsh called *Wike Meadow*. The southern tip of the site falls within separate fields owned by Mr Harris, Mr Pratt, Mr Salmon and Mr Brookes, indicating that private individuals had managed to acquire part of the common meadow shown in Rocque's earlier map.



- 4.6.5 Chapman and Andre's map of the County of Essex dated to 1777 and Milne's map of 1800 shows that little changed during the 18<sup>th</sup> century within PDZ5 and 6, illustrating Temple Mill in the north-western part of PDZ6, whilst the remainder of the zones remained open and undeveloped. Within the later map a stipple along the west side of the Channelsea River in the western part of the zone indicates the presence of a river embankment, almost certainly constructed to prevent flooding. Within neighbouring PDZ5 in 1768 the Hackney Cut canal was constructed (defining the western side of PDZ5) after the passing of the 1766 River Lee Act, which approved major alterations to eliminate loops in the natural river. This canal can be seen on the 1799 OS survey drawing.
- 4.6.6 Within Stanford's map of 1862 Temple Mills is shown as a number of separate small buildings, constructed after the original mills were pulled down in 1854. The map shows 'White Hart Inn' to the north of the mills at the edge of PDZ6. However, most of PDZ6 is open field divided by artificial watercourses, with some amalgamation of smaller land parcels shown in 1800. Stanford's map shows a branch of the River Lea, marked as Lead Mill Stream (the Mill River on Rocque, and subsequently named Waterworks River) feeding the mills and continuing southwards in the western part of the zone beside a second more sinuous channel (the Channelsea). Stanford's map shows the Great Eastern Railway, which was built in the 1840s and forms the eastern boundary of the zone, along with considerable Victorian expansion across the higher ground on both sides of the valley and along the main crossing of Stratford High Street, c. 1km to the south of PDZ6.
- 4.6.7 The 1st edition 25" Ordnance Survey (OS) map of 1882 shows little change within the location of PDZ6, other than the appearance of a large brickfield outside the southern boundary of PDZ6. The brickfield probably produced brick for local building programmes, as there is continued expansion of residential development on the eastern side of the valley. The 2nd edition 25" OS map of 1896 shows artificial manure works in the south of PDZ6 comprising buildings and sewage beds. There is also the start of residential development in the northeast corner of PDZ6 with Temple Mills Crescent marked as well as Wycliffe Road leading to another artificial manure works.

- 4.6.8 In 1894 the first buildings were constructed within the southwest corner of PDZ5, alongside the Hackney Cut. These are labelled on Bacon's map of 1900 as Clarke, Nicholson & Coombs, confectionery and jam makers established in 1872, becoming registered as Clarnico in 1946. To the south of the site on White Post Lane was the Hope Chemical Works established in 1859 by Eugene Careless. The rest of the site in 1894/1900 was used as a recreation ground. The watercourses depicted previously appear to have been formalised and extended to the south to provide a flow of water into the former East London Waterworks reservoir in the adjacent PDZ4. The main north-south stream passes beneath the Eastern Counties Railway to feed into the Victoria Park Steam Bone Works.
- 4.6.9 The OS 25" map of 1914 shows small groups of what are probably industrial buildings alongside the ditches in the north half of the zones and allotment gardens are marked south of Temple Mills Lane. The manure works are still present and the clusters of buildings at Temple Mills remain unchanged. The later 1920 and 1938 OS maps show little change. An anti-aircraft battery is documented as being located in the western side of PDZ6 during World War II, representing an effort to protect the industries within the valley.
- 4.6.10 OS maps dating from the 1950s show considerable development including the construction of a cooperage and a piggery in the north-west, a Ministry of Supply storage depot (later a Civil Defence training ground) between the White Hart and the River Lea, the infilling of the Waterworks River, the demolition of Temple Mills Bridge and the construction of a small speedway track adjacent to the White Hart Inn, a furniture factory, meat extract works, a timber yard and allotment gardens. West of Waterden Road was Lea Mill for fabrics as well as Marsh View, a cloth works and a shoe works. There was a Cabinet Works and an Oxygen and Acetylene Gas Factory. Massive ground raising also took place within the northern and central parts of PDZ6 throughout the 1950-70s.
- 4.6.11 By the time the 1988 OS map was produced CZ5 comprised industrial and retail estates and CZ6 allotment gardens. This was how the sites remained until enabling works for the Olympic Park began in 2005.

#### 4.7 The Channelsea River

- 4.7.1 The following description of the Channelsea River's history is designed to compliment the findings of this report. A more detailed description of the Channelsea River's history and detailed survey of its current form can be found within *The Olympic Park, Waterways and associated Built Heritage Structures: A landscape and standing buildings survey report* (MoLAS-PCA 2008).
- 4.7.2 Before the early 20<sup>th</sup> century, the course of the Channelsea River branched off the Waterworks River, south of Temple Mills, then headed southeast towards the Causeway (later Stratford High Street), below which it passed through Wigen/Abbey Mill, before joining the Lea below Three Mills. A short distance south of the junction with the Waterworks River, a number of ditches joined the Channelsea from the east. The Wanstead Slip, which almost certainly predated the 13<sup>th</sup> century (VCH Essex, 1973: 317) entered at Potter's Ditch. To the north of this another channel entered the Channelsea river, it was labelled the Leyton Common Sewer on a map of 1825/8 (CLA/036/02/1828/4/3), which showed it draining into the Channelsea at the same point where the present day Henniker's Ditch joins the river.
- 4.7.3 The earliest depiction of the Channelsea River, Bridge and Abbey Mill appears in 1560 on a sketch map of the Lea and the Back Rivers drawn by Elizabeth I's Lord Chancellor William Cecil, Lord Burghley, which also showed the braided channels of the Lea, the upper Waterworks and the Channelsea south of Temple Mills joining and then dividing again above Old Ford (Bull, 1958: 375; SP12. State Papers (Domestic) Elizabeth, Volume 15, No. 16).
- 4.7.4 The land on either side of the upper reaches of the river was generally set aside for grazing, though osiers were cultivated along the banks between the mid 16<sup>th</sup> and 19<sup>th</sup> centuries (VCH Essex, 1973: 74-6). By the end of the 17<sup>th</sup> century the area of the Abbey Marsh between Channelsea Bridge and Abbey Mill on the east bank of the Channelsea had become the centre of the English calico printing industry (VCH Essex, 1973: 77; ACC/2423/P/0601, plan not reproduced). In 1699 a calico printer was accused of erecting dams and sluices in the Channelsea presumably in the vicinity of the later 'Calico Ground', and was instructed to remove them. Calico printing on the east bank expanded throughout the first half of the 18th century, to become one of the major industries in the area by 1740.

- 4.7.5 An 1825 petition, which related to the abuses on the River Lea and Lea Navigation, had also affected the local businesses associated with the Channelsea River. One of the signatories of the 1825 petition was a Mr Moline, owner of the Hop Ground on the northeast bank of the Channelsea at High Meads, (CLA/036/02/1828/4/3). Both Chapman and Andre's map of 1777 and the petitioners' map of 1825 show the Hop Ground located close to an unidentified riverside property on the east bank of Channelsea. This structure and a footbridge over the river were probably associated with the Hop Ground. A short distance to the south on the west bank, a dye works was depicted on a speculative canalisation plan of c.1812, though this does not appear on any other map of the period.
- 4.7.6 By 1828 however, 'the creek by Temple Mills communicating with the main stream' at the top of the Channelsea had become blocked, preventing vessels from entering the Waterworks and Lea Navigation, rendering the river inaccessible to shipping from the Channelsea (CLA/036/02/1828/4/2). Clayton's tithe map of 1821 shows what appears to be floodwater in the field on the east bank adjacent to the two channels that linked the Channelsea with the Waterworks, indicating that the river had indeed breached its banks at this point, most likely as a result of an obstruction. Temple Mills was derelict throughout much of the 1820s suggesting that the blockage was a consequence of neglect (VCH Essex, 1973: 199).
- 4.7.7 The Waterworks appeared free of obstruction in the Commissioners of Sewers survey of 1829 (ACC/2423/P/0601). However, the upper reaches of the river appear to have become increasingly sluggish and blocked thereafter, and it is possible that the navigation was never fully restored.

- 4.7.8 Major works were carried out by the L.C.B. in the upper reaches of the Channelsea River during the early 1890s. These were designed to improve drainage into the main channel of the Lea. This necessitated the infilling of a number of the rivers superfluous stretches. Specifically, a bank was built between the east end of the Potter's Ditch, south-east along the east bank of the Channelsea, thereby isolating the curved stretch of the Channelsea to the east in order that it might be infilled and a new junction created beneath it between the Channelsea and the Waterworks. The Channelsea above this point had been scarcely navigable for most of the preceding 60 years, so it was intentionally converted into a conduit to convey floodwater from Henniker's and other ditches into the improved upper Waterworks.
- 4.7.9 Once the curve had been removed, the junction with the Waterworks above Potter's Ditch, west of the junction with the nameless ditch parallel to and north of Henniker's Ditch, was closed and the once navigable top stretch of the Channelsea was infilled. The sole connection between the surviving section of the truncated upper stretch of the Channelsea and the Waterworks above Temple Mills was therefore the non-navigable weir by-pass channel. This was infilled between 1916 and 1926, leaving a short redundant stretch to the south that came to a dead end immediately below Temple Mills Lane, which was infilled itself in 1927. A 1908 survey revealed that the short stretch of new bank was reinforced with timber piles, possibly of a similar specification to those specified for the proposed Pudding Mill River cut of 1908 (ACC/2423/P/1747/1, 2, 4).
- 4.7.10 The 1938 Lea Conservancy Catchment Board Act proposed the construction of a "new channel in earth" between the improved channel of the Lea and the Channelsea at the junction of the Lea and what remained of the northern stretch of the Waterworks; i.e. at the former Bully Fence. This channel was not dug in the 1950 round of works. However, when the remaining stretch of the Waterworks between the Bully Fence and the 1890s Channelsea/Waterworks junction to the north was culverted later in the 1950s, the opportunity was taken to excavate this long-planned channel, which seems to have been completed at some point between 1961 and 1974. The final stretch of the Channelsea to be culverted before recent works commenced was the stretch between Stratford High Street and Lett Road, which was covered in 1957/8.

## **SECTION 5: AIMS AND OBJECTIVES**

5.1 In line with the ongoing archaeological work at the site, RPS/AOC adopted the already established aims and objectives, as set out in the Detailed Desk Based Assessment (MoLAS-PCA 2007b) and adopted by the Written Scheme of Investigation (Atkins 2008, RPS-AOC 2008). The objectives relevant to the Channelsea Gorge site are set out below:

- Do Late Glacial deposits exist within re-worked gravels in the southwest part of the zone (Landscape Zone 3)? What is the potential for past environment reconstruction and/or Late Upper Palaeolithic activity in these deposits?
- Do slope deposits of Pleistocene and/or Holocene origin overlie Pleistocene gravel in the zone? What direct or indirect evidence of past human activity is associated with the colluvium?
- Did the Leyton River cross the zone in the Pleistocene or Holocene and is there evidence for human activity associated with the river?
- Can channels of the River Lea be distinguished from its tributaries in the southwestern part of the zone? Does evidence for human activity, similar to that found in the Stratford Box, associated with the river, survive?
- What environmental evidence suitable for past landscape reconstruction exists within deposits associated with ancient channels of the River Lea and its tributaries?
- Can episodes of channel activity and abandonment and wetland expansion across previously dry land surfaces on the zone be dated?
- Is there any evidence of a Roman road and/or occupation activity within the area of the zone? If so, how does it relate to what is known of the settlement pattern further north in the Leyton area during the Roman period?
- Is there any evidence of medieval and post-medieval agricultural activity present in the zone? Is this associated with Chobham manor or Ruckholt manor and their later landholdings?
- What was the pre-modern/pre-Victorian topography of the zone?

- How extensive is modern truncation across the zone? Do made ground deposits bury or truncate the post-medieval/modern land surface?
- Is there evidence for past water management, i.e. drainage ditches, mill remains, sluices and revetments associated with earlier courses of the Channelsea River/Henniker's Ditch and River Lea?

5.2 The works followed the guidance set out in *Archaeological Guidance Paper 3 Standards and Practices in Archaeological Fieldwork In London*; *Archaeological Guidance Paper 4: Archaeological Reports*; *Archaeological Guidance Paper 5: Evaluations* (English Heritage, 1998)

## SECTION 6: METHODOLOGY

- 6.1 The Evaluation was carried out across the length of the Channelsea Gorge, within the southwestern corner of PDZ6 (Figure 2). The initial trench layout proposed that four trenches, each measuring 10.00m x 2.00m at base, would be equally spaced along the length of the Channelsea River. However, an environmental preservation order on the existing trees within the Gorge meant there was limited machine access across much of the area. In addition there were practical safety issues regarding the fluctuating high water levels. These factors resulted in numerous changes to the trenching plan. The final trench plan comprised one 8.00m x 4.00m trench (PDZ6.CG.01), one 8.00m x 2.00m trench (PDZ6.CG.03) and one 9.00m x 2.40m trench (PDZ6.CG.02) excavated within the northern end of the gorge, and one 8.00m x 2.00m trench (PDZ6.CG.04) excavated within the far southern end of the gorge (Figure 2). All of the trenches were excavated across the base of the existing Channelsea Gorge River, perpendicular to its current course.
- 6.2 A toothless ditching bucket was used to excavate the trenches to the first archaeological horizon or natural sands and gravels.
- 6.3 Once the initial machine excavation of the trenches had taken place, all accessible trench faces that required examination or recording were cleaned using appropriate hand tools. All investigation of archaeological levels was undertaken by hand, with cleaning, examination and recording in both plan and section. Within significant levels partial excavation, the recovery of dating evidence, sampling and the cleaning and recording of structures was undertaken, as agreed with English Heritage (GLAAS).
- 6.4 Investigation was not undertaken at the expense of any structures, features or finds which might reasonably have been considered to merit preservation *in situ*.
- 6.5 Specific guidance on the treatment of palaeo-environmental remains within the Olympic Park area has been issued by English Heritage. Prehistoric landscapes have survived within the Olympic Park area and this presence has been identified in the Environmental Statement.



