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79-85 MONIER ROAD, LONDON BOROUGH OF TOWER HAMLETS

Geoarchaeological Assessment Report

NGR: TQ 3716 8416

Site Code: MOI16

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CONTENTS

1. NON-TECHNICAL SUMMARY

A program of geoarchaeological fieldwork, deposit modelling and laboratory-based assessment was carried out by Quaternary Scientific (University of Reading) in connection with the proposed development of land at 79-85 Monier Road, London Borough of Tower Hamlets. The work was commissioned by CgMs Consulting. The aims of the investigation were: (1) to clarify the composition, nature and distribution of the sediments beneath the site; (2) to evaluate the potential of these sediments for providing information on the environmental history of the site, and evidence of human activity.

In order to carry out the work, a program of fieldwork was instigated incorporating the retrieval of two targeted geoarchaeological boreholes. The resultant records were combined with those from existing archaeological/geoarchaeological/geotechnical investigations for deposit modelling purposes (35 records in total). The depth, thickness and nature of each major sedimentary unit was extracted and entered into geological modelling software, from which a series of topographic surface and thickness maps were produced. A laboratory-based assessment was subsequently carried out to: (1) determine the age of the sequence, and (2) evaluate the concentration, preservation and main types of floral and faunal remains present within the sequence.

The arrangement of the deposits is largely consistent with those recorded during the larger Lea Valley (Corcoran et al., 2011) and Olympic Park (Powell, 2012) modelling exercises. The results of the current investigation demonstrate a sequence of River Terrace Gravels (the Lower Lea Gravel), overlain by floodplain deposits of peat, organic-rich and tufa sediments, and inorganic alluvium (silts and clays). However, the peat, organic-rich and tufa sediments appear to be located towards the western end of the site, and are recorded in the same area beneath adjacent sites Fish Island, Neptune Wharf (Batchelor et al., 2016) and Omega Works Phase III (Spurr, 2005, 2006). Furthermore, these deposits did not accumulate at the same time: at 79-85 Monier Road, the deposits are dated from the early Neolithic to Medieval period, whilst at Omega Works Phase III they were dated from the early to middle Mesolithic.

The results of the pollen and macrofossil assessment both indicate that the floodplain environment was dominated by sedge fen and reed swamp communities. There is little evidence to suggest that trees or shrubs formed a substantial component of this community. On the adjacent dryland, the growth of mixed deciduous woodland dominated by oak and hazel. Cereal pollen grains dandelions, fat hen and ribwort plantain do however indicate a strong and nearby evidence of human activity in the form of cultivation, open and disturbed ground.

The assessment work has thus demonstrated that the deposits from 79-85 Monier Road have the potential to fully address aims 2 & 3 of the project as outlined in the geoarchaeological WSI (Young & Batchelor, 2016). It is therefore recommended that a targeted program of additional radiocarbon dating, pollen, plant macrofossil analysis and waterlogged wood identification is undertaken. The results of this should be integrated with the results from adjacent sites in order to produce a short publication, thus contributing to aim 4 of the WSI (Young & Batchelor, 2016).

2. INTRODUCTION

2.1 Site context

This report summarises the findings arising out of the fieldwork and deposit modelling undertaken by Quaternary Scientific (University of Reading) in connection with the proposed development of land at 79-85 Monier Road, London Borough of Tower Hamlets (site code: MOI16; NGR centred on: TQ 3716 8416; Figures 1 & 2). Quaternary Scientific were commissioned by CgMs Consulting to undertake the geoarchaeological investigations. The site is in the lower valley of the River Lea, approximately 4km from its confluence with the River Thames. The site is on the western side of the floodplain *ca.* 100m from the present-day River Lea Navigation; one of a number of waterways that flow southwards along the River Lea floodplain in this area. The Hertford Union Canal which joins the River Lea Navigation runs parallel to the site approximately 100m to the north. The British Geological Survey (http://mapapps.bgs.ac.uk/geologyofbritain/home.html) shows the site underlain by Lambeth Group bedrock overlain by Alluvium, described as comprising clay, peat, sand, silt and clay. In fact, the alluvial deposits of the Lower Thames and its tributaries are almost everywhere underlain by Late Devensian Late Glacial Gravels (in the Thames valley, the Shepperton Gravel of Gibbard, 1985, 1994; in the Lea valley, the Lea Valley Gravel of Gibbard, 1994), and this gravel is widely recorded in boreholes in the vicinity of the site.

The site lies within the area investigated as part of the Lea Valley Mapping Project (Corcoran *et al.,* 2011). In this project the Lea Valley has been divided into Landscape Zones characterised by their Quaternary landscape history, based largely on sedimentary evidence derived from borehole records. The Monier Road site is located in 'Map 2: the Bow Back Rivers' within Landscape Zone LZ 2.1 (Terrain 1; Figure 1) which is described as containing the deposits of the valley floor. Within this zone the surface of the Lea Valley Gravel undulates, lying at around 2-2.5m OD in the north and close to 0m OD in the south. Deeper gravel surfaces are recorded in places, indicting the course of the main channel, and the confluence with tributaries. More specifically, the site is on the western side of Landscape Zone LZ 2.1. Here, a deep area of tributary or braided channel activity is identified, which dissects the low terrace (LZ 2.2), creating a mosaic of high and low gravel surfaces. The channel is thought to be of Pleistocene or early Holocene age and of palaeoenvironmental significance. Finally, the site is mapped within 100m of the high terrace (LZ 2.4) to the west and north; the northern island being the result of erosion by the aforementioned channel (Corcoran *et al.*, 2011). Subsequent modelling carried out in the vicinity of the Neptune Wharf site, (Powell., 2012) as part of the Olympic Park archaeological investigations indicates similar features in the gravel surface topography to those recognised by Corcoran *et al.*,

The results of a recent site-based geoarchaeological desk-based exercise (Batchelor & Young, 2016) supported the findings made by Corcoran *et al.* (2011) and Powell (2012), enabling the model for the Lea Valley to be enhanced further. The results also indicated the ephemeral presence of peat deposits in the nearby area. No peat was positively identified in the archived boreholes within the 79-85 Monier Road site, but the description of 'black' alluvium in certain boreholes, might imply an organic-rich (peaty) element, Furthermore, peat has been found to form a thin basal unit overlying the Lea Valley Gravel and as bands within the alluvium in several of the boreholes from

the neighbouring Fish Island Neptune Wharf (site code: MIE16) and Omega Works Phase III (site code: OMW05) sites, demonstrating the potential for such deposits to exist beneath the 79-85 Monier Road site (Batchelor *et al*., 2016; Spurr, 2005, 2006). In the latter case, a thick peat horizon was recorded in association with a deep palaeochannel located towards the northern part of the Omega Works Phase III site; this was radiocarbon dated to the middle-late Mesolithic (ca. 9000 to 7000 cal BP; Figure 1; MoLAS, 2006). The organic-rich / peat sediments recorded across the Fish Island, Neptune Wharf site are yet to be radiocarbon dated.

2.2 Archaeological and palaeoenvironmental significance

The geoarchaeological and archaeological desk-based assessment of the site considered the archaeological potential of the site to be low. Although Upper Palaeolithic people may have visited the area, evidence for such activity is rarely found in open-air sites in south-east England (Corcoran *et al*., 2011), and thus the potential to record remains within the river terrace gravels is considered low. Later prehistoric archaeological remains have not previously been recorded in the deposits of LZ 2.1, and in the nearby area generally, although such environments would have been rich in food resources (such as fish and fowl), and the marginal river environment provides greater potential for the preservation of archaeological remains, even if only ephemeral in nature (Corcoran et al., 2011).

In the western part of LZ 2.1 where remnants of the low terrace LZ 2.2 are present, Roman remains are well represented, particularly associated with the settlement at Old Ford and the conjectured Roman Road (Corcoran *et al*., 2011). The findings of the present geoarchaeological deposit modelling exercise are thus considered to support the conclusions reached during the archaeological desk-based assessment: 'It is likely that during this period the site lay on the edge of any settlement activity within the floodplain of the Lea tributary. The archaeological potential of the study site for evidence of Roman activity on the site is therefore also considered to be low. If present any remains are likely to reflect water management such as drainage ditches, timber revetments located at depth within the site' (CgMs Consulting, 2016).

However, the geoarchaeological deposit model report concluded that the site has the potential to contain ephemeral peat deposits. Even in the absence of the archaeological remains, such sediments have the potential to contain a wealth of further information on the past landscape, through the assessment/analysis of palaeoenvironmental remains (e.g. pollen, plant macrofossils and insects) and radiocarbon dating. So called environmental archaeological or palaeoenvironmental investigations can identify the nature and timing of changes in the landscape, and the interaction of different processes (e.g. vegetation change, human activity, climate change, hydrological change) thereby increasing our knowledge and understanding of the site and nearby area. In the case of human activity, palaeoenvironmental evidence can include: (1) decreases in tree and shrub pollen suggestive of woodland clearance; (2) the presence of herbs indicative of disturbed ground, pastoral and/or arable agriculture; (3) charcoal/microcharcoal suggestive of anthropogenic or natural burning, and (4) insect taxa indicative of domesticated animals. The limited number and potential to uncover such sequences in this area of the Lea Valley (especially if they date to the Late Glacial / Early Holocene periods), and increased knowledge/understanding of

the historic/prehistoric environment that they could provide, only increases the importance of undertaking such work (see Corcoran *et al.*, 2011).

2.3 Aims and objectives

Further borehole records are required in order to enhance our understanding of the sub-surface stratigraphy at the 79-85 Monier Road site, and to assess its palaeoenvironmental and archaeological potential. Four significant research aims were thus proposed within the geoarchaeological Written Scheme of Investigation (WSI; Young & Batchelor, 2016) for the site as follows:

1. To clarify the nature, depth, extent and date of any former land surfaces, alluvial and peat deposits
2. To investigate whether the sequences contain any artefact or ecofact evidence for prehistoric or historic human activity
3. To investigate whether the sequences contain any evidence for natural and/or anthropogenic changes to the landscape (wetland and dryland)
4. To integrate the new geoarchaeological record with other recent work in the local area for publication in an academic journal

In order to clarify the first of these aims and the potential of addressing aims 2 & 3, the following objectives were proposed:

1. To put down two geoarchaeological boreholes at the site: borehole QBH1 has been located towards the northeast of the site where no previous geotechnical records are available (see Figure 2); QBH1 has been located in order to investigate the area of thickest alluvium at the site, identified during the previous geoarchaeological deposit modelling (Batchelor & Young, 2016; see Figure 6),
2. To carry out an environmental archaeological assessment of one selected borehole sequence (if necessary), incorporating: (1) range finder radiocarbon dating to determine the approximate chronology of any periods of peat formation recorded within the borehole samples; (2) an assessment of their archaeobotanical content, and (3) recommendations for further environmental archaeological investigations (if necessary);
3. To make recommendations for environmental archaeological analysis and publication (if necessary).

