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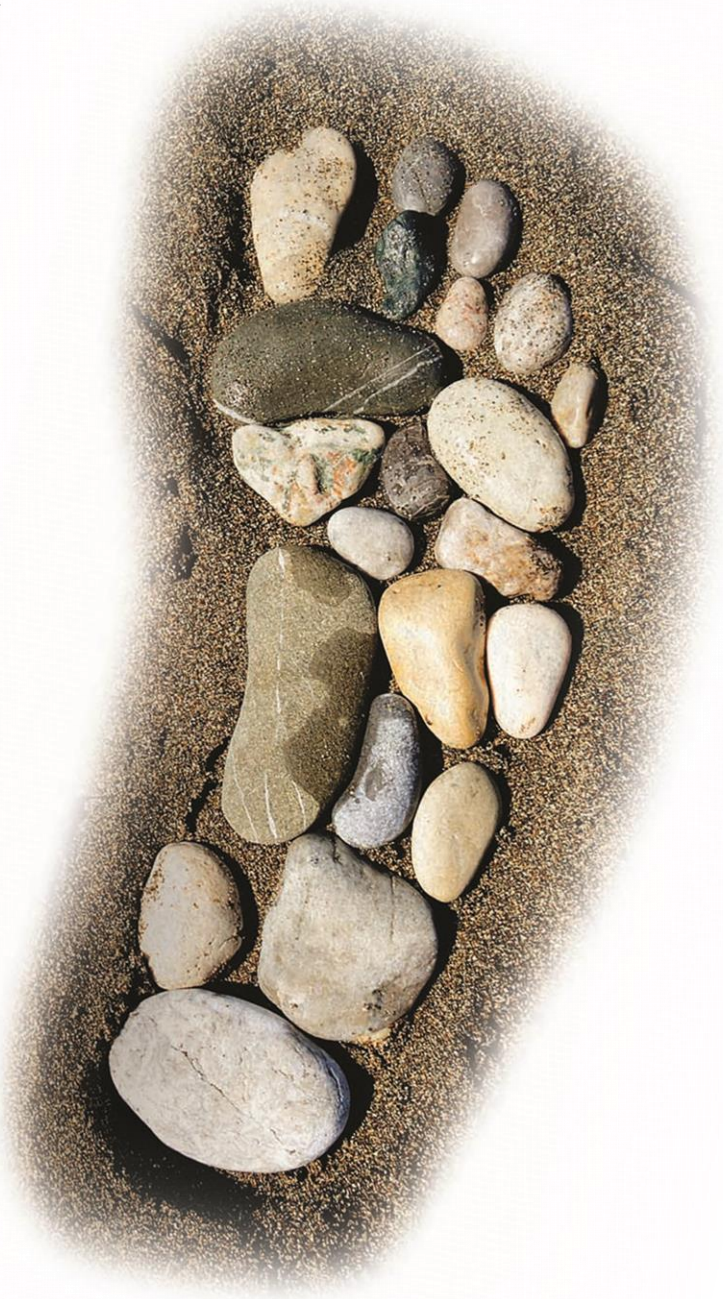
LEE PARK DISTRIBUTION CENTRE, ENFIELD

Geoarchaeological Fieldwork and Deposit Modelling Report



NGR: TQ 3673 9625

Site Code: LEP16

Date: 22nd March 2016

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1. NON-TECHNICAL SUMMARY

A program of geoarchaeological fieldwork and deposit modelling was carried out by Quaternary Scientific (University of Reading) in connection with the proposed development of land at Lee Park Distribution Centre, London Borough of Enfield. 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 address these aims, four geoarchaeological boreholes were put down across the site. The resultant records were combined with over 50 geoarchaeological and geotechnical borehole/test pit logs for the wider area, which were inspected and evaluated, together with existing geotechnical records for the site itself. 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.

The results of the deposit modelling demonstrate a sequence of River Terrace Gravels (the Lea Valley Gravel), overlain by Holocene alluvial floodplain deposits and Made Ground. No peat or organic horizons were recorded within the Holocene alluvium, which was predominantly silty and sandy in its lower part (the Lower Alluvium) and clay-rich in its upper part (the Upper Alluvium). Due to the absence of any peat or organic horizons, the palaeoenvironmental potential of the site is considered to be low, and no further geoarchaeological investigations are recommended. The site has however contributed to our understanding of the archaeological and palaeoenvironmental potential of this area of the Lower Lea Valley.

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 Lee Park Distribution Centre, London Borough of Enfield (NGR centred on: TQ 3673 9625; site code: LEP16; 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, immediately to the west of the River Lee Navigation channel, King George V Reservoir and *ca.* 500m to the west of the present course of the River Lea (Figure 1). The mouth of the River Lea (known as Bow Creek), at its confluence with the Thames, lies *ca.* 10km to the south. The British Geological Survey (1:50,000 Sheet 257 Romford 1996) shows the site underlain by Alluvium, described as comprising mainly sand, silt and clay with some gravel, resting on London Clay bedrock. In fact, the Holocene alluvium of the Lower Thames and its tributaries is 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).

The site lies within the area that has been investigated in the Lea Valley Mapping Project (Corcoran *et al.*, 2011). In this project the Lea Valley has been divided into Landscape Zones characterised by their Holocene landscape history based largely on sedimentary evidence derived from borehole records. The Lee Park Distribution Centre site lies within Landscape Zones 5.5 and 5.6. In Zone 5.5 Corcoran et al. (2011) suggest that the Lea Valley Gravel surface lies at *ca.* 11-12m OD. However, Corcoran et al. (2011) highlight that 'there are virtually no borehole data or archaeological interventions within this zone', and 'there are no borehole data to reconstruct the depositional sequences that exist above the gravels'. They also highlight that 'the construction of the (King George V) reservoir has truncated the natural deposits below the level of the Pleistocene gravels, removing almost all of the deposits of archaeological or palaeoenvironmental significance. However, a thin slice of land exists on the western periphery of the zone... (where) alluvial deposits may survive that may contain palaeoenvironmental or archaeological evidence'.

Landscape Zone 5.6 is described by Corcoran *et al.* (2011) as defined by the Leyton Gravel terrace, mapped by the BGS as Kempton Park Gravel. The gravels are described as occurring at *ca.* 17-13m OD. In this area, the gravels are 'overlain by silty clays and clays up to 1m in thickness... likely to be the results of overbank flooding of prehistoric to modern date'. Significantly the eastern edge of this zone, bordering the King George V reservoir, has 'produced Mesolithic channel deposits with good palaeoenvironmental and landscape reconstruction potential'.