6.6 Alluvial deposits were cleaned and recorded by the archaeological team, before being sampled and recorded in greater depth by a team of geoarchaeological specialists. The field team for the evaluation trench included a geoarchaeologist from Quaternary Scientific, University of Reading (formerly ArchaeoScape), who was available for the duration of the project to assess the potential of the natural deposits for reconstructing the past environment, which was of relevance to understanding the context of any archaeological levels (or the lack of them). The geoarchaeologist conformed to the methodology set out in the original method statement (MoLAS/PCA 2007b).

6.7 All trenching conformed to current best practice and was undertaken according to the relevant guidelines set out in:

Department of the Environment, 1990 Planning Policy Guidance 16, Archaeology and Planning (PPG 16).

English Heritage, 1991 Management of Archaeological Projects (MAP2).

English Heritage Greater London Archaeology Advisory Service, June 1998 Archaeological Guidance Papers 1-5.

English Heritage Greater London Archaeology Advisory Service, May 1999 Archaeological Guidance Papers 6.

Institute of Field Archaeologists (IFA), rev. 2001 By-Laws, Standards and Policy Statements of the Institute of Field Archaeologists, Standard and guidance: Desk Based Assessment.

Museum of London, 1998 General Standards for the preparation of archaeological archives deposited with the Museum of London.

The Unitary Development Plans of the London Boroughs of Newham (2001), Hackney (1995), Waltham Forest (1996), and Tower Hamlets (1998).

- 6.8 Archaeological work was monitored by Atkins on behalf of the Olympic Delivery Authority. The English Heritage (GLAAS) Archaeological Advisor, David Divers, was responsible for monitoring progress and standards throughout the project on behalf of the Olympic Delivery Authority Planning Decisions Team (ODA PDT).

## SECTION 7: RESULTS

### 7.1 Trench PDZ6.CG.01 (Figure 3)

Height	Context	Description
3.67m OD	101	Mid – dark blackish brown, gravelly, clayey silt, with 19 <sup>th</sup> and 20 <sup>th</sup> century domestic and industrial waste inclusions. Made ground.
3.28m OD	102	Mid yellowish orange gravelly, sandy clay, with frequent moderately sized, rounded pebble and modern glass bottle inclusions. Secondary river backfill.
2.23m OD	103	Dark blackish brown, charcoal rich, gravelly clay. Primary river backfill.
3.16m OD	104	Pale orangey brown, firm clay, with occasional CBM inclusions.
2.10m OD	105	Mid – light brownish grey, poorly sorted gravels within a fine sand matrix. Natural.
3.31m OD	108	Mid brownish grey clay, with frequent crushed brick, CBM, 20 <sup>th</sup> century pottery and organic material inclusions. Tertiary river backfill.
2.87m OD	109	Mid yellow, soft, clay. Re-deposited alluvium packed around revetment.
3.04m OD	110	Mid – dark bluish grey, heavily organic clay with frequent shell inclusions.
2.31m OD	111	Mid grey gravelly clay.
2.33m OD	112	Mid yellowish orange, slightly clayey, gravelly sands.

7.1.1 Trench PDZ6.CG.01 was located within the northern extent of the Channelsea Gorge archaeological investigation area (Figure 2). It was orientated east - west, set perpendicularly to the course of the current Channelsea River and measured 8.00m x 4.00m at base.

- 7.1.2 Natural sands and gravels (105) were uncovered at a height of 2.10m OD. The massive non-calcareous gravels may be undisturbed Holocene alluvium or the upper part of the Late Devensian Lea Valley Gravel (Appendix B). The gravels were overlain by a 0.10m thick deposit of mid yellowish orange, slightly clayey, gravelly sands (112), which were found below a 0.10m thick deposit of mid grey gravelly clay (111). A 0.72m thick deposit of mid – dark bluish grey, heavily organic clay with frequent shell inclusions (110) was found above (111) and below (104), a pale orangey brown, firm clay, with occasional CBM inclusions, 0.95m thick. This sedimentary sequence was found beneath a 1.00m+ thick dumping deposit of mid – dark blackish brown, gravelly, clayey silt made ground, with 19th and 20th century domestic and industrial waste inclusions (101).
- 7.1.3 A series of four 50cm long column samples were taken through the alluvial sequence, targeting the interfaces between (105), (112), (111), (110) and (104). Pollen and microscopic charred particles were present in variable (absent to moderately high) concentrations and preservation within contexts (110) and (111). The sediments recorded within trenches PDZ6.CG.01, were similar to those within Trenches PDZ6.CG.02 and PDZ6.CG.03 to the south (see below) and represent conditions outside the network of Early Holocene channels found within trenches PDZ6.07, PDZ6.08, PDZ6.09 and PDZ6.48 further to the west. The deposits resting on the surface of trench PDZ6.CG.01 may be in part semi-natural but in part are undoubtedly disturbed by anthropogenic intervention and may have originated either as Made Ground or in association with the revetment of nearby water courses (Appendix B).
- 7.1.4 A previous river channel [107] cut into the natural sands and gravels (105) truncated the sedimentary sequence. It was orientated on a similar north-south alignment to the current Channelsea River. Only the eastern extent of the channel was revealed, which had vertically, straight sides that broke sharply from horizontal to a gently undulating base. The section of the channel revealed within trench PDZ6.CG.01 measured 7.40m x 2.00m x 1.23m.

7.1.5 River Channel [107] contained three distinct backfill deposits (103), (102) and (108) and the eastern side of the cut was supported by a wooden revetment [106], comprised of a continuous line of re-used, vertically set timbers, which appeared in form to resemble re-used railway sleepers. Each timber measured 1.20m x 0.30m x 0.08m and was secured by iron nails to a single cross beam that measured 4.00m+ x 0.30m x 0.10m.

7.1.6 The primary fill of [107] comprised a 0.12m thick dark blackish brown, charcoal rich, gravely clay (103). No finds were recovered from the deposit. It was overlain by a 0.80m deep deposit of mid yellowish orange gravely, sandy clay, with frequent moderately sized, rounded pebble and modern glass bottle inclusions (102). The tertiary fill was 1.27m thick and consisted of a mid brownish grey clay, with frequent crushed brick, CBM, 20th century pottery and organic material inclusions (108). The river sediments are datable to the late 19th and early 20th century from the recovered pottery and glass inclusions.

## 7.2 Trench PDZ6.CG.02 (Figure 4)

Height	Context	Description
3.52m OD	201	Mid – dark greyish brown, soft clay, with occasional 19 <sup>th</sup> /20 <sup>th</sup> century demolition rubble and domestic waste inclusions.
2.67m OD	202	Mixed deposit of mid orange sandy gravel and black, charcoal rich, gravelly silt. Primary river backfill.
2.02m OD	203	Mid – light grey, sandy gravels, with frequent organic inclusions.
1.55m OD	204	Mid – light yellowish grey, fine sand matrix, with frequent poorly sorted gravel inclusions. Natural.
4.12m OD	205	Mid – light brownish yellow clay, with frequent rooting and occasional gravel inclusions.
2.56m OD	206	Mid – light orangey brown, silty clay.
2.34m OD	207	Mid – dark bluish green, slightly silty clay, with occasional gravel inclusions.
1.18m OD	208	Mid – light grey sandy, peaty, gravels, with frequent organic inclusions.
2.07m OD	213	Mid – dark bluish green, slightly silty clay, with occasional gravel

7.2.1 Trench PDZ6.CG.02 was located within the northern end of the Channelsea Gorge archaeological investigation area, to the south of PDZ6.CG.01 (Figure 2). It was orientated east - west, set perpendicularly to the course of the current Channelsea River and measured 9.00m x 2.40m at base.

- 7.2.2 Natural sands and gravels (204) were reached at 1.55m OD. They were found beneath a 0.64m deep deposit of mid – light grey sandy, peaty, gravels, with frequent organic inclusions (208), which probably represent undisturbed Holocene sediment reworking the Late Devensian Lea Valley Gravel. Within the centre of the site (Section 6, Figure 4) (208) was overlain by a 0.40m deep mid – dark bluish green, slightly silty clay, with occasional gravel inclusions (207) and detrital plant remains, root channels and root remains, with many of the roots in their original vertical position at the base of the deposit. Above this was a 0.34m thick layer of mid – light orangey brown, silty clay (206). Within the eastern end of the trench (Section 8, Figure 4) a 0.38m thick deposit of mid – dark bluish green, slightly silty clay, with occasional gravel inclusions (213) was found above (208) and below (206). The uppermost deposit was a mid – light brownish yellow clay (205), which measured 1.56m thick and contained frequent rooting and occasional gravel inclusions.
- 7.2.3 A series of three 50cm long overlapping column samples were taken through the depositional sequence, targeting the interfaces between (204), (205), (206), (207) (208) and a bulk sample was taken from (206), (207) and (208). The rapid geo-archaeological assessment (Appendix B) indicates that pollen was absent or recorded in low concentrations in all samples and that diatom were only found within sediment (208). Assessment of the sequence of bulk samples taken from PDZ6.CG.02 showed charred wood remains in low quantities except within deposit (206), insect remains in low concentrations and waterlogged wood in low or moderate concentrations within deposit (207) (Appendix B).
- 7.2.4 The rapid assessment has concluded that the sediments recorded within PDZ6.CG.02, like those within PDZ6.CG.01 to the north and PDZ6.CG.03 to the south, represent conditions outside the network of Early Holocene channels, found within the trenches PDZ6.07, PDZ6.08, PDZ6.09 and PDZ6.48 further to the west. Instead, within PDZ6.CG.02 the natural pre-Holocene gravel surface is overlaid by part semi-natural and part made ground deposits (Appendix B).

- 7.2.5 The cut of a previous river channel [212] truncated the stratigraphic sequence within trench PDZ6.CG.02. It was orientated on a similar north-south alignment to the current Channelsea River and to river channel [107] found within trench PDZ6.CG.01 to the north. The limited reach of the machine and tree preservation order meant that only the eastern extent of the channel was revealed. It was straight sided and almost vertically sided, breaking sharply to its flat base. The extent of the channel revealed within the trench measured 2.40m + x 6.50m x 1.44m. It contained two distinct fills (201) and (202), and was supported by a line of posts [210] secured by iron nails to three horizontal planks [209].
- 7.2.6 Five wooden posts [210] each measuring 1.60m x 0.16m x 0.16m were spaced out approximately 0.90m apart, in a roughly north-south orientation along the edge of river channel cut [212]. The posts were squared, sawn cut timbers that were cut into a two-sided point at base. The posts had been driven through the sedimentary sequence into natural sands and gravels (204) and secured by iron nails to horizontal planks [209] situated between 0.56m and 1.30m above the natural sediments (204) and base of river channel [212].
- 7.2.7 Horizontal revetment planks [209] comprised a single complete timber and two broken timbers each measuring up to 2.70m in length, 0.22m in width and 0.03m in depth. The wood had squared corners and contained saw marks over its surface.
- 7.2.8 The primary fill of river channel [212] comprised 0.60m of mid orange sandy gravel and black, charcoal rich, gravelly silt (202), overlain by a secondary deposit, 0.84m thick, comprising mid – dark greyish brown, soft clay, with occasional 19th/20th century demolition rubble and domestic waste inclusions (201). The river sediments affirm the late 19th or early 20th century date of the channel.

### 7.3 Trench PDZ6.CG.03 (Figure 5)

Height	Context	Description
4.03m OD	301	Mid – dark brown, gravely clayey silt with frequent 19 <sup>th</sup> / 20 <sup>th</sup> century industrial and domestic waste inclusions. Made ground.
3.09m OD	302	Dark brown, friable, clayey gravel, with frequent 19 <sup>th</sup> / 20 <sup>th</sup> century industrial and domestic waste inclusions. River backfill.
1.74m OD	303	Sub rounded and sub angular gravels within a mid yellowish brown, fine sand matrix. Natural.
3.99m OD	306	Mid orangey yellow, firm clay, with occasional CBM inclusions.
2.10m OD	307	Mixed dark black organic material and yellowish grey sands, within a mid yellowish grey clay. Contained china, concrete and rubber fragments. Fill of ditch [308].
2.04m OD	309	Mid – light greyish yellow clayey sand, with frequent rounded gravel inclusions.
2.32m OD	311	Mid bluish grey sandy clay.

7.3.1 Trench PDZ6.CG.03 was located to the north of the centre of the Channelsea Gorge archaeological investigation area and to the south of PDZ6.CG.01 and PDZ6.CG.02 (Figure 2). It was orientated east - west, set perpendicularly to the course of the current Channelsea River and measured 8.00m x 2.00m at base.

7.3.2 Natural sands and gravels (303) were reached at 1.74m OD. They were overlain by a 0.30m thick deposit of mid – light greyish yellow clayey sand, with frequent rounded gravel inclusions (309), which was overlain by a 0.30m layer of mid bluish grey sandy clay (311). An irregularly shaped pit or ditch [308] was cut into sedimentary deposits (309) and (311). It measured 1.50m x 1.20m x 0.82m, had undulating sides that broke moderately from the horizontal and gently to its undulating base. The fill contained a single fill of mixed dark black organic material and yellowish grey sands, within a mid yellowish grey clay, from which fragments of china, concrete and rubber were recovered (307).

7.3.3 A 1.52m thick deposit of mid orangey yellow, firm clay, with occasional CBM inclusions (306) was found above sediments (309), (311) and modern pit fill (307), suggesting that it was a re-deposited naturally formed clay deposit. It was covered by 0.22m+ of mid – dark brown, gravely clayey silt made ground, which contained frequent 19th/20th century industrial and domestic waste inclusions.



- 7.3.4 Three 50cm long column samples were taken from trench PDZ6.CG.03 incorporating contexts (303) and (307). Rapid geo-archaeological assessment of the samples has revealed that pollen was absent or recorded in low concentrations throughout both deposits (Appendix B). Diatoms were recorded in the samples from context (307), mainly in low concentrations, with the exception of between 1.92 and 1.91m OD where the concentration and preservation of diatoms was moderate to high.
- 7.3.5 The rapid assessment has concluded that the sediments recorded in PDZ6.CG.03, as within PDZ6.CG.01 and PDZ6.CG.02 to north, represent conditions outside the network of Early Holocene channels where the pre-Holocene gravel surface remained undissected. The deposits resting on this surface may be in part semi-natural but are undoubtedly disturbed by anthropogenic intervention and may have originated as made ground (Appendix B).
- 7.3.6 The cut of a previous river channel [312] truncated the sedimentary sequence, orientated on a similar north-south alignment to the current Channelsea River and representative of a continuation of river channels [107] and [212] within trenches PDZ6.CG.01 and PDZ6.CG.02 to the north. The western extent of the channel was not reached during the excavation, but the eastern edge had almost vertically sloping, gently undulating sides that broke sharply to its undulating base. The section of the channel revealed within trench PDZ6.CG.03 measured 4.00m+ x 5.50m+ x 1.20m. It contained a single fill of dark brown, friable, clayey gravel, with frequent 19th/20th century industrial and domestic waste inclusions (302).
- 7.3.7 A horizontal wooden plank [304], which measured 4.00m+ x 0.20m x 0.06m, was secured in front of posts [305] and [310] to form a basic revetment support for the eastern edge of channel [312]. Assessment of a sample taken from plank [304] identified that the post was machine sawn and formed from Pine, most probably imported into the UK during the 19th century (Appendix C). Post [305] measured 0.80m x 0.15m x 0.15m; it was squared in section and had visible saw marks over its surface. Post [310] measured 1.28m x 0.15m x 0.15m. It had clearly been driven through the alluvial sequence into natural sands and gravels (303). It was similarly squared in section and the base of the post had been sawn cut into a two-sided point.