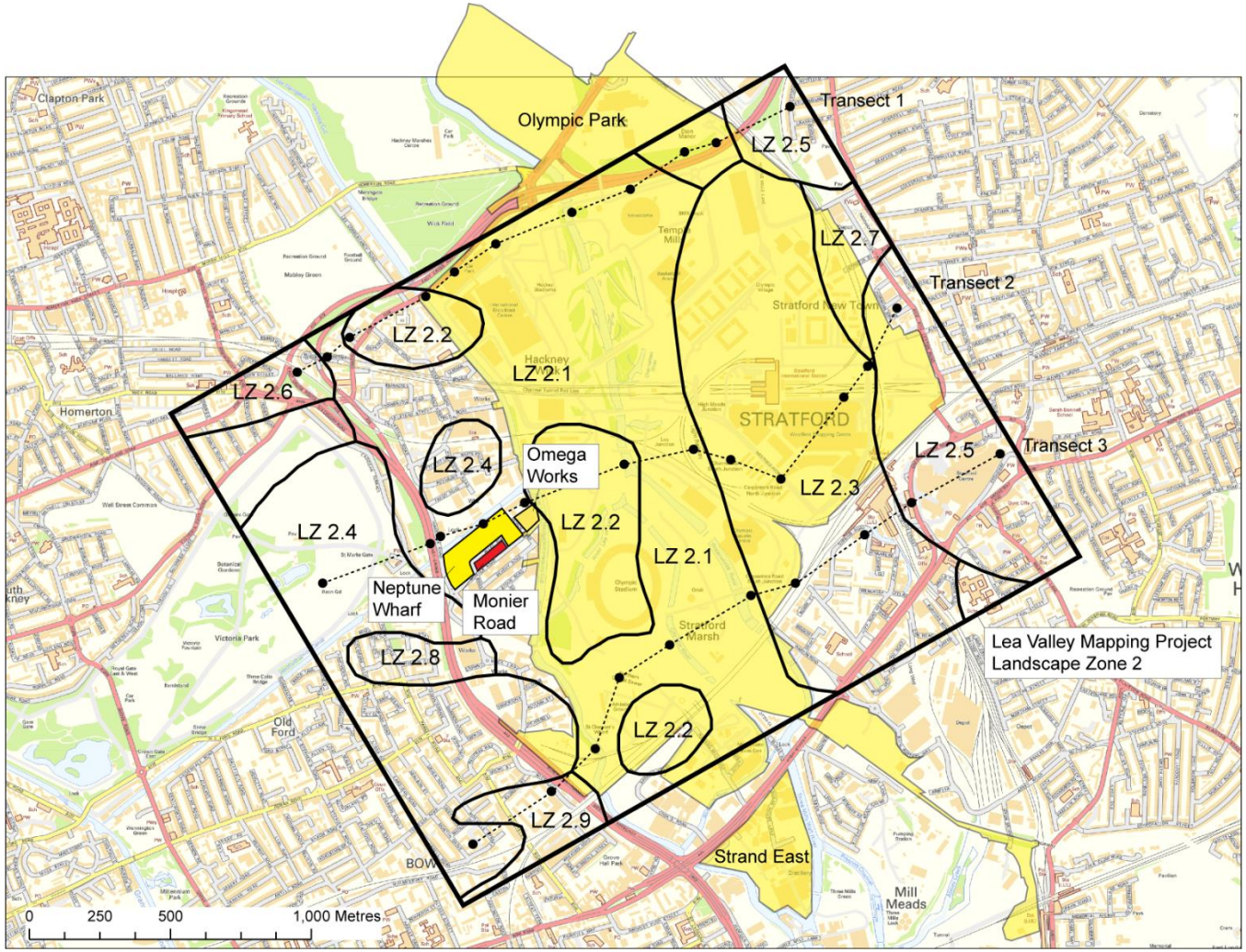

Figure 1: Location of 79-85 Monier Road, London Borough of Tower Hamlets and other local sites including: Fish Island, Neptune Wharf (Batchelor et al., 2016), Omega Works Phase III (Spurr, 2005, 2006), Strand East (Green & Batchelor, 2014) and the area encompassed by the Olympic Park (Powell, 2012). Also displayed are the interpreted Landscape Zones (LZ) of Map 2, investigated as part of the Lower Lea Valley Mapping Project (Corcoran *et al.*, 2011). *Contains Ordnance Survey data © Crown copyright and database right [2016]*.

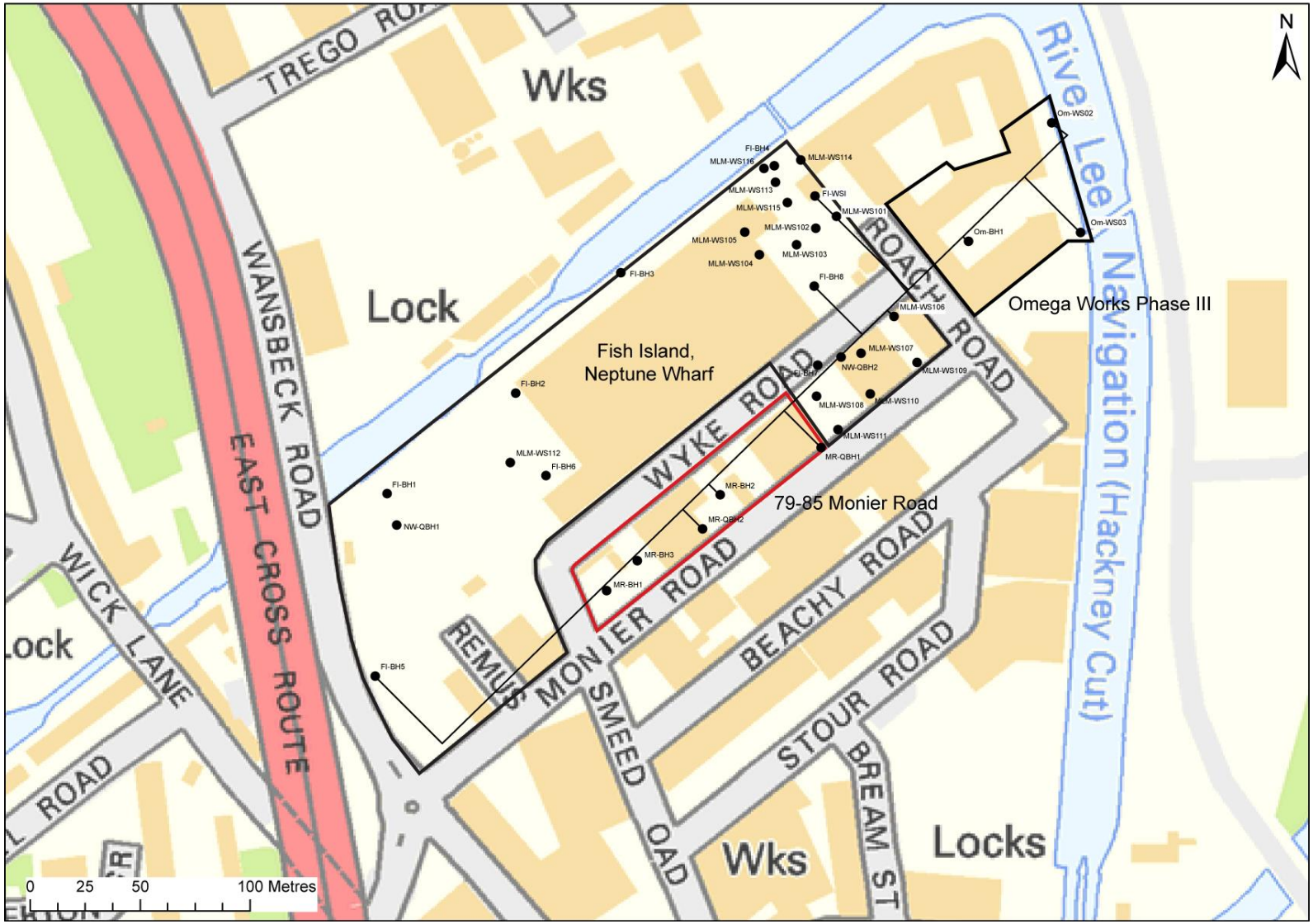

Figure 2: Location of the geotechnical and geoarchaeological boreholes at the 79-85 Monier Road site, London Borough of Tower Hamlets. ***Contains Ordnance Survey data © Crown copyright and database right [2016].***

3. METHODS

3.1 Field investigations

Two geoarchaeological boreholes (boreholes MR-QBH1 & QBH2) were put down at the site in May 2016 (Figure 2) by Quaternary Scientific. The borehole core samples were recovered using an Eijkelkamp window sampler and gouge set using an Atlas Copco TT 2-stroke percussion engine. This coring technique provides a suitable method for the recovery of continuous, undisturbed core samples and provides sub-samples suitable for not only sedimentary and microfossil assessment and analysis, but also macrofossil analysis. The new and historic borehole locations were obtained with reference to site maps and recent topographic surveys (Table 1).

3.2 Lithostratigraphic description

The lithostratigraphy of the core samples was described in the field using standard procedures for recording unconsolidated sediment and organic sediments, noting the physical properties (colour), composition (gravel, sand, clay, silt and organic matter) and inclusions (e.g. artefacts) (Tröels-Smith, 1955). The procedure involved: (1) cleaning the sample using a scalpel; (2) recording the physical properties, most notably colour using a Munsell Soil Colour Chart; (3) recording the composition; gravel (Grana glareosa; Gg), fine sand (Grana arenosa; Ga), silt (Argilla granosa; Ag) and clay (Argilla steatoides); (4) recording the degree of peat humification and (5) recording the unit boundaries e.g. sharp or diffuse. The results of the geoarchaeological descriptions of the monitored boreholes are displayed in Tables 2 and 3.