No geotechnical borehole records are currently available for the site; however, a series of geotechnical test pits have been put down at the site by Capita (2016). Recorded to depths of between 2 and 3.2m below ground level (bgl), these test pits recorded a sequence of alluvium, generally described as silty clay and in places 'organic' or containing plant remains, between *ca.* 14.7 and 17.5m OD, overlain by Made Ground to a level of *ca.* 18-18.5m OD. Geoarchaeological investigations at the Enfield Distribution Park site, immediately to the south (Young, 2014) revealed a sequence of Lea Valley Gravel, overlain by variable thicknesses of Holocene Alluvium (in places containing Peat), in turn overlain by Made Ground. The deposit models generated for this site suggest that the majority of the site lies within Corcoran *et al.*'s Zone 5.5, the Gravel surface lying at between *ca.* 10.5 and 12.5m OD. Peat was recorded in selected boreholes either directly overlying the Gravel (BH101, WS103 and QBH2) or the Lower Alluvium (QBH1, WS03, WS18B, WS403 and WS417). The Peat here was generally between 0.07 and 0.41m thick and present at elevations between *ca.* 10.68 and 12.91m OD; given its stratigraphic position in the sequence it was hypothesised (Young, 2014) that the peat here is of a similar age to that recorded at Millmarsh Lane (Mesolithic; Bowsher, 1994). At this site (Bowsher, 1994) *ca.* 1km to the north and upstream of the River Lea, the Lea Valley Gravel surface was recorded at *ca.* 12.75m OD and was overlain by a sequence of Holocene Alluvium, including Peat or highly organic horizons. An organic horizon at 12.9m OD was recorded within a north-south aligned palaeochannel at the site, and was subsequently radiocarbon dated to 8120 to 7790 cal BP (6170–5840 cal BC; Mesolithic).

2.2 Palaeoenvironmental and archaeological significance

The existing records for this area thus indicate significant thicknesses of alluvial deposits may survive at the site, with the associated uncertainty as to the type, thickness and age of these Holocene deposits and the underlying Lea Valley Gravel. Such variations are significant as they represent different environmental conditions that would have existed in a given location. For example: (1) the varying surface of the Lea Valley Gravel may represent the location of former channels and bars; (2) the presence of peat represents former terrestrial or semi-terrestrial land-surfaces, and (3) the Lower and Upper Alluvium represent periods of inundation/flooding by estuarine or fluvial waters. Thus by studying the sub-surface stratigraphy across the site in greater detail, it will be possible to build an understanding of the former landscapes and environmental changes that took place across space and time.

Organic-rich sediments (in particular Peat) also have high potential to provide a detailed reconstruction of past environments on both the wetland and dryland from the Mesolithic to Late Bronze Age periods. In particular, there is the potential to increase knowledge and understanding of the interactions between relative sea level, human activity, vegetation succession and climate in this area of the Lower Lea Valley. Significant vegetation changes include the Mesolithic/Neolithic decline of elm woodland, the Neolithic colonisation and decline of yew woodland; the Late Neolithic/Early Bronze Age growth of elm on Peat, and the general decline of wetland and dryland woodland during the Bronze Age. Such investigations are carried out through the assessment/analysis of palaeoecological remains (e.g. pollen, plant macrofossils & insects) and radiocarbon dating.

Finally, areas of high gravel topography, soils and peat represent potential areas that might have been utilised or even occupied by prehistoric people, evidence of which may be preserved in the archaeological (e.g. features and structure) and palaeoenvironmental record (e.g. changes in vegetation composition).

2.3 Aims and objectives

Further borehole records are required to enhance our understanding of the sub-surface stratigraphy of the Lee Park Distribution Centre site, and for any further assessment/analysis of the deposits (if necessary). Five significant research aims were thus proposed within the geoarchaeological Written Scheme of Investigation (WSI; Young, 2016) for the site, as follows:

1. To clarify the nature of the sub-surface stratigraphy across the site;
2. To clarify the nature, depth, extent and date of any alluvium and organic/peat deposits;
3. To investigate whether the sequences contain any artefact or ecofact evidence for prehistoric or historic human activity;
4. To investigate whether the sequences contain any evidence for natural and/or anthropogenic changes to the landscape (wetland and dryland), including those related to sea level change;
5. To integrate the new geoarchaeological record with other recent work in the local area for publication in an academic journal.

The content of this report achieves the first two of these aims and considers the potential of addressing aims 3 to 5 through laboratory-based assessment and analysis. The following objectives were carried out in order to address aims 1 & 2:

1. To retrieve four geoarchaeological borehole sequences (QBH1 to QBH4) at selected locations across the site (see Figure 2);
2. To use the stratigraphic data from the new geoarchaeological boreholes and the existing geotechnical data to produce a deposit model of the elevation and thickness of the main stratigraphic units at the site.

Figure 1: Location of Lee Park Distribution Centre site with data from the GLHER (CgMs, 2016).

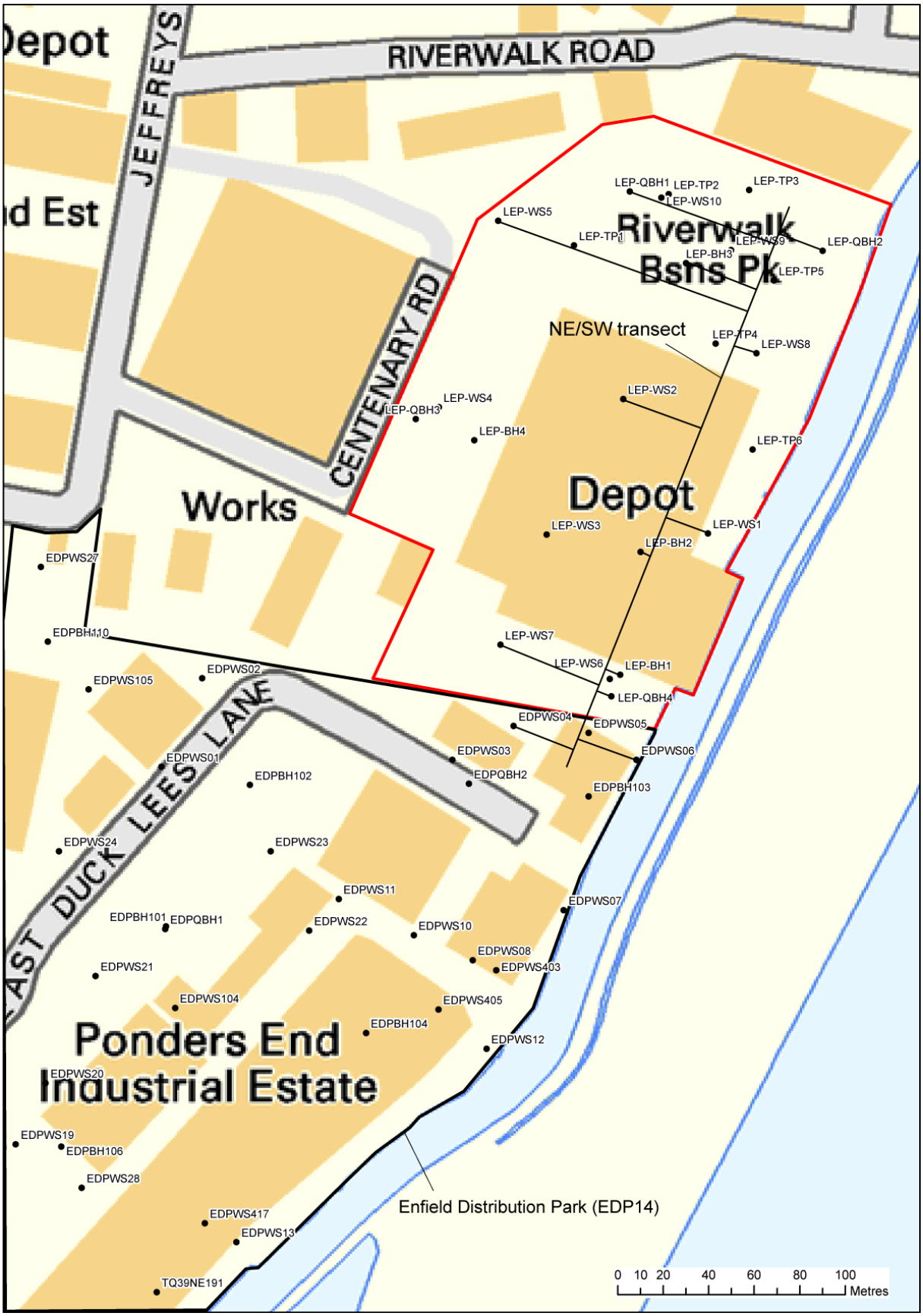

Figure 2: Location of the geoarchaeological boreholes and geotechnical boreholes/test pits at the Lee Park Distribution Centre site (modelled area incorporates data from the Enfield Distribution Park site (Young, 2014).