#### 7.4 Trench PDZ6.CG.04 (Figure 6)

Height	Context	Description
4.30m OD	401	Mid – dark greyish brown, clayey silt containing frequent sub rounded pebble and occasional CBM inclusions. Made ground.
3.90m OD	402	Mid orangey, yellowish grey clay with occasional iron concentrations, rounded pebble and rounded gravel inclusions.
2.19m OD	403	Mid brownish grey, sandy, clayey silt, with frequent shell and organic material inclusions.
1.18m OD	404	Mid grey, clayey sand, with frequent gravel, sub rounded and sub angular pebble, and organic inclusions.
0.60m OD	405	Sub rounded and sub angular gravels within a mid yellowish brown, fine sand matrix. Natural.
2.70m OD	407	Redeposited, mid bluish grey, soft, clay. River channel packing material.
2.68m OD	408	Dark black, charcoal rich silt, with frequent 20 <sup>th</sup> century domestic and industrial dumping inclusions (ie. Car tyres, metal and wood). River channel backfill.

7.4.1 Trench PDZ6.CG.04 was located within the southern end of the Channelsea Gorge archaeological investigation area (Figure 2). It was orientated east - west, set perpendicularly to the course of the current Channelsea River and measured 8.00m x 2.00m at base.

7.4.2 Natural sands and gravels (405) were revealed at 0.60m OD. They were overlain by 0.31m thick deposit of mid grey, clayey sand, with frequent gravel, sub-rounded and sub-angular pebbles, and organic inclusions (404). Overlying this was a 1.02m thick layer of mid brownish grey, sandy, clayey silt, which contained frequent shell and organic material inclusions (403). A 1.65m thick deposit of mid orangey, yellowish grey clay (402) with occasional iron concentrations, rounded pebble and rounded gravel inclusions was found above (403) and below 0.37m+ of mid – dark greyish brown, clayey silt made ground (401), which contained frequent sub rounded pebble and occasional CBM inclusions.

- 7.4.3 A series of three 50cm long column samples were taken through the sedimentary sequence, targeting the interfaces between deposits (402), (403) and (404). The Rapid geo-archaeological assessment of the samples has shown that pollen remains were generally either absent or found in low concentrations, except between -1.95 and -1.94m OD where pollen was recorded in high concentrations (Appendix B). Microscopic charred particles were absent in the lower half of the sequence, but increased to low/moderate concentrations in samples taken at above 1.70m OD; (403) and (402). Diatoms were recorded throughout the sequence. In contexts (404) and (402) the concentration and preservation of remains was very low, whilst in sediment (403) it was generally very high. This is indicative that the area around trench PDZ6.CG.04 accumulated sediment in active Early Holocene channels, comparable to the deposition models found within the larger trenches PDZ6.07, PDZ6.08, PDZ6.09 and PDZ6.48 to the west of the Channelsea Gorge.
- 7.4.4 The cut of a river channel [406] that was orientated roughly north-south, in alignment with the course of the current Channelsea River, cut through the sedimentary sequence. Both sides of the channel were revealed during the excavation. It measured 6.15m in width, 4.00m+ in length and 1.33m deep. The channels had gently rounded sides that sloped moderately from the horizontal and gently to its flat base. It cut the lowest deposit (404) and contained a single backfill deposit of dark black, charcoal rich silt (408), within which was frequent 20th century domestic and industrial dumping inclusions (i.e. car tyres, metal and wood).

## **7.5 Finds**

- 7.5.1 With the exception of a wood sample taken from the revetment structures in trench PDZ6.CG.01 no significant artefactual evidence was recovered from the evaluation undertaken within the Channelsea Gorge. Late 19th and early 20th century domestic waste, including pottery, glass, metalwork and CBM fragments were observed within the made ground overburden that covered each trench and within the modern river backfill deposits.

7.5.2 A total of fourteen 50cm long column samples were collected by Quaternary Scientific from the trenches. One bulk sample was also recovered from trench PDZ6.CG.02. These environmental samples illustrated that the trenches within the north of the gorge were outside the network of Early Holocene channels where the pre-Holocene gravel surface remained undissected. Within the south of the gorge the sediments examined from trench PDZ6.CG.04 represented an accumulation of material within active Early Holocene channels, comparable to the stratigraphic models exposed within trenches PDZ6.07, PDZ6.08, PDZ6.09 and PDZ6.48 to the west.

## SECTION 8: CONCLUSIONS AND RECOMMENDATIONS

- 8.1 The stratigraphic sequence exposed within the trenching has illustrated that a significant depth of clays, silts and gravels survive throughout the Channelsea Gorge. Initial geo-archaeological assessment of sediments exposed during the investigation has suggested that the north of the gorge was outside the network of Early Holocene channels where the pre-Holocene gravel surface remained undissected, covered by clayey material that most probably originated as made ground, associated with the wooden river revetment. Alternatively the deposits sampled within the south of the gorge are indicative of sediment laid within active Early Holocene channels, comparable to the stratigraphic sequences revealed within trenches PDZ6.07, PDZ6.08, PDZ6.09 and PDZ6.48 to the west (RPS - AOC 2009).
- 8.2 The clay and sedimentary deposits in each trench were cut by a former river channel that is notably wider than the existing Channelsea River. The full extent of the channel was only revealed within the southernmost trench, PDZ6.CG.04. Only the eastern extent of the river channel was found within the trenches (PDZ6.CG.01, PDZ6.CG.02 and PDZ6.CG.03) excavated in the north of the gorge.
- 8.3 The cut of the channel changed along its course, having moderately sloping, rounded sides within the south of the gorge (PDZ6.CG.04), which became steeper and straighter to the north, possibly relating to a bank of made ground that was built in the late 19<sup>th</sup> century. As the gradient of the cut increased towards the north of the gorge, more significant wooden posts were found piled deep into the natural gravels, held by horizontal planks, supporting the sides of the channel. Within the northernmost trench (PDZ6.CG.01) a continuous line of vertical timbers secured by a single cross beam, attached by iron nails was found, whilst further to the south, within PDZ6.CG.03, only two sporadically placed posts and a single cross beam were found supporting the edge of the channel. It is thought that the revetment was found in its original construction, as there was no evidence that the cladding had been lost or of structural collapse within the south.

- 8.4 A 1908 survey of the Channelsea Gorge revealed that a short stretch of a newly constructed bank was reinforced with timber piles. The revetment found during the Evaluation most likely relates to these structures. The timbers that formed the revetment appeared to be re-used. Within PDZ6.CG.01, the continuous vertical timbers appeared in shape and dimensions to resemble railway sleepers, indicating an association with the late 19<sup>th</sup> and early 20<sup>th</sup> century industrialisation that was taking place within the surrounding area. However, no rail fittings were found on the timbers and there was no evidence that the timbers had been shortened, suggesting that they had not been used prior to their incorporation within the revetment. Analysis of a re-used timber taken from the revetment within trench PDZ6.CG.03 (Appendix C) has identified it as Pine, which supports the channels dating relation with the 1908 survey.
- 8.5 The form of the revetment exposed within the northernmost evaluation trench shows similarities to the 19<sup>th</sup> century revetments revealed at 150 Stratford High Street site towards the southern end of the Waterworks River and the 20<sup>th</sup> century partial wooden revetments found along the course of Potters Ditch, which forms part of the northern stretch of the old Channelsea River (MoLAS / PCA 2008). The latter was found to contain heavy natural silting material at its base, similar to the deposits revealed during the evaluation, which were the result of regular tidal inundation forming mudflats extending into the watercourse (MoLAS / PCA 2008).
- 8.6 A post line on a northwest – southeast orientation, located to the east of the river channel and basic revetment within trench PDZ6.CG.02 may denote a contemporary field boundary or represent fencing associated with the 19<sup>th</sup> century Hop farm, which is known to have been located to the east of the Channelsea gorge.
- 8.7 Within PDZ6.CG.03 an irregular pit was found adjacent to the channel revetment. The feature was filled with heavily organic clay and silt sediments that contained modern china, rubber and metal fragments. The modern inclusions suggest that the cut was formed from a break in the revetment or collapse of the bank that was filled by modern silting. This suggests that by the mid to late 20<sup>th</sup> century the waterway had become neglected and the revetment had fallen into disrepair. It also illustrates the need for the wooden bank supports within the north of the gorge, where the tidal range of the river clearly rose close to the height of the revetment.

- 8.7 Following consultation with EH GLAAS, advisors to the ODA PDT it is not intended to carry out any further archaeological fieldwork within the Channelsea Gorge. It is intended that the results and any further recommended work highlighted in the assessment of environmental remains is included in the site-wide geoarchaeological assessment, and the site-wide geoarchaeological/stratigraphical database and GIS model.
- 8.8 It is recommended that the results of the evaluation are included and assessed in the Site Wide Integrated Post-Excavation Assessment (SWIPEA), which will recommend any further analysis of archaeological data across the Olympic Park and in the eventual production of publication and dissemination of the results.

## SECTION 9: ARCHIVE DEPOSITION

9.1 The documentary archive comprises of:

Context checklist	2 sheets
Trench record	5 sheets
Context sheet series	102, 103, 107-112, 212, 307, 308, 401-408
Timber sheet series	106, 209-211, 304, 305, 310
Levels register	2 sheets
Photo registers	3 sheets
Section register	1 sheet
Section drawings	9 sheets
Plan register	1 sheet
Plan drawings	11 sheets

9.2 The physical archive comprises a wrapped timber, fourteen 50cm long column samples and one bulk sample.

9.3 The integrity of the site archive will be maintained. The finds and records will be available for public consultation. Appropriate guidance set out in the Museum and Galleries Commission's, *Standards in the Museum Care of Archaeological Collections* (1992) *Towards an Accessible Archaeological Archive. The Transfer of Archaeological Archives to Museums: Guidelines for Use in England, Northern Ireland Scotland and Wales*. For deposition with the Museum of London the Guidelines for the Preparation of Archaeological Archives will be followed.

9.4 The results will be made publicly available via the ADS OASIS form (Appendix C).



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## APPENDIX A – CONTEXT REGISTER

Context No.	Context Description	Length	Width	Depth	Image No.	Single Ctxt. Plan?	Plan No.	Section No.	Specialist Drwg. No.
101	Mid - dark blackish brown, gravelly clayey silt. Made Ground	14.00m	8.00m	1.00m		N	1	1, 2 and 3	
102	Mid yellowish orange gravelly sandy clay.	4.00m	1.00m	0.80m		N	1	2	
103	Dark blackish brown gravelly clay	8.00m	4.00m	0.12m		N	1	2	
104	Pale, orangey brown, firm, clay.	4.00m	2.00m	0.95m		N	1	1 and 3	
105	Mid - light brownish grey, gravelly sand	8.00m	4.00m	0.05m		N	1	1, 2 and 3	
106	Wooden Revetment	1.20m	0.30m	4.00m	-	N	1	1	
107	Cut of River Channel	7.40m	2.00m	1.23m	-	N	1	3	
108	Mid brownish grey clay	7.00m	4.00m	1.27m	-	N	1	1, 2	
109	Mid yellow clay	0.10m	0.07m	0.34m	-	N	1	1	
110	Mid - dark bluish grey, organic clay	2.30m	2.00m	0.72m	-	N	1	3	
111	Mid grey gravelly clay	2.30m	2.00m	0.10m	-	N	1	3	
112	Mid yellowish orange, clayey, gravelly sand	2.00m	1.00m	0.10m		N	1	3	
201	Mid - dark greyish brown clay	6.50m	4.50m	0.84m		N	3	7	
202	Mid orange sandy gravel and dark black gravelly silt	6.50m	4.50m	0.60m		N	3	7	
203	Mid - light grey sandy gravel	6.50m	4.50m	0.54m		N	3	7	

Context No.	Context Description	Length	Width	Depth	Image No.	Single Ctxt. Plan?	Plan No.	Section No.	Specialist Drwg. No.
204	Mid - light yellowish grey gravelly sand	9.00m	3.00m	0.05m		N	3	6, 7 and 8	
205	Mid - light brownish yellow clay	4.50m	4.50m	1.56m	-	N	3	6	
206	Mid - light orangey brown silty clay	2.00m	2.00m	0.34m	-	N	3	6 and 8	
207	Mid - dark bluish green silty clay	2.00m	2.00m	0.22m	-	N	3	6 and 8	
208	Mid - light grey sandy gravels, containing frequent organic inclusions	2.00m	2.00m	0.64m		N	3	6 and 8	
209	Horizontal revetment timbers	2.70m	0.22m	0.03m	-	N	3	6	
210	Vertical revetment posts	1.60m	0.16m	0.16m	-	N	3	6	
211	Post line to the east of channel 212	?	0.15m	0.15m	-	N	3		
212	Cut of river channel	4.50m	6.50m	1.44m	-	N	3		
213	Mid – dark bluish green, slightly silty clay, with occasional gravel inclusions	2.00m	2.00m	0.38m		N			
301	Mid - dark brown, gravelly clayey silt	5.50m	4.00m	0.65m		N	2	4 and 5	
302	Dark brown clayey gravel	5.50m	4.00m	1.20m		N	2	5	
303	Mid yellowish brown gravelly sand	7.00m	2.00m	0.05m		N	2	4 and 5	
304	Horizontal revetment timber	4.00m	0.20m	0.06m		N	2	4	
305	Post	0.80m	0.15m	0.15m		N	2	4	
306	Mid orangey yellow, firm clay	4.00m	1.50m	1.52m		N	2	4	
307	Mid yellowish grey clay with frequent organic inclusions	1.50m	1.20m	0.82m		N	2	4	
308	Pit adjacent to river channel	1.50m	1.20m	0.82m		N	2	4	

