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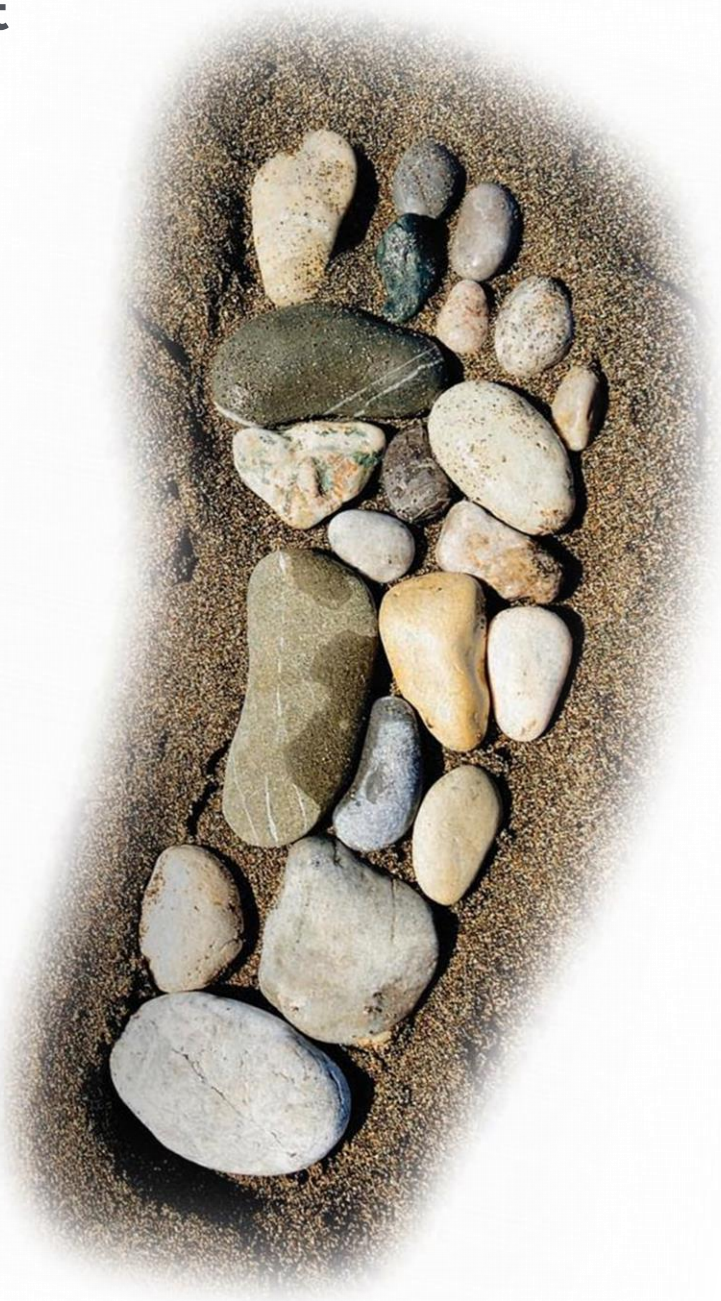
161 ILDERTON ROAD, LONDON BOROUGH OF SOUTHWARK

Geoarchaeological Deposit Model Report



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1. NON-TECHNICAL SUMMARY

A programme of geoarchaeological fieldwork and deposit modelling was carried out at the Ilderton Road site in order to (1) clarify the nature of the sub-surface stratigraphy, and (2) clarify the nature, depth, extent and possible date of any alluvium and organic/peat deposits. The results of the deposit modelling indicate that the sediments recorded at the site are similar to those recorded elsewhere in the Lower Thames Valley, and specifically within the area of Bermondsey Lake, where organic or calcareous-rich deposits of Late Devensian and Holocene age have previously been recorded.

The site lies on the margins of the lower Gravel topography that characterises Bermondsey Lake; here, the Gravel surface falls from *ca*. -1.3m OD towards the north to *ca*. -3.9m OD towards the south. In the southern area of the site the Gravel is overlain by a sequence of Late Devensian/Holocene alluvial sediments, including marl and peat; towards the north however the Made Ground directly overlies the Sand or Gravel, probably truncating the alluvial sequence. Given the potential of the sediments for reconstructing the environmental history of the site and its environs, and the uncertain nature of the chronology of the sediments, a programme of environmental archaeological assessment is recommended on the sequence from borehole IL-QBH2. In addition, the archaeological potential of the elevated Gravel surfaces in the northern area of the site is considered to be relatively high.

2. INTRODUCTION

2.1 Site context

This report summarises the findings arising out of the geoarchaeological deposit modelling undertaken by Quaternary Scientific (University of Reading) in connection with the proposed development of land at 161 Ilderton Road, Southwark (National Grid Reference: centred on 3518 7822; Figures 1 & 2). Quaternary Scientific were commissioned by RPS Planning & Development to undertake the geoarchaeological investigations. The area of investigation at 161 Ilderton Road, Southwark is located on the floodplain of the estuarine Thames, *ca.* 1.5Km to the south of the modern waterfront, and *ca.* 500m north of the higher, drier ground of the gravel terrace. The British Geological Survey (BGS) show the underlying geology here as the Cretaceous Chalk (undifferentiated), overlain by Alluvium, described as 'Clay, Silt, Sand and Peat' (http://mapapps.bgs.ac.uk/geologyofbritain). The site is a linear rectangular plot, covering approximately 0.45 hectares. The site is bounded to the west by Ilderton Road, to the south by Zampa Road and to the east by the Queens Road/South Bermondsey railway line. The site is located within the Archaeological Priority Zone of Bermondsey Lake, as defined by the London Borough of Southwark.