3. METHODS

3.1 Field investigations and lithostratigraphic descriptions

Four geoarchaeological boreholes (boreholes LEP-QBH1 to LEP-QBH4) were put down at the site in February 2016 (Figure 2) by Quaternary Scientific. Due to an obstruction within the Made Ground at the location of borehole LEP-QBH1, this borehole was abandoned after three attempts did not proceed beyond 2.3m below ground level (bgl). 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 is 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 Deposit modelling

The deposit model was based on a review of 58 borehole and test-pit records, incorporating those from both Lee Park Distribution Centre and selected geoarchaeological and geotechnical boreholes from the Enfield Distribution Park site (Young, 2014; see Table 1 and Figure 2).

Sedimentary units from the boreholes were classified into five groupings: (1) Gravel, (2) Lower Alluvium; (3) Peat; (4) Upper Alluvium and (5) Made Ground. The classified data for groups 1-5 were then input into a database with the RockWorks geological utilities software. Models of surface height were generated for the Gravel, Peat and Upper Alluvium (Figures 5, 6 & 8). Thickness of the, Peat, Total Alluvium (incorporating the Lower Alluvium, Peat and Upper Alluvium) and Made Ground (Figures 7, 9 and 10) was also modelled (also using a nearest neighbour routine). 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. Of the records used in the deposit model, the cores from the boreholes put down by Quaternary Scientific (LEP-QBH1 to LEP-QBH4) represent the most detailed record of the sediment sequences at the present site.

Table 1: Borehole and selected test pit attributes for those records used in the deposit model, Lee Park Distribution Centre, London Borough of Enfield

Name	Easting	Northing	Elevation (m OD)
Geoarchaeological boreholes			
LEP-QBH1	536728	196384	18.50
LEP-QBH2	536813	196358	18.60
LEP-QBH3	536634	196284	18.10
LEP-QBH4	536720	196162	18.20
Geotechnical boreholes/test pits (Capita, 2015)			
LEP-BH1	536723.8	196171.4	18.25
LEP-BH2	536732.8	196225.5	18.30
LEP-BH3	536752.7	196352.6	18.60
LEP-BH4	536659.6	196274.7	18.40
LEP-TP1	536703.6	196360.3	18.37
LEP-TP2	536745.2	196382.8	18.50
LEP-TP3	536780.5	196384.7	18.55
LEP-TP4	536765.9	196317.1	18.60
LEP-TP5	536791.4	196344.9	18.55
LEP-TP6	536782	196270.6	18.25
Geotechnical boreholes (JNP Group, 2013)			
LEP-WS1	536762.5	196233.6	18.20
LEP-WS2	536725.1	196292.7	18.20
LEP-WS3	536691.6	196233.2	18.30
LEP-WS4	536644	196289.2	18.20
LEP-WS5	536670.2	196371.2	18.30
LEP-WS6	536719.4	196169.6	18.20
LEP-WS7	536671.1	196184.7	17.50
LEP-WS8	536783.8	196312.9	18.50
LEP-WS9	536772.7	196358.3	18.60
LEP-WS10	536742	196381.4	18.50
Geoarchaeological and geotechnical data from Enfield Distribution Park (Young, 2014)			
EDPQBH1	536523.7	196059.8	14.64
EDPQBH2	536657.3	196123.6	15.35
EDPWS01	536522	196131	14.89
EDPWS02	536540	196170	15.36
EDPWS03	536650	196134	15.51
EDPWS04	536677	196149	15.49
EDPWS05	536710	196146	15.58
EDPWS06	536731	196134	15.41
EDPWS07	536699	196068	15.63
EDPWS08	536659	196046	15.70
EDPWS10	536633	196057	15.64
EDPWS11	536600	196073	14.67
EDPWS12	536665	196007	14.66
EDPWS13	536555	195922	14.05

Name	Easting	Northing	Elevation (m OD)
EDPWS19	536458	195965	14.74
EDPWS20	536471	195992	14.40
EDPWS21	536493	196039	14.53
EDPWS22	536587	196059	14.69
EDPWS23	536570	196094	14.38
EDPWS24	536477	196094	14.77
EDPWS27	536469	196219	15.94
EDPWS28	536487	195946	14.76
EDPWS104	536528	196025	14.84
EDPWS105	536490	196165	14.87
EDPBH101	536524	196061	14.53
EDPBH102	536561	196123	14.71
EDPBH103	536710	196118	15.63
EDPBH104	536612	196014	14.91
EDPBH106	536478	195964	14.80
EDPBH110	536472	196186	15.13
EDPWS417	536541.2	195930.3	14.89
EDPWS405	536643.8	196024.4	14.86
EDPWS403	536669.3	196041.6	15.73
BGS archive boreholes (www.bgs.ac.uk/open geoscience)			
TQ39NE191	536520	195900	13.50

4. RESULTS AND INTERPRETATION OF THE LITHOSTRATIGRAPHIC DESCRIPTIONS & DEPOSIT MODELLING

The results of the geoarchaeological borehole descriptions are shown in Tables 2-4. The results of the deposit modelling are displayed in Figures 3 to 10; Figure 3 is a two-dimensional transect across the site from northeast to southwest (see Figure 2). Figures 4 to 10 are surface elevation and thickness models for each of the main stratigraphic units. The results of the deposit modelling indicate that the number and distribution of logs is insufficient to permit modelling of the complete Holocene sequence, but that the sedimentary sequence can be summarised sufficiently to achieve the aims of the present investigation.

The full sequence of sediments recorded in the boreholes within the area of the Lee Park Distribution Centre site comprises:

1. Made Ground
2. Holocene Alluvium
3. Gravel (Lea Valley Gravel)

4.1 Lea Valley Gravel

The Lea Valley Gravel was recorded in the boreholes that penetrated to the bottom of the Holocene sequence (6 of the 24 borehole/test pit records). 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 surface of the Lea Valley Gravel across the area of the site (Figure 4) displays significantly variable relief, recorded at between 12.65 (LEP-BH1) and 12.7m OD (LEP-QBH4 and LEP-BH2) in the southeastern area of the site, falling to between 10.8 and 11.6m OD in the northern area of the site (LEP-BH3 andLFP-QBH2 respectively) and to 9.1m OD (LEP-BH4) towards the west. The significant depression in the Gravel surface towards the west of the site in the area of LEP-BH4 may be indicative of a former channel or scour-hollow. Beyond the margins of the site, in the area of the Enfield Distribution Park site (Young, 2014; see Figure 4), the Gravel is generally recorded at between 11 and 12.5m OD, consistent with the Gravel surfaces recorded towards the southeast and north of the present site.