3.3 Deposit modelling

The deposit model was based on a review of 35 borehole records, incorporating records from the site, Fish Island, Neptune Wharf and Omega Works Phase III (Figure 2; Table 1). Sedimentary units from the boreholes were classified into four groupings: (1) Gravel, (2) Peat; (3) Alluvium and (4) Made Ground. The classified data for groups 1-4 were then input into a database with the RockWorks geological utilities software. Models of surface height were generated for the Gravel, Peat and Alluvium (Figures 4, 5 and 7). Thickness of the Peat. Alluvium and Made Ground (Figures 6, 8 & 9) were also modelled. Because the boreholes are not uniformly distributed over the area of investigation, the reliability of the models generated using RockWorks is variable. In general, reliability improves from outlying areas where the models are largely supported by scattered archival records towards the core area of commissioned boreholes. Because of the 'smoothing' effect of the modelling procedure, the modelled levels of stratigraphic contacts may differ slightly from the levels recorded in borehole logs and section drawings. As a consequence of this the modelling procedure has been manually adjusted so that only those areas for which sufficient stratigraphic data is present will be modelled. In order to achieve this, a maximum distance cut-off filter equivalent to a 50m radius around each record is applied to all deposit models. In addition, it is important to recognise that multiple sets of boreholes are represented, put down at different times and recorded using different descriptive terms and subject to differing technical constraints in terms of recorded detail including the exact levels of the stratigraphic boundaries.

3.4 Organic matter & calcium carbonate determinations

A total of 17 sub-samples from borehole QBH2 were taken for determination of the organic matter content and calcium carbonate content (Table 4; Figure 10). These records were important as they can identify increases in organic matter possibly associated with more terrestrial conditions, and can quantify the concentrations of calcium carbonate recognised in the lithostratigraphic descriptions. The organic matter content was determined by standard procedures involving: (1) drying the sub-sample at 1100C for 12 hours to remove excess moisture; (2) placing the sub-sample in a muffle furnace at 550°C for 2 hours to remove organic matter (thermal oxidation), and (3) re-weighing the sub-sample obtain the 'loss-on-ignition' value. The samples were then re-weighed after 2 hours at 950°C for determination of the calcium carbonate content (see Bengtsson and Enell, 1986). In order to determine the calcium carbonate concentration, the same sample is reheated to 950°C for two hours; the sample is re-weighed and the difference between the organic matter content and calcium carbonate values determined.

3.5 Radiocarbon dating

Two samples of wood were extracted from the base and top of the organic alluvium in borehole QBH2 for radiocarbon dating. The sample was submitted for AMS radiocarbon dating to the BETA Analytic Radiocarbon Dating Facility, Miami, Florida. The results have been calibrated using OxCal v4.2 (Bronk Ramsey, 1995; 2001 and 2007) and the IntCal13 atmospheric curve (Reimer *et al.*, 2013). The results are displayed in Figure 10 and in Table 5.

3.6 Pollen assessment

12 subsamples from borehole QBH2 were extracted for an assessment of pollen content. The pollen was extracted as follows: (1) sampling a standard volume of sediment (1ml); (2) adding two tablets of the exotic clubmoss *Lycopodium clavatum* to provide a measure of pollen concentration in each sample; (3) deflocculation of the sample in 1% Sodium pyrophosphate; (4) sieving of the sample to remove coarse mineral and organic fractions (>125µ); (5) acetolysis; (6) removal of finer minerogenic fraction using Sodium polytungstate (specific gravity of 2.0g/cm^3); (7) mounting of the sample in glycerol jelly. Each stage of the procedure was preceded and followed by thorough sample cleaning in filtered distilled water. Quality control is maintained by periodic checking of residues, and assembling sample batches from various depths to test for systematic laboratory effects. Pollen grains and spores were identified using the University of Reading pollen type collection and the following sources of keys and photographs: Moore *et al* (1991); Reille (1992). The assessment procedure consisted of scanning the prepared slides, and recording the concentration and preservation of pollen grains and spores, and the principal taxa on four transects (10% of the slide) (Table 6).

3.7 Diatom assessment

A total of four samples were submitted for an assessment of diatom presence. The samples were from depths 2.82m, 3.78m, 4.90m and 5.22m.

0.5g of sediment was required for the diatom sample preparation. Due to the high silt and clay content of most samples, all samples chosen for analysis were first treated with sodium hexametaphosphate and left overnight, to assist in minerogenic deflocculation. Samples were then treated with hydrogen peroxide (30% solution) and/or weak ammonia (1% solution) depending on organic and/or calcium carbonate content, respectively. Samples were finally sieved using a 10µm mesh to remove fine minerogenic sediments. The residue was transferred to a plastic vial, from which a slide was prepared for subsequent assessment. It was noted that, of the four samples submitted, high sand and organic content was encountered in 4.90m and 5.22m.

A minimum of four slide traverses were undertaken across each slide sample. When encountered, diatom species ware identified with reference to van der Werff and Huls (1958-74), Hendy (1964) and Krammer & Lange-Bertalot (1986-1991). The results of the assessment are displayed in Table 7.

3.8 Macrofossil assessment

A total of six small bulk samples from borehole QBH2 were extracted for the recovery of macrofossil remains including waterlogged plant macrofossils, wood, insects and Mollusca. Six of the samples were focussed on the organic-rich horizon, with one sample taken from the unit below, in which frequent Mollusca and detrital wood remains were recorded. The extraction process involved the following procedures: (1) removing a sample of either 5 or 10cm in thickness; (2) measuring the sample volume by water displacement, and (3) processing the sample by wet sieving using 300µm and 1mm mesh sizes. Each sample was scanned under a stereozoom microscope at x7-45 magnifications, and sorted into the different macrofossil classes. The concentration and preservation of remains was estimated for each class of macrofossil (Table 8). Preliminary identifications of the waterlogged seeds and Mollusca have been made using modern comparative material and reference atlases (Cappers *et al.* 2006; Kerney, 1999; Hill-Cottingham, 2008). Nomenclature used follows Stace (2005) and Kerney (1999) (Tables 8-9).

4. COMBINED RESULTS AND INTERPRETATION OF THE LITHOSTRATIGRAPHIC DESCRIPTIONS, DEPOSIT MODELLING, ORGANIC MATTER DETERMINATIONS AND RADIOCARBON DATING

A summary of the geotechnical data is shown in Table 1. The results of the deposit modelling are displayed in Figures 3 to 7; Figure 3 is a 2-dimensional southwest-northeast transect, Figures 4 to 7 are surface elevation and thickness models for each of the main stratigraphic units. The results of the deposit modelling indicate that the number and spread of the logs is sufficient to permit modelling with a high level of reliability across the entire area under investigation.

The full sequence of sediments recorded in the boreholes comprises:

Made Ground
Alluvium – widely present
Peat, organic-rich & tufa sediments – sporadically present
Gravel (Lower Lea Gravel)

4.1 Lower Lea Gravel

The Lower Lea Gravel was present in all the boreholes that penetrated to the bottom of the Holocene sequence. It was deposited during the Late Glacial (15,000 to 10,000 years before present) and comprises the sands and gravels of a high-energy braided river system which, while it was active would have been characterised by longitudinal gravel bars and intervening low-water channels in which finer-grained sediments might have been deposited. Such a relief pattern would have been present on the valley floor at the beginning of the Holocene when a lower-energy fluvial regime was being established.

The Lower Lea Valley Gravel rests on a Lambeth Group bedrock surface that slopes downwards from east (-1.9m OD; FI-BH7) to west (-4.25m OD; FI-BH5) across the area (Figures 2 & 3). This is consistent with the findings of Corcoran *et al* (2011) which indicated that the Gravels infilled a deep trough in the bedrock to this approximate depth on the western side of Landscape Zone LZ 2.1. The sand and gravel deposits range between *ca*. 2.5 and 4.5m in thickness; no lenses of fine grained sediments with palaeoenvironmental potential are recorded.

The surface of the Gravel (Figure 4) is relatively even across the 79-85 Monier Road and Fish Island, Neptune Wharf sites and generally varies between -1 and +1m OD. In one record (FI-BH1), a higher surface of +1.85m OD is recorded. This may be anomalous as it is recorded adjacent to geoarchaeologically monitored borehole NW-QBH1 which records the same surface at -1m OD. Nevertheless, the general surface heights are consistent with those recorded by Corcoran et al (2011) in the nearby boreholes of Transect 2 (Figure 2).

4.2 Peat, organic-rich & tufa sediments

Peat is not recorded in any of the three geotechnical records from the Monier Road site, although the alluvium is sometimes described as 'black', possibly implying an organic-rich/peaty component. Peat, organic-rich and tufa sediments are however present in both of the new geoarchaeological boreholes and in both cases is recorded resting directly on the underlying gravel. Characterisation of these deposits by loss-on-ignition reveals these sediments are up to 30% organic-rich and contain 30% calcium carbonate content (Figure 10; Table 5). Within borehole MR-GBH2, these sediments have been radiocarbon dated between 6180-5920 and 1290-1080 cal BP (Figures 3, 10 and Table 5). Rather than suggesting continuous accumulation from the early Neolithic to Medieval period, it is far more likely that deposition was interrupted on at least one occasion.

Occasional peat units are also recorded nearby; thin units of peat, organic-rich and tufa deposits are recorded various boreholes from the north-western end of the Fish Island, Neptune Wharf site (Figure 4), whilst a thick peat horizon dating to the middle to late Mesolithic was recorded on the neighbouring Omega Works Phase III site (MoLAS, 2006).

The limited presence and thickness of a distinct peat horizon recorded across the 79-85 Monier Road site corresponds with the findings of Corcoran et al. (2011). These ephemeral peat units are recorded immediately on top of the Lea Valley Gravel and are suggestive of a transition towards semi-terrestrial (marshy) conditions supporting the growth of sedge fen/reed swamp and/or woodland communities. The inconsistent presence/thickness of the peat may suggest its formation was either of limited extent/duration, or has been truncated by subsequent processes.