The site itself is projected as lying within an area of lower gravel topography known as Bermondsey Lake (Sidell *et al.*, 2002), forming part of the network of Late Devensian/Early Holocene channels and elevated gravel islands that characterises this area. The site lies to the southeast of the Bermondsey and Horsleydown eyots, areas of higher, drier ground that were the focus of human activity during the prehistoric period (see below and Cowan *et al.*, 2009). Significantly, within the area of Bermondsey Lake and immediately to the west of the present site at Bramcote Green (Thomas & Rackham, 1996) a sequence of up to 3m of organic-rich alluvial sediments accumulated during the Devensian Late Glacial, followed by a Holocene sequence of clay and peat horizons dated to the Late Mesolithic through to the Late Bronze Age. Within this sequence of clay and peat two phases of trackway construction were identified, the second of these phases dated to the Middle Bronze Age (Thomas & Rackham, 1996). Here, the underlying gravel topography was recorded at between -1.0 and -5.1m OD, the gravel falling from the western area of the site towards the north (-2.2m OD) and east (-5.1m OD) (Thomas & Rackham, 1996). Similar elevations for the gravel surface have been recorded within the Bankside Channel towards the northeast, where the gravel has been recorded as low as -4.55m OD (see Young, 2015). During recent geotechnical investigations at the present site (RPS, 2017) a total of ten boreholes were put down, revealing a gravel surface that falls from -1.31m OD in the northwest (BH1) to -3.31m OD towards the southeast (BH10). In the boreholes toward the southeastern half of the site (BH5-BH10) a sequence of Holocene alluvium is recorded overlying the gravel; in four of these the alluvium includes peat (BH5, BH7, BH9 and BH10), present in thicknesses of up to 1.1m (BH10). The alluvial sequence is overlain by Made Ground, at a level of between *ca.* -0.8 and -1.2m OD. In the context of the other topographic features recorded in this area of Southwark, the present site thus appears to extend from the margins of and in to a depression in the gravel topography that most likely represents a Late Glacial/Early Holocene channel.

This previous work in this area of Bermondsey Lake therefore suggests that there is potential at the Ilderton Road site to obtain a sequence that may incorporate sediments dating from the Mesolithic through to Late Bronze Age cultural periods. Furthermore, wooden structures dated to the Bronze Age have been identified in this area, including *ca*. 150m to the west at Bramcote Green (3995-4080 cal BP; Thomas & Rackham, 1996), whilst at the Bricklayer's Arms (Jones, 1991) two Neolithic flint axes, a wooden platform, hearths and horse bones were identified on the margins of the Bermondsey eyot and out in to the adjacent lake basin *ca*. 500m to the west (Sidell *et al*., 2002). The archaeological potential of the site is discussed in more detail in RPS (2016).

2.2 Palaeoenvironmental and archaeological significance

The sedimentary sequence at Ilderton Road therefore also has good potential to provide evidence of prehistoric and historic human activity on both the wetland and dryland surfaces adjacent to the site, which should be compared with existing evidence for this area of Bermondsey Lake. The geotechnical investigations at the site indicates important variations in the height of the gravel surface, and the type, thickness and age of the subsequent Holocene deposits within the vicinity of the site. 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 Gravel may represent the location of pre-Holocene river terraces, former channels and bars; (2) the presence of peat represents former terrestrial or semi-terrestrial land-surfaces, and (3) the various alluvial units represent periods of changing hydrological conditions. 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. In particular, they provide the potential to increase knowledge and understanding of the interactions between hydrology, human activity, vegetation succession and climate. 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 structures) and palaeoenvironmental record (e.g. changes in vegetation composition).

2.3 Aims and objectives

Further borehole records are required in order to enhance our understanding of the sub-surface stratigraphy of the Ilderton Road site, and to assess its palaeoenvironmental potential. Five

significant research aims relevant to the geoarchaeological investigations at the site are outlined here:

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.

In order to address the first two of these aims, two boreholes were put down at the site and a programme of geoarchaeological deposit modelling undertaken, incorporating existing geotechnical and geoarchaeological data from the site and the wider area.

