Wessex Archaeology

Units 300/305,310/315/320/325 and 400, Riverside Way, Uxbridge, London Borough of Hillingdon

Archaeological Evaluation Report

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UNITS 300/305, 310/315/320/325 AND 400 RIVERSIDE WAY, UXBRIDGE LONDON BOROUGH OF HILLINGDON

ARCHAEOLOGICAL EVALUATION REPORT

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Cover photo: The eastern side of the Site from the north-east. A canalised channel of the River Colne is in the foreground.

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ARCHAEOLOGICAL EVALUATION REPORT

Summary

Wessex Archaeology was commissioned by WSP Environmental Ltd on behalf of Slough Estates plc to undertake an archaeological evaluation of a *c*. 2 hectare area of land at Riverside Way, Uxbridge, London Borough of Hillingdon, centred on National Grid Reference 504865 183893. The aim of the evaluation was to assess the potential for surviving archaeological remains likely to be affected by a proposed redevelopment, consisting of the demolition and replacement of existing industrial units. The evaluation was undertaken between 10th and 21st October 2005.

The site lies within the Lower Colne valley, which has been identified as an area with a proven high potential for the preservation of significant Late Upper Palaeolithic and Early Mesolithic (12,000-8,500 BC) environments and *in situ* remains of human occupation and activity. Sites identified as belonging to these early periods are exceptionally rare and are of significant archaeological importance. One such site was excavated at Three Ways Wharf, *c*. 650m to the north-east of the site. The Three Ways Wharf site contained undisturbed artefact scatters and palaeo-environmental evidence judged to be of national importance. Another more minor site of the same date site was recently recorded *c*. 500m to the north-west at Denham. This part of the River Colne valley has also been shown to contain a significant sequence of Holocene deposits containing an important palaeo-environmental history within which to contextualise the evidence from the known Late Upper Palaeolithic and Early Mesolithic sites in the vicinity.

Only a single artefact was recovered from the evaluation. It comprised a heavily rolled and abraded piece of worked flint, a possible core rejuvenation tablet, which is not chronologically distinctive, though could be Neolithic in date. No other artefacts or archaeological features derived from human activity were present. However, a significant sequence of Holocene alluvial deposits dating back to near the Last Glacial maximum, and therefore contemporary with the known Late Upper Palaeolithic and Early Mesolithic sites in this part of the River Colne valley, was recorded, sampled for palaeo-environmental analyses and radiocarbon dated.

The recorded pollen and sedimentary sequences from Riverside Way are typical of the early post-glacial (pre-Boreal, Boreal and Atlantic) sequences reported elsewhere in the River Colne valley within the immediate vicinity. The sequences indicate a typical sediment sequence of alluvium and tufaceous deposits, peat and alluvium. These commence within the Late Devensian/early post-glacial period. Peat formation starts at around 8340 - 8040 cal BC at the pine maxima and the rise in hazel.

This is accompanied by high levels of macroscopic charcoal, and may relate to some charred macro-remains of dock in the same sequence. These may equate with inwashes of charcoal seen at Three Ways Wharf during a period of pine dominance.

The lack of direct evidence of human activity on this site makes the results of the palaeo-environmental analyses difficult to interpret. However, the pollen assessment clearly shows major zones of microscopic charcoals, which probably represent human activity of Early Holocene date in the vicinity of the site. Although undated and undatable in their own right, further pollen analyses and radiocarbon sampling could provide an environmental and chronological context for them and these could be equated with other comparable sites in the vicinity. The microscopic charcoal peak in Trench 2 predates 9410 ± 40 BP, and may relate to the Late Upper Palaeolithic transitional activity at both Denham and Three Ways Wharf. The microscopic charcoal in Trench 3, however, probably postdates 8600 ± 35 BP, and may be related to the Mesolithic flint scatters recorded on the western floodplain at Denham.

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The project was managed on behalf of Wessex Archaeology by Roland J C Smith. The fieldwork was directed by Chris Ellis with the assistance of Steve Beach and Jerry Bond. This report has been compiled by Chris Ellis with assistance from Lorraine Mepham (finds), Michael J. Allen, Chris Stevens (environmental analyses) and Cathie Chisham (geoarchaeology, soils and sediments). Preliminary environmental processing and assessment was carried out by Sarah Wyles. Pollen and micro-charcoal analyses were carried out by Dr R G Scaife (Palaeopol, Southampton University). The Channel Tunnel Rail Link data for Temple Mills has been reproduced with the kind permission of Union Railways (North) Limited and Rail Link Engineering. The illustrations were prepared by Rob Goller.

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ARCHAEOLOGICAL EVALUATION REPORT

1 INTRODUCTION

1.1 Project background

1.1.1 Wessex Archaeology was commissioned by WSP Environmental Ltd on behalf of Slough Estates plc to undertake an archaeological evaluation of a *c*. 2 hectare area of land at Riverside Way, Uxbridge, London Borough of Hillingdon, centred on National Grid Reference 504865 183893 (hereafter referred to as the 'Site'). The aim of the evaluation was to assess the potential for surviving archaeological remains likely to be affected by a proposed redevelopment, consisting of the demolition and replacement of existing industrial units. The evaluation was undertaken between 10th October and 21st October 2005. This report summarises the results of the evaluation, in particular a detailed assessment of the palaeo-environmental potential of the sediments recorded during the evaluation.

1.2 Planning background

1.1.2 Following a desk-based assessment of the site in March 2005 (Wessex Archaeology 2005b), the Greater London Archaeological Advisory Service (GLAAS) advised that important archaeological remains may be disturbed by the proposed development. Planning consent was therefore granted for the redevelopment of the Site with an archaeological condition attached requiring the implementation of an appropriate scheme of archaeological investigation prior to development. GLAAS advised that an archaeological evaluation should represent the first stage of the investigation of the site. Wessex Archaeology prepared a written scheme of investigation (WSI) for the evaluation (Wessex Archaeology 2005c) which has approved by GLAAS. This report sets out the results of the field evaluation.

2 SITE TOPOGRAPHY, GEOLOGY AND HYDROLOGY

2.1 Topography

2.1.1 The Site lies approximately 0.75km east-south-east of Uxbridge church, on the west and east sides of Riverside Way, between the Grand Union Canal to the east and the River Colne to the west (**Figure 1**). It lies on the west edge of the town of Uxbridge.

2.1.2 The Site comprises an irregular sub-rectangular area of land either side of Riverside Way and between two channels of the River Colne. At the time of the evaluation the Site was occupied by an industrial estate of buildings, access roads, concrete yards and surfaces. All the buildings previously in the areas of the evaluation trenches had been cleared. Modern ground levels were mapped at *c*. 31m above Ordnance Datum (OD) at both the east and west areas of the Site with the ground being generally flat.

2.2 Geology

2.2.1 The Site lies on Recent and Pleistocene Alluvium (BGS 1974), overlying valley gravels, which in turn sit on London blue clay. Borehole logs (WSP 2005a and b) indicate a sequence of peats and organic clays overlying sandy gravels which in turn overlie clay.

2.3 Hydrology

2.3.1 The Site is bounded on all sides by watercourses (the Grand Union Canal on the south and east; the River Colne on the south, west and north). A canalised channel of the River Colne crosses the eastern portion of the Site. Smaller streams are present on historic mapping.

3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

3.1 Extensive recent work including a desk-based assessment, auger and borehole survey and extensive test pit and evaluation trenching has been undertaken to the immediate west of the Site at Denham (Wessex Archaeology 2002, 2003, 2005a). A desk-based assessment (Wessex Archaeology 2005b) and earlier borehole surveys (WSP 2005a and 2005b) have already been undertaken on the Site.

3.2 There is almost no evidence of activity in the vicinity of the Site in the Lower and Middle Palaeolithic periods. In the Upper Palaeolithic and Mesolithic (12000 – 8500 BC) the flood plain of the Colne seems to have been a major focus for activity (Lewis 1991; Lewis *et al,* 1992; Wessex Archaeology 2005a), and evidence from this period may have been present on the Site. A nationally important Late Glacial/Early Mesolithic site was recorded at the Three Ways Wharf site *c*. 650m to the north-east (Lewis 1991, 2000; Lewis *et al,* 1992). Extensive recent archaeological investigations have been carried out to the west of the Site, on the other side of the River Colne floodplain (Wessex Archaeology 2002, 2003, 2005a). These have recorded *in situ* scatters of both Late Glacial and Early Mesolithic date. They have also recorded deep sequences of organic-rich deposits (mainly peats) within relict river channels in the River Colne and Rusholt Brook areas (Wessex Archaeology 2005a). These cover the Late Glacial and Early Mesolithic periods and are highly significant in enabling the context of the rare archaeological sites and past human activities in the landscape to be fully understood.

3.3 There are indications of less intense Neolithic (4000 – 2400 BC), Bronze Age (2000 – 700 BC) and Iron Age (700 BC – AD 43) activity in the area, including unstratified material of Neolithic and Bronze Age date at Denham to the west. At the centre of this site Middle and Late Bronze Age material was also recorded. Also at Denham, on the higher ground at the west of the Colne Floodplain, a series of features and artefact scatters suggest Late Bronze Age field boundaries and sporadic settlement activity. Late Bronze Age field systems, together with a barrow and Romano-British features have also been recently excavated at The Lea by Cotswold Archaeology (Mark Collard *pers. comm. c*f. Wessex Archaeology 2005a, 6).

3.4 Evidence of Romano-British (AD 43 – 410) activity is lacking within the vicinity, although scatters of Romano-British pottery have been recorded from the ploughsoil at Denham (Wessex Archaeology 2005a) as well as a number of enclosures of this date at The Lea (Mark Collard *pers. comm. c*f. Wessex Archaeology 2005a, 6). Significant Saxon (AD 410 – 1066) and medieval (1066 – 1499) evidence is not expected on the Site, which is likely to have been rural in character during these periods, an interpretation that is supported by cartographic sources from the Post-medieval period (1500 –1799). In the

medieval period Uxbridge was the principal corn town for west Middlesex and south Buckinghamshire.

3.5 At Denham a small assemblage of unstratified locally made 12th – 14th century pottery and animal bone was recorded suggesting the presence of local farmsteads and the spreading of domestic refuse on associated fields (Wessex Archaeology 2005a).

3.6 The Site underwent alteration following the construction of the Grand Union Canal in 1793-6, including the construction of a mill, the canalisation of the eastern arm of the Colne, and the erection of an increasing number of industrial buildings throughout the 19th and 20th centuries.

3.7 The recent borehole surveys have shown that deep organic-rich deposits of possible archaeological significance (in the light of nationally significant archaeological sites in the vicinity) are present on the Site.

4 AIMS AND OBJECTIVES

4.1 The objective of the evaluation was to establish the presence and nature of any prehistoric archaeological remains that may survive within the footprint of the proposed new development. However, the WSI (Wessex Archaeology 2005c) concentrated on the investigation of possible *in situ* artefact scatters (mostly worked flint) upon the natural basal sands and gravels in the vicinity, which would represent evidence of human activity on islands or *eyots* within the River Colne floodplain. It also included the careful excavation of any alluvial sediments and organic-rich deposits for possible wooden structures and any palaeo-environmental potential.

5 METHODOLOGY

5.1 Introduction

5.1.1 Full details of the evaluation methodology are contained in the WSI, which will not be reiterated in detail here, though is summarised as follows.

5.1.2 It was proposed to evaluate the Site through the excavation of four machine-excavated trenches. Each trench was located within the footprint of proposed new buildings, two were to the east (**Trenches 1 - 2**) and two trenches were to the west of Riverside Way (**Trenches 3 - 4**). The two pairs of trenches, *c*.130m apart, enabled the evaluation of the Site (**Figure 1**). It was proposed that each trench would be 8m x 10m in plan at present ground level; though areas were reduced where deep beams and foundations or contamination were discovered. All the arisings from the trenches were closely visually inspected for residual material. All the trenches were excavated down to the natural Devensian gravels.

Trenches 1-2

5.1.3 Where deep peat sequences were encountered these were to be machine-excavated in 0.10m deep 'spits' to investigate the possible presence of wooden structures. Approximately 1m above the expected top of natural sands and gravels, each trench would have six 1m^2 test pits hand-excavated through the base of the peat sequence to look for the presence of *in-situ* artefact scatters at the interface between overlying peats and the natural gravel. Because of modern disturbance and groundwater ingress this was

not possible for **Trench 2**. However, an 'L-shaped' 5m^2 area of the base of the overlying alluvial deposit (**205**) was hand-excavated.

Trenches 3-4

5.1.4 These trenches were machine excavated to the top of the *c*. 0.6m deep (**Trench 3**) and *c*.0.2m (**Trench 4**) sand horizons directly overlying the natural gravels. The resultant surface was hand-cleaned to check for *in situ* artefact scatters on the natural sands/gravels.

6 RESULTS

6.1 Introduction

6.1.1 This section includes all information on the natural deposits encountered and the archaeological features and deposits recorded. A detailed summary of the evaluation trench stratigraphic sequences and deposits are listed in **Appendix 2**. Detailed sediment descriptions in each trench are listed in **Appendix 3**. The original full pollen report by Dr R G Scaife is included as a technical summary in **Appendix 4**.