4.2 Holocene Alluvium

Alluvium was recorded in 13 of the 24 borehole/test pit records; in those boreholes where the Lea Valley Gravel is recorded, the Alluvium rests directly on its surface. In its lower part (below *ca.* 13m OD) the Alluvium is generally described as silty and variably sandy, and is consistent with the Lower Alluvium recorded elsewhere in the Lower Thames Valley and its tributaries. The sediments of the

Lower Alluvium are indicative of deposition during the Early to Mid-Holocene, at a time when several actively shifting channels were present on the valley floor, with a channel pattern that was still influenced by the relief on the surface of the underlying Shepperton Gravel. At the Enfield Distribution Park site (Young; see Figure 6 and 7) peat was identified within the Lower Alluvium, between 0.07 and 0.76m thick and was present at elevations between *ca*. 10.68 and 12.91m OD. No peat was recorded at the present site, suggesting either that semi-terrestrial conditions supporting the growth of wetland vegetation did not develop, or that such accumulation was subsequently eroded by fluvial activity.

Above *ca*. 13m OD the Alluvium is generally more clay-rich, and typical of the mineral-rich sediments that are present as the uppermost element of the Holocene sequence beneath most floodplains in southern and south-east England. It is generally considered to 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. The surface of the Upper Alluvium here is recorded at between *ca*. 13.5 and 16m OD (Figure 8), in most cases the variation in its surface reflecting different degrees of truncation by the overlying Made Ground (see below). Greater thicknesses of Alluvium are generally recorded at the site where the Lea Valley Gravel surface is lower (Figure 9); towards the north of the site between 3 and 5m is recorded, whilst to the west in borehole LEP-BH4 6.3m is recorded. In the southeastern area of the site between 2.5 and 3.0m is present.

4.5 Made Ground

Made Ground caps the Holocene alluvial sequence at the site. The thickness of the Made Ground is highly variable, with between 1.1 and 4.9m recorded (Figure 10).

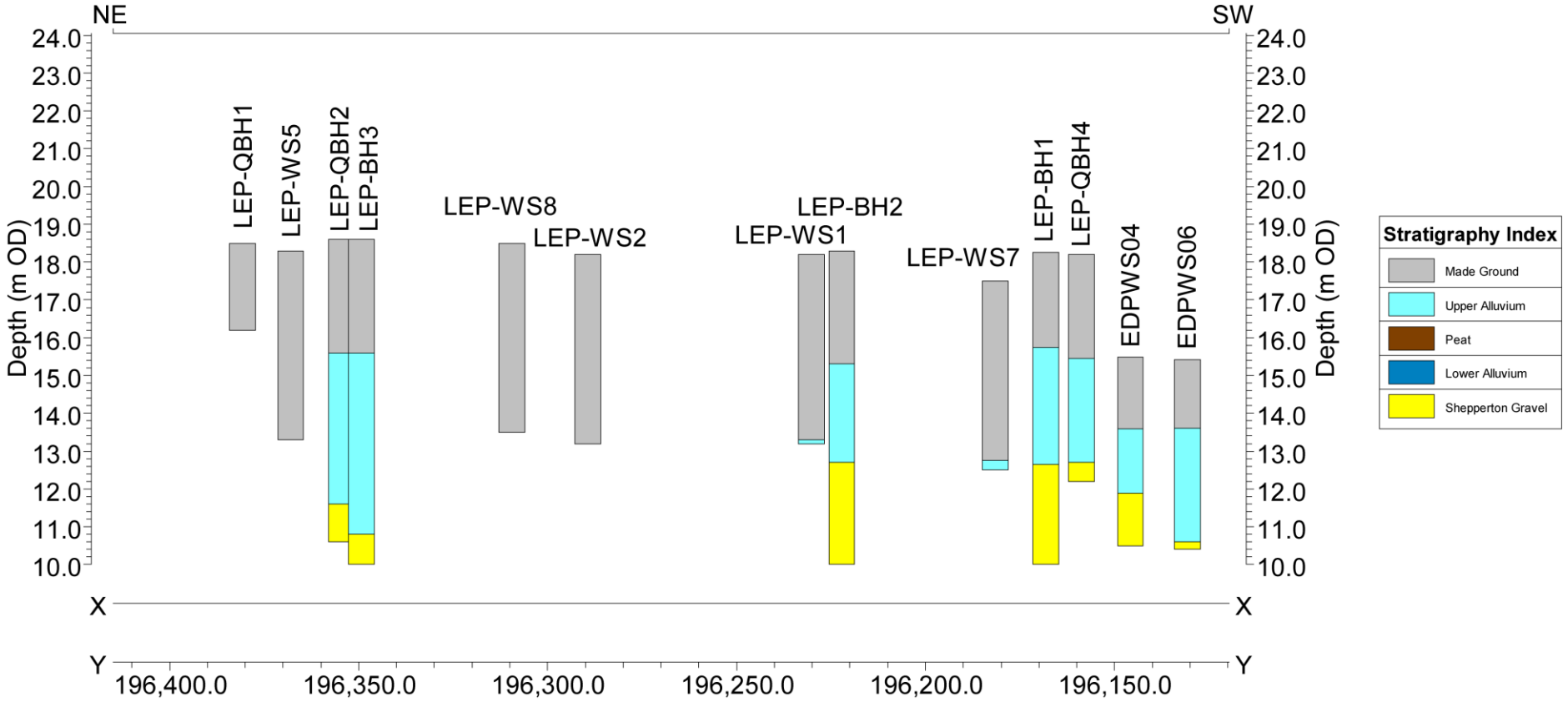

Figure 3: Northeast-southwest transect of selected boreholes across the Lee Park Distribution Centre site, London Borough of Enfield (See Figure 2).