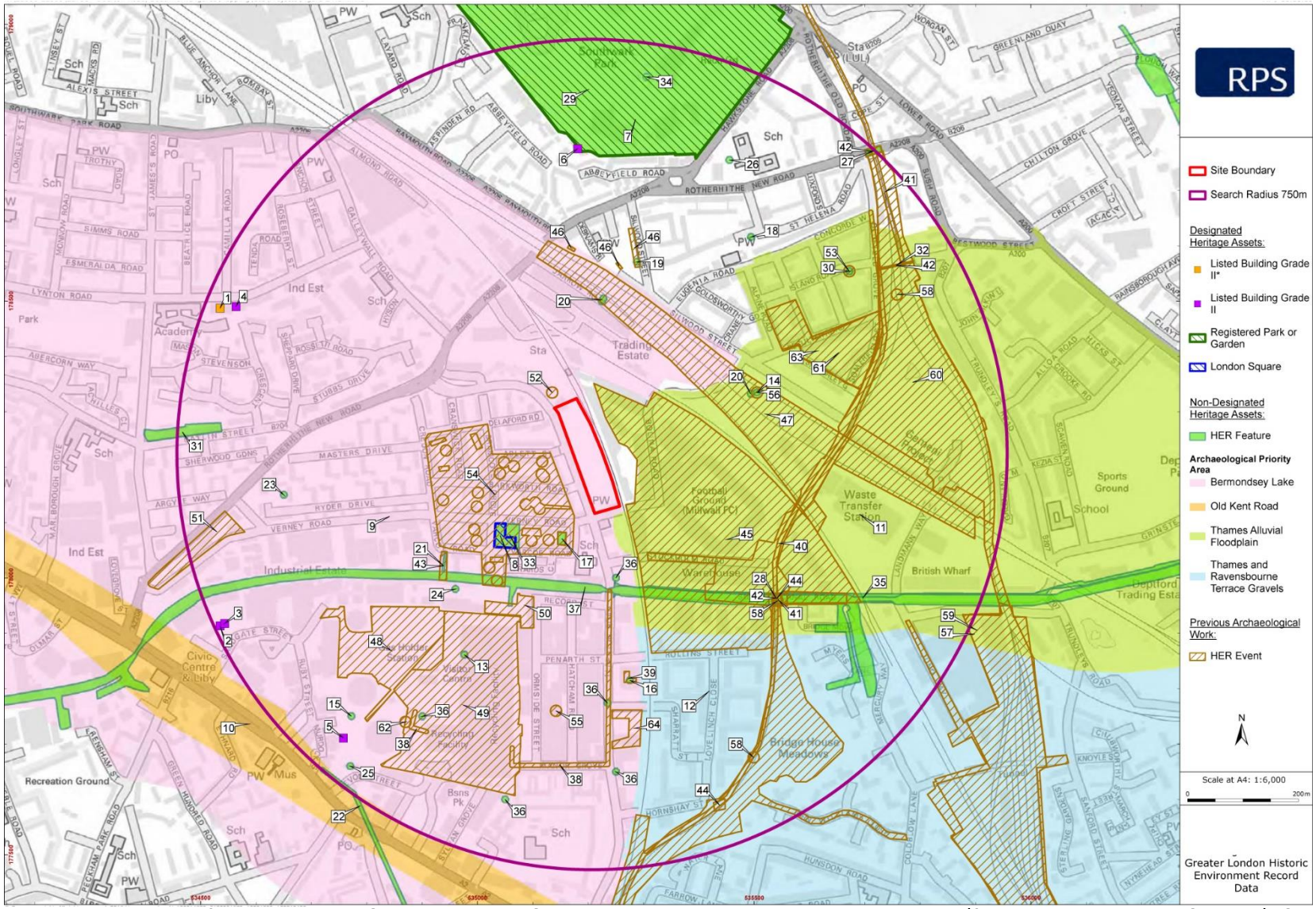

Figure 1: Location of Ilderton Road, Southwark with Greater London Historic Environment data (figure provided by RPS, 2016). Site details shown in Appendix 1.