6.2 Natural deposits and soil sequence

6.2.1 All the trenches had modern concrete slabs and bedding material for the slabs at the top of the stratigraphic sequence, which reflect the semi-industrial nature of the Site until the present. Overall, these deposits comprised the uppermost *c*. 0.7 – 0.8m. Only in one trench (**Trench 3**) was a post-medieval disturbed soil deposit encountered (to 0.93m depth) suggesting that most of the Site had been truncated to construct the recently demolished modern buildings.

6.2.2 All trenches recorded alluvial deposits below modern disturbance and overlying natural sands/gravels which ranged from only 0.47m (**Trench 4**) to 1.07 – 1.41m in thickness. This difference is also reflected in the characteristics of the alluvial deposits. All the alluvial deposits recorded in **Trenches 1-3** were predominantly sterile and malleable clays, mostly gleyed, tufaceous deposits, as well as peat deposits suggesting ox-bow lakes. The lack of thickness of these alluvial deposits in **Trench 4** is probably due in part to the modern disturbance in the area.

6.2.3 The natural sands and gravels were encountered generally at *c*. 1.3 – 1.6m depth though in **Trench 2** they were recorded at 2.15m. Generally they occurred at *c*. 29m above Ordnance Datum (aOD) though were recorded at 29.8m (aOD) in **Trench 4** suggesting a possibly different palaeo-topographic setting at this location. This is borne out by the specific nature of the deposits in this trench compared to the **Trenches 1-3**, and the palaeo-environmental evidence (see **Section 8**).

6.2.4 The gravels were characterised by slightly different matrices and clast sizes and degree of sorting but were generally moderately well-sorted with a medium/coarse sand matrix and clast sizes of 30 – 70mm. The recorded sand matrices included pale grey, light orange/brown and pale yellowish-brown sand. In places the gravels were interdigitated with sand deposits indicating the riverine environment at the base of the sedimentary sequence.

6.3 Evaluation trenches

6.3.1 **Trench 1** was clear of modern structural disturbance so a full exposure of the basal part of the peat deposits overlying the natural gravels could be easily achieved across the base of the trench (**Figure 2**). A machine-excavated sump (3.3m^2) to aid the removal of groundwater was located in the south-west corner of the trench, from which the arisings were fully scanned. A total of five 1m^2 hand-excavated test pits (1.1 – 1.5) was excavated through the basal *c*. 0.3 – 0.38m of the peats (**105-106**) and through gleyed alluvial clays (**107-108**) before the natural gravels were encountered. No finds were recorded.

6.3.2 **Trench 2** was the deepest of all the trenches at 2.14m, which may reflect its palaeo-topographic location at the margins of a gravel *eyot* or island at the edge of a relict river channel. There was disturbance on the west of the trench caused by a very large modern concrete pillar which continued beyond the depth of the excavated trench (**Figure 2**). This in conjunction with requirement of a sump to facilitate the removal of excessive groundwater penetration at the depth of excavation both limited the available area for hand excavation. Consequently a 5 m^2 area of the basal part of the heavily waterlogged tufaceous peat deposit (**205**) overlying the natural gravels, against the south edge of the trench, was hand-excavated. No finds were recorded.

6.3.3 In the west of **Trench 3**, a mid greyish-brown sandy clay deposit (**306**) with relatively abundant gravel inclusions was recorded (**Figure 3**). As this deposit had the potential to contain flint scatters, it was left *in situ* and investigated with two 1m^2 hand-excavated test pits (**TP's 3.1, 3.2**). In the test pits, this deposit overlaid a light blue-grey gleyed clay alluvium (**308**) which in turn overlay a natural pale yellowish-brown clayey sand (**309**) which laid on gravels (**310**). The gravels were part of a series of sands and gravels laid in a large palaeo-channel. No finds were recorded from the test pits, though a single piece of worked flint (possibly Neolithic) was recovered in the backfill (**316**) of a large modern foundation trench (**315**) in the north of the trench.

6.3.4 The palaeo-channel was at least 6.7m(+) wide and 1.1m(+) deep with a steep, convex west side. It was filled with a series of sands and gravels in its basal section (**310 – 314**) overlaid directly by a light blue-grey, gleyed clay (**308**). The remaining channel fills included a peat (**307**), a sandy clay (**306**) and a very characteristic sterile, homogeneous black clay (**305**). Finally, this was overlaid with a tufa deposit (**304**). This identical sequence of tufa, black clay, peat and natural gravel was recorded in a number of trenches and test pits in the River Colne floodplain *c*. 400m to the north of the Site (Wessex Archaeology 2005a, figure 4). In that sequence the black clay dates to 8790 – 8230 cal BC and the tufa dates to probably post-5000 BC (*ibid*, table 5).

6.3.5 In **Trench 4** a full exposure of the underlying natural gravels was possible (**Figure 3**). However, the southernmost *c*. 2.2m of the trench had a large modern sewer pipe running across it which restricted very slightly the area of natural gravel exposed.

6.3.6 Below 0.81m of modern disturbance (**400 – 401**) a relatively shallow sequence of gravel-rich alluvial clays (**401 – 404**, **406**) and sand were recorded, quite different in character from the stratigraphic sequence in **Trenches 1-3**. These overlaid the natural gravels (**405**) and the basal part (*c*. 0.2m) of them was hand-excavated. A total of 45m^2 was exposed and hand-cleaned to check for artefact scatters. No finds were recorded from the hand cleaning and no features were present.

7 FINDS

7.1 Only one artefact was recovered from the evaluation. A single piece of worked flint was recovered from the backfill (**316**) of a modern foundation trench. It has been severely rolled around since original deposition and shows considerable edge damage. It is a possible core rejuvenation tablet, which is not chronologically distinctive, though it could be Neolithic in date.

8 ENVIRONMENTAL ANALYSES

8.1 Aims

8.1.1 Environmental samples, principally for characterising the sediments (monoliths) and for pollen, were taken to characterise the stratigraphic sequences and relate them to known Late Upper Palaeolithic and Mesolithic sequences and archaeology in the River Colne Valley. Specifically, on site interpretation suggested the stratigraphic sequence was directly comparable with that recorded at Denham (Wessex Archaeology 2005a). The environmental assessment aimed to provide the evidence to confirm this on site interpretation.

8.1.2 Bulk samples were taken to assess the presence and potential of the waterlogged remains to aid in this characterisation. The assessment also aimed at defining evidence of human activity, in view of the lack of artefacts.

8.2 Introduction and environmental samples taken

8.2.1 Monoliths of the key stratigraphic sequences and bulk samples were taken from each trench (**Table 1**). Bulk samples of around 10 litres were taken in columns from each trench for waterlogged and molluscan remains. Columns of four and five bulk samples were taken from longer sediment sequences in **Trenches 1** and **2** respectively. Only two samples were taken from the shorter sequences in **Trench 3** and **4**. The longer sequences from **Trench 2** and the river-edge peat from **Trench 3** were subsampled for pollen.

Table 1. Summary of environmental samples

	Trench 1	Trench 2	Trench 3	Trench 4
Monoliths	1	1	1	1
Pollen Sub-samples	0	8+	4+	0
Waterlogged	4	5	2	2
Mollusc	0	1 (tufa)	0	0
Insect Samples	2	1	2	0

8.3 Sedimentary sequence

8.3.1 Two key sequences from **Trench 2**, and the river-edge peat in **Trench 3**, were described. The four monoliths were cleaned prior to recording and terminology follows Hodgson (1976) and included Munsell colour, texture, structure and nature of boundaries, as given below in **Appendix 3**. The deposits were assigned to sedimentary 'Units' (1-5) to aid description.

8.3.2 The Site is mapped as recent alluvium over fluvial gravels and London Clay and lies adjacent to the River Colne, a tributary of the Thames. Alluvium and peat deposits over likely Devensian age fluvial gravels were noted during borehole surveys (WSP 2005a and b) and trial trenching and sampled by monolith.

8.3.3 Two deep sequences were collected from **Trenches 1** and **2** (monoliths of 1.1m and 1.26m respectively), while the sediments were found to be thinner in **Trenches 3** and **4** (0.58m and 0.39m respectively) and therefore interpreted as channel-edge deposits. Since the pairs of trenches were *c.* 130m apart, direct correlation of the layers of **Trenches 1** and **2**, with the shallower ones of 3 and 4 could not be undertaken in the field, although the sequences within each pair were suggested to be equivalent. Sediment descriptions and interpretation attempted to confirm this correlation.

8.3.4 The exposed sequences are typical of the area, and similar to those reported at Three Ways Wharf (Lewis 1991; Lewis *et al.* 1992), and Denham (Wessex Archaeology 2003; 2005a). The thickest and seemingly most complete sequence occurs in **Trench 2**.

8.3.5 In summary, the probably Devensian Age river gravels were overlain by a fine alluvium of organic sandy silt loam (unit 4c, context 205). Above this lay a band of fine pale calcareous tufa (unit 4b, context 205) and a complex unit of laminated tufa, organic alluvium and fine bands of peat (unit 4a, context **205**). Intercalation of fine alluvium laid under slow-moving water conditions at the channel edge or as overbank sedimentation, calcareous spring deposits and edge peat growth is indicated. This fluctuation in conditions clearly indicates a dynamic floodplain and repeated fluctuation in the dominance of river channel, spring and damp terrestrial conditions in a marginal/edge environment.

8.3.6 More substantial peat formation followed, with an accumulation of 0.36m layer of silty peat (unit 3, context **204**), indicating the formation of wet terrestrial marshland conditions beyond the shifting channel edge or within a former (cut-off) channel. Horizontal layering of herbaceous material, presence of woody reed (*Phragmites)* stem bases and evidence of vertical rooting support an interpretation of a stabilised surface and an emergent reed population. *In situ* peat accumulation was replaced by deposition of highly organic clay silt alluvium above (unit 2, context **203**), which may also be described as gyttja), indicating continued local presence of a well vegetated local landscape but a return of the influence of slow moving or pooled water, likely due to another shift in channel position or increased flooding.

8.3.7 A similar sequence was observed in the monolith from **Trench 1**, however unit 4 (context **107**, tufa/silts) was seemingly simpler (though its base was not collected), comprising organic alluvium with no evidence of tufa deposition. This may be due to it being slightly further from the spring source or any fine bands of tufa were eroded during alluviation.

8.3.8 **Trenches 3** and **4** displayed shallower and more disturbed sediment sequences and had been subject to soil formation processes (pedogenesis), indicating both their relative position and a longer period of exposure and drying out of the alluvial deposits post-deposition. It is suggested that the upper deposit, a greasy black organic silty clay, correlates to unit 2 described in **Trenches 1** and **2**. The underlying organic deposits were degraded in **Trench 4**, and while may be of the same alluvial unit, could represent heavily degraded peat, possibly equivalent to unit 3. If it were the same, then it thins away from the channel edge and onto the bank.

8.3.9 **Trench 3** displayed a sequence slightly thicker and less affected by post-depositional process. A herbaceous fen peat (unit ?3 context **307**) occurred over a slightly stony sandy silt loam alluvium with organic bands (unit ?4, context **308**). Tentative correlation with units 3 and 4 observed in the deeper sequences is made, however definite linking of the units cannot be made on sedimentological grounds though it may be achieved by comparing the pollen spectra from **Trench 4** and **Trench 2**. The lower fen peat (unit ?3b) contained thin lenses of sand indicating periodic flooding of the terrestrial edge peat.

8.3.10 Alluvial and marsh deposits that post-date the Devensian age river gravels and which are likely to be predominantly of early Holocene date have been described. A wetland environment is clearly indicated, with some fluvial and spring influence demonstrated. The simplest explanation and useful working hypothesis is one of a single, migrating and infilling channel, with deposits thinning towards the edge and terrace.

8.3.11 Comparison with other sites and sedimentary sequences in the area is appropriate. Sequences similar in nature, and potentially in period, have been described for Cowley Mill Road (Lewis *et al.* 1991, 244) and Harefield, Willowbank, Denham and Iver (Lacaille 1963), also in the River Colne Valley. These sites show relative concentrations of Late Glacial and Early Mesolithic material on a possible soil above the basal gravels and at the base of the peat. At the nearby site of Three Ways Wharf, Uxbridge (Lewis 1991; 2000; Lewis *et al.* 1992), a thin loam (likely palaeosol) overlay basal fluvial gravels possibly formed on a bar or island within the Late Glacial braided channel system of the River Colne. As with this Site and Denham (Wessex Archaeology 2003; 2005a), the layer was sealed by black clay or gyttja, indicating increasingly wet and vegetated conditions moving into the Holocene and was there overlain by tufa (Lewis *et al.* 1992, 235 & 239). The deposition of tufa *subsequent* to that of peats and organic clay is in places reflected in the sequence of another Thames tributary of the Kennet Valley. However, there too in places, (notably on the floodplain at Thatcham) contemporary deposition and intercalation of organic deposits and tufa were observed for the Early Mesolithic (Chisham 2004), as is indicated for Riverside Way.