4.3 Alluvium

The Alluvium rests directly on the Gravel or Peat and was recorded in all boreholes across both the 79-85 Monier Road site and the neighbouring Fish Island, Neptune Wharf site. The deposits of the Alluvium are described as predominantly silty or clayey and occasionally organic-rich (e.g. MR-BH3) or with sporadic bands of peat (e.g. FI-BH2, FI-BH4 and FI-BH5). The surface of the Alluvium (Figure 5) is highly variable, resting between 2.5m and 6m OD and ranges in thickness from 1m to 5m, but is mainly between 2m and 3m (Figure 6).

The sediments of the Alluvium are indicative of deposition within low energy fluvial and/or semi-aquatic conditions during the Holocene. The high mineral content of the sediments may reflect increased sediment loads resulting from intensification of agricultural land use from the later prehistoric period onward, combined with the effects of rising sea level.

4.5 Made Ground

Between 0.5 and 6m of Made Ground caps the Holocene alluvial sequence (Figure 7).

Table 1: Borehole attributes for those records used in the deposit model, 79-85 Monier Road, London Borough of Tower Hamlets.

Name	Easting	Northing	Elevation (m OD)	Top of Alluvium (m bgl)	Top of Peat (m bgl)	Top of Lower Lea Gravel (m bgl)	Top of London Clay (m bgl)
Gearchaeological boreholes from 79-85 Monier Road							
MR-QBH1	537233	184197	5.60	1.25	4.40	4.94	-
MR-QBH2	537179	184160	5.45	1.20	3.93	5.23	-
Geotechnical boreholes from 79-85 Monier Road							
MR-BH1	537135.33	184131.85	6.55	2.10	-	6.30	9.90
MR-BH2	537186.95	184175.48	6.60	0.50	-	5.50	10.00
MR-BH3	537149.28	184145.49	6.40	3.90	-	6.50	9.00
Geoarchaeological boreholes from Fish Island, Neptune Wharf							
NW-QBH1	537039.76	184161.68	6.27	4.00		6.98	-
NW-QBH2	537242.02	184238.25	6.65	3.80	6.77	6.88	-
Geotechnical boreholes from Fish Island, Neptune Wharf							
FI-BH1	537035.26	184176.01	8.15	5.30	-	6.30	12.00
FI-BH2	537093.81	184221.87	7.60	3.70	-	*6.50*	10.50
FI-BH3	537141.71	184276.73	6.65	2.80	-	60	9.60
FI-BH4	537211.72	184325.46	7.30	4.40	-	7.30	9.60
FI-BH5	537029.93	184092.90	7.75	5.80	-	7.60	12.00
FI-BH6	537107.73	184184.20	7.55	4.70	-	7.00	10.70
FI-BH7	537231.38	184234.56	6.50	4.50	-	6.10	8.40
FI-BH8	537229.74	184270.59	7.60	5.60	-	7.70	10.60
FI-WSI	537230.15	184311.54	7.10	4.30	-	6.55	-
MLM-WS101	537240.0	184302.3	6.75	4.50	-	-	-
MLM-WS102	537230.6	184296.9	7.15	5.10	6.60	-	-
MLM-WS103	537221.7	184289.5	7.34	4.00	6.86	7.10	-
MLM-WS104	537204.9	184284.8	7.71	5.90	6.15	-	-
MLM-WS105	537198.1	184295.2	7.68	4.00	-	-	-
MLM-WS106	537266.2	184256.8	6.64	4.00	5.50	5.85	-
MLM-WS107	537251.1	184240.0	6.75	4.10	-	7.00	-
MLM-WS108	537230.9	184220.4	6.65	4.10	-	6.70	-
MLM-WS109	537276.7	184235.8	6.65	4.20	-	6.00	-
MLM-WS110	537255.4	184221.4	6.65	3.95	5.90	6.15	-
MLM-WS111	537240.6	184205.2	6.65	3.70	-	5.68	-
MLM-WS112	537091.5	184190.2	6.65	4.00	-	-	-
MLM-WS113	537212.1	184317.9	7.32	-	-	-	-
MLM-WS114	537223.7	184328.0	7.09	-	-	-	-
MLM-WS115	537217.6	184308.6	7.26	6.00	6.61	-	-
MLM-WS116	537206.9	184324.2	7.34	3.80	-	-	-
Geoarchaeological boreholes from Omega Works Phase III							
Om-BH1	537300	184291	7.05	4.20	5.95	6.60	-
Om-WS02	537338	184345	7.22	3.90	6.10	6.70	-
Om-WS03	537351	184295	7.27	2.40	-	4.80	-

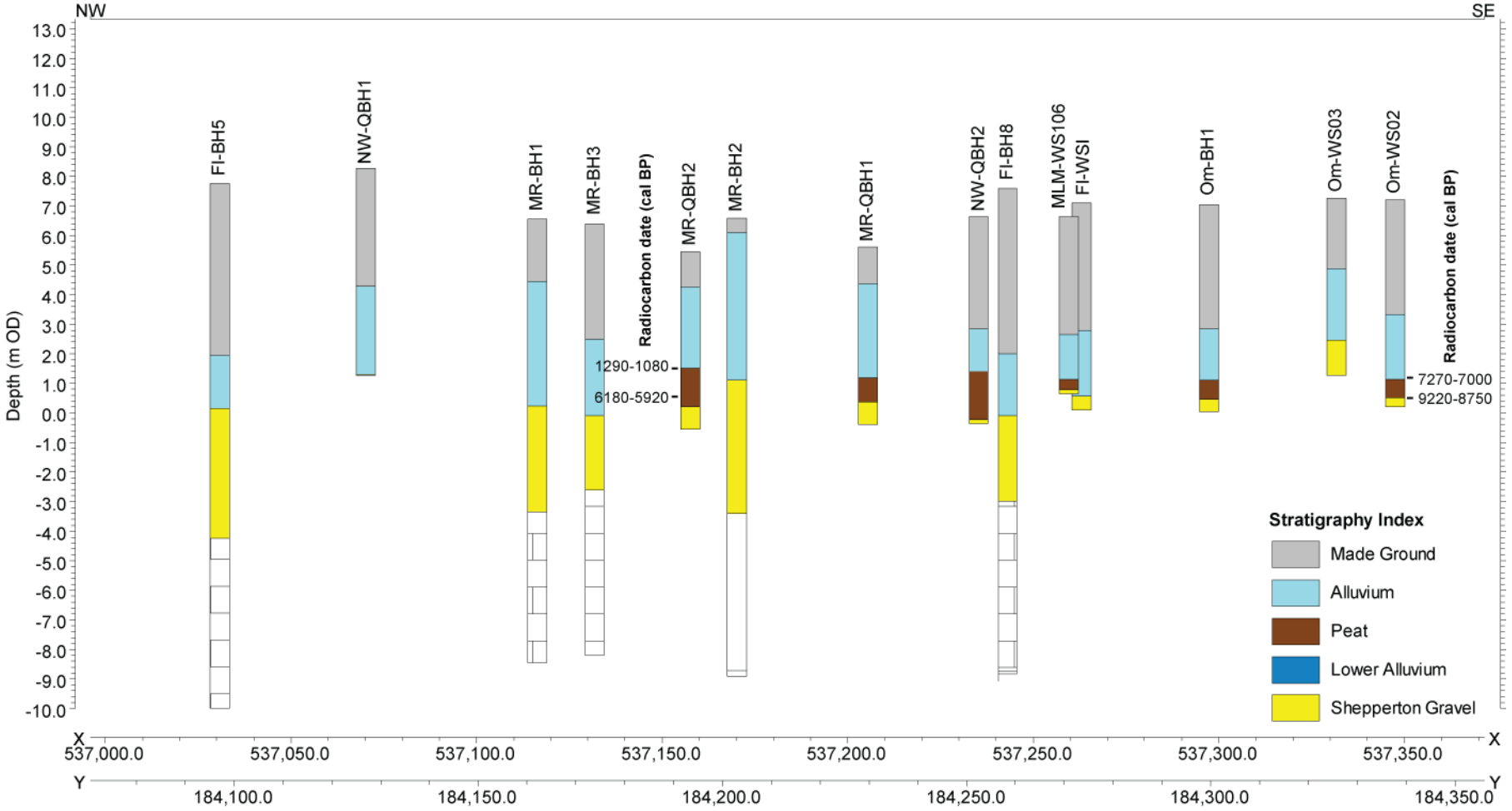

Figure 3: South-west to north-east borehole transect across the 79-85 Monier Road and Fish Island, Neptune Wharf sites

Figure 4: Top of the Lea Valley Gravel (m OD) (site outline in red). ***Contains Ordnance Survey data © Crown copyright and database right [2016].***

Figure 5: Top of the Peat (m OD) (site outline in red). ***Contains Ordnance Survey data © Crown copyright and database right [2016].***