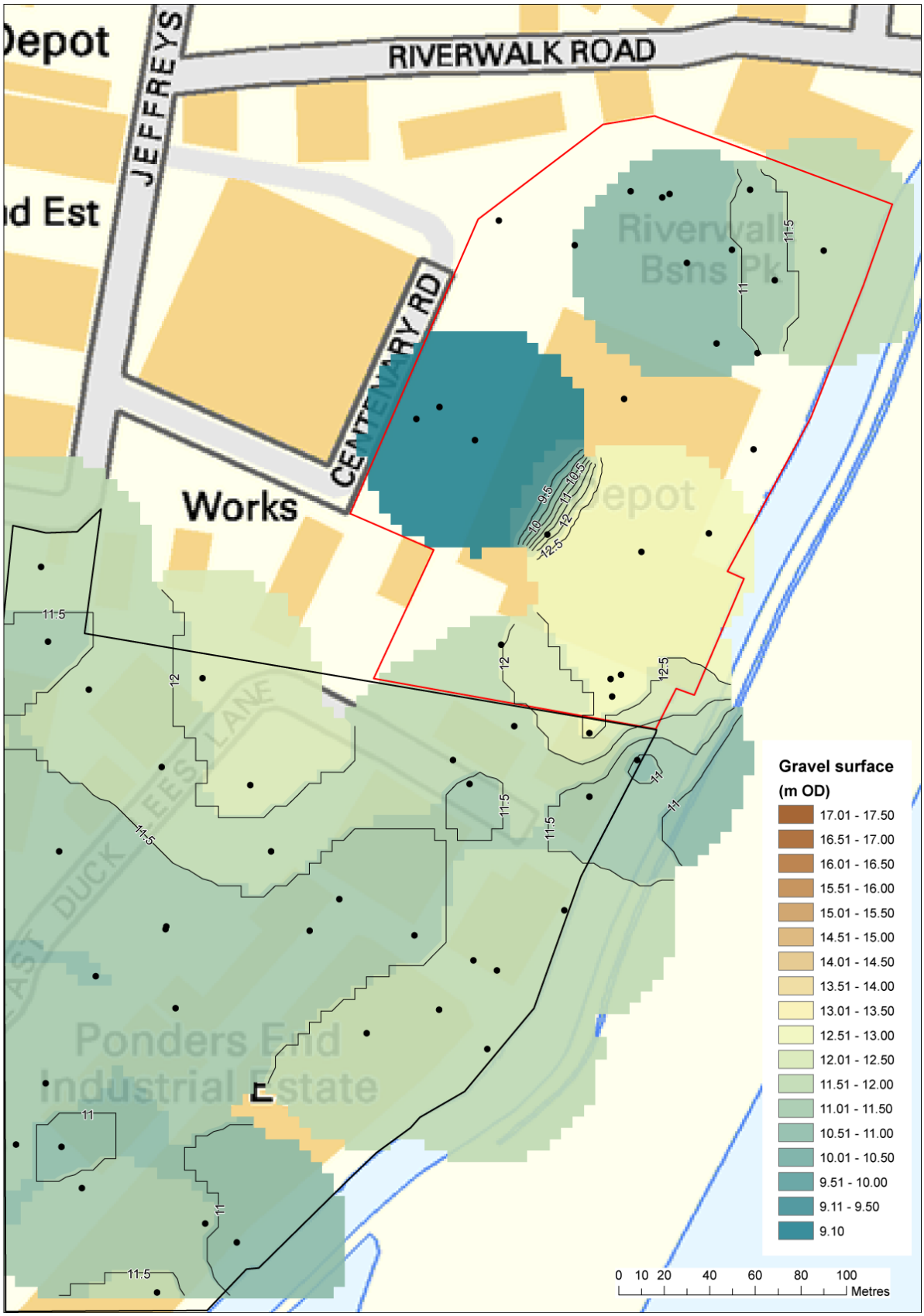

Figure 4: Top of the Lea Valley Gravel (m OD) (site outline in red)

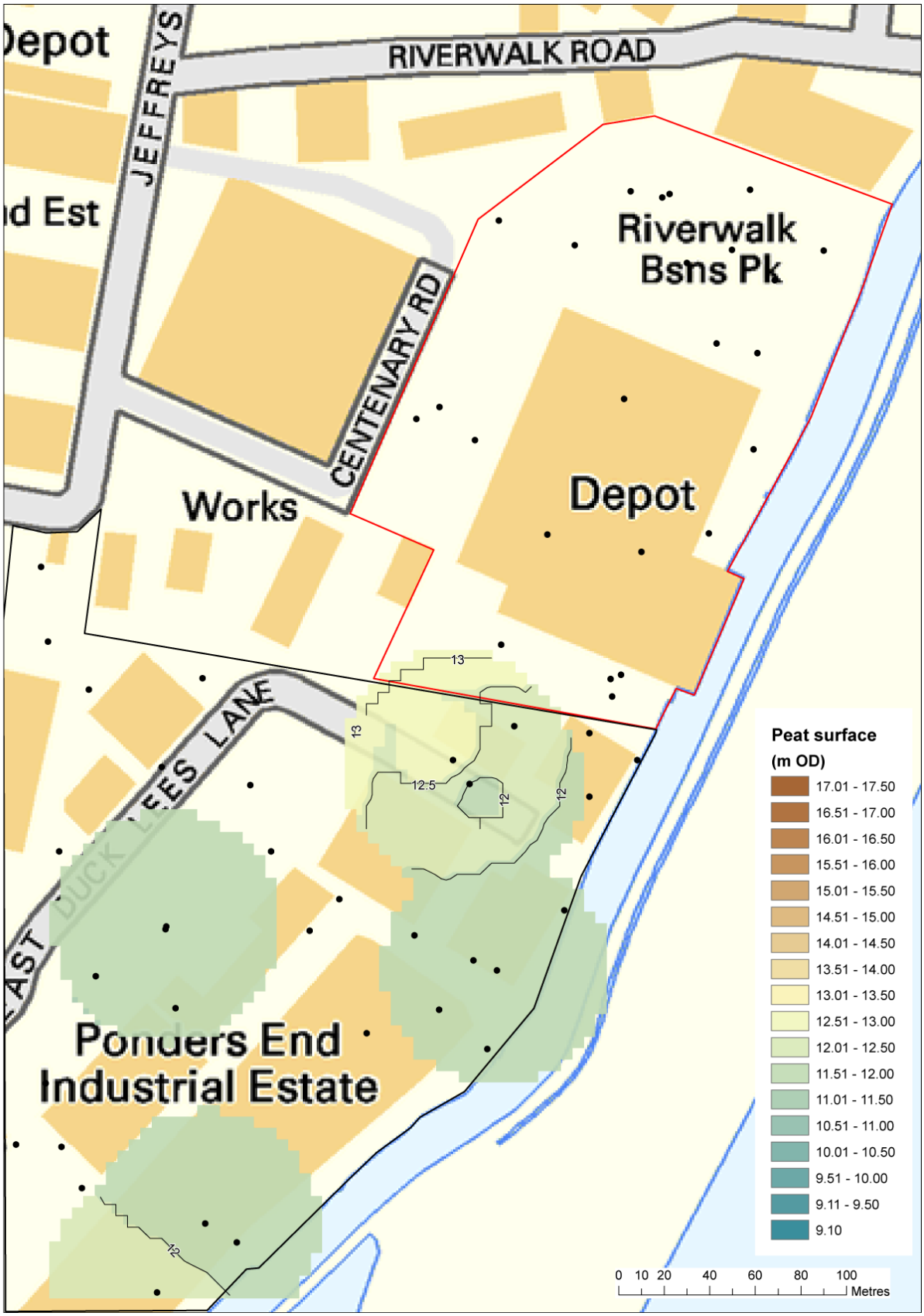

Figure 5: Top of Peat (m OD) (site outline in red)