8.3.12 The proximity and similarities in sedimentary sequence with Three Ways Wharf is of note and raises the potential importance of the Site even though no artefact scatters or features were found in the evaluation. The Three Ways Wharf site provided unambiguous evidence for both Final Upper Palaeolithic (Late Glacial - earliest Holocene) and Mesolithic occupation. Horse remains from the Upper Palaeolithic flint scatter were dated to 10,900 - 9400 cal. B.C. (10,270 ± 100 BP; OxA-1778 and 10,010 ± 120 BP; OxA-1902; Lewis 1991, 253) and the Mesolithic scatter with deer remains gave a thermo-luminescence date of 8000 ± 80 B.P. (OxTL 772f; Lewis *et al.* 1992, 239) although Lewis (2000, 14) suggested an approximate date of 9100 BP.

8.3.13 On balance it is most likely the lower deposits of unit 4 described here represent early Holocene conditions, however, the deposits are somewhat reminiscent of alluvial and peat deposits observed at Temple Mills adjacent to another Thames tributary, the River Lea. From this a herbaceous stem from the peat was dated to the terminal Late Glacial at 10,800-9800 cal BC (10,307 ± 50BP; KIA-24051) and it is feasible these deposits are of a similarly early date. It should also be noted that even if the organic units in **Trenches 2** and **3** are linked stratigraphically, due to the nature of peat growth, they may be diachronous.

8.4 Radiocarbon Dating

8.4.1 Samples of horizontal herbaceous matter were carefully extracted from the top and bottom of the peat (unit 3, context **204**) from the monolith in **Trench 2**. These were submitted to Rafter for AMS dating to provide the date of the peat formation.

8.4.2 The results are indicated below:

Sample	*Material*	*Lab no.*	*Result no.*	δC^{13}	*Result BP*	*Cal BC*
Top peat **204** 0.45m	Herbaceous plant matter	R-29137/1	NZA-24078	-27.9	6800±35	5700-5590
Base peat **204** 0.77m	Herbaceous plant matter	R-29137/2	NZA-24079	-30.9	9140±40	8340-8040

8.5 Pollen

8.5.1 The following represents a summary of the pollen assessment. The full assessment is included at the end of this report within the **Appendix 4**. The samples analysed are listed in **Table 2** (see below).

8.5.2 Sub-samples were taken from the stratified sediment samples (monoliths/ cores) as shown with the sediment descriptions (**Appendix 3**). Samples came from **Trench 2** and **3**. Samples were taken to ascertain if sub-fossil pollen and spores are present; the degree of preservation; to provide a preliminary indication of broad vegetation types and environmental change; to provide an indication of the dates of the deposits; to ascertain any human activity within the area, especially that seen from microscopic charcoal; and finally to provide an indication of the potential for full analysis.

8.5.3 Twelve sub-samples of 2ml were processed (see summary list below) for assessment by Dr Rob Scaife. Samples were processed using standard procedure (Moore and Webb 1978; Moore *et al.* 19911) details). The absolute pollen numbers/frequencies in the samples were calculated using added exotics to known volumes of sample (Stockmarr 1971). A pollen sum of up to 200 grains of dry land taxa per level was counted for each level where possible. All extant spores and pollen of marsh taxa (largely Cyperaceae), fern spores and miscellaneous pre-Quaternary palynomorphs was also counted for each of the samples analysed. Data from the two pollen profiles are presented as pollen diagrams has been plotted using Tilia and Tilia Graph (**Figures 4 and 5**). Percentages have been calculated in a standard way as follows:

Sum = % total dry land pollen (tdlp)
Marsh/aquatic = % tdlp+sum of marsh/aquatics
Spores = % tdlp+sum of spores
Misc. = % tdlp+sum of misc. taxa.

8.5.4 Taxonomy, in general, follows that of Moore and Webb (1978) modified according to Bennett *et al.* (1994) for pollen types and Stace (1997) for plant descriptions. These procedures were carried out in the Palaeoecology Laboratory of the Department of Geography, University of Southampton.

Table 2. Summary of pollen samples analysed and radiocarbon results

Monolith/core sample no.	*Depth*	*Depth m. aOD*	*Context*	*Unit*	*Summary description*
Tr2 monolith 6	0.28m	29.97	203	2	Highly organic alluvium
	0.44m 0.60m 0.76m	29.81 29.65 29.49	204	3	Fen peat 6800±35 BP (5700-5590 cal BC) 9140±40 BP (8340-8040 cal BC)
	0.92m 1.08m	29.33 29.17	205	4a	Intercalated tufa, peat and organic alluvium
	1.16m	29.09		4b	Tufa
	1.24m	29.01		4c	Organic alluvium
Tr3 monolith 12	0.24m*	30.01	305	2	Highly organic alluvium
	0.32m*	29.93	307	?3a	Fen peat
	0.40m*	29.85		?3b	Fen peat with sand inwash
	0.48m*	29.77	308	?4	Laminated alluvium and organic alluvium

8.5.5 Eight samples were examined from the longer sequence within **Trench 2**. Pollen was well preserved and with absolute pollen values ranging from 7,000 to 54,000 grains/ml. Three possible local pollen assemblage zones have been recognised. The lowest zone (*Trench 2; Zone 1: 125cm to 112cm*) corresponds to the base of context **205**. It is defined by the highest values of birch (*Betula*), pine (*Pinus*) and willow (*Salix*). There are few herb taxa with grasses (Poaceae) and sedges (Cyperaceae) being the most important with also some reed-swamp taxa, e.g. reed mace (*Typha* sp.).

8.5.6 The middle of the second zone (*Trench 2; Zone 2; 112cm to 35cm*) was radiocarbon dated to around 8340 - 8040 cal BC (9140 ± 40 BP; NZA-24079. Birch and pine decline within this zone in response to an expansion in hazel type pollen and also elm (*Ulmus*). Oak appears at the top of the zone. Herb levels are similar to those within zone 1, but with fewer sedges. A radiocarbon date of 5700-5590 cal BC (6800 ± 35 BP; NZA-24078) comes from the upper part of this zone.

8.5.7 The uppermost zone (*Trench 2; Zone 3; 35cm to 28cm*) is distinguished by a sharp expansion within sedges and monolete fern spores. Pine increases again to become dominant with hazel type pollen. Oak is seen to have its highest values in the top of this profile.

8.5.8 Four samples were examined from the shorter sequence within **Trench 3**. Absolute pollen frequencies were calculated at between 10,000 and 124,000 grains/ml for pollen sums of between 150 and 200 grains per sample. Two preliminary local pollen assemblage zones can be recognised. The lowest zone (*Trench 3: Zone 1: 48cm to ca. 44cm*) was dominated by herbs, notably grasses, sedges and dandelion types (Lactucoideae). The only tree-taxon represented is pine. The upper zone (*Trench 3: Zone 2: 44cm to 24cm*) is dominated by tree species in particular pine and birch while other tree and shrub taxa include elm, oak, juniper (*Juniperus*) and willow (*Salix*).

8.5.9 Herbs are much reduced with similar values of grasses and sedge. By comparison with other regional pollen diagrams this lowest part of the sequence is likely to be either Late Devensian or transitional Holocene in date. Although pine was present, this wind-borne pollen may be greatly over-represented in pollen spectra and subject to long-distance transportation.

8.5.10 The assessment of macroscopic charcoal showed that carbon particles were more concentrated in the upper levels of **Trench 3** (pollen *zone 2*) between 32 and 28cm and, in the lower section of **Trench 2** (pollen *zone 1* and lower part of *zone 2*) (see **Figures 4 and 5**). These particles were spheroidal rather than angular, behaving in a similar way to airborne pollen, and so subject to transport over further distances. The parts of the sequences where these concentrations occur, as seen, are thought to be broadly contemporary. They date to a time when pine dominated the landscape, but as hazel was incoming. This phenomenon has been noted before and widely discussed with respect to the possibility that within this early post-glacial period hazel may have been promoted by the use of fire (see Smith 1970 for further discussion). In light of the strong evidence within the Early Mesolithic for activity within the region (e.g. Three Ways Warf, Denham), it may be possible to relate the charcoal particles to localised woodland burning and/or domestic camp fires around the period *c.* 9000 BP. However the possibility of the particles resulting from natural fires, caused by lightening strikes should be considered.

8.5.11 The indication is that the sequence from **Trench 3** is slightly earlier than that from **Trench 2**. The sequences cover the pre-Boreal (Flandrian Chronozone Ia) and Boreal (Flandrian Chronozone Ib). This equates with the early Mesolithic (Maglemosian) period from *c.* 10,000 BP to 8,000 BP of the post-glacial (Devensian) period.

8.5.12 The sequence is closely comparable to three other sites in the area for which pollen sequences are available. These are Denham (Scaife 2005), Three Ways Wharf (Lewis *et al*. 1992) and Sandersons Road (Scaife 2002). The Site is also comparable to several published sites within London for which early Holocene sequences are available showing the migration and establishment of pioneer woodland. These include Bramcote Green (Thomas and Rackham 1996), Enfield Lock (Bedwin 1991; Chambers *et al.* 1996), Silvertown (Wilkinson *et al.* 2000), and Ferry Lane, Brentford (Scaife 2000a). Comparable unpublished sites include Elizabeth Fry, dated to 9000-8500 BP, (Davis *et al.* 1995), Strathfield Road (Giorgi *et al.* 1995) and Point Pleasant, Wandsworth (Scaife and Rackham forthcoming).

8.6 Waterlogged plant and insect remains

8.6.1 Subsamples of 1 litre were taken from bulk samples and processed for the recovery of waterlogged remains. Laboratory flotation was undertaken with flots retained on a 0.25mm mesh and residues on a 0.5mm mesh. Residues and flots were stored in sealed containers with Industrial Methylated Spirits (IMS). The larger fraction (>5.6mm) was sorted, weighed and discarded. The flots were visually inspected under a x10 to x40 stereo-binocular microscope to determine if waterlogged material occurred.

8.6.2 Both samples from **Trench 4** were noted during processing to contain no waterlogged material and were discarded. The remaining samples were assessed for the survival of waterlogged plant remains, and preliminary identifications were undertaken (**Appendix 3**). Where insect remains were noted a further five litres of material was processed from the samples. The remainder of the samples was sieved though 4mm and 2mm meshes to obtain larger macroscopic remains, which are often under-represented as well as identifiable fragments of twig, branch and other wood (see below).

8.6.3 **Trench 1** produced no waterlogged material from the lowest deposit (context **106**), but unit 3 (context **105**) contained high amounts of wood and only a few species of open

conditions. The taxa present are generally those associated with woody scrub, hazelnut (*Corylus avellana*), dogwood (*Cornus sanguinea*), sloe (*Prunus spinosa*) and birch (*Betula* sp.). The impression is that the edge of the palaeo-channel was heavily wooded at this time. Dogwood is a common coloniser of oxbows and former floodplains (Ellenberg 1988), and perhaps quickly colonised drier margins of the channel edges, possibly finding an ecological niche in this period prior to dominance of such situations by alder. Occasional seeds of open-country species were present, gypsywort (*Lycopus europaeus*) is a common species of wooded fens, while buttercup (*Ranunculus* sp.) and sedge (*Carex* sp.) may have grown within shaded or open areas at the channel edge. The uppermost sample contained fragments of hemp-agrimony (*Eupatorium cannabinum*), the seeds of which seem quite resistant to decay within waterlogged deposits. The species is common within slightly wooded to more wooded conditions.

8.6.4 **Trench 2** contained few waterlogged remains in the upper samples (contexts **203** and **204**), with some remains of wood and reed stems present. The lowest deposit (context **205**; 29.47-29.37m aOD) from the top of the tufa deposit was very rich in plant remains. This deposit contained some elements of wooded scrub seen in **Trench 1**, such as hazelnut and possibly dogwood or sloe. More significantly elements of open wetlands were highly abundant. These included water-lily (*Nuphar* sp.) and pondweed (*Potamogeton*), as well as species of shallow water, such as sedges (*Carex* sp.), rushes (*Juncus* sp.) and, bur-reed (*Sparganium erectum*). This sample corresponds to **Trench 2** (78-88cm), during the dominance of hazel pollen.

8.6.5 Samples from **Trench 3** produced little identifiable waterlogged material, comprising possible stems of common reed (*Phragmites* sp.) and seeds of woundwort (*Stachys* sp.). While these seeds could be of any date, that they are absent from the sequences in the other trenches, might suggest that they are intrusive elements. That the pollen sequence from the upper part of **Trench 3** contains *Centaurea nigra* type pollen (cornflower), also suggests some intrusive elements may be present. **Trench 4** as seen produced no waterlogged remains

8.6.6 Insect remains were seen in samples from the upper deposits from **Trench 1**, the lowest deposits from **Trench 2** and both the sampled contexts from **Trench 3**. Such remains even within these samples were relatively sparse, comprising occasional wing cases. However both the lowest deposit from **Trench 2** (context **205**) and that from **Trench 1** (context **106**), produced large amounts of waterlogged material, and by analogy are likely to be richer in insect remains.