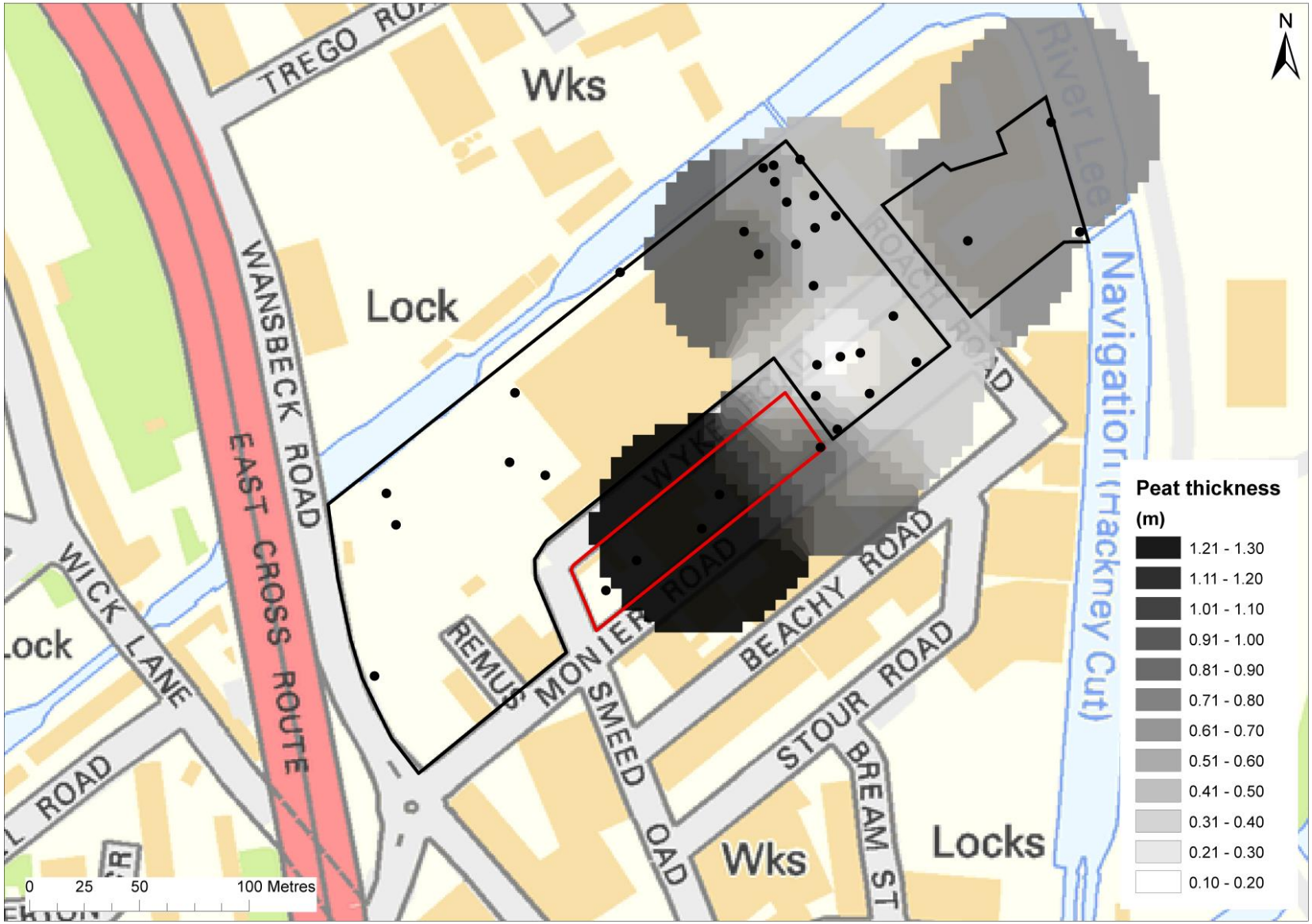

Figure 6: Thickness of Peat (m) (site outline in red). ***Contains Ordnance Survey data © Crown copyright and database right [2016].***

Figure 7: Top of the Alluvium (m OD) (site outline in red). ***Contains Ordnance Survey data © Crown copyright and database right [2016].***

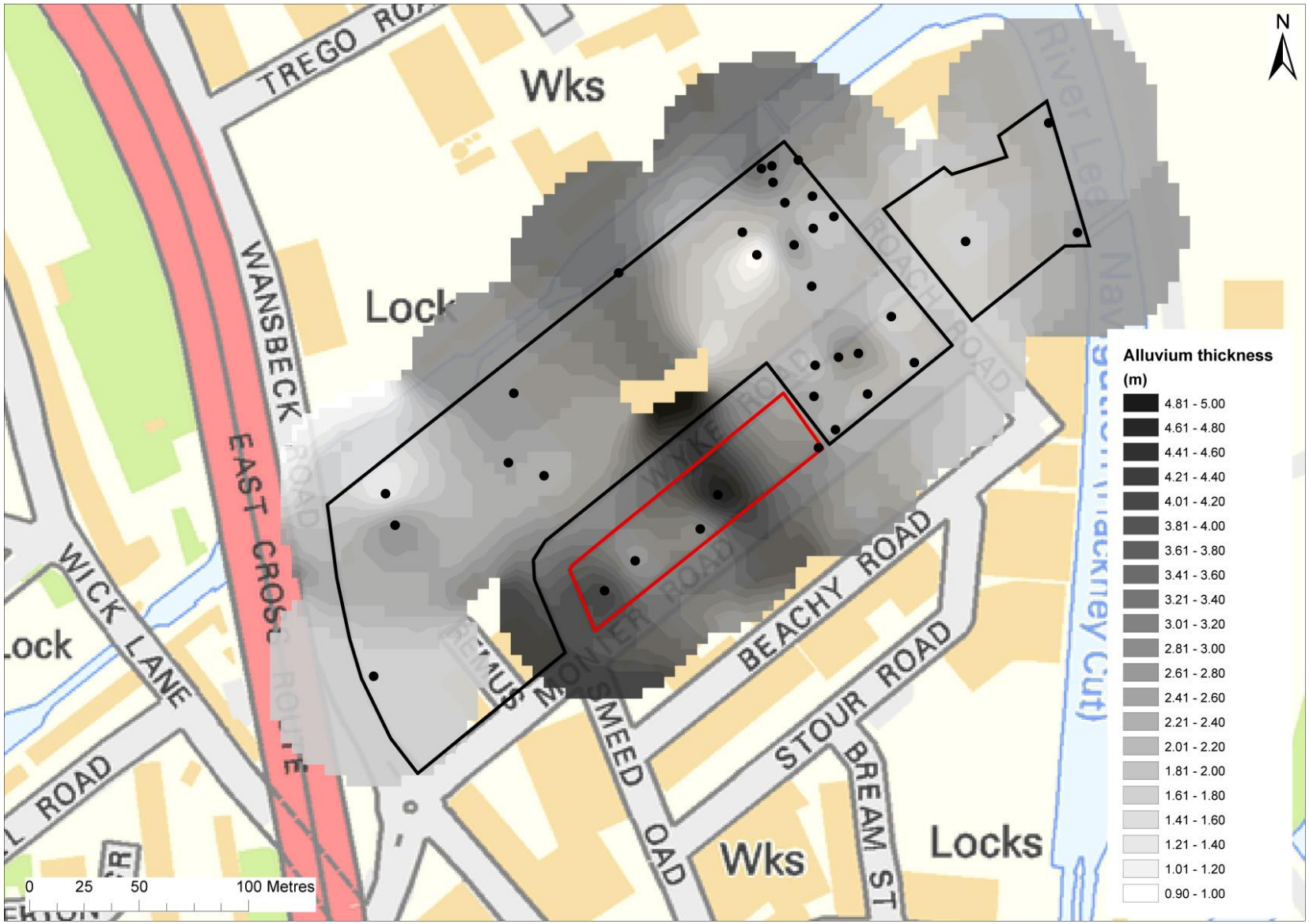

Figure 8: Thickness of Alluvium (m) (site outline in red). ***Contains Ordnance Survey data © Crown copyright and database right [2016].***

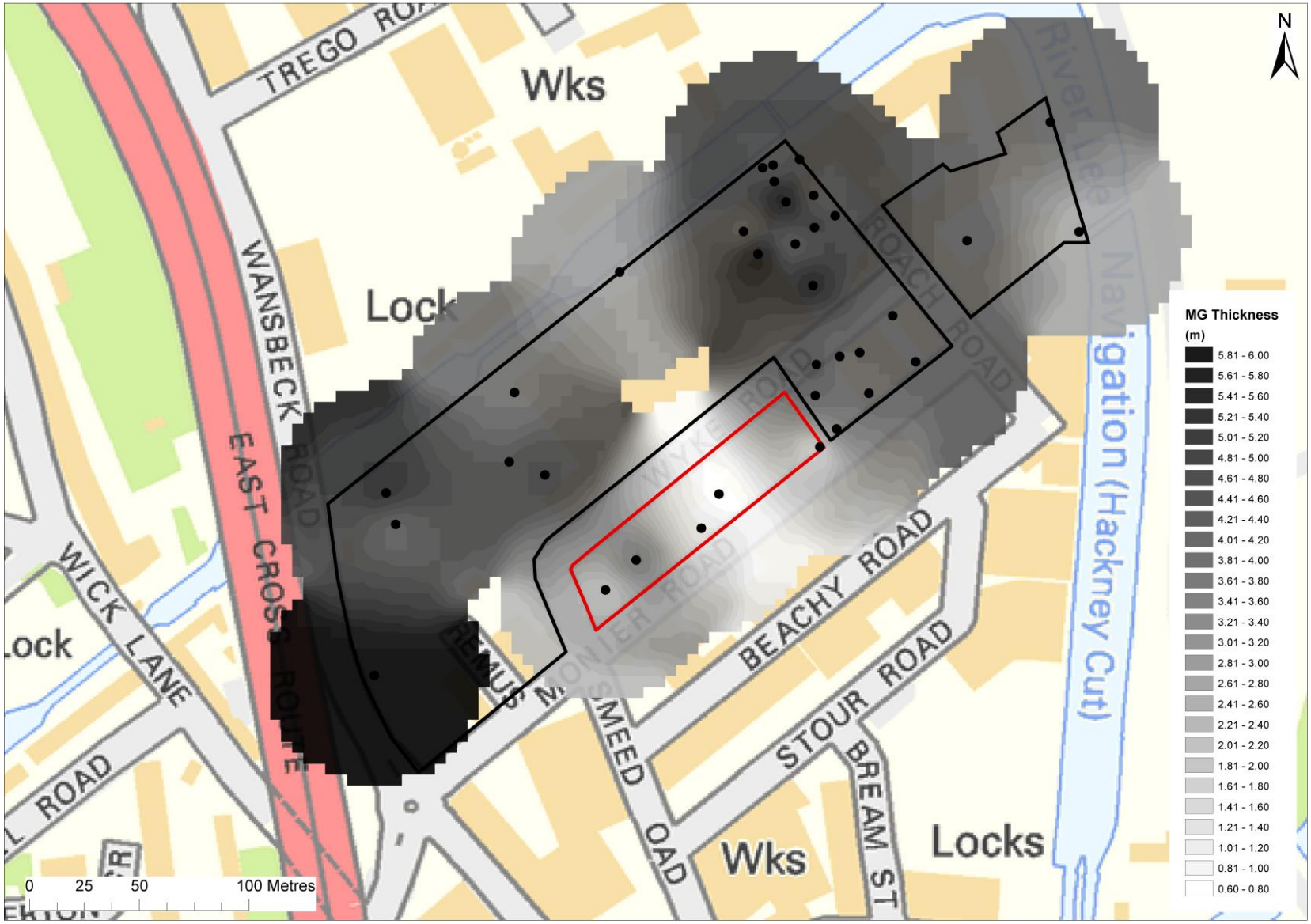

Figure 9: Thickness of Made Ground (m) (site outline in red). ***Contains Ordnance Survey data © Crown copyright and database right [2016].***