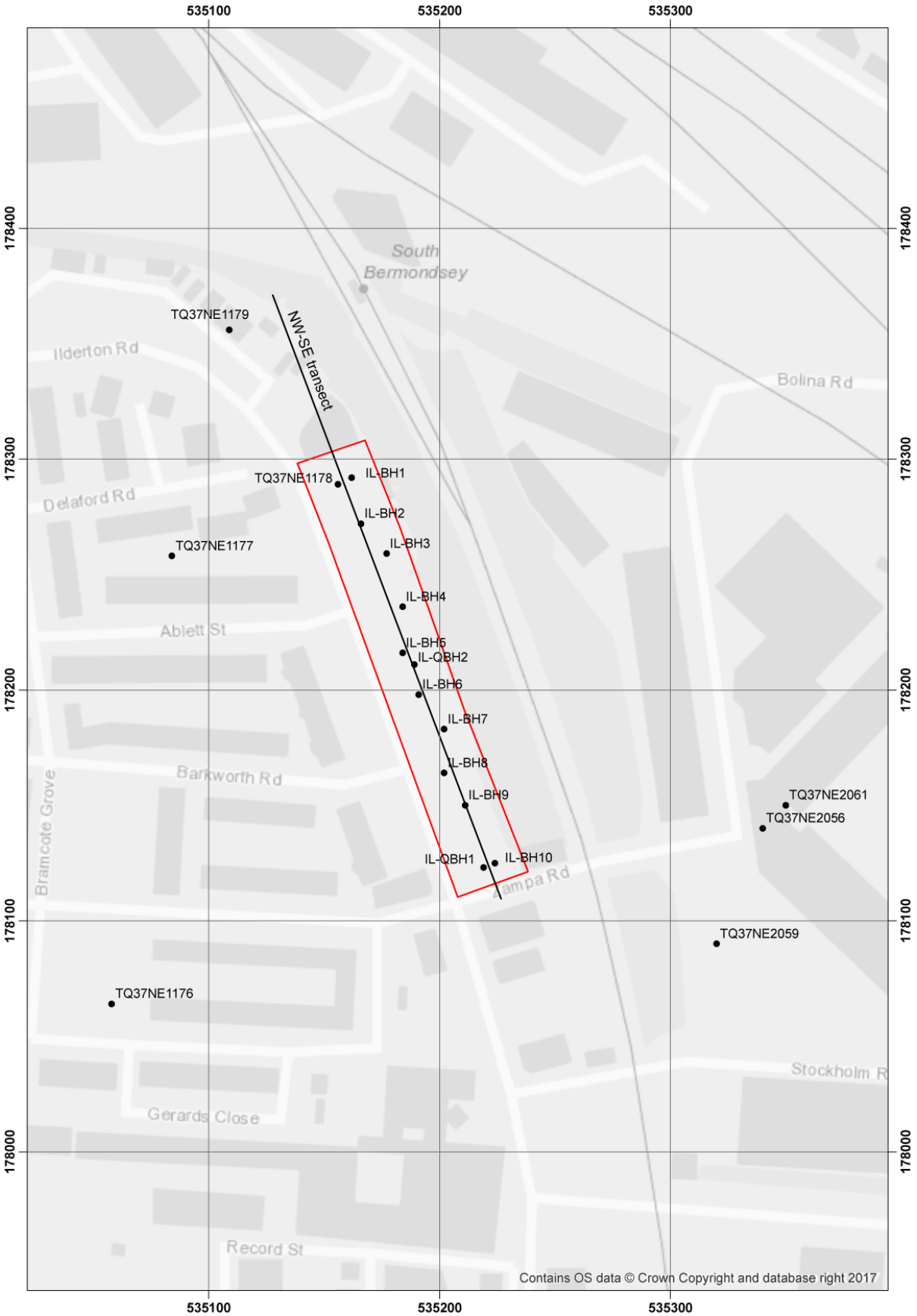

Figure 2: Location of the new geoarchaeological boreholes (IL-QBH1 and IL-QBH2) at 161 Ilderton Road, Southwark, and existing geotechnical/geoarchaeological boreholes at the site and within the wider area (see Table 1). Alignment of the northwest-southeast transect (see Figure 3) also shown.

3. METHODS

3.1 Field investigations

Two geoarchaeological borehole (boreholes IL-QBH1 and IL-QBH2) were put down at the site in October 2017 (Figure 2). 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 borehole locations were obtained using a Leica Differential GPS (see Table 1).

3.2 Lithostratigraphic descriptions

The lithostratigraphy of the core samples was described in the laboratory 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 description of the boreholes are displayed in Tables 2 and 3.

3.3 Deposit modelling

The deposit model, incorporating the present site and a limited number of available boreholes from the wider area, was based on a review of 19 geotechnical and geoarchaeological records, incorporating the two new geoarchaeological boreholes, ten geotechnical logs provided by RSK (2016) and seven BGS archive boreholes (http://mapapps.bgs.ac.uk/geologyofbritain/home.html) (see Figure 2). Sedimentary units from the boreholes were classified into five groupings: (1) Gravel, (2) Lower Alluvium/Marl Deposits. (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 16 geological utilities software. Models of surface height were generated for the Gravel (Figure 4), Lower Alluvium (Figure 5), Peat (Figure 6) and Upper Alluvium (Figure 8). Thickness of the Peat (Figure 7), combined Holocene alluvial sequence (Figure 9) and Made Ground (Figure 10) were also modelled (also using a nearest neighbour routine). A two-dimensional northwest-southeast transect is shown in Figure 3.

Although the boreholes at the present site are linearly 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 boreholes. In addition, 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. Finally, 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.

Table 1: Borehole attributes for those records used in the deposit model, 161 Ilderton Road, Southwark

Name	Easting	Northing	Elevation (m OD)
New geoarchaeological borehole			
IL-QBH1	535219.00	178123.00	1.20
IL-QBH2	535189.00	178211.00	1.20
Existing geotechnical boreholes (RSK,2016)			
IL-BH1	535156.00	178289.00	1.49
IL-BH2	535166.00	178272.00	1.38
IL-BH3	535177.00	178259.00	1.01
IL-BH4	535184.00	178236.00	1.49
IL-BH5	535184.00	178216.00	1.18
IL-BH6	535191.00	178198.00	1.32
IL-BH7	535202.00	178183.00	1.23
IL-BH8	535202.00	178164.00	1.22
IL-BH9	535211.00	178150.00	1.14
IL-BH10	535224.00	178125.00	1.19
BGS archive boreholes (http://mapapps.bgs.ac.uk/geologyofbritain/home.html)			
TQ37NE1176	535058.00	178064.00	0.91
TQ37NE2059	535320.00	178090.00	1.10
TQ37NE2056	535340.00	178140.00	0.66
TQ37NE2061	535350.00	178150.00	0.80
TQ37NE1177	535084.00	178258.00	0.91
TQ37NE1178	535162.00	178292.00	0.91
TQ37NE1179	535109.00	178356.00	0.76

4. RESULTS, INTERPRETATION & DISCUSSION OF THE LITHOSTRATIGRAPHIC DESCRIPTIONS & DEPOSIT MODELLING

The results of the lithostratigraphic description of boreholes IL-QBH1 and IL-QBH2 are shown in Tables 2 and 3, with the results of the deposit modelling displayed in Figures 3 to 10. Figure 3 is a two-dimensional northwest-southeast transect of selected boreholes across the site and wider area; 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 spread of the logs is sufficient to permit modelling with a reasonable level of certainty across the site (Figure 2).