8.7 Waterlogged Wood

8.7.1 Identification of six randomly selected waterlogged wood fragments >4mm from the (unsorted) 4mm fractions of waterlogged beetle and artefact samples was undertaken. A fine slice was taken from each wood fragment along three planes (transverse section (TS), radial longitudinal section (RL) and tangential longitudinal section (TL)) using a razor blade. The pieces were mounted in water on a glass microscope slide, and examined under bi-focal transmitted light microscopy at magnifications of x50, x100 and x400 using a Kyowa ME-LUX2 microscope. Identification was undertaken according to the anatomical characteristics described by Schweingruber (1990) and Butterfield and Meylan (1980). Identification was to the highest taxonomic level possible, usually that of genus, and nomenclature is according to Stace (1997). The results are shown in **Appendix 3**.

8.7.2 Identifiable wood fragments were only recovered from **Trenches 1** and **2**. All identifiable fragments examined proved to be of *Salix/Populus* type (willow/ aspen type, the two taxa indistinguishable in their wood anatomy). Twigwood and small roundwood was common, several fragments of whole diameter and with bark remaining. Locally dominant willow or aspen is clearly indicated. Both possible taxa were common on and at the wetland edge of early Holocene environs, the latter forming thickets. Most fragments were noted to have a larger than normal number of tyloses particularly in the inner wood and in early wood in annual growth rings and it is suggested this was in response to stress caused by waterlogging.

8.8 Land and freshwater/brackish molluscs

8.8.1 A single sample from the tufa deposit, in the base of **Trench 2** (context **205**) was processed for the extraction of molluscs. The sample of 1000g was processed by standard methods (Evans 1972) for land snails. The flot (0.25mm) was rapidly assessed by scanning under a x10 – x30 stereo-binocular microscope to provide some information about shell preservation and species representation. No material was seen within this deposit and the material was added to the waterlogged material. A limited amount of material from this same deposit was however noted within the sample processed for beetles, and artefact sieved. This may indicate some localised preservation within the deposit itself. This material comprised entirely of opercula from *Bithynia* and no whole shells were seen.

8.9 Palaeo-environmental summary

8.9.1 The pollen and sedimentary sequences are typical of the Early Post Glacial (pre-Boreal, Boreal and Atlantic) sequences reported elsewhere in the River Colne valley within the immediate vicinity. The sequences indicate a typical sediment sequence of alluvium and tufaceous deposits, peat and alluvium. These commence within the late Devensian/early post-glacial period. Peat formation starts at around 8340 - 8040 cal BC (9140 ± 40 BP; NZA-24079) at the pine maxima and rise in hazel. This is accompanied by high levels of macroscopic charcoal, and may relate to some charred macro-remains of dock in the same sequence. These may equate with inwashes of charcoal seen at Three Ways Wharf (Lewis 1991) during a period of pine dominance.

8.9.2 Deposits in **Trench 2** are broadly contemporary. The sediments from the sequences show a dynamic floodplain in the lower part of **Trench 2** followed by substantial peat formation, perhaps within a cut of channel or beyond the shifting channel edge. It is also possible that the plant macros might suggest that the channel stabilised during this period just prior to the rise of hazel

8.9.3 The lack of any evidence of direct human activity makes these analyses difficult to interpret. However, the pollen assessment clearly shows major zones of microscopic charcoals (**Figures 4 and 5**), which probably represent human activity. Although undated and undatable in their own right, the analysis could provide an environmental and chronological context for them and these could be equated with human activity in the vicinity. The microscopic charcoal peak in **Trench 2** predates 9410 ± 40 BP, and may relate to the Late Upper Palaeolithic transitional activity at both Denham (Wessex Archaeology 2005a) and Three Ways Wharf (Lewis 1991). The microscopic charcoal in **Trench 3**, however, probably post dates 8600 ± 35 BP, and may be related to the

Mesolithic flint scatters recorded on the western floodplain at Denham (Wessex Archaeology 2005a).

9 CONCLUSIONS

9.1 No archaeological features or artefact scatters derived from human activity on the Site were recorded from the evaluation. A single piece of worked flint, a core rejuvenation tablet of possible Neolithic date, was recovered during the present fieldwork It was recovered from the backfill of a modern building foundation trench in **Trench 3**.

9.2 Stratified sequences of River Colne floodplain alluvial deposits of Early Holocene date were recorded in all four trenches. Although containing no direct evidence of human activity the deposits are contemporary with nationally significant sites of Late Glacial and Early Mesolithic date previously recorded in the Uxbridge area including Three Ways Wharf (Lewis 1991, Lewis *et al.* 1992), Iver (Lacaille 1963) and Denham (Wessex Archaeology 2003, 2005a) and contemporary with deposits recorded at the Sanderson Road site to the north of the Site (David Larkin [MoLAS] *pers. comm.* cf Wessex Archaeology 2005a, 6).

9.3 The pollen and sedimentary sequences are typical of the Early Post Glacial (pre-Boreal, Boreal and Atlantic) sequences reported elsewhere in the River Colne valley within the immediate vicinity. The sequences indicate a typical sediment sequence of alluvium and tufaceous deposits, peat and alluvium. These commence within the Late Devensian/Early Post Glacial period. Peat formation starts at around 8340 - 8040 cal BC (9140 ± 40 BP; NZA-24079) at the pine maxima and rise in hazel. This is accompanied by high levels of macroscopic charcoal, and may relate to some charred macro-remains of dock in the same sequence. These may equate with inwashes of charcoal seen at Three Ways Wharf (Lewis 1991) during a period of pine dominance.

9.4 Deposits in **Trench 2** are broadly contemporary with those of **Trench 1**. The sediments from the sequences show a dynamic floodplain in the lower part of **Trench 2** followed by substantial peat formation, perhaps within a cut of channel or beyond the shifting channel edge. It is also possible that the plant macros might suggest that the channel stabilised during this period just prior to the rise of hazel

9.5 The lack of any cultural evidence or cultural horizons makes the results of the analyses difficult to interpret. However, the pollen assessment clearly shows major zones of microscopic charcoals, which probably represent human activity of Early Holocene date in the vicinity of the Site. Although undated and undatable in their own right, further pollen analyses could provide an environmental and chronological context for them and these could be equated with other comparable sites in the vicinity. The microscopic charcoal peak in **Trench 2** predates 9410 ± 40 BP, and may relate to the Late Upper Palaeolithic transitional activity at both Denham (Wessex Archaeology 2005a) and Three Ways Wharf (Lewis 1991). The microscopic charcoal in **Trench 3**, however, probably post dates 8600 ± 35 BP, and may be related to the Mesolithic flint scatters recorded on the western floodplain at Denham (Wessex Archaeology 2005a).

10 THE ARCHIVE

10.1 The project archive from the present fieldwork has been compiled into a stable, fully cross-referenced and indexed archive in accordance with Appendix 6 of *Management of Archaeological Projects* (2nd Edition, English Heritage 1991). The archive is currently held at the offices of Wessex Archaeology, Salisbury, under the project code **RVD 05 (WA 59990)**. The full list of the contents of this archive are detailed in **Appendix 1** of this report. The project archive will be deposited with the Museum of London in due course.

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APPENDIX 1 – ARCHIVE INDEX

File No.	NAR Cat.	Details	Format	No. Sheets
1	-	Index to Archive	A4	1
1	A	Client Report	A4	40
1	-	Project Specification	A4	13
1	B	Day Book (photocopy)	A4	15
1	B	Trial trench records	A4	9
1	B	Context Records	A4	6
1	B	Graphics Register	A4	1
1	B	Site Graphics	A4	1
1	B	Site Graphics	A3	3
1	B	Survey Data Index	A4	2
1	B	Survey Data Print-out	A4	13
1	D	Photographic Register	A4	6
1	B	CD-Rom (Digital photos)	-	1
1	E	Environmental Sample Register	A4	1
1	E	Environmental Sample Records	A4	17
2	B	Site Graphics	A1	1
3	-	B+W Negatives	35mm	-
3	-	Colour slides	35mm	-
FINDS	(1 Piece worked flint)			

APPENDIX 2 – TRENCH SUMMARY TABLES

All archaeological deposits/features shown in **bold**.
All (+) indicate deposits/features not fully excavated.
'Depth' equals depth from present ground surface.

Trench No. 1	**Co-ordinates: NE corner 504834.905 / 183935.908 SW corner 504828.954 / 183930.641 Ground Level (m AOD): 31.025m**	**Dimensions: 6.0m×5.4m Max.depth : 1.68m**
Context	**Description**	**Depth (m)**
100	Concrete slab (0.20m thick), with modern rubble layer below.	0m – 0.40m
101	Modern soil layer - Dark grey silty clay with moderate inclusions of modern brick, concrete, sand, clinker and ash fragments/flecks (<0.02m max dia.)	0.40m – 0.56m
102	Alluvium – Very dark grey with a dark blue tinge, homogenous and sterile, gleyed clay. Grades into 103 below.	0.56m – 0.71m
103	Alluvium – Light to mid blue-grey gleyed clay, with common pale yellow clay mottling. Diffuse interface with both 102 and 104.	0.71m – 0.75m
104	Alluvium – very dark grey-black with a very dark blue tinge, homogeneous gleyed clay. Diffuse interface with 103, but sharp with 105 below.	0.75 – 0.90m
105	Peat – Very dark reddish brown peat, fibrous and organic rich silty clay, containing unworked driftwood pieces (including silver birch and willow, <0.04m max dia.)	0.90m – 1.36m
106	Peat – Medium to dark greyish brown silty clay with inclusions of abundant degraded, and fibrous organic material, and rare gravel fragments <0.04m max dia.	1.36 – 1.47m
107	Alluvium – Light bluish grey homogeneous gleyed clay, which is soft and malleable. It contained inclusions of rare plant material consisting of waterlogged and degraded reed stems. The deposit had good definition with 106, but was present below 108 in places.	1.47m – 1.63m
108	Alluvium – Light to mid greyish brown alluvium. It contains inclusions of rare and small waterlogged plant material (reed stems). The deposit had a sharp interface with 105, but only a moderately clear interface with 107. In places the deposit is present below 105 and above 107.	1.36m – 1.56m
109	Natural gravel – Sorted gravel consisting of angular and sub-angular gravels <0.03m max dia. with abundant blue-grey natural flint gravels, in a pale grey course sand matrix containing very common, fibrous fine root material.	1.63+
110	Natural sand (present below gravel in places) – Pale grey fine to medium sand layer containing sparse to moderate angular to sub-angular flint gravels <0.02m max dia.	1.68+

Trench No. 2	Co-ordinates: NE corner 504812.473 / 183891.156 SW corner 504806.062 / 183886.897 Ground Level (m AOD): 31.162m	Dimensions: 5.49m× 5.33m Max.depth : 2.14m
Context	**Description**	**Depth (m)**
200	Modern concrete slabs with underlying tarmac and rubble.	0m – 0.57m
201	Modern disturbed natural alluvium – Mid grey-brown clay with inclusions of common small (<0.005m) brick, sand, clinker and ash.	0.57m – 0.70m
202	Alluvium – Mid to light grey-brown sterile and homogeneous, malleable soft clay. With inclusions of common iron flecking throughout, and very common yellow clay mottling. The deposit has a moderate to good interface with 203.	0.70m – 0.89m
203	Peaty clay – Very dark reddish brown to black silty clay with abundant fine, but degraded waterlogged plant remains <0.001m max dia.	0.89m – 1.27m
204	Peat – Dark reddish brown silty clay, with abundant, but degraded fibrous waterlogged plant remains, including sparse elements of driftwood <0.02m max dia. and common elements of reed material <0.001m max dia. A radiocarbon date of 5700-5590 cal BC (6800 ± 35 BP; NZA-24078) comes from the upper part of this layer. The base of this layer was radiocarbon dated to 8340 - 8040 cal BC (9140 ± 40 BP; NZA-24079).	1.27m – 1.62m
205	Tufaceous peat – A mixed deposit of lenses tufaceous course gritty pale yellow to white calcareous fragments. The tufaceous material is present in lenses c.0.05m thick and in 'tube like' spring holes c. 0.10m in diameter, and have a dark blue-grey gleyed clay material on the outer edge. The deposit also contains lenses of very dark reddish brown silty clay peat c.0.01m thick, and lenses of mid blue grey gleyed alluvial clay lenses c.0.025m thick.	1.62m – 2.11m
206	Natural gravel – Very dark reddish brown stained course sand matrix containing abundant poorly sorted sub-rounded to rounded mid to dark blue-grey flint gravel <0.04m max dia. It contain inclusions of very poor thermally fractured flint gravel and common waterlogged fine roots and plant remains <0.002m max dia.	2.11m – 2.14m+

Trench No. 3	Co-ordinates: NE corner 504731.69 / 183789.397 SW corner 504723.933 / 183783.459 Ground Level (m AOD): 31.069m	Dimensions: 7.09m× 6.69m Max.depth : 2.39m
Context	**Description**	**Depth (m)**
300	Concrete and modern rubble – A 0.25m thick modern concrete slab overlying a modern concrete, sand and brick rubble layer.	0m – 0.58m
301	Modern layer – Contains very common iron fragments, ash, charcoal and clinker.	0.58m – 0.68m
302	Disturbed Clay layer – Very dark grey stiff malleable clay, with inclusions of rare sub-angular and sub-rounded flints <0.05m max dia. and rare brick fragments <0.02m max dia.	0.68m – 0.93m
303	Alluvium – Light to mid blue-grey clay. This deposit is stiff, malleable, homogeneous and sterile.	0.93m – 1.03m
304	Tufa – A light to pale grey-white 'gritty' course silty sand with sparse lumps of calcium carbonate. Only seen in the south and east of the trench. It overlies the black clay deposit 305.	1.03m – 1.10m
305	Alluvium – Black clay, which was stiff and blocky when broken, the deposit was homogeneous and sterile.	1.10m – 1.30m