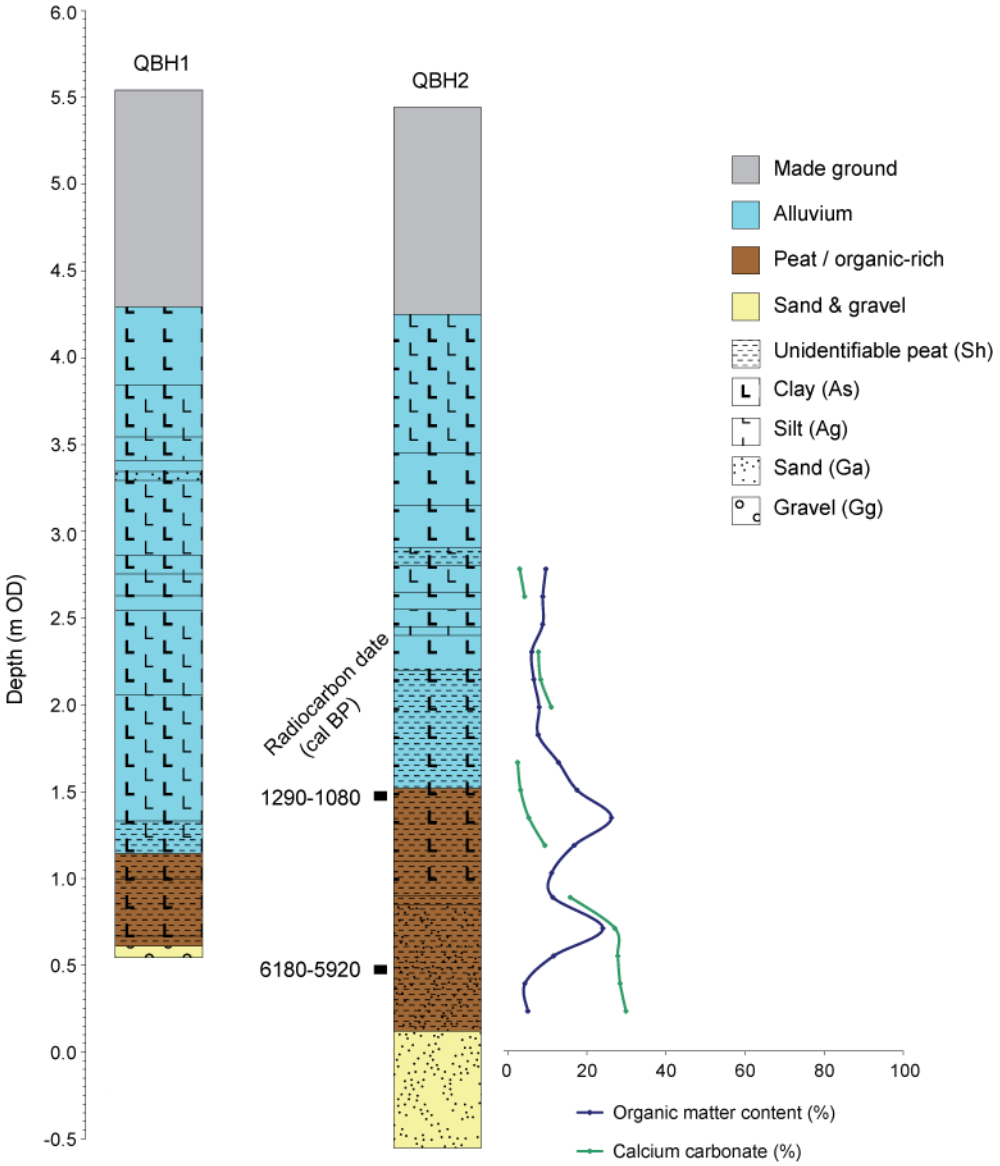

Figure 10: Results of the lithostratigraphic descriptions, radiocarbon dating, organic matter content and calcium carbonate determinations from geoarchaeological boreholes MR-QBH1 and MR-QBH2, 79-85 Monier Road, London Borough of Tower Hamlets

Table 2: Lithostratigraphic description of borehole MR-QBH1, 79-85 Monier Road, London Borough of Tower Hamlets

Depth (m OD)	Depth (m bgl)	Description	Stratigraphic group
5.60 to 4.35	0 to 1.25	Made Ground	MADE GROUND
4.35 to 3.90	1.25 to 1.70	10YR 5/1; As4, Ag+, CBM+, Gg+; Grey clay with silt, CBM and gravel inclusions; sharp contact into:	
3.90 to 3.60	1.70 to 2.00	10YR 5/3; As3, Ag1; Greyish brown silty clay.	ALLUVIUM
3.60 to 3.46	2.00 to 2.14	10YR 5/2; As3, Ag1, Ga+, Gg+; Greyish brown silty clay with sand, gravel, slag and CBM inclusions; diffuse contact into:	
3.46 to 3.40	2.14 to 2.20	10YR 5/2; As4; Greyish brown clay with CBM inclusions; diffuse contact into:	
3.40 to 3.35	2.20 to 2.25	10YR 4/2; As2, Ag1, Ga1; Dark greyish brown silty sandy clay; diffuse contact into:	
3.35 to 2.92	2.25 to 2.68	10YR 5/2; As4; Greyish brown clay; very sharp contact into:	
2.92 to 2.82	2.68 to 2.78	10YR 3/1; As2, Ag1, Sh1; Very dark grey organic-rich silty clay with one large flint gravel fragment; diffuse contact into:	
2.82 to 2.68	2.78 to 2.92	10YR 4/1; As3, Ag1, Sh+; Dark grey silty clay with organic-rich inclusions; diffuse contact into:	
2.68 to 2.60	2.92 to 3.00	10YR 4/1; As4, Sh+; Dark grey clay with traces of organic-rich material; diffuse contact into:	
2.60 to 2.12	3.00 to 3.48	10YR 5/1; As3, Ag1; Grey silty clay; diffuse contact into:	
2.12 to 1.38	3.48 to 4.22	10YR 5/1; As3, Ag1; Grey silty clay with traces of tufa sand and gravel, Mollusca, detrital plant remains and organic material; diffuse contact into:	
1.38 to 1.20	4.22 to 4.40	10YR 4/1; As2, Ag1, Sh1, Dh+; Dark grey organic-rich silty clay with traces of detrital plant remains; sharp contact into:	
1.20 to 1.05	4.40 to 4.55	10YR 2/1; As2, Sh2; Black highly organic-rich clay; diffuse contact into:	PEAT
1.05 to 0.73	4.55 to 4.87	10YR 2/1; Sh3, As1, Th+; Black peat with clay and traces of herbaceous peat; diffuse contact into:	
0.73 to 0.66	4.87 to 4.94	10YR 2/1; Sh3, As1, Gg+; Black peat with clay and traces of flint gravel; sharp contact into:	
0.66 to 0.60	4.94 to 5.00	10YR 4/2; Gg2, Ga2, Sh+, As+; Dark greyish brown sand and gravel with traces of organic remains and clay.	LOWER LEA GRAVEL

Table 3: Lithostratigraphic description of borehole MR-QBH2, 79-85 Monier Road, London Borough of Tower Hamlets

Depth (m OD)	Depth (m bgl)	Description	Stratigraphic group
5.45 to 4.25	0 to 1.20	Made Ground	MADE GROUND
4.25 to 3.45	1.20 to 2.00	10YR 3/3; As3, Ag1, Ga+, Gg+; Brown silty clay with sand and gravel inclusions.	ALLUVIUM
3.45 to 3.14	2.00 to 2.31	10YR 5/2; As4; Greyish brown clay with CBM inclusions; diffuse contact into:	
3.14 to 2.90	2.31 to 2.55	10YR 5/2; As4; Greyish brown clay; very sharp contact into:	
2.90 to 2.79	2.55 to 2.66	10YR 3/1; As2, Ag1, Sh1; Very dark grey organic-rich silty clay with traces of Mollusca; diffuse contact into:	
2.79 to 2.67	2.66 to 2.78	10YR 4/1; As3, Ag1, Sh+; Dark grey silty clay with organic-rich inclusions and traces of Mollusca; diffuse contact into:	
2.67 to 2.54	2.78 to 2.91	10YR 4/1; As4, Sh+; Dark grey clay with traces of organic-rich material; diffuse contact into:	
2.54 to 2.45	2.91 to 3.00	10YR 5/1; As3, Ag1; Grey silty clay; diffuse contact into:	
2.45 to 2.40	3.00 to 3.55	10YR 5/1; As3, Ag1; Grey silty clay with traces of tufa sand and gravel, Mollusca, detrital plant remains and organic material; diffuse contact into:	
2.40 to 2.20	3.55 to 3.75	10YR 5/1 to 10YR 5/2; As4; Grey to greyish brown clay with traces of Mollusca and organic-rich remains; diffuse contact into:	
2.20 to 1.52	3.75 to 3.93	10YR 4/2; As3, Sh1, Dh/Th+; Dark greyish brown organic-rich clay with traces of plant remains; diffuse contact into:	
1.52 to 1.09	3.93 to 4.36	10YR 4/2; As2, Sh2, Th+; Dark greyish brown highly organic-rich clay with traces of herbaceous peat; diffuse contact into:	PEAT
1.09 to 0.90	4.36 to 4.55	10YR 4/2; As2, Sh2; Dark greyish brown highly organic-rich clay with high quantities of Mollusca and traces of charcoal; diffuse contact into:	
0.90 to 0.84	4.55 to 4.61	Wood	
0.84 to 0.22	4.61 to 5.23	10YR 2/1 & 10YR 7/1; Sh2, Ga2; Black peat and white tufaceous sands; sharp contact into:	
0.22 to -0.55	5.23 to 6.00	10YR 4/2; Gg2, Ga2; Dark greyish brown sand and gravel.	LOWER LEA GRAVEL

Table 4: Results of the borehole MR-QBH2 organic matter and calcium carbonate determinations, 79-85 Monier Road, London Borough of Tower Hamlets.