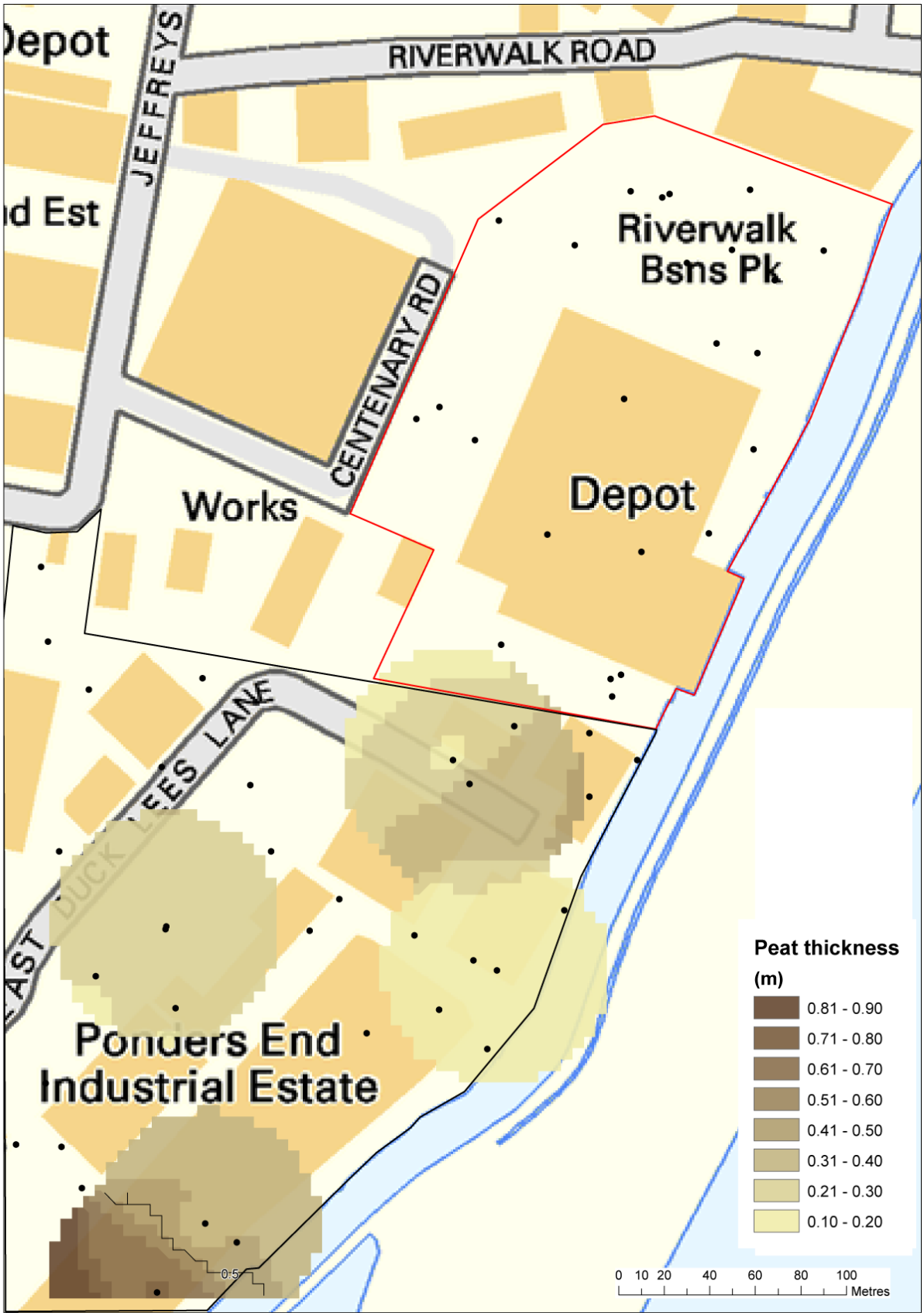

Figure 6: Thickness of Peat (m) (site outline in red)

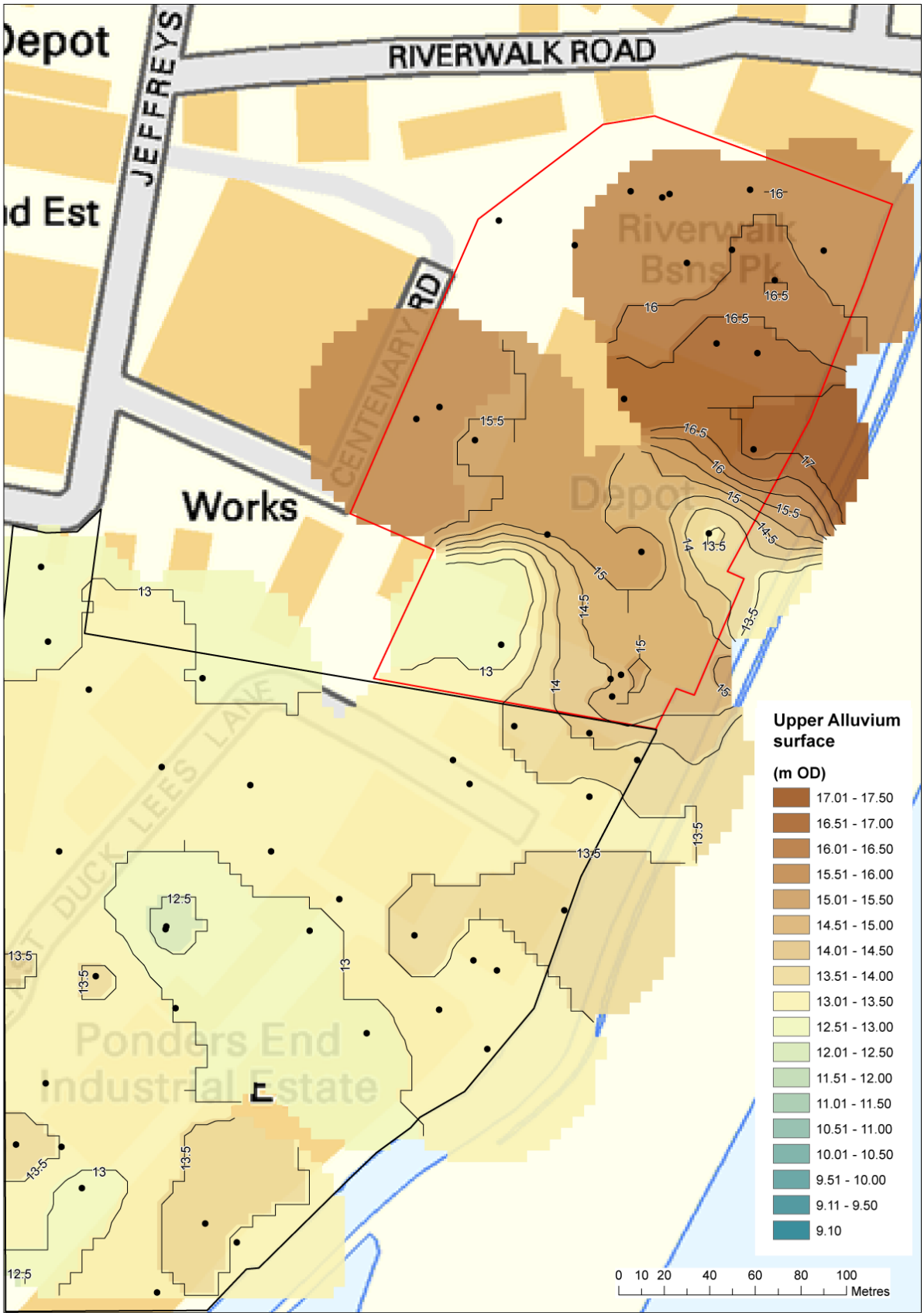

Figure 7: Top of the Upper Alluvium (m OD) (site outline in red)