306	Clay deposit – Mid grey-brown sandy clay deposit with sparse to moderate inclusions of sub-rounded and sub-angular flint gravels <0.04m max dia.	1.30m – 1.49m

Trench No. 3 (cont..)	**Co-ordinates: NE corner 504731.69 / 183789.397 SW corner 504723.933 / 183783.459 Ground Level (m AOD): 31.069m**	**Dimensions: 7.09m× 6.69m Max.depth : 2.39m**
Context	**Description**	**Depth (m)**
307	Peat – Very dark reddish-brown to reddish-black silty clay with abundant degraded waterlogged plant and driftwood debris <0.02m max dia. Possible fill of Palaeochannel?	1.30m – 1.49m
308	Alluvium – Light blue-grey gleyed sandy clay with inclusions of rare sub-angular flint <0.04m max dia.	1.49m – 1.65m
309	Coarse sand – Pale yellow-brown clayey sand.	1.49m – 1.65m
310	Gravel – Light orange-brown course sand matrix with abundant sub-rounded and sub-angular flint gravels <0.06m max dia.	1.49m – 1.71m
311	Alluvial sands and clays – Yellow-brown slightly silty clay with common iron staining/deposition. A small number of 0.02m to 0.025m thick lenses of pale yellow-brown fine sands were present and were seen to be dipping gently down to the east.	1.71m – 1.89m
312	Alluvium – Light to mid grey slightly silty, homogeneous and malleable clay. With inclusions of sparse to moderate, very small waterlogged plant remains. Fill of palaeochannel.	1.89m – 2.39m
313	Natural gravel – Mid grey course sand matrix containing abundant, moderately well sorted blue-grey sub-rounded and rounded flint gravels <0.07m max dia.	2.15 – 2.39m+
314	Gravel – Pale grey ‘gritty’ sandy clay matrix with abundant moderately sorted sub-angular and sub-rounded gravels <0.04m max dia. Only seen in the east of the sondage.	1.21m – 1.40m

Trench No. 4	**Co-ordinates: NE corner 504736.052 / 183762.539 SE corner 504728.484 / 183756.824 Ground Level (m AOD): 31.088m**	**Dimensions:6.87m×6.47m Max.depth : 1.28m**
Context	**Description**	**Depth (m)**
400	Modern Overburden – Concrete slabs (0.15m thick) over brick and mortar rubble (0.50m thick), over concrete slab (0.10m thick), over modern brick rubble.	0m – 0.81m
401	Clay – Very dark grey-brown blocky clay with common iron panning and sparse small stone inclusions.	0.81m – 0.97m
402	Clay – Black slightly silty clay with sparse small sub-rounded (mostly flint and quartzite) stone inclusions.	0.97m – 1.10m
403	Sand – A small lens of dark yellow-brown sand. A very ‘patchy’ deposit only seen in two places within the trench (the north and west facing sections).	1.10m – 1.12m
404	Clay – Very dark grey-black silty clay with inclusions of very abundant gravels.	1.12m – 1.18m
405	Natural gravels – Mid to pale yellowish-brown sandy gravels (mostly flint and quartzite).	1.28m+
406	Clay – Dark grey-brown silty clay, no inclusions.	1.12m – 1.18m

APPENDIX 3 – ENVIRONMENTAL/SEDIMENT SUMMARY TABLES

Waterlogged plant-macro remains.

The table shows original sample size and the amount in litres processed for waterlogged, beetles and artefact.
The resultant 'flot' sizes are then shown in ml.

Sample	Context	Unit	Depth m. AOD	Volume litres	Waterlogged processed (Flot size)	Beetles Processed (flot size)	Artefact vol. Processed Flot (4/2m)	Notes
Trench 1								
2	104	2	30.25-30.10	8	1L (10ml)	5L (120 ml)	2L (0ml)	Hemp agrimony (*Eupatorium cannabinum*).
3	105	3	30.10-29.9	10	1L (800ml)	5L (3500ml)	4L (50 ml/ 100ml)	hazelnut (*Corylus avellana*). dogwood (*Cornus sanguinea*). birch (*Betula* sp.) possible pine seed. cf. Salix sp. (bud). leaf. fragments. buttercup (*Ranunculus* sp.). gypsywort (*Lycopus europaeus*), sedge (*Carex* sp.)
4	105	3	29.84-29.64	8	1L (500ml)	n/a	7L (100ml/ 100ml)	sloe (*Prunus spinosa*) dogwood (*Cornus sanguinea*) birch seeds (*Betula* sp.)
5	106	4 (a?)	29.64-29.53	9	1L (500ml)	n/a	8L (50ml//30ml)	Root/twig
Trench 2								
7	203	2	30.17-30.07	7	1L (250ml)	n/a	6L (0 ml)	-
8	203	2	29.92-29.82	9	1L (500ml)	n/a	8L (15ml/ 15ml)	1 charcoal fragment. some wood. no macros.
9	204	3	29.82-29.72	9	1L (500ml)	n/a	8L (10ml/ 60ml)	1 piece of charcoal. numerous reed stems?
10	204	3	29.57-29.47	9	1L (250ml)	n/a	8L (50ml/ 100 ml)	*Bithynia* sp. opercula. sedge (*Carex* sp.)
11	205	4a	29.47-29.37	10	1L (250ml)	5L (1000ml)	4L (80ml/ 100 ml)	hazelnut (*Corylus avellana*). cf. *Prunus/Cornus*. Sedge (*Carex* sp.), rush (*Juncus* sp.), docks (*Rumex* sp.), persicaria (*Persicaria maculosa/lapathifolia*). water lily (*Nuphar* sp.). bristle club-rush (*Schoenoplectrus lacustris*), bur-reed (*Sparganium erectum*), pondweed (*Potamogeton* sp.), partially charred dock seed. Leaf fragments. Bithynia opercula ++
Trench 3								
13	305	1	28.90-29.70	10	1L (10ml)	5L (120ml)	4L (0 ml)	woundwort (*Stachys* sp.)
14	307	?3a	28.70-28.51	10	1L (10ml)	5L (120ml)	4L (0 ml)	*Phragmites* stems. woundwort (*Stachys* sp.)
Trench 4								
16	401	2	30.07-30.00	1	n/a	n/a	n/a	No identifiable waterlogged material. Sample discarded.
17	402	2/3	30.00-29.87	1	n/a	n/a	n/a	No identifiable material. Sample discarded.

Waterlogged Wood Identifications

Context	Sample no.	ID	No. of fragments	Comments
Trench 1				
105 Unit 2	3A	*Salix/Populus* type	5	Large fragmentary wood sample, mature dominates
		Unidentified knotwood	1	
105 Unit 3	3B	*Salix/Populus* type	4	Wood generally good condition though somewhat fragmentary, dominant part of fraction
		Roundwood of *Salix/Populus* type	2	
105 Unit 3	4A	*Salix/Populus* type	2	Large number wood fragments notably twigwood <3mm diameter
		Twigwood *Salix/Populus* type	2	
		Humified branching wood cf. *Salix/Populus* type	1	
		Unidentified twigwood	1	
106 Unit 4 a?	5A	*Salix/Populus* type (humified)	3	Moderate wood sample, twig (<5mm) and mature wood)
		Twigwood *Salix/Populus* type	3	
Trench 2				
203 Unit 2	8A	Humified, degraded cf. *Salix/Populus* type	6	Moderate wood sample, dominated by mature, rare twigwood
204 Unit 3	9A	Salix/Populus type (humified)	2	Smaller wood assemblage, twigwood dominant
		Twigwood Salix/Populus type	4	
204 Unit 3	10A	*Salix/Populus* type	1	As above, includes several large twigwood-small roundwood fragments
		Roundwood of *Salix/Populus* type <10mm	3	
		Twigwood *Salix/Populus* type	2	
205 Unit 4a	11A	Twigwood/ roundwood *Salix/Populus* type	6	Scarce wood in herbaceous matter, all identifiable fragments used, all large twig/ small roundwood 7mm diameter, 4-5yrs
205 Unit 4a	11B	*Salix/Populus* type	3	3 large fragments extracted in processing, small roundwood 7-10mm

Sediment descriptions and sub-samples

Tr. 1 Dwg11a-b, monolith 1, ?oxbow/ channel [NB associated bulk samples 2 (top)-5] 0cm= 30.55m aOD (0.10m below ?stripped ground surface) [[1] is used to denote when top of monolith taken as 0cm]						
Depth [1](m)	*Pollen samples taken*	*Other samples taken*	*Context (and excavators description)*	*Full sediment description*	*Interpretation*	*Unit*
0-0.10m	none	none	102 (mid grey clay)	c.40% small gravel 1-5mm in 10YR 4/3 brown slightly organic silty clay (as below) matrix. Few molluscs. Sharp boundary	Possible made ground	0
0.10-0.18m			103 (mid grey clay with yellow clay lenses)	10YR 4/3 brown slightly organic silty clay, no inclusions. Gradual boundary	Alluvium	1
0.18-0.36m			104 (black clay)	10YR 2/1 black greasy clay silt to silty clay. Highly organic, no inclusions becoming mottled with 10YR 4/3 brown slightly organic silty clay (as above) above 0.28m. Gradual boundary	Highly organic alluvium	2
0.36-0.94m			105 (peat)	10YR 2/1 black soft moderately humified moist silty peat, silt decreasing up profile (from base of peaty silt) until 0.40m after which increases again. Few well-preserved recognisable horizontal plant remains including herbaceous stems (reeds) and small rare wood fragments. Clear boundary	Fen peat	3
0.94-1.02m			106 (brown sandy clay)	10YR 4/2 dark greyish brown smooth highly organic silt, no inclusions. Clear boundary, undulating due to rooting	Highly organic alluvium	4 (a?)
1.02-1.10m			107 (grey sandy clay and gravels)	10YR 5/2 greyish brown smooth fine sandy silt, rare sub-rounded flint gravel and grit 1-30mm. Common vertical well-preserved roots from overlying peat Overlies 109 (Devensian age) fluvial sands and gravels	Alluvium	4 (c?)

*** recommended for pollen assessment**

Tr. 2 Dwg20, monolith 6 ?oxbow/ channel [NB associated bulk samples 7 (top)-11] 0cm= 30.23m aOD (0.85m below (made)ground) [[1] is used to denote when top of monolith taken as 0cm]						
Depth [1](m)	*Pollen samples taken*	*14C samples taken*	*Context (and excavators description)*	*Full sediment description*	*Interpretation*	*Unit*
0-0.42m	**0.28m***		203 (black clay)	0-0.07m 10YR 2/1 black greasy silty clay with fine mottles of 10YR 4/2 dark greyish brown clay (transition to unit 1, 207). No inclusions, clear boundary 0.07-0.14m 10YR 2/1 soft silty peat as 204, gradual boundary 0.14-0.42m 10YR 2/1 black greasy well humified peaty/ highly organic clay silt, diffuse boundary	Highly organic alluvium	2
0.42-0.78m	**0.44m*** **0.60m*** **0.76m***	**0.45m** herbaceous stem ?*Phragmites,* top peat **0.58m** stem *Phragmites*mid peat **0.77m** herbaceous stem rush/ sedge,base peat	204 (peat)	10YR 2/1 soft well humified fibrous silty peat, silt decreasing up profile. Occasional horizontal and vertical rooted herbaceous material (including *Phragmites,* including woody reed bases). Gradual boundary	Fen peat	3
0.78-1.17m	**0.92m*** **1.08m***		205 (tufa)	0.78-0.87m 10YR 3/2 very dark greyish brown smooth organic slightly sandy silt 0.87-0.88m 1cm band comprising fibrous peat to base and pale grey sand above, abrupt boundary 0.88-0.91m 10YR 3/2 very dark greyish brown smooth organic slightly sandy silt 0.91-0.92m 1cm band comprising fibrous peat to base and pale grey sand above, abrupt boundary 0.92-0.99m dominantly tufa as below with fine bands of organic sandy silt 0.99-1.08m dominantly organic sandy silt (as below, 10YR 3/1 very dark grey soft loose organic fine sandy silt) with fine bands of peat and tufa 1.08-1.17m dominantly tufa with irregular fine bands (<4mm) sedimentary bands of organic sandy silt (as below), sharp boundary	Intercalated tufa, peat and organic alluvium	4a
1.17-1.22m	**1.16m***			10YR 6/2 light brown grey fine soft silty granular calcareous tufa, nodules/ concretions <3mm. No inclusions (notably no visible molluscs). Clear boundary	Tufa	4b
1.22-1.26m	**1.24m***			10YR 3/1 very dark grey soft loose organic fine sandy silt with faint sedimentary laminations of fine tufa as above Seemingly the transition to (Devensian age) fluvial sands and gravels below (206, not collected)	Organic alluvium	4c