Depth (m OD)		Organic matter content (%)	Calcium carbonate content (%)
From	To		
2.79	2.80	9.63	3.02
2.63	2.64	8.84	4.24
2.47	2.48	8.83	
2.31	2.32	6.05	7.73
2.15	2.16	6.60	8.32
1.99	2.00	7.92	11.00
1.83	1.84	7.69	
1.67	1.68	12.82	2.50
1.51	1.52	17.51	3.24
1.35	1.36	26.21	5.33
1.19	1.20	16.79	9.35
1.03	1.04	11.10	
0.89	0.90	11.38	15.79
0.71	0.72	24.04	27.09
0.55	0.56	11.57	27.79
0.39	0.40	4.34	28.40
0.23	0.24	5.06	29.89

Table 5: Results of the borehole MR-QBH2 organic matter and calcium carbonate determinations, 79-85 Monier Road, London Borough of Tower Hamlets.

Laboratory code / Method	Material and location	Depth (m OD)	Uncalibrated radiocarbon years before present (yr BP)	Calibrated age BC/AD (BP) (2-sigma, 95.4% probability)	δ13C (‰)
BETA-438395 AMS	Twig wood; Top of Alluvium	1.50 to 1.45	1260 ± 30	660-870 cal AD 1290-1080 cal BP	-27.5
BETA-438936 AMS	Twig wood; Base of Alluvium	0.50 to 0.45	5240 ± 30	4230-3970 cal BC 6180-5920 cal BP	-25.5

5. RESULTS AND INTEPRETATION OF THE POLLEN ASSESSMENT

Samples were prepared for pollen assessment through the peat, organic-rich and tufa horizons of MR-QBH2. The results of this assessment (Table 6) indicate a variable concentration and preservation of remains.

Between 0.23 and 0.91m OD, the concentration and preservation of pollen is poor, with *Alnus* (alder), *Quercus* (oak), *Corylus* type (hazel) and Cyperaceae (sedges) the most frequently represented.

The five samples from the between 1.03 and 1.67m OD contained a high concentration of remains characterised by high values of herbaceous pollen including: Cyperaceae and Poaceae (grasses) with *Cereale* type (e.g. barley), Asteraceae (daisies), Lactuceae (dandelions), *Plantago lanceolate* (ribwort plantain), *Chenopodium* type (e.g. fat hen) and sporadic occurrences of *Rumex acetosa/acetosella* (sorrel) / *R. obtusifolius* (dock), Aquatics *Sparganium* type (bur-reed) and *Typha latifolia* (bulrush) were frequently present. Trees and shrubs were dominated by *Quercus* and *Corylus* type with sporadic occurrences of *Alnus*, *Pinus* (pine) and *Ulmus* (elm). Microcharcoal was either recorded in either negligible or occasional quantities throughout these samples.

The final two samples from the Alluvium in MR-QBH2 contained a low concentration and preservation of pollen with only Poaceae, Lactuceae, Asteraceae and *Sparganium* type represented. Microcharcoal concentrations are moderate within these samples.

Minimal interpretation can be provided for the basal three and uppermost two samples from the sequence, other than to say that the species represented were most likely growing in the nearby vicinity. Within the middle five samples, the quantity of herbaceous and aquatic pollen suggests the dominant growth of sedge fen and reed swamp communities occupying the floodplain environment; there is very little evidence to indicate the growth of floodplain woodland. On the adjacent dryland, the growth of mixed deciduous woodland dominated by oak and hazel. A strong anthropogenic signal is also indicated by the frequent occurrence of cereal pollen grains, and indicators of disturbed / open ground (e.g. dandelions, fat hen, and ribwort plantain).

Table 6: Results of the pollen assessment from QBH2, 79-85 Monier Road, London Borough of Tower Hamlets

	Depth (m OD)	2.77	2.63	1.67	1.51	1.35	1.19	1.03	0.91	0.71	0.47	0.23
Latin name	Common name											
Trees												
Alnus	alder					1		1	3	3		1
Quercus	oak			10	1	9	4	2	2		2	1
Pinus	pine			1	2	1		1		1		
Ulmus	elm				1		1	1				
Tilia	lime										1	
Shrubs												
Corylus type	e.g. hazel				6	10	2	4	1		3	
Ilex	holly							1				
Herbs												
Cyperaceae	sedge family			40	25	18	19	23	1		5	
Poaceae	grass family	2		4	9	3	9	11				
Cereale type	e.g. barley			3	4	5	4	1		1		
Asteraceae	daisy family	1		1	3	2	2	1				
Lactuceae	dandelion family	2	4	1	4		1	4				
Plantago lanceolata	ribwort plantain				1							
Chenopodium type	goosefoot family				1							
Caryophyllaceae	pink family				2							
Rumex acetosa/acetosella	sorrel				1	1	1					
Rumex obtusifolius	dock				1		1					
Apiaceae	carrot family				1							
Ranunculus type	buttercup / water crowsfoot				1							
Aquatics												
Typha latifolia	bulrush		1		2		2					
Sparganium type	bur-reed			1		2	5					
Spores												
Pteridium aquilinum	bracken						1					
Filicales	ferns			1						1		
Polypodium vulgare	polypody						1					
Total Land Pollen (grains counted)		5	4	59	63	50	44	50	7	5	11	2
Concentration*		1	1	5	5	5	5	5	1	1	2	1
Preservation**		2	2	3-4	3	4	3-4	4	3	4	3	1
Microcharcoal Concentration***		3	3	1	1	1	2	2	1	3	1	0

	Depth (m OD)	2.77	2.63	1.67	1.51	1.35	1.19	1.03	0.91	0.71	0.47	0.23
Latin name	Common name											
Suitable for further analysis		NO	NO	YES	YES	YES	YES	YES	NO	NO	NO	NO

*Key: *Concentration: 0 = 0 grains; 1 =1-75 grains, 2 = 76-150 grains, 3 =151-225 grains, 4 = 226-300, 5 =300+ grains per slide; **Preservation: 0 = absent; 1 = very poor; 2 = poor; 3 = moderate; 4 = good; 5 = excellent; ***Microcharcoal Concentration: 0 = none, 1= negligible, 2 = occasional, 3 = moderate, 4 = frequent, 5 = abundant*

6. RESULTS AND INTEPRETATION OF THE DIATOM ASSESSMENT

A summary of the diatom presence-absence assessment results for context is provided in the Table 7. Diatoms are listed in order of abundance (most common at the top of each list)

Diatoms were encountered in three of the four samples submitted. The uppermost sample (2.63m OD) had a restricted assemblage containing low numbers of only two taxa. In contrast, diatoms were found in greater abundance at 1.67m and 0.23m OD. However, in these samples, the majority of the taxa encountered were fragmented, making species identifications difficult during an assessment of this nature. The samples will have the potential to be identified to species level with further analysis. There was also evidence of frustule dissolution in sample 1.67m OD, which suggests some level of post-depositional frustule dissolution having taken place (Mayer et al, 1991). Of the taxa encountered, the majority of genera in 1.67m and 0.23m are more typically associated with freshwater settings, but identifications to species level would be needed to confirm this. Although encountered in very low abundance, those taxa encountered at 2.63m depth are more typical of higher salinity conditions and hence there may be evidence of a variation in the influence of relative sea level through the sequence. Such species can also however be encountered in freshwater settings with higher pH levels and so such an interpretation is therefore based on a rapid assessment. Further analysis would be required to support such an interpretation.

Table 7: Results of the diatom assessment, 79-85 Monier Road, London Borough of Tower Hamlets

Depth (m OD)	Diatoms encountered
2.63	*Diploneis ovalis* *Nitzschia navicularis*
1.67	Gomphonema sp. Gyrosigma sp. Synedra sp. Pinnularia sp. Surirella sp. Cyclotella sp Fragilaria sp.
0.55	n/a
0.23	Synedra sp. Epithemia sp. Gomphonema sp. Amphora sp. Eunotia sp. Cyclotella sp. *Cocconeis scutellum* Cymbella sp.

7. RESULTS AND INTEPRETATION OF THE MACROFOSSIL ASSESSMENT

Four small bulk samples from borehole QBH2 were extracted and processed for the recovery of macrofossil remains, including waterlogged plant macrofossils, wood, insects and Mollusca (Table 8). Three of the samples were extracted from the main horizon of peat/organic rich alluvium (1.45 to 1.50, 0.45 to 0.50 and 0.25 to 0.34m OD, whilst one was extracted from an organic horizon within the overlying alluvium (2.85 to 2.88m OD).

The results of the macrofossil rapid assessment indicate that charcoal 2-4mm in diameter (potentially identifiable) and industrial waste (slag/clinker) was recorded in low concentrations in the sample from the alluvium (2.85 to 2.88m OD). Waterlogged wood was present in low to moderate concentrations in the two lower samples from the peat/organic-rich alluvium (0.45 to 0.50 and 0.25 to 0.34m OD), but was an absent in the upper sample (1.45 to 1.50m OD) and from the overlying alluvium (2.85 to 2.88m OD). Waterlogged seeds were recorded in low to moderate concentrations in all four samples. Mollusca, including opercula of *Bithynia* sp., were recorded in low to moderate concentrations in the samples from 2.85 to 2.88, 0.45 to 0.50 and 0.25 to 0.34m OD. A low concentration of insect remains were recorded in the sample from 1.45 to 1.50m OD.

The samples that contained waterlogged seeds underwent a more detailed assessment of the plant macrofossil remains (Table 9).

Peat/organic rich alluvium

The assemblage in the three samples from the peat/organic rich alluvium included *Solanum* cf. *dulcamara* (bittersweet nightshade), *Carex rostrata* (beaked sedge), *Carex* sp. (sedge), *Scirpus* sp. (bulrush) and *Alnus glutinosa* (alder). The assemblage is typical of damp or wet carr or sedge fen environments.

Alluvium

Silene/*Stellaria* sp. (campion/stitchwort) was recorded in the sample from the alluvium; although this assemblage is too small to attempt a full environmental interpretation, these species are common in open and perhaps damp environments.