The full sequence of sediments recorded in the boreholes comprises:

Made Ground – widely present
Upper Alluvium – widely present
Peat – present in the southern area of the site
Lower Alluvium/Marl deposits – locally present towards the south of the site
Sand – locally present; confined to areas of lower Gravel topography
Gravel (Shepperton Gravel) – widely present

4.1 Shepperton Gravel

The Shepperton 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 surface of the Gravel (see Figures 3 and 4) is recorded at Ilderton Road at between -1.31 (IL-BH1) and -3.92m OD (IL-BH5); in general the surface of the Gravel slopes downwards towards the south, although the deepest level is recorded in IL-BH5 towards the centre of the site. A higher level is recorded in IL-BH7 (-2.77m OD), although adjacent boreholes indicate a lower level more consistent with the general trend in the southern area of the site.

Beyond the margins of the site, the Gravel is recorded at similar levels in boreholes TQ37NE1176/1177 towards the west (see Figure 4); slightly deeper levels are recorded towards the southeast in boreholes TQ37NE2056/2061 (-4.24 and -4.20m OD respectively), although borehole TQ37NE2059 shows the surface of the Gravel rising to -2.6m OD just to the south. The topography of the Gravel surface in the area of the site is thus consistent with its presence on the margins of the area identified as Bermondsey Lake (see Sidell *et al.*, 2002; Thomas & Rackham, 1996), an area of lower Gravel topography forming part of the network of Late Devensian/Early Holocene channels and elevated gravel islands that characterises this area of Southwark and

Lambeth. Within the area of Bermondsey Lake and immediately to the west of the site at Bramcote Green (Thomas & Rackham, 1996) the Gravel surface was recorded at between -1.0 and -5.1m OD, the gravel falling from the western area of the site towards the north (-2.2m OD) and east (-5.1m OD) (Thomas & Rackham, 1996). Similar elevations for the gravel surface have been recorded within the Bankside Channel towards the northeast, where the gravel has been recorded as low as -4.55m OD (see Young, 2015).

4.2 Sand

A unit of sand was identified overlying the Gravel in three boreholes from the present site (IL-BH3, BH4, BH10). This unit probably forms a remnant of the sandy sediments deposited under fluvial conditions at the site, perhaps during the Early Holocene. It should be noted however that its absence elsewhere in the existing geotechnical borehole logs could be a result of the difficulty identifying sand units within the silty and sandy Lower Alluvium, due to the nature of the coring methods and different methods of description adopted by geotechnical units.

4.3 Lower Alluvium/Marl deposits

The deposits of the Lower Alluvium/Marl rest directly on the Shepperton Gravel or Sand and are only recorded over the lower Gravel topography in the southern area of the site (IL-BH5, BH9, QBH1 and QBH2) (Figure 5). For deposit modelling purposes these units are combined, since they generally lie at similar elevations, and are difficult to differentiate in the geotechnical logs.

The deposits of the Lower Alluvium are predominantly silty, tending to become increasingly coarse (sandy) downward in most sequences. The Lower Alluvium frequently contains detrital wood or plant remains, and in many cases, is described as organic and with occasional Mollusca. In both of the new geoarchaeological boreholes units of marl-rich (calcareous) sediment are recorded within the Lower Alluvium, at between -2.80 and -3.42m OD in IL-QBH1 and at 2.95 to -3.11 and -3.35 to -3.52m OD in IL-QBH2. Both the Lower Alluvium and marl are indicative of deposition during the Late Devensian/Early Holocene, as the main course of the Thames became confined to a single meandering channel. During this period, the surface of the Shepperton Gravel was progressively buried beneath the sandy and silty flood deposits of the river. The richly-organic nature of the Lower Alluvium suggests that this was a period during which the valley floor was occupied by a network of actively shifting channels, with a drainage pattern on the floodplain that was still largely determined by the relief on the surface of the underlying Shepperton Gravel. The marl-rich units are indicative of accumulation in a calcareous lake or low-energy stream, generally under still or slack-water conditions; such deposits dated to the Late Devensian period have previously been identified at Bramcote Green immediately to the west (Thomas & Rackham, 1996) in the area identified as Bermondsey Lake.

The surface of the Lower Alluvium (Figure 5) is variable, its surface generally following the topography of the underlying Gravel: within the area of the Ilderton Road site it lies at between -1.82 (IL-BH5) and -2.38m OD (IL-QBH2). Due to a void core between 3 and 4m below ground level

(bgl) in IL-QBH1 the level of the contact between the peat and Lower Alluvium is unclear, although this is present somewhere between -1.80 and -2.80m OD.

4.3 Peat

Recorded in six of the 12 boreholes and limited to the southern area of the site, and generally directly overlying the Lower Alluvium, is a unit of peat described as either herbaceous or woody and in places silty. The surface of this unit is relatively even, generally recorded at about -1m OD (Figure 6) within the area of the site. The Peat is between 1.9 (IL-BH7) and 0.7m thick (IL-BH9) (Figure 7).

Significantly, the peat is indicative of a transition towards semi-terrestrial (marshy) conditions, supporting the growth of either saltmarsh, sedge fen/reed swamp and/or woodland communities. Such semi-terrestrial conditions may have represented former land surfaces that might have been utilised by prehistoric communities. Assuming that 1m of peat represents 1000 years of peat formation (a typical figure in fen peatlands), the peat may represent up to 2000 years of accumulation in such conditions.