Context No.	Context Description	Length	Width	Depth	Image No.	Single Ctxt. Plan?	Plan No.	Section No.	Specialist Drwg. No.
309	Mid - light greyish yellow clayey sand	4.00m	1.50m	0.45m		N	2	4	
310	Post	1.28m	0.15m	0.15m		N	2	4	
311	Mid bluish grey sandy clay	2.00m	1.50m	0.30m		N	2	4	
401	Mid greyish brown clayey silt	12.00m	6.00m	0.37m		N	4	9	
402	Mid orangey, yellowish grey clay	12.00m	6.00m	1.65m		N	4	9	
403	Mid brownish grey, sandy, clayey silt	10.00m	4.00m	1.02m		N	4	9	
404	Mid grey clayey sand with frequent organic inclusions	8.00m	2.00m	0.31m		N	4	9	
405	Mid yellowish brown gravelly sand	8.00m	2.00m	0.05m		N	4	9	
406	Cut of River channel	6.15m	4.00m	1.33m		N	4		
407	Mid bluish grey clay	4.00m	0.60m	0.49m		N	4		
408	dark blackish brown, clayey silt	6.15m	4.00m	1.30m		N	4		

## APPENDIX B – GEO-ARCHAEOLOGICAL RAPID ASSESSMENT

### Channelsea Gorge, PDZ6, Olympic Park: Rapid Environmental

### Archaeological Assessment

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#### Introduction

This report summarises the findings arising out of the rapid environmental archaeological assessment undertaken by Quaternary Scientific (QUEST) in connection with the proposed development of Channelsea Gorge, PDZ6 of the Olympic Park. During recent archaeological investigations at the site undertaken by RPS and AOC Archaeology, QUEST and AOC Archaeology recorded the sedimentary sequences in trenches PDZ6.CG.01, PDZ6.CG.02, PDZ6.CG.03 and PDZ6.CG.04 and obtained column and bulk samples suitable for a laboratory-based environmental archaeological rapid assessment, and possible future assessment and analysis. The key aims of the environmental archaeological (including geoarchaeology, zooarchaeology and archaeobotany) rapid assessment are outlined in the following documents: PDZ6 Method Statement for an Archaeological Evaluation (MoLAS-PCA, 2007a), PDZ6 Detailed Desk Based Assessment (MoLAS-PCA, 2007b), and PDZ6 Addendum to a Method Statement for an Archaeological Investigation (AOC-RPS Planning, 2008). The environmental archaeological aims for PDZ6 are:

- Do Late Glacial deposits exist within re-worked gravels in the southwest part of the zone (Landscape Zone 3)? What is the potential for past environment reconstruction and/or Late Upper Palaeolithic activity in these deposits?
- Did the Leyton River cross the zone in the Pleistocene or Holocene and is there evidence for human activity associated with the river?
- Can channels of the River Lea be distinguished from its tributaries in the southwestern part of the zone? Does evidence for human activity, similar to that found in the Stratford Box, associated with the river, survive?

- What environmental evidence suitable for past landscape reconstruction exists within deposits associated with ancient channels of the River Lea and its tributaries?
- Can episodes of channel activity and abandonment and wetland expansion across previously dry land surfaces on the zone be dated?
- Is there any evidence of a Roman road and/or occupation activity within the area of the zone? If so, how does it relate to what is known of the settlement pattern further north in the Leyton area during the Roman period?
- Is there any evidence of medieval and post-medieval agricultural activity present on the zone?
- What was the pre-modern/pre-Victorian topography of the zone?
- Is there evidence for past water management, i.e. drainage ditches, mill remains, sluices and revetments associated with earlier courses of the Channelsea River/Henniker's Ditch and River Lea?

In order to evaluate the potential of the samples for achieving the research aims and questions proposed for PDZ6, the environmental archaeological rapid assessment consisted of:

- Integration of detailed sediment descriptions from the column samples, field-based descriptions and archaeological sections, to produce a preliminary interpretation of the depositional history of the site (deposit model)
- A rapid assessment of the concentration of pollen grains and spores (from the column samples) to evaluate the potential for reconstructing the vegetation history and detecting evidence for human activities
- A rapid assessment of the concentration of diatom frustules (from the column samples) to evaluate the potential for reconstructing the hydrological history, in particular changes in the riverine environment and salinity



- A rapid assessment of the concentration of macroscopic plant remains (waterlogged and charred seeds, waterlogged wood and charcoal), insect remains, Ostracoda and Mollusca (from the bulk samples) to evaluate the potential for reconstructing the environmental and land-use history. In particular, the former vegetation cover, the nature of woodland utilisation, cultivation and diet, and changes in the aquatic and terrestrial environment.

### **The Site**

The Channelsea River is entirely within Development Zone PDZ6, which is on the floor of the lower Lea valley towards the southern end of the area formerly occupied by Hackney Marshes. The site is underlain by the floodplain Alluvium of the river (British Geological Survey 1:50,000 Sheet 256 North London 1994). The floodplain here is *ca.*1.6km in width and is flanked on both sides by discontinuous remnants of a low terrace, now regarded as equivalent to the Kempton Park Terrace of the River Thames. The bedrock beneath the valley floor is the sands, clays and pebble beds of the Lower Tertiary (Palaeocene) Lambeth Group (formerly Woolwich and Reading Beds). The valley floor of the Lea has been extensively modified, particularly since the mid-19th century, by quarrying, the construction and demolition of industrial premises and the development of water-supply, power and communications networks. Made and disturbed ground are widely present reflecting extensive programmes of ground raising.

The western boundary of PDZ6 is the Waterworks River which separates PDZ6 from PDZ5. This channel probably follows quite closely the course of an ancient tributary of the River Lea, the Leyton River. Eastward PDZ6 extends to the eastern edge of the valley floor. The Channelsea River, as currently defined, flows from north to south parallel with part of the course of the Waterworks River and probably also originated as an ancient distributary of the Lea.

The history of these watercourses is complicated by the fact that the names attached to them have changed, the alignment of the channels has been artificially modified and in places the original natural channel has been completely obliterated. Early maps (Rocque 1746; Chapman & André 1777) show three watercourses with broadly north to south alignments in the western part of the area occupied by PDZ6. These rivers are still recognisable in the Ordnance Survey map of 1896. The most westerly follows the western boundary of PDZ6 and is called *River Lea* (now the Waterworks River). About 150m to the east and approximately parallel with the 'River Lea', converging slightly southward, is a second channel called *Waterworks River* (now in part the Channelsea River). Eastward again at a distance of up to 100m is a third, more sinuous but unnamed channel that wound around an Artificial Manure Works, continued southward to become confluent with the Waterworks River but diverged to form a separate course in the south west corner of PDZ6. By 1938 the reach between the Artificial Manure works and the Waterworks River (ca. 200m) had disappeared and the present configuration of the channels had been established. Thus, the watercourse now termed the Channelsea River, and the subject of the present account, is in the north a remnant of the original Waterworks River and in the south a remnant of the most easterly, unnamed channel, delineated on early maps. Trenches PDZ6.CG.01, PDZ6.CG.02 and PDZ6.CG.03 described below are adjacent to the old Waterworks River. Trench PDZ6.CG.04 is adjacent to the most easterly, unnamed, river.

Previous investigations in the area occupied by PDZ5 and PDZ6, based on borehole records (MoLAS-PCA, 2007a, b) suggest that the active channels and associated floodplains of two substantial prehistoric rivers can be traced within the area. One of these rivers, regarded as the proto-Lea, crosses PDZ5 from north west to south east; the other, the Leyton River, approaches the area from the north and, straddling the boundary between PDZ5 and PDZ6, is confluent with the proto-Lea near the southern end of PDZ6. The alignment of this ancestral river appears to coincide quite closely with the modern course of the Waterworks River.

The borehole record in PDZ6 suggests that the floodplain of the prehistoric Leyton River is underlain by a buried channel cut into sands and gravels of Late Devensian Late Glacial age and locally through the sand and gravel into bedrock. This sand and gravel, the Lea Valley Gravel of Gibbard (1994), can be regarded as equivalent to the Late Devensian Shepperton Gravel of the River Thames. These and similar gravels are widely recognised beneath the Holocene floodplain alluvium of the Thames and its tributaries. They have a characteristically uneven surface representing the bars and channels that formed during the final stages of their deposition.

River deposits of Holocene age have been identified infilling the buried channel of the Leyton River and spreading out extensively across the adjacent surface of the Lea Valley Gravel. These alluvial deposits formed the natural floor of the Lea valley prior to the land-raising programmes of the late nineteenth and early twentieth century. A mature soil is present in the upper part of this Holocene alluvium.

The surface of the Late Devensian sand and gravel in PDZ6 is at levels close to 2.0m OD, with local 'islands' (former gravel bars) rising to between 3.0m and 4.0m OD. Beneath the Leyton River, the buried channel is recognised down to *ca.* -4.0m OD close to the confluence with the proto-Lea. Upstream from this confluence area the buried channel appears to be much shallower, down to between 0.0m and 1.0m OD, suggesting the possibility that the greater depth near the confluence may represent localised scour holes.

The Holocene alluvium across the greater part of PDZ6 has been recognised in boreholes and trial trenches at levels between 0.0m and 4.0m OD. Channel deposits often form the lower part of these sediment sequences, between 0.0m and 2.0m OD, with fine-grained floodplain silts forming the upper part between 2.0m and 4.0m OD.

## **Methods**

### Field investigations

During the excavations, column and bulk samples were recovered from trenches PDZ6.CG.01, PDZ6.CG.02, PDZ6.CG.03 and PDZ6.CG.04. The samples were collected from specific archaeological contexts that would enable a rapid assessment of the potential of the deposits to address the site-specific research aims.

### Lithostratigraphic descriptions (Geoarchaeology)

The field investigation records were enhanced by laboratory-based lithostratigraphic descriptions of all column samples using standard procedures for recording unconsolidated sediment and peat, noting the physical properties (colour), composition (gravel, sand, clay, silt and organic matter) and inclusions (e.g. artefacts). The procedure involved: (1) cleaning the samples with a spatula or scalpel blade and distilled water to remove surface contaminants; (2) recording the physical properties, most notably colour; (3) recording the composition e.g. gravel, fine sand, silt and clay; (4) recording the degree of peat humification, and (5) recording the unit boundaries e.g. sharp or diffuse.

### Pollen rapid assessment (Archaeobotany)

A total of thirty pollen samples were extracted from the contexts recorded in the column sequences obtained from trench PDZ6.CG.01 (11 samples), PDZ6.CG.02 (8 samples), PDZ6.CG.03 (6 samples), and PDZ6.CG.04 (5 samples). The pollen was extracted as follows: (1) sampling a standard volume of sediment (1ml); (2) deflocculation of the sample in 1% Sodium pyrophosphate; (3) sieving of the sample to remove coarse mineral and organic fractions ( $>125\mu$ ); (4) acetolysis; (5) removal of finer minerogenic fraction using Sodium polytungstate (specific gravity of  $2.0\text{g/cm}^3$ ); (6) mounting of the sample in glycerol jelly. Each stage of the procedure was preceded and followed by thorough sample cleaning in filtered distilled water. Quality control is maintained by periodic checking of residues, and assembling sample batches from various depths to test for systematic laboratory effects. Pollen grains and spores were identified using the Reading University pollen type collection and the following sources of keys and photographs: Moore *et al* (1991); Reille (1992). The rapid assessment procedure consisted of scanning the prepared slides, and recording the concentration and preservation of pollen grains and spores on four transects (10% of the slide) (Table 1).

### Diatom rapid assessment (Archaeobotany)

A total of thirty pollen samples were extracted from the contexts recorded in the column sequences obtained from trench PDZ6.CG.01 (11 samples), PDZ6.CG.02 (8 samples), PDZ6.CG.03 (6 samples), and PDZ6.CG.04 (5 samples). The diatom extraction involved the following procedures (Battarbee *et al.*, 2001):

1. Treatment of the sub-sample (0.2g) with Hydrogen peroxide (30%) to remove organic material and Hydrochloric acid (50%) to remove remaining carbonates
2. Centrifuging the sub-sample at 1200 for 5 minutes and washing with distilled water (4 washes)
3. Removal of clay from the sub-samples in the last wash by adding a few drops of Ammonia (1%)
4. Two slides prepared, each of a different concentration of the cleaned solution, were fixed in mounting medium of suitable refractive index for diatoms (Naphrax).

The rapid assessment procedure consisted of scanning the prepared slides, and recording the concentration and preservation of diatom frustules (Table 1).

Bulk sample assessment (charred and waterlogged seeds, waterlogged wood, charcoal, insects, Ostracoda and Mollusca) (Archaeobotany and Zooarchaeology)

Five of the eleven bulk samples collected from trench PDZ6.CG.02 were processed and rapidly assessed for charred and waterlogged seeds, waterlogged wood, charcoal, insects, and Mollusca. In order to maximise the recovery of each class of sub-fossil remains, a minimum 1litre sub-sample was processed by wet-sieving using 300 micron and 1mm mesh sizes. The residues from each sieve size were then scanned using a low power zoom-stereo microscope. The quantities of each class were recorded for each sample (Table 2).

## Results and interpretation of the sedimentary sequences (Geoarchaeology)

Records from four trenches are described here. Trench PDZ6.CG.04 is close to the boundary of PDZ6 at its southern end and adjacent to a remnant of the most easterly of the three historic water courses in the western part of PDZ6. It is ca. 0.14km north of PDZ6 Trench 48 (Green *et al.*, 2009) and ca. 0.11km NE of PDZ6 Trench 35 (MoLAS-PCA, 2007a). Trench PDZ6.CG.03 is ca. 0.20km to the north of trench PDZ6.CG.04 and adjacent to a remnant of the original Waterworks River. Trenches PDZ6.CG.02 and PDZ6.CG.01 are respectively ca. 40m and 80m north of trench PDZ6.CG.03. Trench PDZ6.CG.03 is about 0.1km to the east of PDZ6 trench 9 (Green *et al.*, 2009). A total of 13 column samples have been described, allowing the reconstruction of five sediment sequences.