Table 8: Results of the macrofossil assessment of borehole QBH2, 79-85 Monier Road, London Borough of Tower Hamlets

				Charred					Waterlogged		Mollusca		Bone					
Depth (m OD)	Volume sampled (ml)	Volume processed (ml)	Fraction	Charcoal (>4mm)	Charcoal (2-4mm)	Charcoal (<2mm)	Seeds	Chaff	Wood	Seeds	Whole	Fragments	Large	Small	Fragments	Insects	Artefacts	Industrial waste
2.85 to 2.88			>300µm	-	2	-	-	-	-	1	1	-	-	-	-	-	-	2
1.45 to 1.50			>300µm	-	-	-	-	-	-	3	-	-	-	-	-	1	-	-
0.45 to 0.50			>300µm	-	-	-	-	-	2	1	2	-	-	-	-	-	-	-
0.25 to 0.34			>300µm	-	-	-	-	-	2	1	2	-	-	-	-	-	-	-

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

Table 9: Results of the plant macrofossil assessment of samples from borehole QBH2, 79-85 Monier Road, London Borough of Tower Hamlets

Depth (m OD)	Seed identification		Quantity
	Latin name	Common name	
2.85 to 2.88	*Silene/Stellaria* sp.	campion/stitchwort	1
1.45 to 1.50	*Solanum* cf. *dulcamara* *Carex rostrata* *Scirpus* sp.	bittersweet nightshade beaked sedge bulrush	18 3 2
0.45 to 0.50	*Alnus glutinosa* catkin	alder	1
0.25 to 0.34	*Carex* sp.	sedge	1

8. DISCUSSION & CONCLUSIONS

Subsequent to the findings of a desk-based geoarchaeological exercise, a program of fieldwork and laboratory-based assessment was instigated to: (1) clarify the nature of the sub-surface stratigraphy, in particular the presence and thickness of Alluvium and Peat across the site, and (2) to evaluate the potential of the sedimentary sequences for reconstructing the environmental history of the site and its environs. In order to address these aims, two geoarchaeological boreholes were put down at targeted locations on the site, and the resultant stratigraphic data from were used to update the existing deposit model of the major depositional units across the site; in addition, new borehole records from the neighbouring Fish Island, Neptune Wharf site were also integrated into the updated model (Batchelor *et al.*, 2016).

8.1 Sedimentary and hydrological history

The results of the geoarchaeological deposit modelling have contributed to our understanding of the Holocene stratigraphic sequence in this area of the Lea Valley. Overlying the London Clay bedrock at the site is a sequence of Late Devensian Lea Valley Gravel, Holocene alluvial deposits and variable thicknesses of Made Ground. The site lies within Corcoran *et al.*'s (2011) Landscape Zone LZ 2.1 (Terrain 1; Figure 1) which is described as containing the deposits of the valley floor. More specifically, the site is mapped towards the western margins of LZ 2.1, where a deep area of channel activity has been identified, dissecting the neighbouring low terrace (LZ 2.2) a few hundred metres to the east. The high terrace (LZ 2.4) is mapped to the west and north; the northern island being the result of erosion by the aforementioned channel (Corcoran *et al.*, 2011). These features have also been identified during modelling for the Olympic Park archaeological investigations (Powell., 2012).

The results of these investigations enhance the findings made by Corcoran *et al.* (2011) and Powell (2012), enabling the model for the Lea Valley to be enhanced further. The borehole records indicate the presence of a Late Pleistocene gravel aggradation (Lea Valley Gravel) infilling inequalities in the underlying bedrock surface to create a slightly uneven gravel surface at or slightly above OD. Peat is patchily preserved resting directly on the gravel surface. Above the peat, mineral-rich silty alluvium forms the upper part of the sediment sequence across the whole of the site. The deposits appear to have been laid down under freshwater conditions. Similar Late Pleistocene-Holocene sediment sequences have been recorded at neighbouring sites at Fish Island, Neptune Wharf (Batchelor *et al.*, 2016) and Omega Works Phase III (Spurr, 2005, 2006).

Two radiocarbon dates have been obtained from peat recovered from borehole MR-QBH2 at the 79-85 Monier Road site. The lower sample yielded a date of 6180-5920 cal BP (early Neolithic), and the upper sample a date of 1290-1080 cal BP (Medieval). These dates are significantly different from dates obtained from organic material directly overlying gravel at a closely similar level recovered from borehole OM-WS02 at the Omega Works Phase III site. Here the lower sample yielded a date of 9220-8750 cal BP and the upper sample 7270-7000 cal BP.

The substantial difference in the age of the organic sediments overlying the gravel surface at closely similar levels within this part of the LZ 2.1 Landscape Zone of Corcoran *et al* (2011) suggests that this area was affected by active channel processes at least intermittently for much of the early and middle Holocene. As a result although semi-terrestrial conditions leading to peat accumulation were able to become established on more than one occasion, the evidence suggests that such conditions were interrupted by erosional episodes which left only patchy remnants of the organic horizons. Indeed, in the case of the MR-QBH2 record, it is considered unlikely that accumulation was continuous between 6180-5920 cal BP, and 1290-1080 cal BP.

8.2 Vegetation history & evidence of human activity

The results of the pollen and macrofossil assessment both indicate that during the deposition of peat, organic-rich and tufa sediments, the floodplain environment was dominated by herbaceous and aquatic communities forming sedge fen and reed swamp communities. There is little evidence to suggest that trees or shrubs formed a substantial component of this community; very little alder pollen is recorded and very limited catkin remains, although pieces of waterlogged wood remain unidentified. On the adjacent dryland, the growth of mixed deciduous woodland dominated by oak and hazel.

Cereal pollen grains dandelions, fat hen and ribwort plantain are however consistently recorded during the upper part of the peat, organic-rich and tufa sediments (i.e. sometime after 6180-5920 cal BP, but prior to and until after 1290-1080 cal BP). This assemblage is strongly indicative of nearby anthropogenic activity in the form of cultivation, open and disturbed ground. The significance of this find clearly depends upon how long after the start of the early Neolithic this activity commenced.

9. RECOMMENDATIONS

Assessment of the pollen and macrofossil remains has demonstrated that the deposits from 79-85 Monier Road contain a sufficient concentration and preservation of remains for full analysis, and to fully address aims 2 & 3 of the project as outlined in the geoarchaeological WSI (Young & Batchelor, 2016) and section 2.3 above. Indeed, the results have provided strong evidence of anthropogenic activity throughout the upper part of the peat, organic-rich and tufa sediments, which were laid down sometime after 6180-5920 cal BP, but prior to and until after 1290-1080 cal BP (early Neolithic to Medieval period).

In order to fully address aims 2 & 3, it is therefore recommended that a targeted program of additional radiocarbon dating, pollen, plant macrofossil analysis and waterlogged wood identification is undertaken. The results of this should be integrated with forthcoming results from Fish Island, Neptune Wharf (Batchelor et al., 2016), Omega Works Phase III (Spurr, 2005, 2006) and recently instigated work at 35 Monier Road (Watson, pers. comm.) in order to produce a short publication, thus contributing to aim 4 of the WSI (Young & Batchelor, 2016).

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11. APPENDIX 1: OASIS

Project details

Project name	79-85 Monier Road, London Borough of Tower Hamlets
Short description of the project	A program of geoarchaeological boreholes, deposit modelling and laboratory-based assessment was carried out at the site. The results revealed a sequence of River Terrace Gravels overlain by peat, organic-rich and tufa sediments then alluvium and made ground. The peat, organic-rich and tufa sediments were radiocarbon dated from the early Neolithic to Medieval period. An assessment of the pollen, diatom and macrofossil content indicated a freshwater environment supporting the growth of sedge fen and reed swamp communities with little floodplain woodland. The neighboring dryland was dominated by mixed deciduous woodland. A strong anthropogenic signal was recorded in the form of cereal pollen grains and indicators of disturbed / open ground. Further work was recommended.
Project dates	Start: 01-05-2016 End: 15-06-2016
Previous/future work	Yes / Yes
Any associated project reference codes	MOI16 - Sitecode
Type of project	Environmental assessment
Monument type	PEAT Late Prehistoric
Significant Finds	PEAT Late Prehistoric

Project location

Country	England
Site location	GREATER LONDON TOWER HAMLETS BOW 79-85 Monier Road
Study area	2500 Square metres
Site coordinates	TQ 3716 8416 51.539155640488 -0.022018832166 51 32 20 N 000 01 19 W Point

Project creators

Name of Organisation	Quaternary Scientific (QUEST)
Project brief originator	Consultant
Project design originator	Dr C.R. Batchelor
Project director/manager	C.R. Batchelor
Project supervisor	C.R. Batchelor
Type of sponsor/funding body	Developer

Project archives

Physical Archive Exists?	No

Digital Archive Exists?	No
Paper Archive recipient	LAARC
Paper Contents	"Environmental"
Paper Media available	"Report"

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	79-85 Monier Road, London Borough of Tower Hamlets: Geoarchaeological Deposit Model Report
Author(s)/Editor(s)	Batchelor, C.R.
Author(s)/Editor(s)	Young, D.S.
Other bibliographic details	Quaternary Scientific (QUEST) Unpublished Report April 2016; Project Number 032/16
Date	2016
Issuer or publisher	Quaternary Scientific
Place of issue or publication	University of Reading

Project bibliography 2

Publication type	Grey literature (unpublished document/manuscript)
Title	79-85 Monier Road, London Borough of Tower Hamlets: Written Scheme of Investigation
Author(s)/Editor(s)	Young, D.S.
Author(s)/Editor(s)	Batchelor, C.R.
Other bibliographic details	Quaternary Scientific (QUEST) Unpublished Report April 2016; Project Number 032/16.
Date	2016
Issuer or publisher	Quaternary Scientific
Place of issue or publication	University of Reading

Project bibliography 3

Publication type	Grey literature (unpublished document/manuscript)
Title	79-85 Monier Road, London Borough of Tower Hamlets: Geoarchaeological and Palaeoenvironmental Assessment Report
Author(s)/Editor(s)	Batchelor, C.R.
Author(s)/Editor(s)	Green, C.P.

Author(s)/Editor(s)	Young, D.S.
Other bibliographic details	Quaternary Scientific (QUEST) Unpublished Report June 2016; Project Number 032/16.
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