Within the area of Bermondsey Lake and immediately to the west of the present site at Bramcote Green (Thomas & Rackham, 1996) a sequence of up to 3m of organic-rich alluvial sediments accumulated during the Devensian Late Glacial, followed by a Holocene sequence of clay and peat horizons dated to the Late Mesolithic through to the Late Bronze Age. Within this sequence of clay and peat two phases of trackway construction were identified, the second of these phases dated to the Middle Bronze Age (Thomas & Rackham, 1996).

4.4 Upper Alluvium

The Upper Alluvium was recorded in selected sequences towards the south of the site, generally resting on the Peat (or in one sequence, the Shepperton Gravel). Towards the north this unit is not present (IL-BH1-BH4, BH6), and it appears to have been entirely truncated by the overlying Made Ground, which directly overlies the Sand or Gravel units. The deposits of the Upper Alluvium are described as predominantly silty or clayey and very occasionally organic-rich. The surface of the Alluvium (Figure 8) is relatively even where it is not truncated, generally lying at between -0.8 and -1.2 OD. 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.

The combined Holocene alluvial sequence, incorporating the Lower Alluvium, Sand, Peat and Upper Alluvium, is generally recorded in thicknesses of between *ca*. 2 and 2.5m across the southern area of the site (Figure 9). Greater thicknesses are found where the Gravel topography is lower.

4.5 Made Ground

Between *ca.* 2 and 4.5m of Made Ground caps the sequence across the site, with greater thicknesses generally recorded towards the north where it directly overlies the Sand or Shepperton Gravel (see Figures 3 and 10).

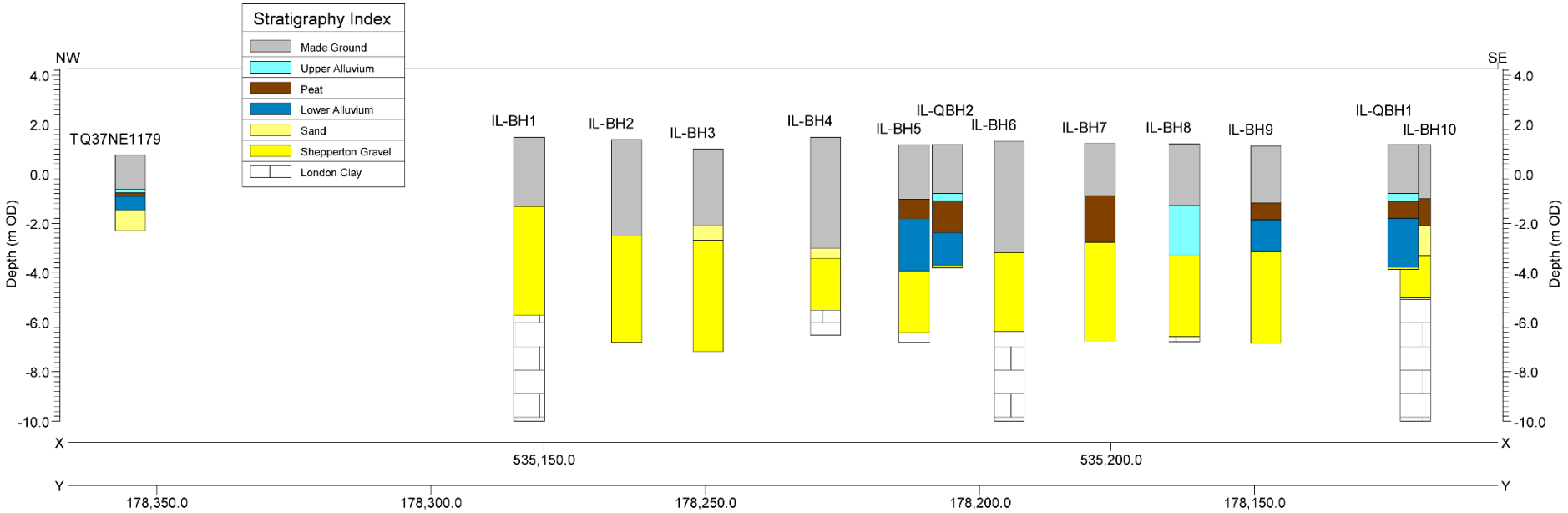

Figure 3: Northwest-southeast transect of selected boreholes across the Ilderton Road site