### ***Trench PDZ6.CG.01***

Two sets of two overlapping column samples were taken from the same section (Section 3) in this trench. The more westerly set, samples <3> and <4> between 3.09m and 2.09m OD from sediments forming contexts (105), (110) and (111) and the second set, samples <1> and <2>, about 1.0m to the east of samples <3> and <4>, between 3.01m and 2.04m OD from sediments forming contexts (104), (105), (110) and (111). The sediment forming context (104) rests against the sloping surface of sediment forming context (110).

#### *Westerly sample set: column samples <3> and <4>*

The lowest unit (Unit 1), representing context (105) was a massive non-calcareous, well sorted silty sand, grey and brown in colour with scattered clasts of sub-angular flint, and incorporating scattered finely divided detrital plant remains. This unit passed up through a gradual but steeply inclined boundary to Unit 2. This unit was a moderately calcareous dark grey fairly well sorted massive fine sandy silt with scattered clasts of sub-angular flint and incorporating numerous detrital plant remains and common, mainly broken, mollusc shell. Overlying Unit 2 and separated from it by a sharp steeply inclined contact was a thin (0.03m) layer of chalk debris (Unit 3). Above this and again separated by a sharp steeply inclined contact was a massive dark grey calcareous fine sandy silt with scattered sub-angular flint clasts (Unit 4) in which detrital plant remains and mollusc remains were common.

Another well-marked and steeply inclined boundary separated the overlying Unit 5 which was generally similar to Unit 4 but less calcareous, dark greyish brown in colour and contained fewer plant and mollusc remains. The presence of ostracod valves was however noted. Unit 5 was separated from the overlying Unit 6 by another well-marked steeply inclined boundary. Unit 6 was a moderately calcareous massive slightly gritty clayey silt with scattered sub-angular flint clasts and incorporating common detrital plant remains and scattered mollusc remains. Units 3-6 together appear to represent Context (110). Units 4, 5 and 6 all contained finely divided CBM and Unit 6 contained inclusions of ash.

At the base of the more westerly sediment sequence in trench PDZ6.CG.01, the slightly stony non-calcareous silty sand of Unit 1, equivalent to context (105) may be undisturbed Holocene alluvium or the upper part of the Late Devensian Lea Valley Gravel. Its upper surface, which is probably an erosional contact is at a level of 2.27m OD, within the height range at which sandy alluvium has been identified elsewhere in PDZ5 and PDZ6 (Green *et al.*, 2009). All the overlying units (Units 2- 6) seem likely to be material introduced in association with the construction of the adjacent revetment. The steeply inclined contacts between units resemble tip lines. The presence of chalk rubble would be difficult to explain except as an anthropogenic introduction and in the upper units, the CBM and ash are undoubtedly of anthropogenic origin.

*Easterly sample set: column samples <1> and <2>*

The lowest unit (Unit 1), representing context (105) was a massive non-calcareous greyish brown slightly silty sandy gravel incorporating very scattered detrital plant remains. A sharp sub-horizontal contact separated Unit 1 from Unit 2, a non-calcareous greyish brown slightly gravelly silty sand, probably representing context (111), with irregular inclusions of bluish grey sandy silt. Roots and plant remains were present throughout but especially common in the silty inclusions. Another sharp sub-horizontal contact separated Unit 2 from Unit 3, representing context (110), a massive grey non-calcareous silty and sandy gravel containing detrital plant remains and penetrated from above by numerous roots. Another sharp sub-horizontal contact separated Unit 3 from Unit 4, representing context (104), a massive greyish brown non-calcareous gritty silt with scattered sub-angular flint clasts. Root channels and root remains were present throughout and particularly well-preserved in their original vertical position in the lower part of the unit. In the upper part of the unit in column sample <2> strong red mottling represented staining of the root channel margins. Detrital plant remains were common throughout the unit.

The more easterly sequence in trench PDZ6.CG.01, occupies much the same height range but obviously differs from the westerly sequence. The basal units (Units 1-3) are gravels and sand with an upper surface at 2.30m OD, representing context (105) and possibly also context (111). They may be undisturbed Early Holocene sediments or the upper part of the Late Devensian Lea Valley Gravel. The overlying deposits are gritty and slightly stony silts in which well-preserved in situ root systems are present, particularly in the layer immediately overlying the gravel of Unit 3. This sediment sequence looks like undisturbed Holocene alluvium and contains no intrusive material of anthropogenic origin, although occasional CBM inclusions were noted in the field. The field evidence indicates that at least the upper part of the sequence (Unit 4) representing context (104) rests against the sloping surface of the sediments represented in the westerly sequence (column samples <3> and <4>). On the basis of the lithostratigraphic evidence it seems likely that the easterly sequence represents natural accumulation adjacent to the revetment located a few metres to the west

#### ***Trench PDZ6.CG.02***

A set of three overlapping column samples <2> <3> and <4> was taken from Section 8 in trench PDZ6.CG.02 between 3.27m and 1.56m OD from sediments forming contexts (205), (206) (207) and (208).

The lowest unit in the sequence (Unit 1) was a massive black non-calcareous peaty fine to medium flint gravel representing context (208). This was overlain by a layer of very dark grey non-calcareous silt (Unit 2) in which detrital plant remains, root channels and root remains were common, with many roots in their original vertical position. This unit probably represents the lower part of context (207). The overlying unit (Unit 3) was a massive grey non-calcareous silt containing only very scattered root and detrital plant remains. A well-marked sub-horizontal boundary separated Unit 3 from Unit 4, a crumbly non-calcareous iron-rich sandy clay containing very few root remains and very little detrital plant material. Overlying this unit with a well-marked sub-horizontal boundary was a dark grey rather crumbly non-calcareous silt with red mottling (Unit 5), slightly gritty in its lower part and penetrated throughout by root channels in which root remains were common. Mollusc remains and detrital plant remains were also present but very scattered.



The peaty gravel (Unit 1) at the bottom of the sediment sequence in trench PDZ6.CG.02, with an upper surface at 3.03m OD is probably undisturbed Holocene sediment reworking the Late Devensian Lea Valley Gravel. It is overlain by sandy silt in which there are well preserved in situ root systems. This material (Units 2 and 3) with an upper surface at 2.17m OD seems likely to be undisturbed Holocene alluvium. The overlying silt (Unit 4) and sandy clay (Unit 5) were identified as alluvium in the field but are not typical of the undisturbed fine-grained Holocene alluvium seen elsewhere in PDZ6 and may be Made Ground. Both units are rather crumbly and friable. Unit 4 contains no visible organic material and is unusually iron-rich, to the extent that it contains many iron cemented granules and larger aggregates. Unit 5 is less atypical, being penetrated by root systems with iron-staining of the root channel margins and containing small amounts of detrital plant material and broken mollusc shell.

### ***Trench PDZ6.CG.03***

Two overlapping column samples <1> and <2> were taken from Section 4 in trench PDZ6.CG.03 between 2.3m and 1.5m OD from sediments forming contexts (303) and (307). A third column sample was taken from the same section, about 1m to the east of column samples <1> and <2>, between 2.22m and 1.72m OD, also from sediments forming contexts (303) and (307).

The lowest unit in the sequence (Unit 1), representing context (303) was a massive grey non-calcareous sandy fine to medium gravel. A sharp sub-horizontal contact separated it from the overlying unit (Unit 2), a bed of very dark grey non-calcareous gritty silty fine sand coarsening slightly upward with scattered detrital plant remains and common mollusc remains including specimens of *Viviparus viviparus* and *Trichia hispida*. Twigs, fish scales and probable CBM were also noted. A sharp slightly inclined contact separated this unit from an overlying lenticular bed of silty sand fining upward to sandy silt (Unit 3). The overlying unit (Unit 4) was a rather crumbly calcareous silty clay with irregular inclusions of organic silt and, in its lower part, clasts of sub-angular flint. Scattered mollusc remains and fish scales were present and inclusions of ash. Units 2-4 can be equated with context (307). Column sample <3> presents a similar sequence, with a basal unit of non-calcareous silty fine sand with scattered clasts of sub-angular flint (Unit 1) passing up to slightly sandy stoneless non-calcareous silt (Unit 2) overlain by brown rather crumbly calcareous silty clay (Unit 3 - probably equivalent to Unit 4 in column samples <1> and <2>)

The sandy fine to medium gravel at the bottom of the sequence recorded in column samples <1> and <2> in trench PDZ6.CG.03, and seen as Unit 1 in column sample <1> with an upper surface at 1.64m OD may be undisturbed Holocene alluvium or the upper part of the Late Devensian Lea Valley Gravel. In the overlying deposits (Units 2-4) in this sequence and in the sequence recorded in column sample <3> there are indications that the deposits are not undisturbed Holocene alluvium. In Unit 1 in column sample <1> and in Unit 1 in column sample <3> sorting is poor to moderate and there is patchy juxtaposition of different textures and colours. Similar poor sorting and patchy structure is present in Unit 4 in column samples <1> and <2> and inclined contacts and CBM and ash are present in this sequence. Pieces of concrete and white glazed earthenware were identified in the field in this context and confirm its intrusive origin.

#### ***Trench PDZ6.CG.04***

Three overlapping column samples <upper>, <middle>, <lower> were taken from Section 9 in trench PDZ6.CG.04, between 2.31m and 1.07m OD from sediments forming contexts (402), (403) and (404).

The lowest unit in this sediment sequence (Unit 1), representing context (404) was a massive dark greyish brown calcareous sandy gravel with scattered detrital plant remains. It was separated by a well-marked sub-horizontal boundary from the overlying Unit 2, representing context (403), a thick bed of very dark greyish brown calcareous fine sandy silt in which both detrital plant remains and mollusc remains were common. Mollusc species included *Theodoxus fluviatilis*, *Bithynia tentaculata* and small bivalves with valves conjoined. Between 2.05m and 1.97m OD a wooden stake, circular in cross section and with a diameter of ca. 60mm passed obliquely through the column. At a level of 2.06m OD a well-marked sub-horizontal boundary separated Unit 2 from the overlying Unit 3, representing context (402), a massive calcareous greyish brown fine sandy silt penetrated by root channels with iron-stained margins, giving the sediment a yellowish red mottled appearance. Root and plant remains were common together with large amounts of finely divided mollusc shell and a few complete individual gastropods and valves of bivalves.

The calcareous gravelly sand (Unit 1) at the base of the sediment sequence in trench PDZ6.CG.04, representing context (404) is likely to be early Holocene in age reworking sands and gravels of Late Devensian age (Lea Valley Gravel). The level of its upper surface at 1.17m OD is fairly close to the level (1.02m OD) of the similar basal gravel in nearby PDZ6 trench 48 (Green *et al.*, 2009). The gravelly sand passes up into the very dark greyish brown calcareous fine sandy silt, 0.89m thick, forming Unit 2 in which detrital plant material and mollusc remains are common. The presence of *Theodoxus fluviatilis* and *Bithynia tentaculata* is indicative of deposition in a large well oxygenated body of running water. The presence of small bivalves with valves conjoined shows that the sediment has suffered little or no post depositional disturbance. The upper surface of this organic unit is at 2.06m OD where it is succeeded by a mottled fine sandy silt (Unit 3) in which root channels and root remains are common. This sequence resembles closely Holocene alluvial sequences reported from other trenches and from boreholes in PDZ6 and PDZ5. The similarities relate to sediment characteristics, the level of the significant boundary surfaces and the likely depositional environment.

### **Summary Overview of the sedimentary sequences**

In a previous investigation of Development Zones PDZ5 and PDZ6 (Green *et al.*, 2009) sediments regarded as the Early Holocene channel and floodplain deposits of the River Lea and the Leyton River were recorded rather consistently as a richly organic fining upward sequence between approximately 1.0m and 2.0m OD. These sediments were succeeded upward by rather uniform silty deposits in which evidence of soil-forming processes could often be identified, representing the lower horizons of the soil formed on the pre-industrial floodplain of the Lea.

Only the sediments recorded in trench PDZ6.CG.04 in the present investigation appear to conform to the lithostratigraphic model outlined in the previous paragraph and it seems very likely that these sediments form part of the prehistoric channel and floodplain deposits of the Leyton River, a short distance upstream from its confluence with the Proto-Lea.

The deposits in trenches PDZ6.CG.01, PDZ6.CG.02 and PDZ6.CG.03, which are all recorded from levels above 1.5m OD and in the case of trench PDZ6.CG.01, from above 2.0m OD, obviously have a different origin. In all the sediment sequences in these trenches the lowest units are sandy gravels which appear to be undisturbed sediment, either the upper part of the Late Devensian Lea Valley Gravel or Early Holocene reworking of it. The upper surface of these gravels at 2.12m OD in trench PDZ6.CG.01, 1.92m OD in trench PDZ6.CG.02 and 1.64m OD in trench PDZ6.CG.03, is above the level at which similar sandy gravels have been recorded nearby underlying richly organic channel-fill sediments of probable Early Holocene age, e.g. in PDZ6 trenches 7, 8 and 9 (Green *et al.*, 2009). Furthermore, the deposits overlying the sandy gravels in trenches PDZ6.CG.01, PDZ6.CG.02 and PDZ6.CG.03 are unlike the sequences regarded elsewhere in PDZ6 as undisturbed Holocene floodplain accumulations. In trenches PDZ6.CG.01 and PDZ6.CG.03 there is positive evidence of anthropogenic intervention in the process of accumulation. In trench PDZ6.CG.02 the evidence is ambiguous.

The relatively high level at which gravel is present in trenches PDZ6.CG.01, PDZ6.CG.02 and PDZ6.CG.03 is not inconsistent with the topographic model being developed for PDZ6 (MoLAS-PCA, 2007a) which recognises that the pre-Holocene gravel surface will have been uneven, with a general level close to 2.0m OD and 'islands' rising to higher levels, up to 4.0m OD. The sandy gravel at the base of the sediment sequences in trenches PDZ6.CG.01, PDZ6.CG.02 and PDZ6.CG.03 may therefore represent undissected remnants of the pre-Holocene, Late Devensian floodplain.

### **Results and interpretation of the rapid pollen assessment**

A total of thirty pollen samples were extracted from the contexts recorded in the column sequences obtained from trench PDZ6.CG.01 (11 samples), PDZ6.CG.02 (8 samples), PDZ6.CG.03 (6 samples) and PDZ6.CG.04 (5 samples) (Table 1).

#### ***Trench PDZ6.CG.01***

In the westerly sample set, pollen was absent in context (105), but was recorded in variable (absent to moderately high) concentrations and preservation in contexts (110) and (111). Pollen was absent in all contexts from the easterly set of samples (contexts (105), (111) and (104)). Microscopic charred particles were recorded occasionally in contexts (110) and (111).