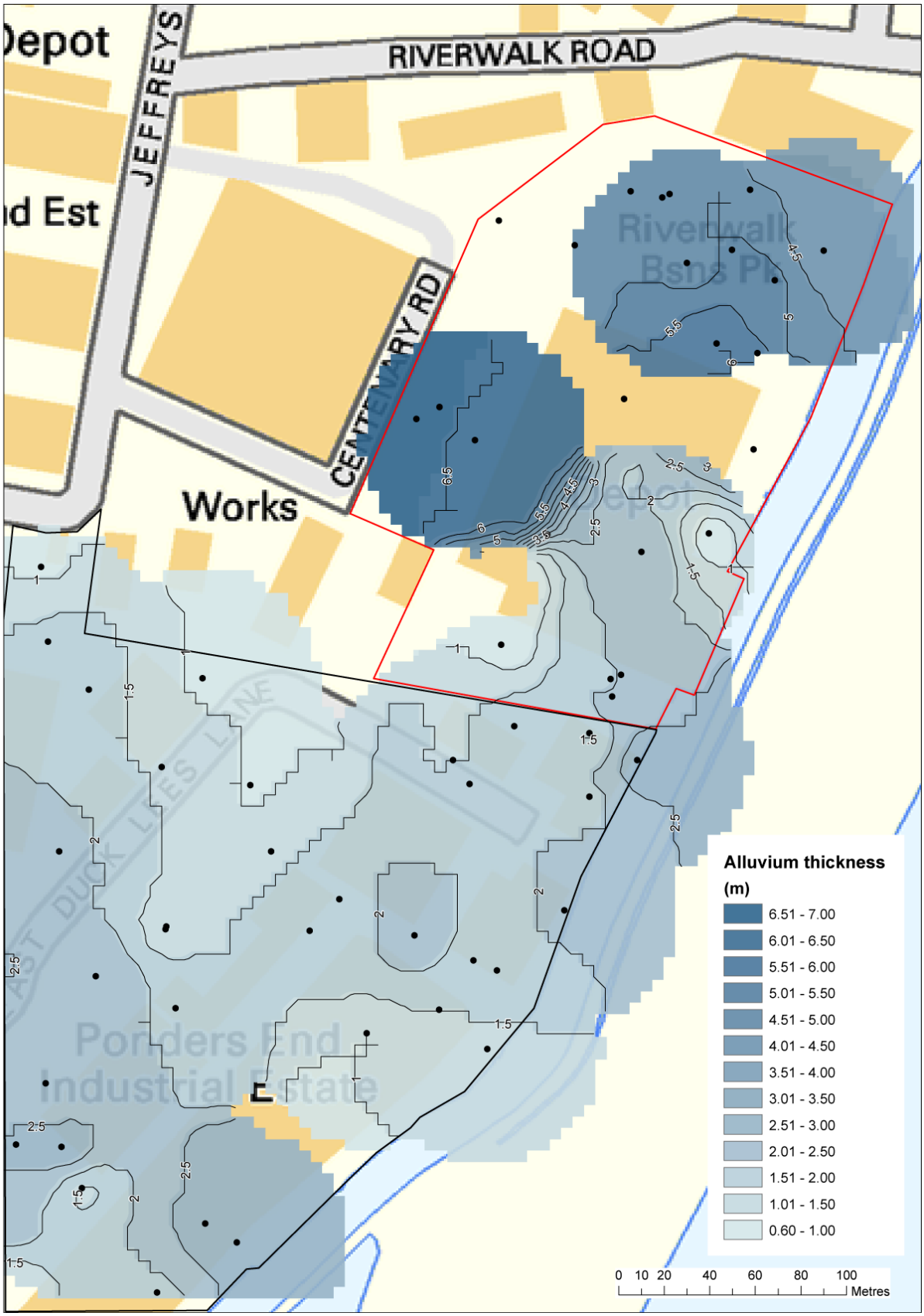

Figure 8: Thickness of Total Alluvium (m) (site outline in red)

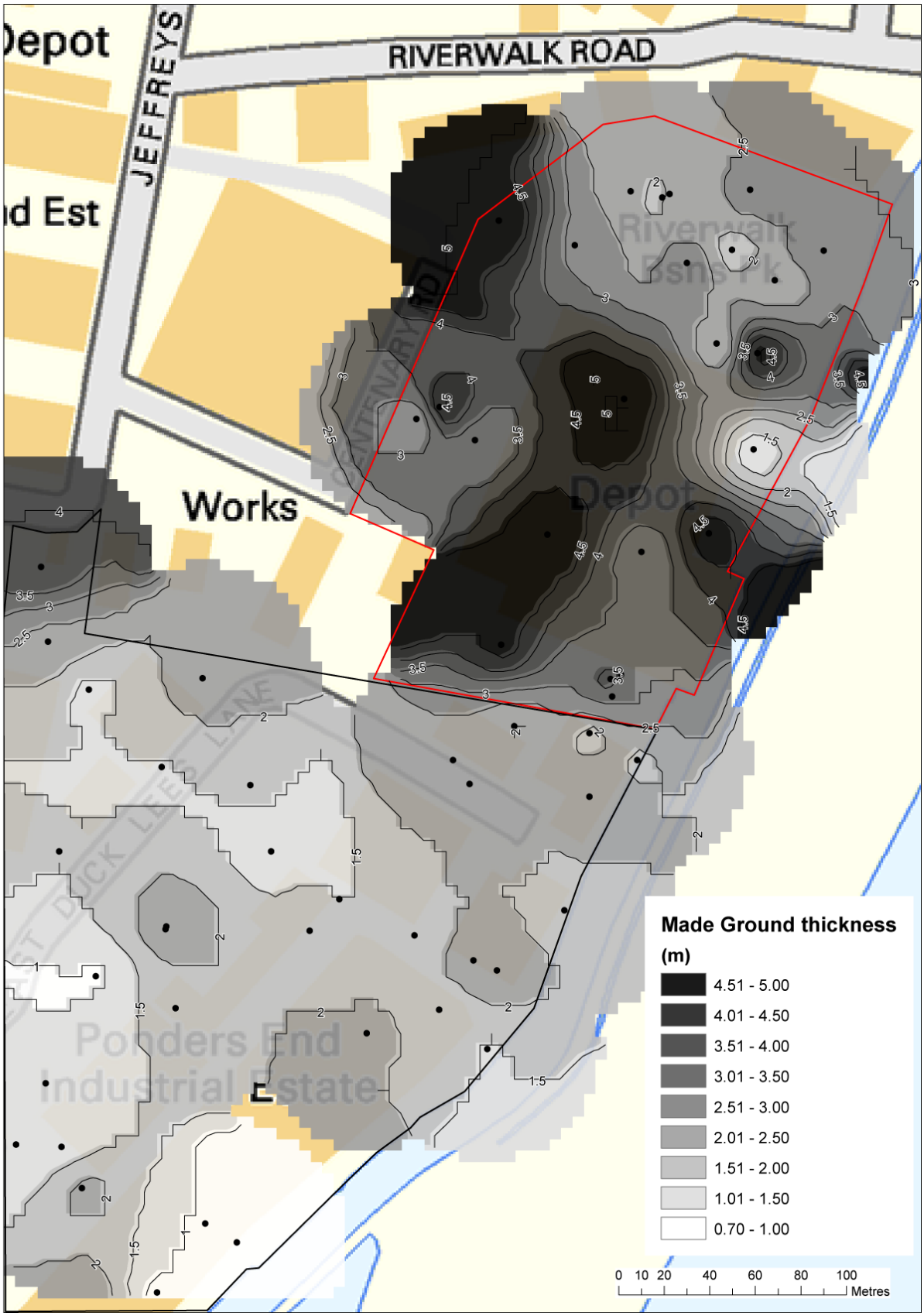

Figure 9: Thickness of Made Ground (m) (site outline in red)

Table 2: Lithostratigraphic description of borehole QBH1, Lee Park Distribution Centre

Depth (m OD)	Depth (m bgs)	Composition
18.50 to 16.20	0.00 to 2.30	Made Ground
16.20	2.30	Obstruction; borehole abandoned.