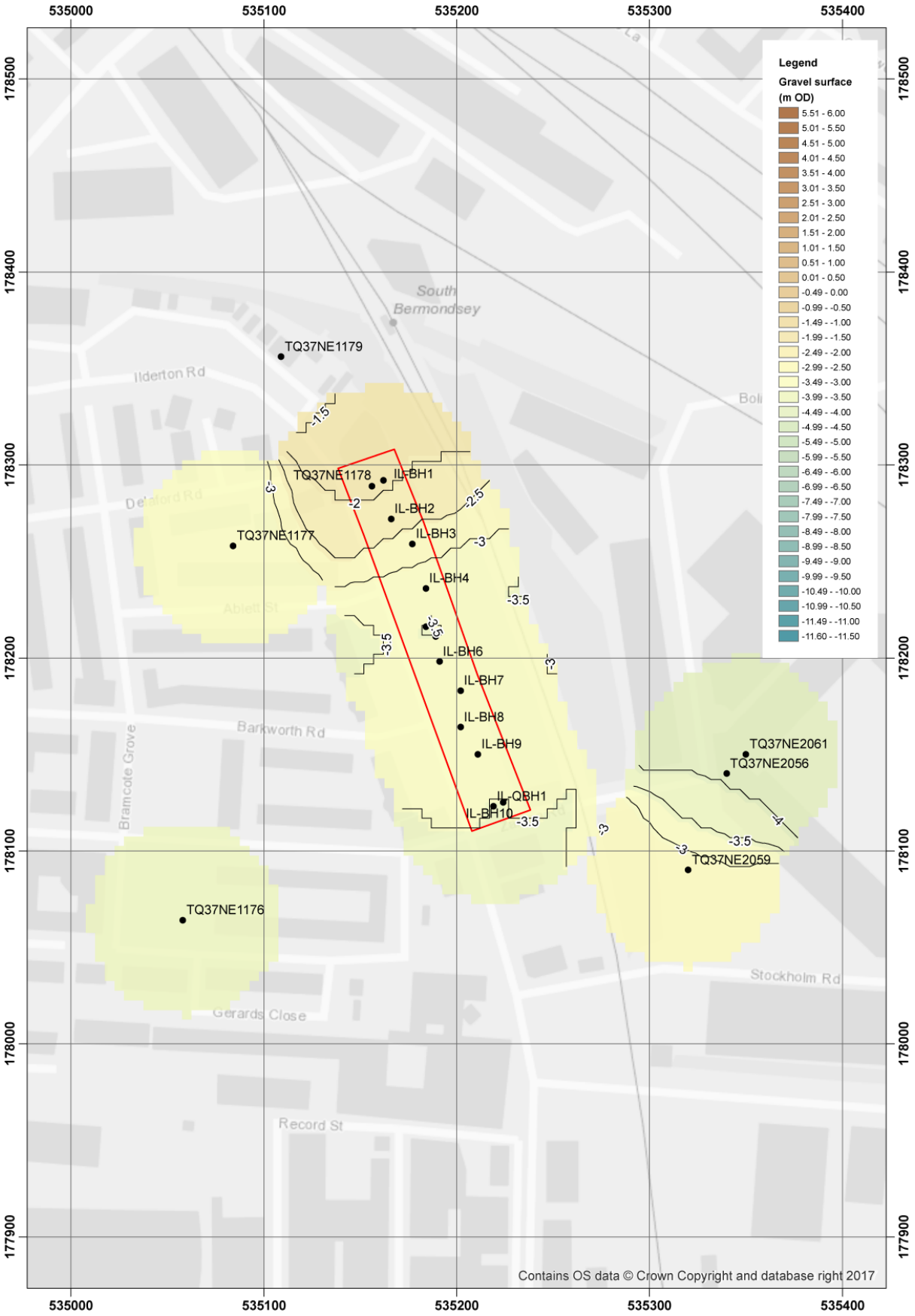

Figure 4: Top of the Shepperton Gravel (m OD) (site outline in red).