### ***Trench PDZ6.CG.02***

Pollen was absent or recorded in low concentrations in all samples rapidly assessed from contexts (208), (207), (206), (207/206) and (205). Microscopic charred particles were recorded occasionally in contexts (207) and (207/206).

### ***Trench PDZ6.CG.03***

Pollen was absent or recorded in low concentrations in all samples rapidly assessed from contexts (303) and (307). Microscopic charred particles were either absent or recorded occasionally. The only exception was the sample from 1.92 to 1.91m OD in which pollen and microscopic charred particles were recorded in high concentrations

### ***Trench PDZ6.CG.04***

Pollen was generally recorded in either absent or low concentrations in samples from this trench, the exception being -1.95 to -1.94m OD in which pollen was recorded in high concentrations. Microscopic charred particles were absent in the lower half of the sequence, but increased to low/moderate concentrations in samples taken at and above 1.70m OD (contexts (403) and (402)).

## **Results and interpretation of the rapid diatom assessment**

A total of thirty diatom samples were extracted from the contexts recorded in the column sequences obtained from Trench PDZ6.CG.01 (11 samples), PDZ6.CG.02 (8 samples), PDZ6.CG.03 (6 samples), and PDZ6.CG.04 (5 samples) (Table 1).

### ***Trenches PDZ6.CG.01 and PDZ6.CG.02***

There were no identifiable diatoms present on the slides from the contexts recorded in trenches PDZ6.CG.01 and PDZ6.CG.02. The only exception was in a single sample taken from trench PDZ6.CG.02 (context (208)), in which a single diatom was recorded.

### ***Trench PDZ.6CG..03***

No identifiable diatom fragments were recorded on the samples rapidly assessed from context (303); however, diatoms were recorded in the samples from context (307). In the main remains were recorded in low concentrations, with the exception of the sample from 1.92 to 1.91m OD in which the concentration and preservation of diatoms was moderate to high.

### ***Trench PDZ6.CG.04***

Diatoms were recorded throughout the sequence. In contexts (404) and (402), the concentration and preservation of remains was very low. However, in context (403), the concentration and preservation of remains was generally very high.

### **Results and interpretation of the bulk sample assessment (charred and waterlogged seeds and wood, insects and mollusca)**

Five of the eleven bulk samples collected from Trench PDZ6.CG.02 were processed and rapidly assessed for charred and waterlogged seeds, waterlogged wood, charcoal, insects, and Mollusca.

The sequence of bulk sample taken from west face of trench PDZ6.CG.02 traversed three different contexts (contexts (207/206), (206), (207)). Charred wood was recorded in low quantities, in samples <1>, <3>, <7> and <9>, and was absent from sample <5> (context (206)). Waterlogged wood was recorded in low or moderate concentrations in samples <7> and <9> from context (207), but was absent elsewhere. Insects were recorded in low concentrations in samples <7> and <9> from context (207), but were absent elsewhere. Waterlogged and charred seeds, chaff and Mollusca were absent in samples.

**Table 1: Results of the pollen and diatom rapid assessment, Trenches PDZ6.CG.01, PDZ6.CG.02, PGZ6.CG.03 and PDZ6.CG.04, Channelsea Gorge, PDZ6, Olympic Park**

Column sample			Depth (m OD)	Context	Pollen Rapid Assessment			Diatom Rapid Assessment		
					Concentration	Preservation	Microscopic charcoal	Concentration	Preservation	
Trench PDZ6.CG.01; Section 3; Westerly sample set										
4		3.04 to 3.03	(110)	0	0		3	0	-	
4		2.74 to 2.73	(110)	2	1		1	0	-	
3		2.42 to 2.41	(110)	1-2	2		0	0	-	
3		2.26 to 2.25	(111)	0	-		0	0	-	
3		2.22 to 2.21	(111)	2-3	3-4		1	0	-	
3		2.10 to 2.09	(105)	0	-		0	0	-	
Trench PDZ6.CG.01; Section 3; Easterly sample set										
2		2.59 to 2.58	(104)	0	-		0	0	-	
2		2.41 to 2.40	(104)	0	-		0	0	-	
1		2.34 to 2.33	(111)	0	-		0	0	-	
1		2.18 to 2.17	(105)	0	-		0	0	-	
1		2.03 to 2.02	(105)	0	-		0	0	-	
Trench PDZ6.CG.02; Section 8										
2		2.79 to 2.78	(205)	0	-		0	0	-	
2		2.47 to 2.46	(206)/(207)	1	2		2	0	-	
3		2.47 to 2.46	(206)/(207)	0	-		1	0	-	
3		2.31 to 2.30	(206)	0	0		0	0	-	

			Pollen Rapid Assessment			Diatom Rapid Assessment		
Column sample	Depth (m OD)	Context	Concentration	Preservation	Microscopic charcoal	Concentration	Preservation	
3	2.07 to 2.06	(207)	1-2	2	1	0	-	
3	1.99 to 1.98	(207)	1	1	0	0	-	
4	1.83 to 1.82	(208)	1	4	0	1	2	
4	1.67 to 1.66	(208)	0	-	0	0	-	
Trench PDZ6.CG.03; Section 4								
3	2.00 to 1.99	(307)	0	0	1-2	1	3	
3	1.84 to 1.83	(307)	0	-	0	0	-	
3	1.68 to 1.67	(303)	0	-	0	0	-	
2	2.25 to 2.24	(307)	1	1	1	1	2	
1	1.92 to 1.91	(307)	3	3-4	4	4	3	
1	1.56 to 1.55	(303)	0	-	0	0	-	
Trench PDZ6.CG.04; Section 9								
Upper	2.27 to 2.26	(402)	1	1	1	1	2	
Middle	1.95 to 1.94	(403)	3	3-4	2	4-5	2-3	
Middle	1.71 to 1.70	(403)	1	1	1	3	2-3	
Lower	1.39 to 1.38	(403)	0	-	0	4	3	
Lower	1.08 to 1.07	(404)	1	1-2	0	1	1	

Key: 0 = 0 estimated grains or frustules per slide; 1 = 1 to 75; 2 = 76 to 150; 3 = 151 to 225; 4 = 226-300; 5 = 300+. Estimated number based on assessment of 10% of total number of slide transects (4 of 40 transects)



**Table 2: Bulk sample rapid assessment from trench PDZ6.CG.02, Channelsea Gorge, PDZ6, Olympic Park**

Trench Number	Section	Sample number	Depth (m OD)	Context number	Volume (litres)	Fraction (e.g. flot, residue, >300µm)	Charred		Waterlogged		Mollusca	Insects
							Wood	Seeds	Wood	Seeds		
2	4	<1>	2.32 to 2.37	(207/206)	1.0	>300µm	1	-	-	-	-	-
						>1mm	-	-	-	-	-	-
2	4	<3>	2.17 to 2.22	(206)	1.0	>300µm	1	-	-	-	-	-
						>1mm	-	-	-	-	-	-
2	4	<5>	2.12 to 2.07	(206)	1.0	>300µm	-	-	-	-	-	-
						>1mm	-	-	-	-	-	-
2	4	<7>	2.02 to 1.97	(207)	1.0	>300µm	-	-	-	-	-	1
						>1mm	2	-	3	-	-	-
2	4	<9>	1.92 to 1.87	(207)	1.0	>300µm	-	-	-	-	-	1
						>1mm	1	-	1	-	-	-

Key: 0 = Estimated Minimum Number of Specimens (MNS) = 0; 1 = 1 to 25; 2 = 26 to 50; 3 = 51 to 75; 4 = 76 to 100; 5 = 101+

## Conclusions

The rapid environmental archaeological assessment was conducted to evaluate the potential of the column and bulk samples collected during the archaeological excavations of Trenches PDZ6.CG.01, PDZ6.CG.02, PDZ6.CG.03 and PDZ6.CG.04 from the Channelsea Gorge, to address the aims proposed for PDZ6 (see MoLAS-PCA, 2007a, b; AOC-RPS Planning, 2008).

The sediments recorded in trench PDZ6.CG.04 are closely similar to sequences previously recorded in PDZ6 in boreholes and open trenches and regarded as representing accumulation in active Early Holocene channels (see MoLAS-PCA, 2007a; Green *et al.*, 2009). The sediments recorded in Trenches PDZ6.CG.01, PDZ6.CG.02 and PDZ6.CG.03 appear to represent conditions outside the network of Early Holocene channels where the pre-Holocene gravel surface remained undissected. The deposits resting on this surface in trenches PDZ6.CG.01, PDZ6.CG.02 and PDZ6.CG.03 may be in part semi-natural but in part are undoubtedly disturbed by anthropogenic intervention and may have originated either as Made Ground or in association with the revetment of nearby water courses.

The results of the zooarchaeological and archaeobotanical rapid assessments indicate the preservation of low concentrations of microfossil remains (pollen and diatoms) in trenches PDZ6.CG.01, PDZ6.CG.02 and PDZ6.CG.03. In Trench PDZ6.CG.04, pollen is also recorded in low concentrations, but diatoms are recorded in concentration and preservation is moderate to high. The bulk samples collected from trench PDZ6.CG.02 record, in general, a low quantity of macrofossil (charcoal, charred seeds, chaff, waterlogged wood and seeds, Mollusca, Ostracoda and insects) remains. No horizons were considered of value for radiocarbon dating at the rapid assessment stage. Each of the aims are addressed below based upon the results of the rapid assessment.

## Aims

Do Late Glacial deposits exist within re-worked gravels in the southwest part of the zone (Landscape Zone 3)? What is the potential for past environment reconstruction and/or Late Upper Palaeolithic activity in these deposits?

*The results of the rapid assessment indicate that no sediments from the Late Glacial or pre-dating the Last Glacial Maximum have been identified.*

Did the Leyton River cross the zone in the Pleistocene or Holocene and is there evidence for human activity associated with the river?

*The results of the rapid assessment indicate that the Leyton River entered the area from the north at its western margin and flowed south to be confluent with the proto-Lea near the southern end of the area. No evidence for human activity was recorded.*

Can channels of the River Lea be distinguished from its tributaries in the southwestern part of the zone? Does evidence for human activity, similar to that found in the Stratford Box, associated with the river, survive?

*The Lea and the Leyton Rivers cannot be distinguished on sedimentological grounds, and evidence for human activity was not recorded.*

What environmental evidence suitable for past landscape reconstruction exists within deposits associated with ancient channels of the River Lea and its tributaries?

*Microfossil diatom remains are recorded in the channel deposits forming the lower part of the Holocene alluvium in trench PDZ6.CG.04. Further assessment and possible analysis (if required) of the columns from trench PDZ6.CG.04 (contexts (404), (403) and (402)) may provide evidence suitable for past landscape reconstruction. This will be undertaken as part of either the Geo-archaeological assessment or SWIPEA as indicated in 8.7 and 8.8 above.*

Can episodes of channel activity and abandonment and wetland expansion across previously dry land surfaces on the zone be dated?

*No material suitable for dating was recognised, and no unequivocal evidence of wetland expansion was recognised in the present phase of investigation.*

Is there any evidence of a Roman road and/or occupation activity within the area of the zone? If so, how does it relate to what is known of the settlement pattern further north in the Leyton area during the Roman period?

*No evidence recorded.*

Is there any evidence of medieval and post-medieval agricultural activity present on the zone?

*The low concentration and preservation of biological remains indicate that the potential for recovering evidence of Roman or Medieval activity is very low.*

What was the pre-modern/pre-Victorian topography of the zone?

*There is evidence for the development of a soil at the surface of silty alluvium forming the floodplain of the Lea.*

Is there evidence for past water management, i.e. drainage ditches, mill remains, sluices and revetments associated with earlier courses of the Channelsea River/Henniker's Ditch and River Lea?

*Insufficient evidence relevant to this question fell within the purview of the present report.*

It is therefore recommended that further assessment and possible analysis (if required) might be carried out on the zooarchaeological microfossil remains (diatoms) from the column samples of trench PDZ6.CG.04 as part of either the Geo-archaeological assessment or SWIPEA as indicated in 8.7 and 8.8 above.. Otherwise, no further work is recommended.

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## APPENDIX C – WOOD ASSESSMENT

Phil Austin

### Introduction.

A single waterlogged plank (304) recovered during trial trenching of the proposed development of Channelsea Gorge PDZ6 in East London, Site Code: OL-103-08, by AOC Ltd. was submitted for assessment. The purpose of this assessment was to a). determine the identity of the wood and b). to record any evidence of modification of the wood. The plank formed part of 19<sup>th</sup> Century revetment support for the eastern edge of channel [312] and was secured by iron nails in front of posts [305] and [310].

### Methodology.

Preparation for and identification of the wood followed standard procedures for the analysis of waterlogged wood as described in Hather (2000). Growth ring characteristics were assessed as an aid to evaluating the method of conversion employed. Evidence of woodworking, *i.e.* axe/adze or saw marks, was recorded where present.

### Results & remarks

The wood was identified as *Pinus* sp. ('*sylvestris* type'). It is not possible to anatomically differentiate between *P. sylvestris* (Scots Pine), *P. mugo* (Mountain Pine) and *P. nigra* (Black Pine - or Austrian Pine, Corsican Pine). Of these three possibilities, Scots Pine is the only one native to the British Isles (Scotland only). Central and southern Europe is the nearest indigenous source of both Black Pine and Mountain Pine. Pine timber was imported in great quantities throughout the 19<sup>th</sup> Century and it is almost certain that the timber converted to form the plank had been imported from overseas.

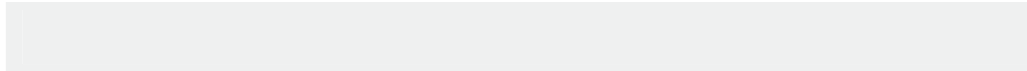
This substantial wooden plank measured 4m (L) x 0.20m (W) x 0.06m (D) and had been machine sawn to square it off. A large iron nail remained embedded within the wood. It was extremely well preserved and showed no sign of weathering or significant decay.