Tr. 3 Dwg30b, monolith 12, ?channel edge [NB associated bulk samples 13 (top)-14] 0cm= 30.104m aOD (0.10m below ?stripped ground surface) [[1] is used to denote when top of monolith taken as 0cm]						
Depth [1](m)	*Pollen samples taken*	*14C samples taken*	*Context (and excavators description)*	*Full sediment description*	*Interpretation*	*Unit*
0-0.03m		None taken as no suitable material	305 (black clay)	10YR 3/2 slightly organic greasy silty clay, medium blocky peds, increasingly weathered and well-developed blocky peds above 0.16m, with deposition of olive clay in interped spaces. No inclusions. Clear boundary	Weathered organic alluvium	1
0.03-0.27m	**0.24m***			10YR 2/1 black greasy highly organic silty clay, no inclusions or recognisable plant remains. Clear boundary	Highly organic alluvium	2
0.27-0.34m	**0.32m***		307 (peat)	10YR 2/1 black smooth heavily humified silty peat with rare small fragments of recognisable (degraded) herbaceous plant remains. Gradual boundary	Fen peat	?3a
0.34-0.43m	**0.40m***			10YR 3/1 very dark grey smooth highly organic humified peaty clay silt at base with <5% fine grit (<2mm) grading into 10YR 2/1 black silty peat with rare sub-angular gravel 2-10mm. Clear boundary	Fen peat with sand inwash	?3b
0.43-0.55m	**0.48m***		308 (grey sandy clay)	10YR 4/2 dark greyish brown coarse sandy silt loam with 5% sub-rounded-sub-angular fine gravel 2-10mm. Irregular bands of greasy black humified clay silt (possibly degraded peat). Few rooting voids traceable to overlying peat Clear boundary	Laminated alluvium and organic alluvium	?4
0.55-0.58m			Natural (gravels)	Gravels 5-20mm sub-rounded in 10YR 4/3 brown coarse sandy clay matrix	(Devensian age) fluvial sands and gravel	7

Tr. 4 Dwg40, monolith 15, ?channel edge [NB associated bulk samples 16 (top)-17] 0cm= 30.131m aOD (0.24m below ?stripped ground surface) [[1] is used to denote when top of monolith taken as 0cm]						
Depth [1](m)	*Pollen samples taken*	*Other samples taken*	*Context (and excavators description)*	*Full sediment description*	*Interpretation*	*Unit*
0-0.17m	none	none	401	10YR 2/1 black highly organic/ peaty silty clay, no inclusions (as below). Mottled with 10YR 3/2 very dark greyish brown, dominantly in interped spaces (translocation of unit 1 not collected?). Common strong coarse Fe mottles (7.5YR 4/6 strong brown) dry and compact to top. Well-developed medium blocky structure. Clear boundary	Oxidised, weathered highly organic alluvium	2
0.17-0.29m			402	10YR 2/1 black highly organic/ peaty silty clay, no inclusions. Well-developed small-medium blocky peds. Clear boundary	Oxidised, weathered highly organic alluvium	2/3?
0.29-0.38m			406	10YR 2/1 black sticky highly organic/peaty clay loam, c.5% sub-angular-sub-rounded gravel 1-20mm. Moderately well developed small blocky structure. Clear boundary	Highly organic/ peaty fluvial gravels	2/3?
0.38-0.39			404	Just seen at base: 70% gravel in matrix as 406	Fluvial gravels	5

APPENDIX 4 – ARCHIVE POLLEN REPORT

This pollen assessment report consists of the following sections.

(i.) An introduction to the site and the aims of the investigation.
(ii.) Palynological procedures used.
(iii.) The results of the pollen analysis.
(iv.) Discussion of the pollen results and the inferred vegetation history.
(v.) Summary of findings.
(vi.) Comments on the potential of the site for further analysis.
(vii.) References.

1.) Introduction and aims.
The organic, peat and alluvial sediment sequence exposed at Riverside Way form part of a more extensive spread of deposits which have been examined in this area of the River Colne floodplain at the sites of Three Ways Wharf (Lewis et al. 1992), Sandersons Lane (Scaife 2002) and Denham (Scaife 2005). These previous studies have identified early Holocene (pre-Boreal and Boreal) sediments and associated Mesolithic archaeology. Pollen preservation is, however, very variable at these sites depending on the depositional environment and post depositional drainage and disturbance. Thus, if found to contain pollen, the sequences exposed in this river palaeochannel would prove important in providing corroborative and possibly new data for this region of West London. This is further enhance by the important Mesolithic archaeology reported from Three Ways Wharf, Sandersons and Denham which are in relatively close proximity.

As a first stage of analysis, a pollen assessment study was undertaken which had the following objectives.

a.) To ascertain if sub-fossil pollen and spores are present in the Riverside Way sediments with quality of preservation and sufficient numbers to allow preliminary pollen identification and counting to be carried out.

b.) If pollen were present, to provide a broad idea of the vegetation types present and the environment during the time-span of sediment deposition.

c.) To provide a preliminary idea of the age of the deposits prior to the programme of radiocarbon dating.

d.) To ascertain if there was any evidence of prehistoric activity in the pollen record, especially, if present, in the form of microscopic charcoal.

e.) Assess the potential for a more complete pollen analysis of the samples taken from this site at a future date.

2.) Sampling and preparation methodology.
Samples for pollen analysis were taken from the exposed archaeological sections using monolith profiles. Sub-samples of 2ml were taken and processed using standard techniques for the extraction of the sub-fossil pollen and spores (Moore and Webb 1978; Moore et al. 1992). Micromesh sieving (10u) was also used to aid with removal of the clay fraction in these

sediments. The absolute pollen numbers/frequencies in the samples were calculated using added exotics to known volumes of sample (Stockmarr 1971). The sub-fossil pollen and spores were identified and counted using an Olympus biological research microscope fitted with Leitz optics. A pollen sum of up to 200 grains of dry land taxa per level was counted for each level where possible. Additionally, all extant spores and pollen of marsh taxa (largely Cyperaceae), fern spores and miscellaneous pre-Quaternary palynomorphs was also counted for each of the samples analysed. Data from the two pollen profiles are presented as pollen diagrams has plotted using Tilia and Tilia Graph (figures 1and 2). Percentages have been calculated in a standard way as follows:

Sum =% total dry land pollen (tdlp)
Marsh/aquatic = % tdlp+sum of marsh/aquatics
Spores =% tdlp+sum of spores
Misc. =% tdlp+sum of misc. taxa.

Taxonomy, in general, follows that of Moore and Webb (1978) modified according to Bennett et al. (1994) for pollen types and Stace (1997) for plant descriptions. These procedures were carried out in the Palaeoecology Laboratory of the Department of Geography, University of Southampton.

3.) Results of analysis

Two profiles were examined from Trenches 2 and 3 and pollen was extracted from all of the 12 samples prepared. The palynological characteristics of the two profiles are as follows.

3.a.) Trench 2

This is the thicker of the two profiles examined, comprising 1.26m of peat and sediment underlain by calcareous tufa. Pollen was well preserved and with absolute pollen values ranging from 7,000 to 54,000 grains/ml. Three possible local pollen assemblage zones have been recognised. These are characterised from the base of the profile upwards as follows.

Trench 2; Zone 1: 125cm to 112cm; This basal zone is defined by highest values of Betula (birch; 17%), Pinus (pine; 50%) and Salix (willow; 8%). There are few herb taxa but Poaceae (grasses; to 25%) and Cyperaceae (sedges; to 24%) are most important. There are some reed swamp taxa present (Typha latifolia and Typha angustifolia type; greater red mace and lesser reed-mace or bur reed).

Trench 2; Zone 2; 112cm to 35cm. Pinus-Ulmus-Corylus avellana type. There are a number of significant changes occurring within the time-span represented by this pollen zone. A more detail, closer spaced analysis would likely result in more clearly defined pollen zones within this unit. There is some reduction in Betula (birch; to ca. 10%) and (Pinus , 25-30%) in response to expansion of Corylus avellana type (hazel and sweet gale), Ulmus (elm; 15%). Quercus is incoming from ca. 65cm (pollen zone or sub-zone?). Herbs remain as previously but with fewer Cyperaceae (5-10%).

Trench 2; Zone 3; 35cm to 28cm. Pinus-Corylus avellana-Cyperaceae. This single uppermost level differs by a sharp expansion of Cyperaceae (sedges to 62%) and monolete fern spores (to 64%). After a depression of Pinus in zone 2, values increase to 60% along with Corylus avellana type (26%) are dominant. Quercus (oak; 5%) has highest values in this zone.

3.b.) Trench 3.

Four samples were examined spanning the ca. 0.5m of sediments. Absolute pollen frequencies were calculated at between 10,000 and 124,000 grains/ml for pollen sums of between 150 and 200 grains per sample. A total of 32 pollen and spore taxa was recorded. Two preliminary local pollen assemblage zones can be recognised and are characterised as follows.

Trench 3: Zone 1: 48cm to ca. 44cm. Poaceae-Cyperaceae. Although only a single sample (at present), there are significant differences from the overlying sample/levels. Herbs are dominant (65%) with trees to 35%. Pinus (pine) is only principal arboreal taxon. There are small numbers of Corylus avellana type (hazel and/or sweet gale) and Salix (willow). The range of herbs present is notable diverse (35%) compared with the subsequent levels examined. Poaceae (grasses; 40%), Cyperaceae (sedges; 33% sum+marsh) and Lactucoideae (dandelion types; 12%) are dominant. Spores of ferns comprise monolete (Dryopteris type; typical ferns; 15%) with occasional Equisetum (horse-tail fens) and Pteridium aquilinum (bracken).

Trench 3: Zone 2: 44cm to 24cm. Pinus-Betula. Tree pollen values rise sharply (to ca. 90% of total pollen). Conversely there is a reduction in herb diversity and percentage values. Pinus becomes dominant (to 80%) from 40cm. Betula also increases in value to a peak (13%) at 32cm. There are also occasional/sporadic occurrences of a range of other tree and shrub taxa which include Ulmus, Quercus, Juniperus communis, Sorbus, Prunus/Malus type, Corylus avellana type and Salix. Juniperus at 40cm is of note (see discussion) and it can be noted that Corylus avellana type appears to become more important in the uppermost level. Herbs are fewer with much reduced values of Poaceae(to 10%0 and Cyperaceae (to 10%). Spore values remain similar throughout with monolete forms being most important.

4.) Discussion; the suggested vegetation.

The two trench sections, although in relatively close proximity, show different vegetation and environment. These differences are attributed to the different ages of the sediments in the two profiles. Both profiles appear to be of early Holocene age, that is, pre-Boreal (Flandrian Chronozone Ia) and Boreal (Flandrian Chronozone Ib). This equates with the early Mesolithic (Maglemosian) period from ca. 10,000 BP to 8,000BP of the post (Devensian) glacial period. The data obtained are thus, directly comparable to the sites at Sandersons and Three Ways Wharf.

The early Holocene, post-glacial period was one of rapid vegetation change in response to temperature amelioration at ca. 10,000 years BP. This amelioration saw the start of vegetation migration from their glacial refugia and the rapid spread of the pioneer and subsequent more competitive type across the country. All of these aspects are seen within the two pollen profiles examined here.

By comparison with existing data and our more general knowledge of the early Holocene period, Trench3 appears to pre-date Trench2. In Trench2, a basal sample (Trench3; zone 1) is dominated by herbs with relatively few trees which suggests that this lowest level is of late-Devensian (younger Dryas) age or transitional Devensian/Holocene. The environment at this time was a one of open herbaceous, possibly Tundra like plant communities. Although pine was present, this pollen may be greatly over represented in pollen spectra and subject to long-distance transportation because of its anemophily and production of substantial quantities of pollen. If pine was present this may have been scattered communities.

In Trench3: zone 2, Pine clearly arrives on or close to the site and becomes the dominant woodland type. The presence of juniper at 40cm, although in small numbers, is diagnostic of this transition from the Devensian to the Holocene. In many areas, birch is the pioneer coloniser

(Scaife in Wilkinson et al. 2000; Scaife 2000b in Sidell et al.). Here, although there is some expansion of birch representing this colonisation, pine reached early dominance. Occasional oak and elm pollen in the lower levels are thought to be due to long distance transport as these taxa became geographically closer. Corresponding with the expansion to dominance of woodland, is the ousting of heliophilous herb communities. By the end of peat accumulation in Trench3, pine remained dominant but, however, with some indication that oak and especially hazel were becoming more important.

Trench 2 has a greater dominance of tree type including birch, oak, elm and hazel whilst pine is also important. This increased arboreal diversity suggests that this trench's sequence is younger than Trench 3, although the temporal gap between the two sequences may not be great. As noted for Trench 3, there are indications of incoming oak and hazel. In Trench 2, this can also be seen with rising quantities of hazel from the base (Trench 2; zone 1). This expansion of deciduous woodland represents the arrival slower migrating taxa but which had the ability to out compete the pioneer types (birch and pine). Whilst pine remained important, this was also associated initially with hazel to give the often quoted Boreal pine-hazel woodland (Godwin 1975) into which oak and elm infiltrated. It is also this period of hazel dominance which gives rise to the presence of the charred hazel nuts frequently associated with Mesolithic archaeological sites such as Thatcham, Berkshire.