Table 3: Lithostratigraphic description of borehole QBH2, Lee Park Distribution Centre

Depth (m OD)	Depth (m bgs)	Composition
18.60 to 15.60	0.00 to 3.00	Made Ground
15.60 to 13.60	3.00 to 5.00	As2 Ag2; dark grey silt and clay with some horizontal bedding. Sharp contact in to:
13.60 to 12.60	5.00 to 6.00	As2 Ag2; olive grey silt and clay. Diffuse contact in to:
12.60 to 12.20	6.00 to 6.40	As3 Ag1 Ga+; dark grey silty clay with a trace of sand. Some horizontal bedding. Diffuse contact in to:
12.20 to 11.60	6.40 to 7.00	As2 Ag2; dark olive grey silt and sand. Contact with lower unit obscured.
11.60 to 10.60	7.00 to 8.00	Gg3 Ga1 Ag+; orangey brown sandy gravel with a trace of silt. Clasts are mainly flint, up to 30mm in diameter, well-rounded to sub-angular.

Table 4: Lithostratigraphic description of borehole QBH3, Lee Park Distribution Centre

Depth (m OD)	Depth (m bgs)	Composition
18.10 to 15.90	0.00 to 2.20	Made Ground
15.90 to 14.80	2.20 to 3.30	As2 Ag2; dark grey silt and clay with some horizontal bedding. Sharp contact in to:
14.80 to 14.10	3.30 to 4.00	As2 Ag2; olive grey silt and clay. Contact with lower unit obscured.
14.10 to 13.25	4.00 to 4.85	As3 Ag1 Ga+ Gg+; dark grey silty clay with a trace of sand and occasional gravel clasts. Some horizontal bedding. Diffuse contact in to:
13.25 to 12.60	4.85 to 5.50	As2 Ag2; dark olive grey silt and sand. Contact with lower unit obscured.
12.60 to 12.50	5.50 to 5.60	Ga3 Ag1 Gg+; greyish brown silty sand with occasional gravel clasts. Sharp contact in to:
12.50 to 11.25	5.60 to 6.85	Ag3 As1; dark olive grey clayey silt. Sharp contact in to:
11.25 to 11.10	6.85 to 7.00	Ag2 As1 Sh1; dark greyish brown organic clayey silt. Contact with lower unit obscured.
11.10 to 10.10	7.00 to 8.00	Ag2 As2; dark grey silt and clay. Contact with lower unit obscured.
10.10 to 9.10	8.00 to 9.00	Ag3 As1 Ga+; firm dark grey clayey silt with a trace of sand.

Table 5: Lithostratigraphic description of borehole QBH4, Lee Park Distribution Centre

Depth (m OD)	Depth (m bgs)	Composition
18.20 to 15.45	0.00 to 2.75	Made Ground
15.45 to 15.00	2.75 to 3.20	Disturbed Alluvium (Made Ground)
15.00 to 13.60	3.20 to 4.60	As3 Ag1 Ga+ Sh+; blue grey silty clay with traces of sand and organic matter. Diffuse contact in to:
13.60 to 13.20	4.60 to 5.00	Ag2 As2; light blueish grey silt and clay. Diffuse contact in to:
13.20 to 12.70	5.00 to 5.50	Ag2 As2 Gg+; light blueish grey silt and clay with occasional gravel clasts. Sharp contact in to:
12.70 to 12.20	5.50 to 6.00	Gg3 Ga1 Ag+; orangey brown sandy gravel with a trace of silt. Clasts are mainly flint, up to 30mm in diameter, well-rounded to sub-angular.

5. DISCUSSION AND CONCLUSIONS

The results of the deposit modelling indicate that the sediments recorded at the London Distribution Park site are similar to those recorded elsewhere in the Lower Lea Valley, with Late Devensian Lea Valley Gravel overlain by a sequence of Holocene alluvial sediments, buried beneath modern Made Ground.

Within the area of the site the principal relief feature of the Lea Valley Gravel surface is a depression in the western area of the site, where it is recorded at 9.1m OD. Towards the north of the site it rises to between 10.8 and 11.6m OD, and to the southeast to *ca*. 12.7m OD. With the exception of the depression towards the west of the site, these levels are broadly consistent with those recorded at the Enfield Distribution Park site to the south (Young, 2014), where the Gravel surface lies at between *ca*. 10.5 and 12.5m OD, and with Corcoran et al. (2011)'s Landscape Zone 5.5, where it was suggested that the Lea Valley Gravel surface lies at *ca*. 11-12m OD. The depression in the Gravel surface to the west of the site may be indicative either of a former channel or scour-hollow in the surface of the Lea-Valley Gravel; in the absence of additional borehole data for this feature it is not possible to interpret it any further.

Following the deposition of the Lea Valley Gravel, active fluvial processes dominated much of the Lower Thames and Lea Valley floodplains, resulting in the deposition of the Lower Alluvium. At the present site the Lower Alluvium is recorded to a level of *ca*. 13m OD. Significantly, no peat (such as that recorded at the Enfield Distribution Park and Millmarsh Lane (Mesolithic; Bowsher, 1994) sites) was recorded within the Lower Alluvium. Towards the east of the Millmarsh Lane site (Bowsher, 1994) *ca*. 500m to the north and upstream of the River Lea, the Lea Valley Gravel surface was recorded at *ca*. 12.75m OD and was overlain by a sequence of Holocene Alluvium, including Peat or highly organic horizons. An organic horizon at 12.9m OD was recorded within a north-south aligned palaeochannel at the site, and was subsequently radiocarbon dated to 8120 to 7790 cal BP (6170–5840 cal BC; Mesolithic). The absence of Peat at the present site suggests either that semi-terrestrial conditions supporting the growth of wetland vegetation did not develop in this area, or that such accumulation was subsequently eroded by fluvial activity.

Above *ca*. 13m OD the alluvium is predominantly clay-rich, and typical of the Upper Alluvium recorded elsewhere within the Lower Lea and Lower Thames Valleys. The deposition of this unit was most likely brought about by a regional increase in the rate of relative sea level rise (Sidell, 2003). At the present site the surface of the Upper Alluvium is recorded at between *ca*. 13.5 and 16m OD, the variation in its surface mainly reflecting different degrees of truncation by the overlying Made Ground.

6. RECOMMENDATIONS

The aims of the geoarchaeological investigations at the Lee Park Distribution Centre site were: (1) to clarify the nature of the sub-surface stratigraphy across the site, (2) to clarify the nature, depth, extent and date of any alluvium and peat deposits, and (3) to evaluate the potential for

reconstructing the environmental history of the site and its environs (aims 3 to 5 of the project). In order to achieve these aims, a programme of deposit modelling of the surface elevation and thickness of the major stratigraphic units at the site was carried out, incorporating previous geotechnical borehole descriptions and records from four new geoarchaeological boreholes.

The results of the geoarchaeological investigations have confirmed a sequence of Lea Valley Gravel, overlain by a sequence of mineral-rich Holocene Alluvium and Made Ground. In the absence of any peat or organic horizons within the alluvium at the site, the palaeoenvironmental potential of the site is considered to be low. No further environmental archaeological investigations are therefore recommended.

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