### References

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## APPENDIX D – OASIS FORM

**OASIS ID: AOCARCHA1-54500**



### Project details

Project name	Channelsea Gorge, Planning Development Zone 6, Olympic Park
Short description of the project	<p>The stratigraphic sequence exposed within the four evaluation trenches excavated through the modern day course of the Channelsea Gorge has illustrated that only within the south of the gorge was there active Early Holocene channels that laid down alluvial sediments comparable to those found within Trenches PDZ6.07, PDZ6.08, PDZ6.09 and PDZ6.48 to the west. In the north of the Gorge an untruncated gravel surface is overlain by part natural, part man made deposits. The evaluation has also revealed that as shown within cartographic sources for the area a widened Channelsea river channel and associated revetting within the north of the gorge was constructed at the end of the 19th century or beginning of the 20th century.</p>
Project dates	Start: 10-12-2008 End: 22-01-2009
Previous/future work	No / Not known
Any associated project reference codes	OL-103-08 - Sitecode

Type of project	Field evaluation
Site status	Local Authority Designated Archaeological Area
Current Land use	Open Fresh Water 1 - Running water
Monument type	REVETMENT Modern
Significant Finds	NONE
Methods & techniques	'Environmental Sampling',' Sample Trenches'
Development type	Olympic Park
Prompt	Direction from Local Planning Authority - PPG16
Position in the planning process	After full determination (e.g. As a condition)

#### Project location

Country	England
Site location	GREATER LONDON NEWHAM STRATFORD Channelsea Gorge, Planning Delivery Zone 6, The Olympic Park, Stratford



Postcode E15 2

Study area 133170.00 Square metres

Site coordinates TQ 537750 185300 50.9450968624 0.189215177823 50 56 42 N  
000 11 21 E Point

Height OD / Depth Min: 0.60m Max: 2.10m

#### Project creators

Name of Organisation AOC Archaeology Group

Project brief originator RPS Planning

Project design originator RPS

Project director/manager Andy Leonard

Project supervisor Paul Harris

Name of sponsor/funding body Olympic Delivery Authority (ODA)

### Project archives

Physical Archive recipient    Museum of London

Physical Archive ID            OL-103-08

Physical Contents                'Wood'

Physical Archive notes        Timber Sample

Digital Archive recipient       Museum of London

Digital Archive ID               OL-103-08

Digital Contents                 'Environmental','Stratigraphic','Wood'

Digital Media available        'Images raster / digital photography','Survey','Text'

Paper Archive recipient        Museum of London

Paper Archive ID                OL-103-08

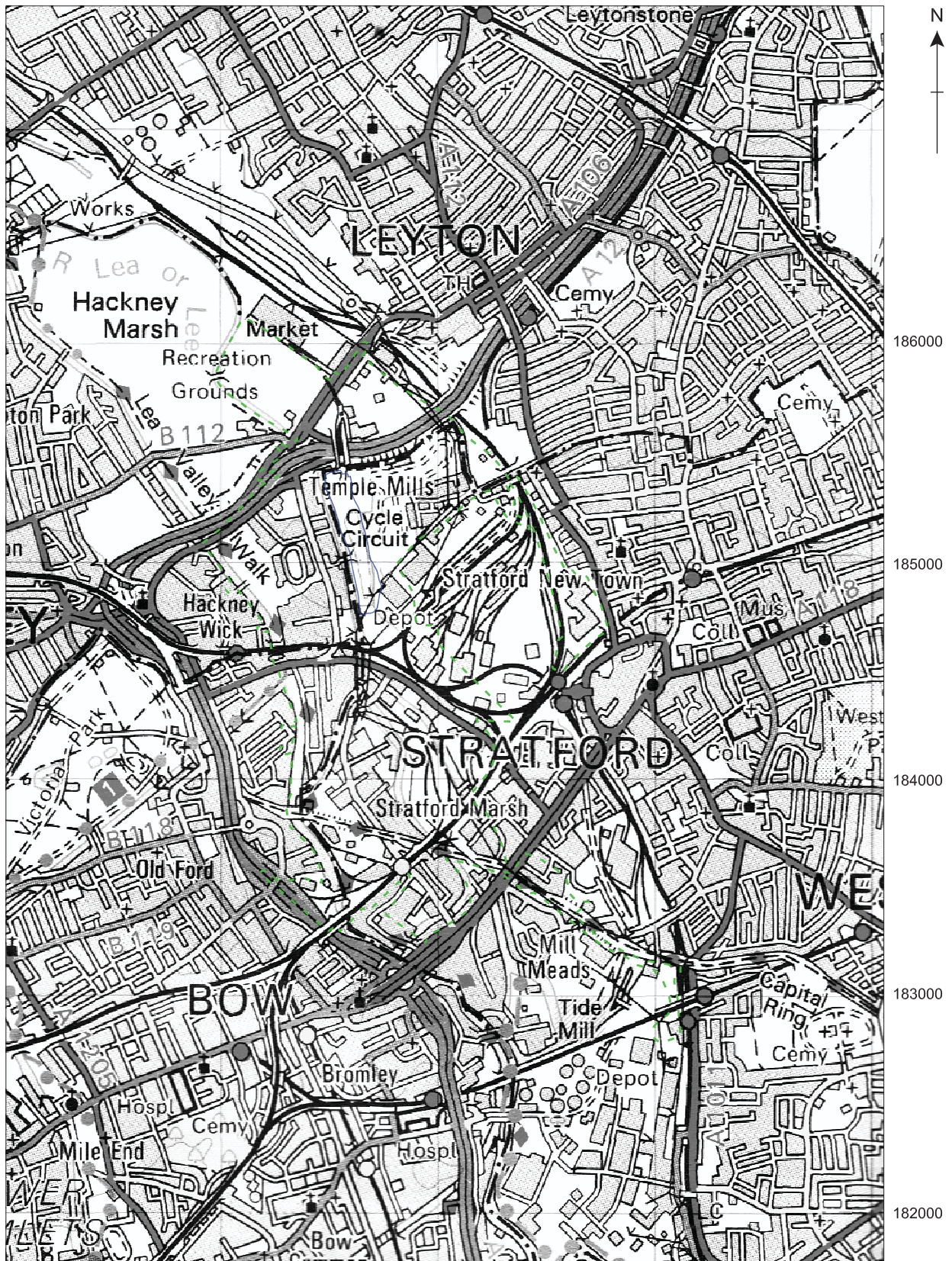
Paper Contents	'Stratigraphic','Wood','other'
Paper Media available	'Context sheet','Microfilm','Photograph','Plan','Report','Section','Survey '

### Project bibliography 1

	Grey literature (unpublished document/manuscript)
Publication type	
Title	Channelsea Gorge, Planning Delivery Zone 6, The Olympic Park, Stratford; An Archaeological Evaluation
Author(s)/Editor(s)	Harris, P.
Author(s)/Editor(s)	RPS Planning
Date	2009
Issuer or publisher	AOC Archaeology
Place of issue or publication	AOC Archaeology London
Description	A4 bound (blue spine unibind cover). 75 pages, 6 figures.

Entered by Paul Harris (paul.harris@aocarchaeology.com)

Entered on 15 April 2009



Based on the Ordnance Survey's 1:50,000 Landranger Map of 2004  
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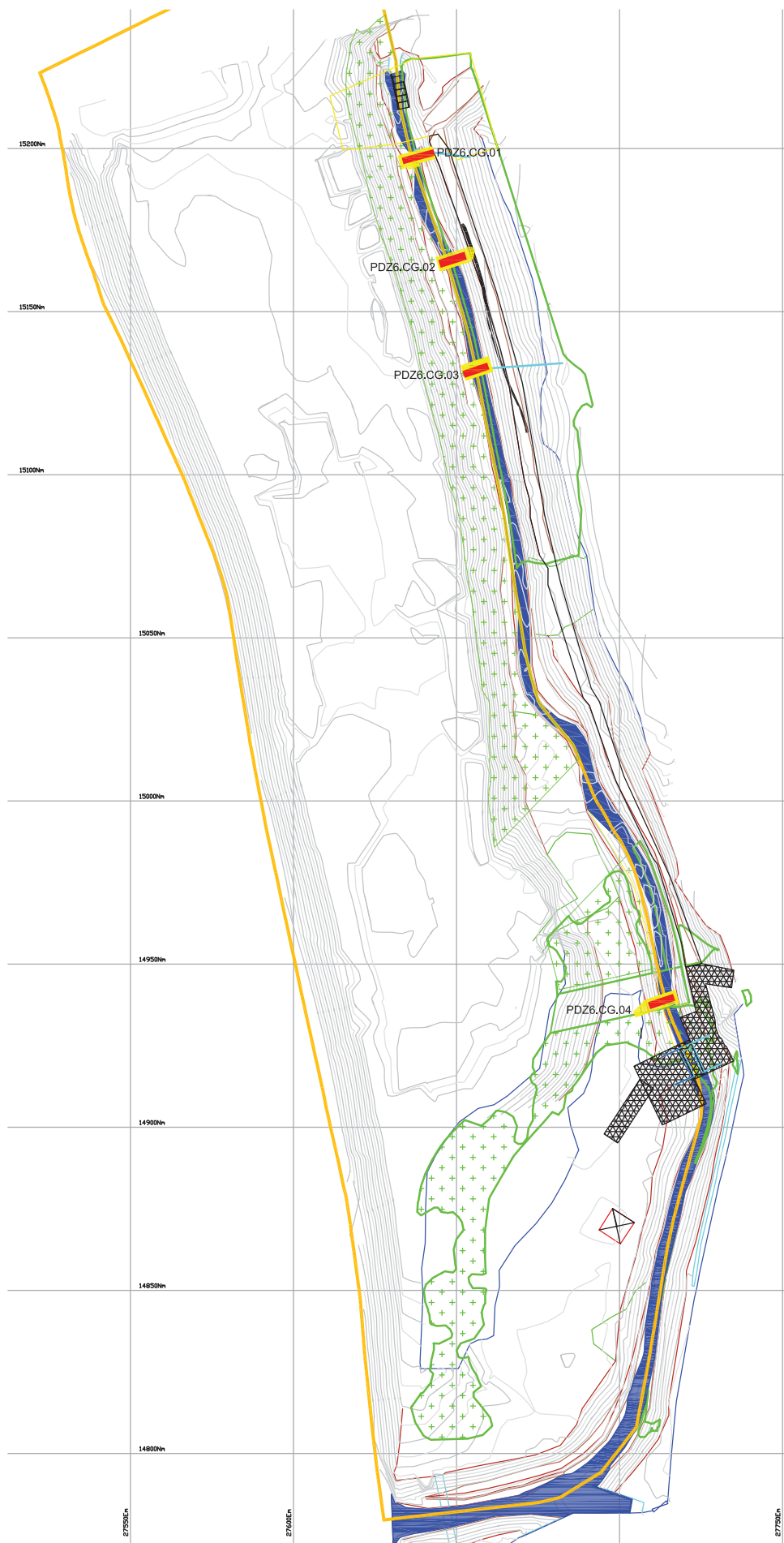
Site Outline PDZ6 Outline