At this site, there is evidence for the incoming of elm prior to oak (in Trench 2; zone 2) followed by oak at the top of this zone. Although not seen here, these trees would have become the dominant woodland elements on the site during the later Boreal period (Flandrian Chronozone Ic. from ca. 8,000 to 7,000 BP).

4.a.) The environment of deposition: From the pollen data obtained, it appears that as conditions became wetter at the start of the Holocene, the valley bottom, floodplain habitat was a grass sedge fen (with reed-mace and bur reed as well as grasses and sedges). Willow pollen is under represented in pollen spectra/assemblages and the small numbers here may come from localised growth on the fringes of the floodplain.

4.b.) Microscopic Charcoal: All of the samples were examined for microscopic carbonaceous particles. If found, these might be expected to relate to the evidence of Mesolithic activity and especially woodland clearance by fire and use of timber for domestic burning. Carbon particles were found, especially in the upper levels of Trench 3 (pollen zone 2) between 32 and 28cm and, in the lower part of Trench 2 (pollen zone 1 and lower part of zone 2) (see pollen diagrams).

These particles were spheroidal rather than angular, and as such behave in a similar way to airborne pollen. It is clear that where these particles occur in the early Boreal period, they were at a time when pine was dominant but hazel is incoming. This phenomenon has been widely discussed in terms of the possibility that hazel may actually have been favoured or promoted by use of fire early in this interglacial (see Smith 1970 for discussion). Given that there is strong local Mesolithic activity at this time, it is tempting to see the charcoal particles as a function of woodland burning and/or domestic fires around the period ca. 9000 BP. The possibility of natural fires (from lightening strikes) should also be considered.

4.c.) Comparative Data: Other regional, published data from London which are relevant to this site include Bramcote Green (Thomas and Rackham 1996), Enfield Lock (Bedwin 1991; Chambers et al. 1996) and Silvertown (Wilkinson et al. 2000). Sites yet to be published, include Elizabeth Fry dated to 9000-8500 BP (Scaife 1993; Davis et al. 1995), Strathfield Road (Giorgi et

al. 1995) and Point Pleasant, Wandsworth (Scaife and Rackham forthcoming). These all demonstrate similar, typical early Holocene changes in woodland with the migration and establishment of the pioneer woodland in the early Holocene in Britain from their glacial refugia and are closely comparable with the pollen data from Denham. The nearest sites of Three Ways Wharf (Lewis et al. 1992) and Denham (Scaife 2005) have produced data which is comparable with the site discussed here. However, from discussion in (Lewis et al. 1992), it appears that the Denham peat sequences and here, contain better preserved pollen and have a greater temporal range than the three Ways Wharf. Data from Riverside Way is definitely comparable with the Ferry Lane, Brentford (Scaife 2000), Sandersons Site (Scaife 2002) and Denham (Scaife 2005). It is considered, therefore, that these peat sequences are of substantial importance and if analysed in more detail could contribute greatly to our knowledge of early Holocene vegetation and environments in London.

5.) Summary and Conclusions

Sub-fossil pollen and spores have been recovered from all of the sub-samples examined from Trenches 2 and 3. This enabled the identification and counting of pollen and construction of two preliminary pollen diagrams from which inferences regarding the past vegetation and the ages of the sequences have been given. Useful information has been obtained from this analysis and the following principal points are made.

* The pollen preservation is as good as, or better than the Sandersons site, which to date, has provide the most useful pollen data.

* The two profiles are of early Holocene age, that is, pre-Boreal and Boreal, Flandrian Chronozone Ia and Ib.

* Trench 3 pre-dates Trench 2 and at its base may be of late-Devensian age (upper Dryas or transitional into the Holocene).

* These sediments are contemporaneous with the local Mesolithic archaeology.

* The pollen demonstrates the typical dynamic vegetation ecology of the early Holocene with the successional expansion of tree and shrub taxa consequent upon thermal amelioration at 10,000 BP. Conversely there is evidence of suppression of heliophytes.

* Trench 3, being the earliest (pre-boreal), demonstrates the early dominance of pine woodland from ca. 10,000 BP with lesser representation of birch with some juniper at the Devensian/Holocene transition.

* Trench 2 is temporally later (early Boreal). Pine remains important throughout but we see the progressive expansions of oak, elm and hazel woodland.

* Hazel is especially important and is typical of the early Boreal pine-hazel woodland which is often discussed in relation to its use by Mesolithic communities.

* Oak, elm and hazel would have ousted the pine to become the dominant woodland by the end of the late Mesolithic period and the alder, lime and mixed forest of the late Mesolithic period.

* There is no clear evidence in the pollen record for human interference with the vegetation environment. This is not, however, surprising given that the Mesolithic communities of this

period are generally conceived as being bands of hunting and foraging peoples with only ephemeral settlements. However, microscopic charcoal particle may derive from woodland fires caused by these communities; possibly for hunting. This is evidenced at the time when hazel was becoming important and the question as to whether such Mesolithic activity actually promoted the spread of hazel scrub has been argued periodically during past decades.

* Although radiocarbon dating should be undertaken to provide an absolute chronology for the events described, it is suggested by comparison with existing pollen data from the region that the two trenches span the period from just prior to 10,000 BP to ca. 8,500 BP (maybe just 8,000!).

* The depositional environment within the palaeochannel appears to have been grass-sedge fen with other reed swamp taxa fringed by willow. No evidence of free/standing water was found.

* The data are an extremely useful addition to our knowledge of Mesolithic environments and early Holocene environments and change.

6.) Suggestions for Additional Analysis

This preliminary pollen study has proven that there is pollen preserved in countable numbers and that the sequences are contemporaneous with the Mesolithic archaeology of the Uxbridge region. Additional and more detailed pollen analysis would be desirable to provide a definitive and radiocarbon dated vegetation and environmental chronology for this area of important Mesolithic archaeology. To meet the demands of any future publication (and referees), additional pollen analysis would also be of necessity. This would require:

* Pollen sampling at intermediate levels of 80 or 40mm (i.e. standard intervals).

* Pollen sum counts of 400-500 grains per level where a.p.f. values permit.

* Because the two profiles are of different age but appear to provide a near complete early Holocene sequence, both sections should be analysed in full.

* Radiocarbon dating of specific, important 'events' should be carried out. This should include assay of the ages of pine maximum, rise of hazel dominance and incoming of elm and oak.

This additional work will provide greater taxonomic and stratigraphical detail and an established model for early Holocene environmental change in this region.

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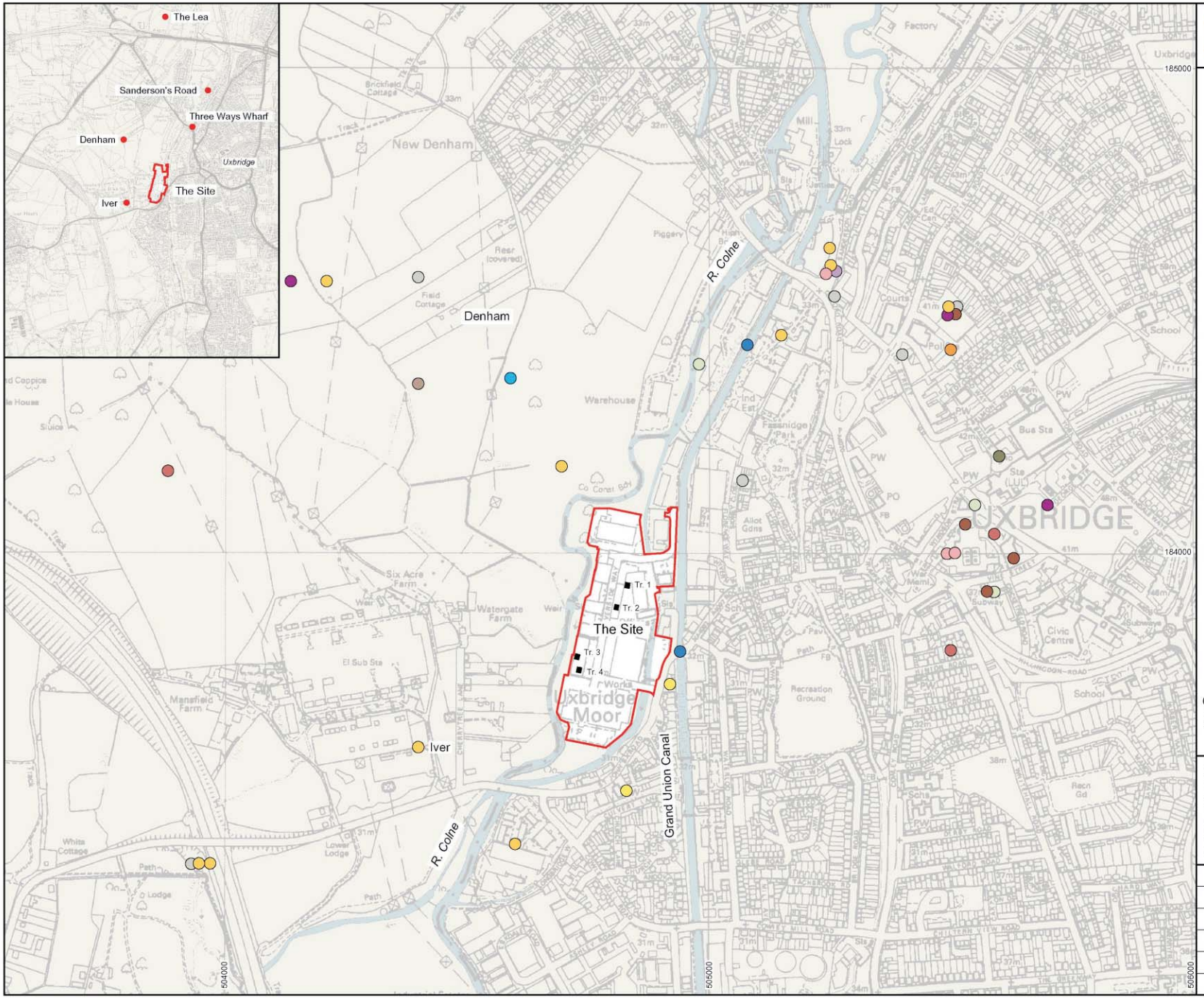

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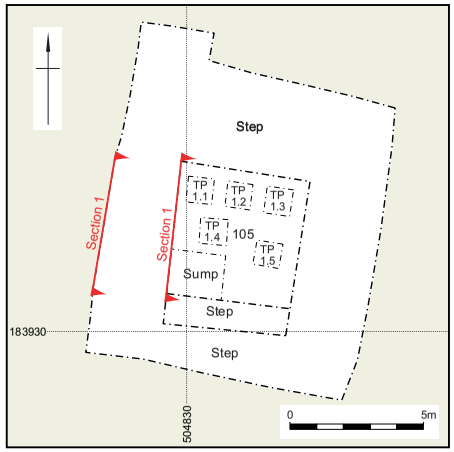
Site and trench location plan

Figure 1

Trench 1



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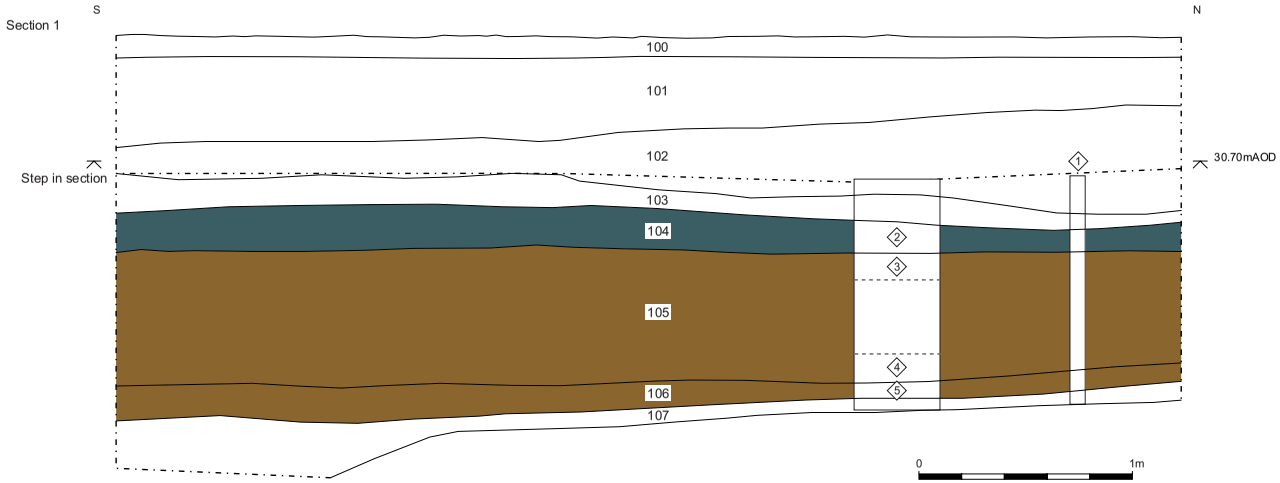