0.5km 0 1km

1:25000

**Figure 1:** Site Location Plan



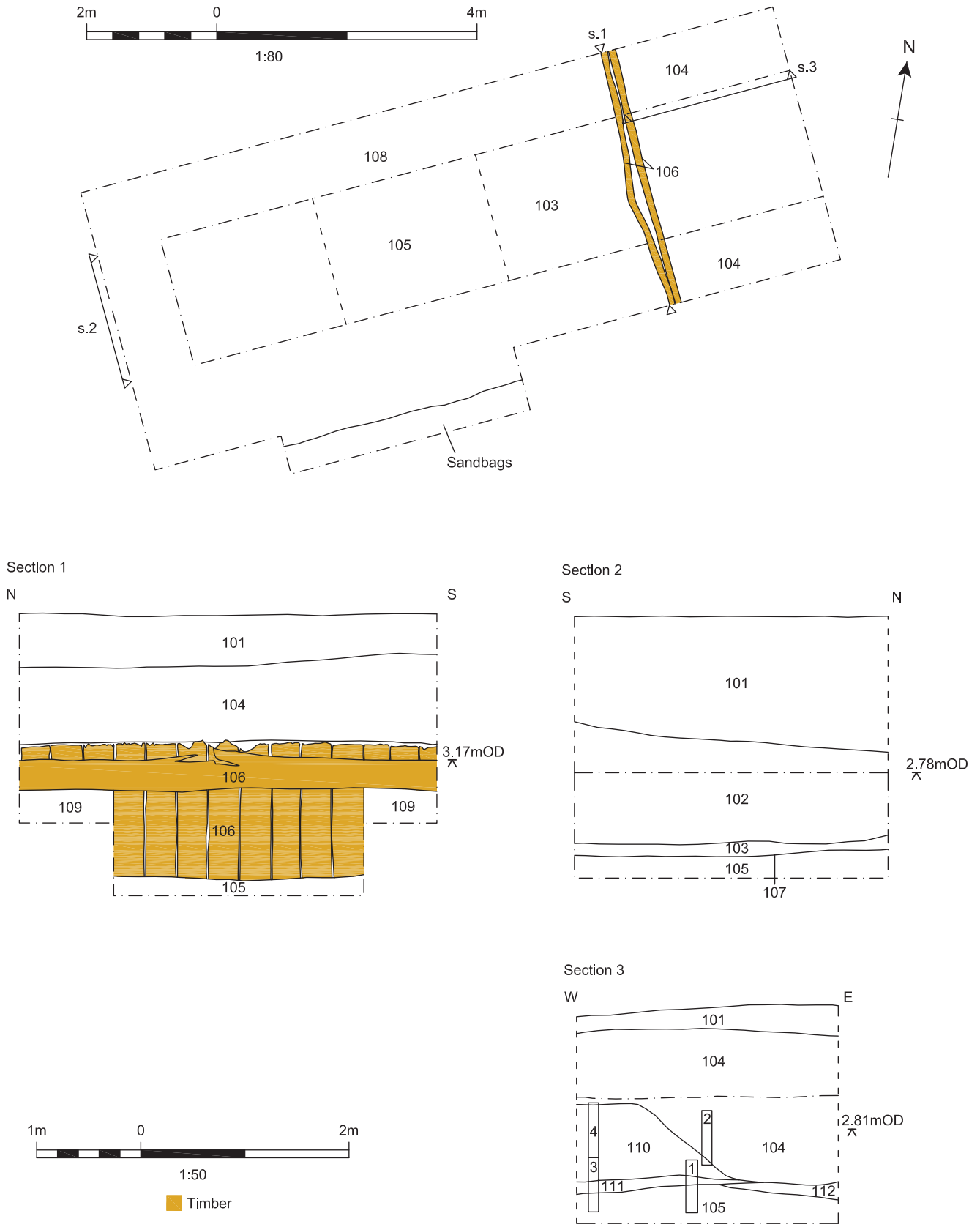


Based on the Survey Data Provided by the Client

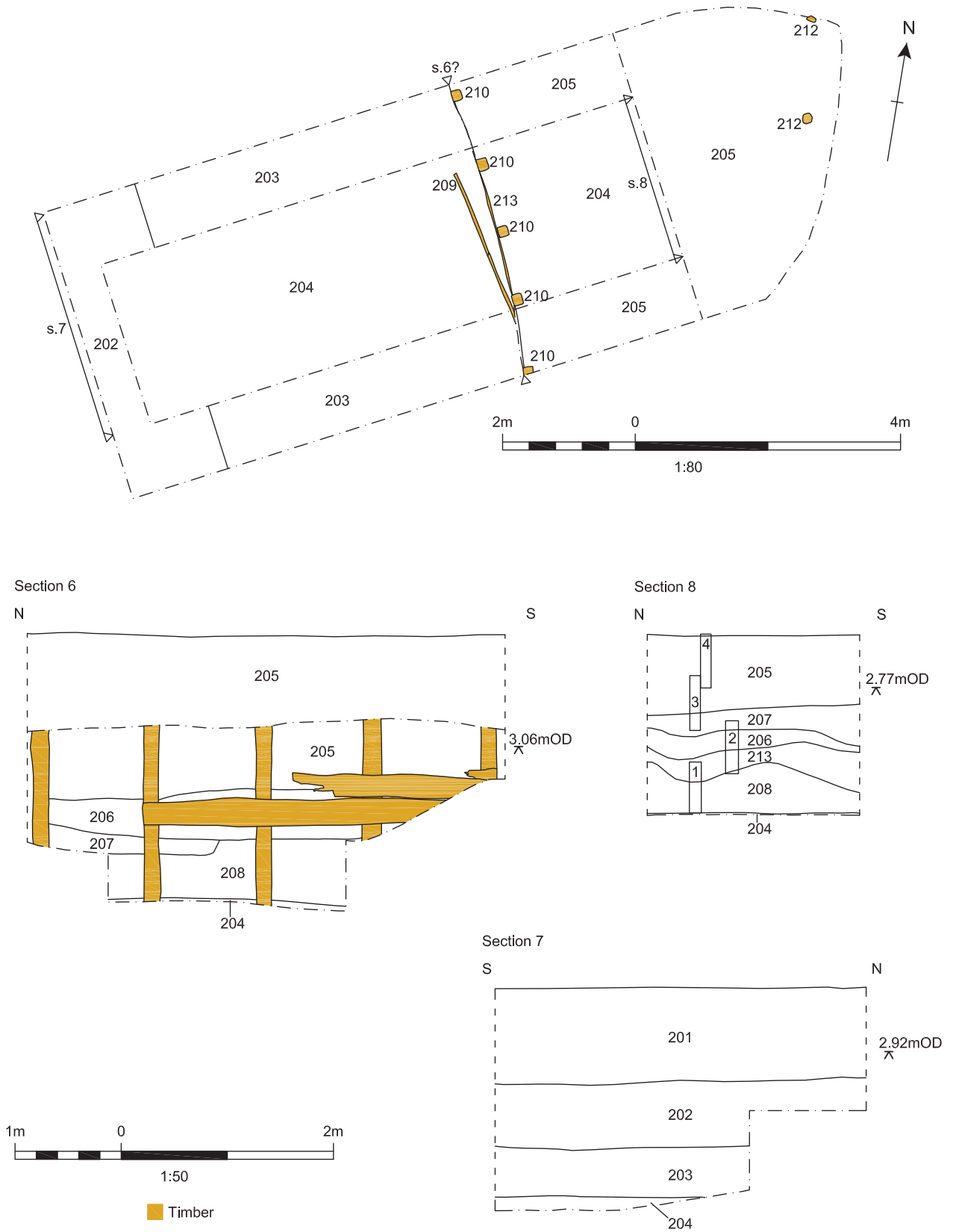
**Figure 2:** Slip Trench Location Plan

- Extent of Area 6d
- Channelsea River
- Base Slip Trenches
- Steps In Slip Trenches



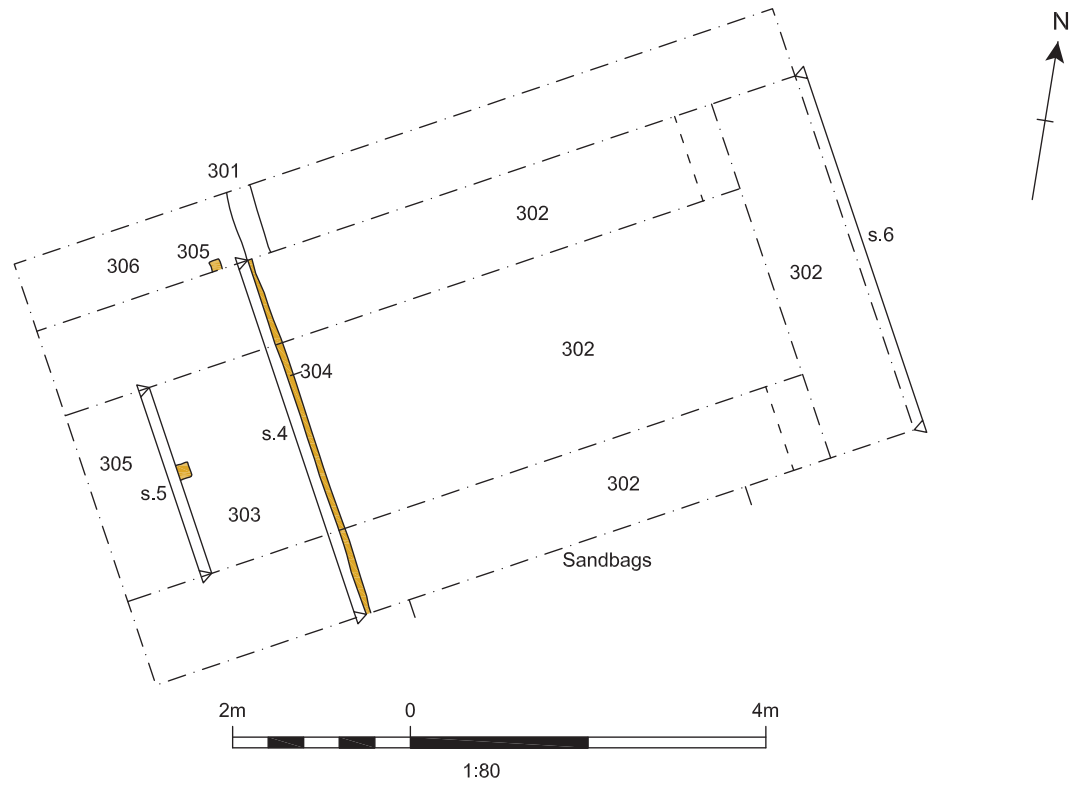


**Figure 3:** PDZ6.CG.01: Plan (1:80) & Sections (1:50)

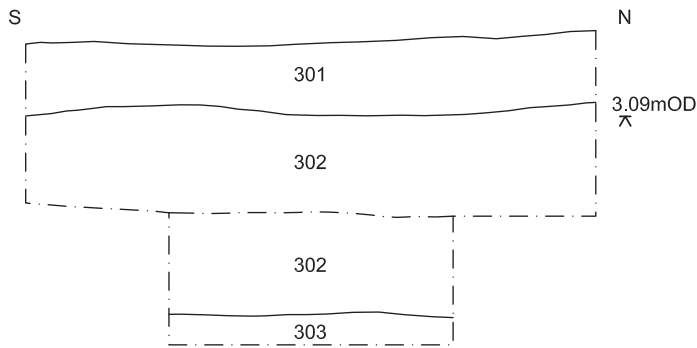


**Figure 4:** PDZ6.CG.02: Plan (1:80) & Sections (1:50)

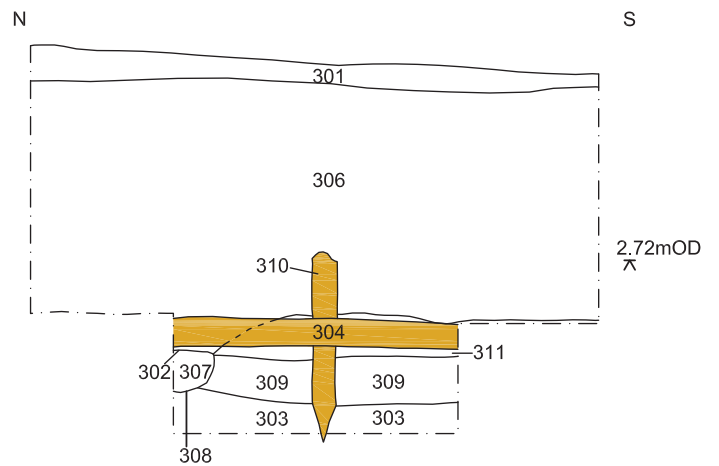




Section 5

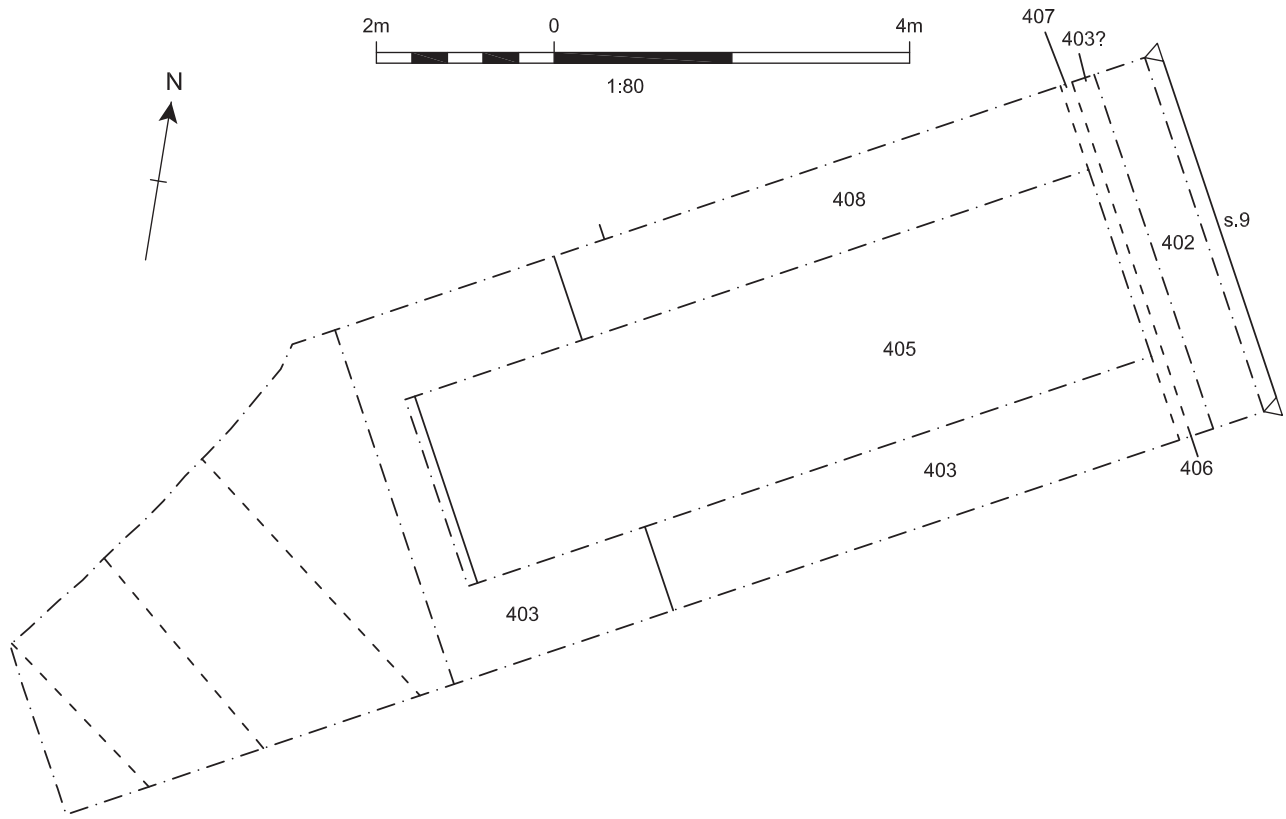


Section 4

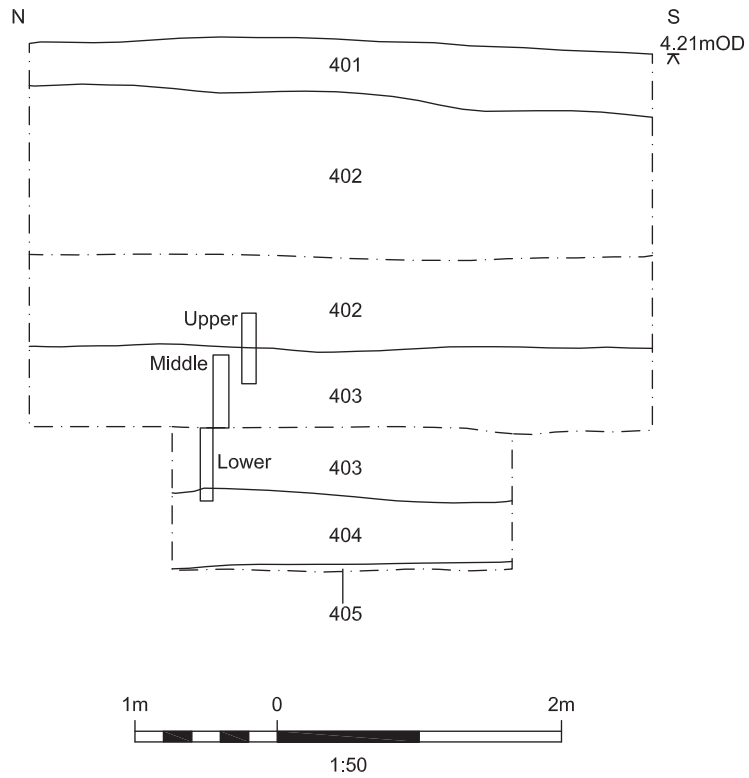


Timber

**Figure 5:** PDZ6.CG.03: Plan (1:80) & Sections (1:50)



Section 9



**Figure 6:** PDZ6.CG.04: Plan (1:80) & Sections (1:50)