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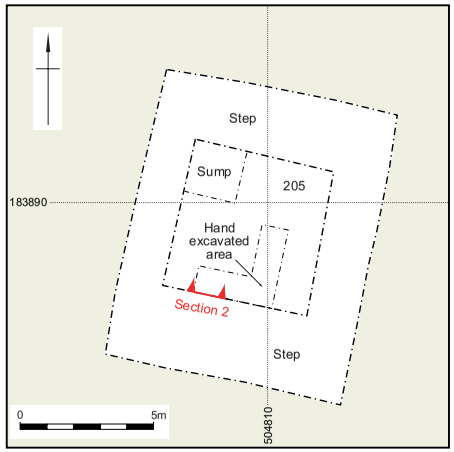

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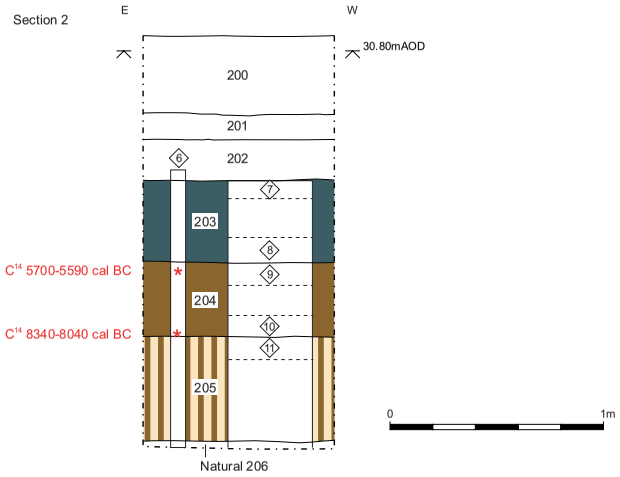

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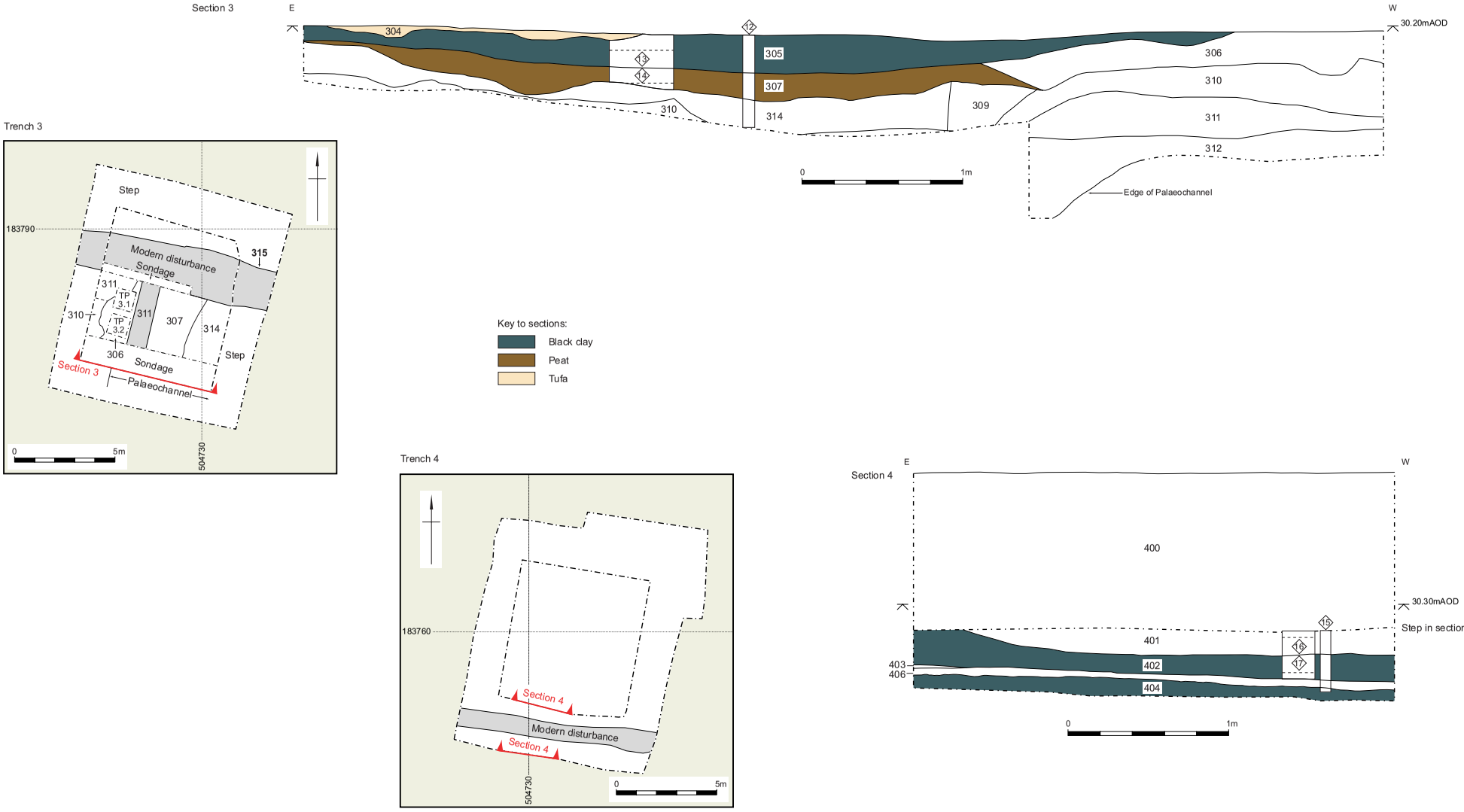
Trenches 1 and 2 plans and sections

Figure 2



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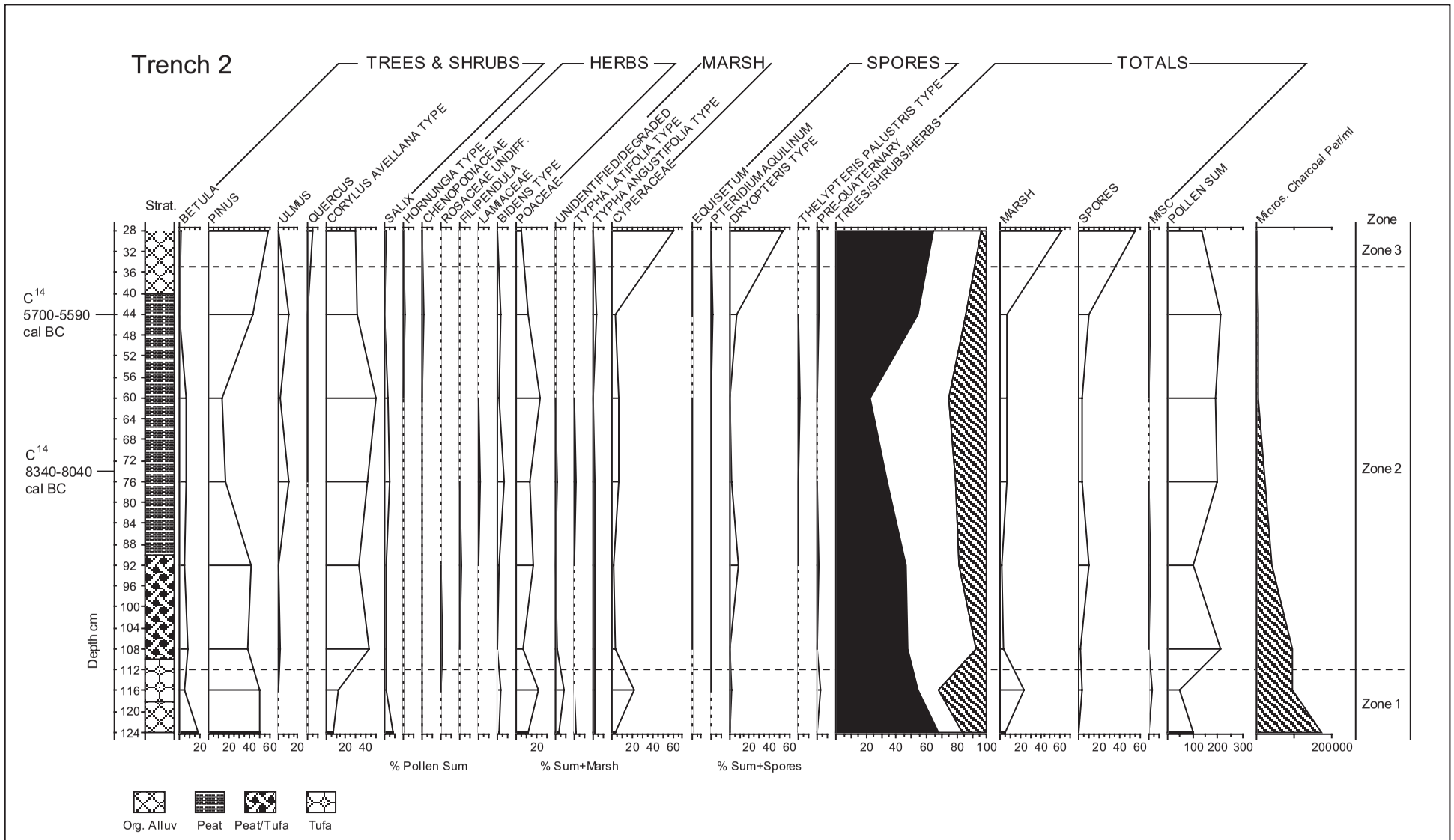
Trenches 3 and 4 plans and sections

Figure 3



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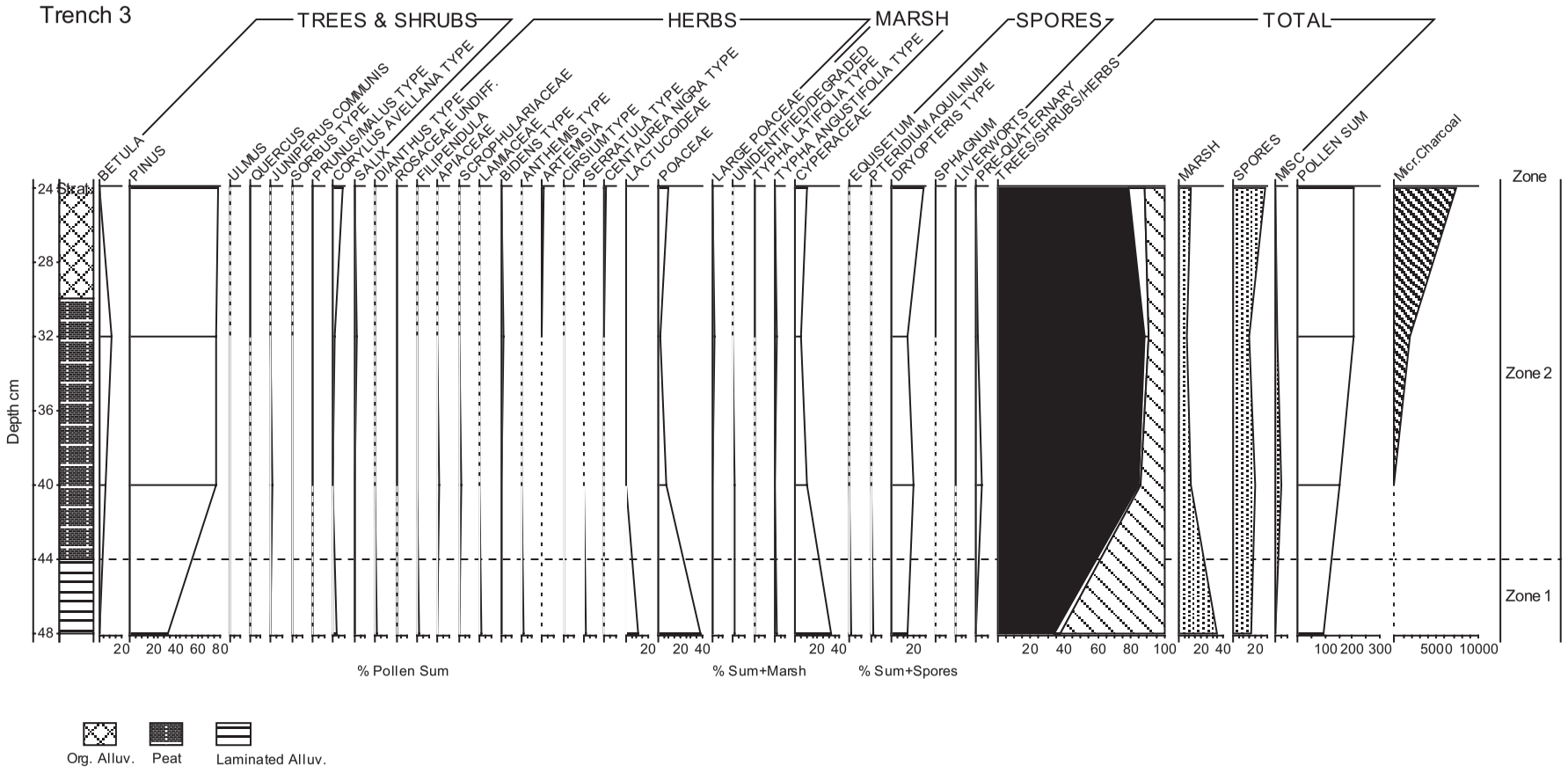
Pollen diagram from trench 2 samples

Figure 4



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Pollen diagram from trench 3 samples

Figure 5

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