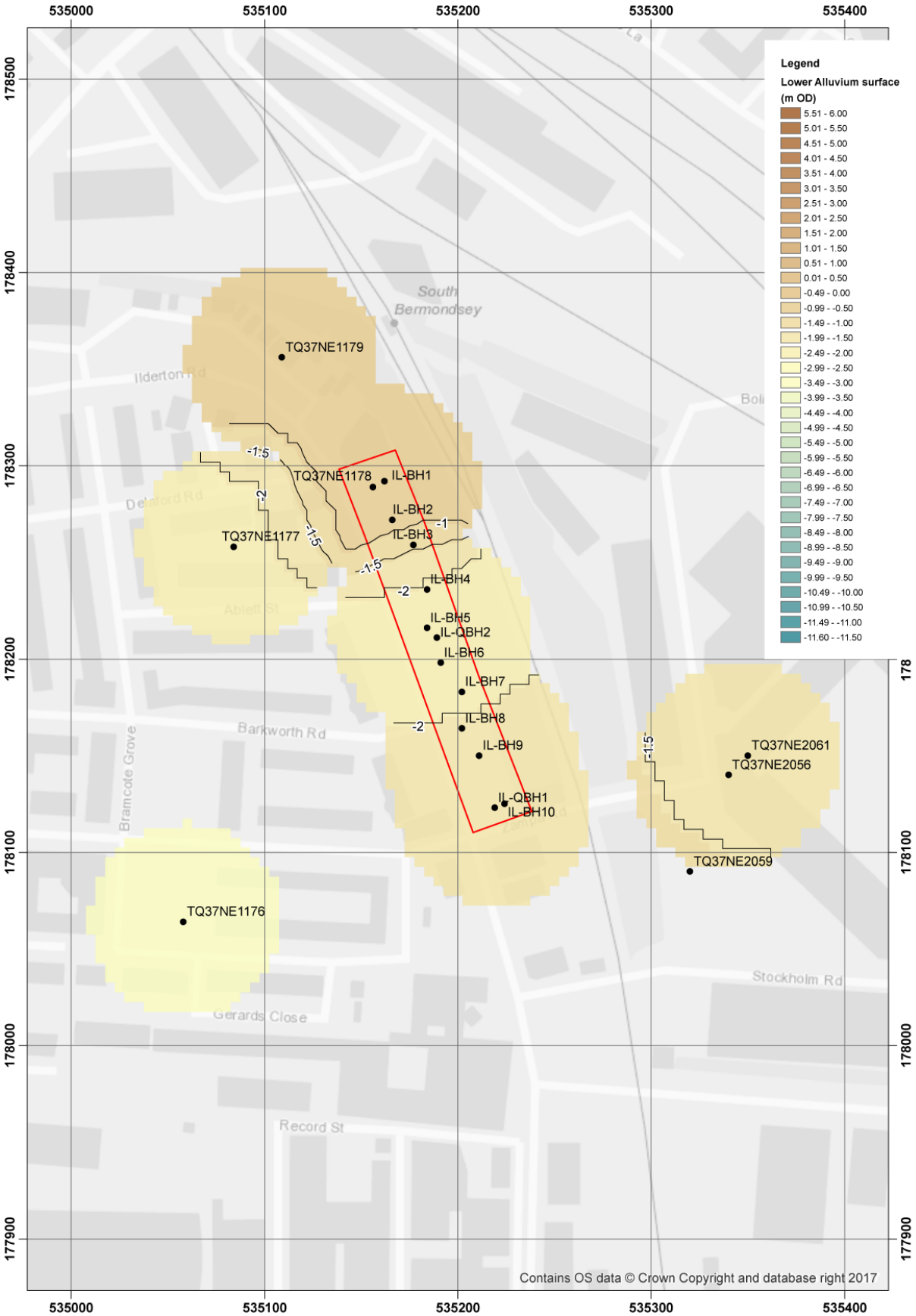

Figure 5: Top of the Lower Alluvium (m OD) (site outline in red).

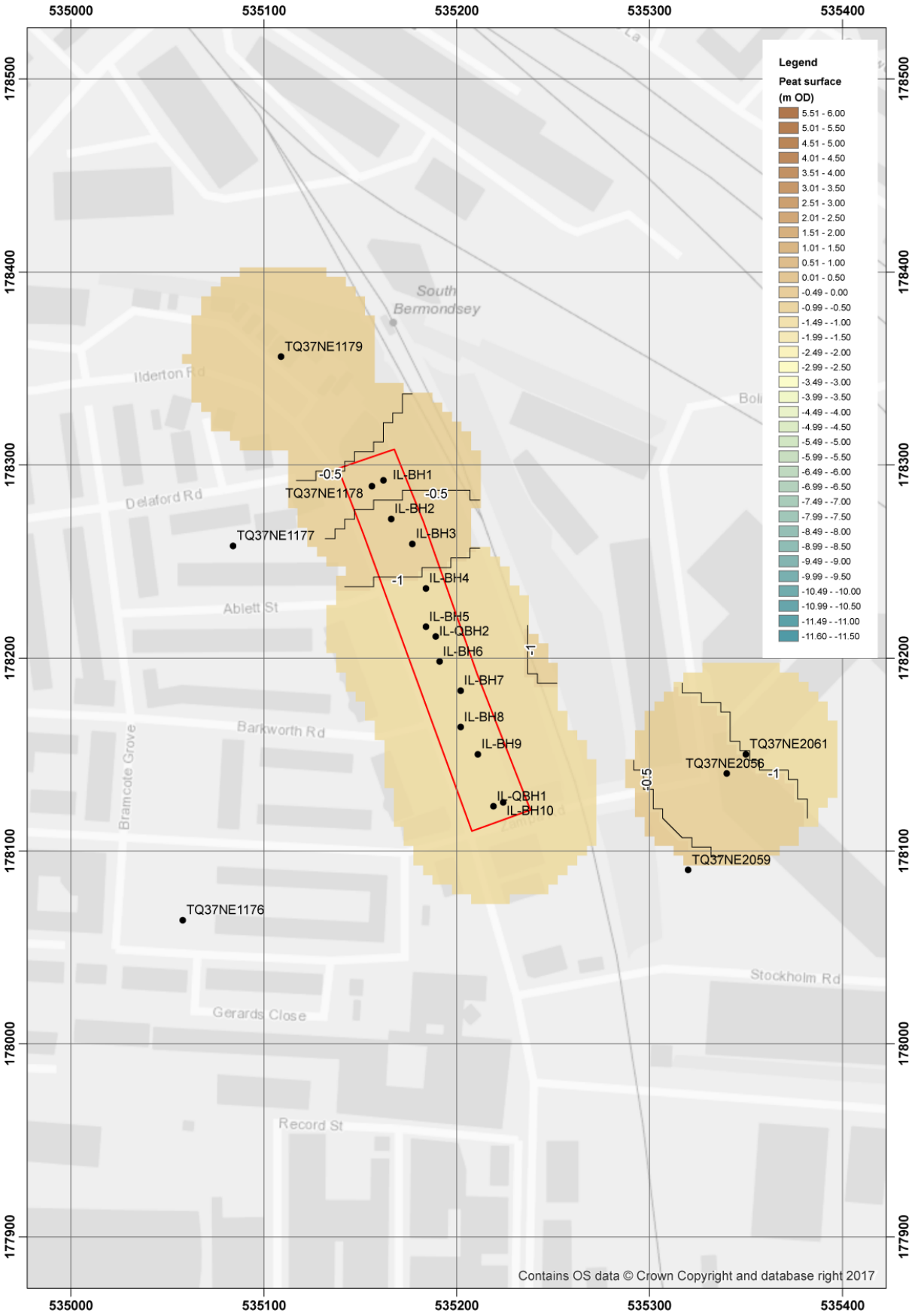

Figure 6: Top of the Peat (m OD) (site outline in red).

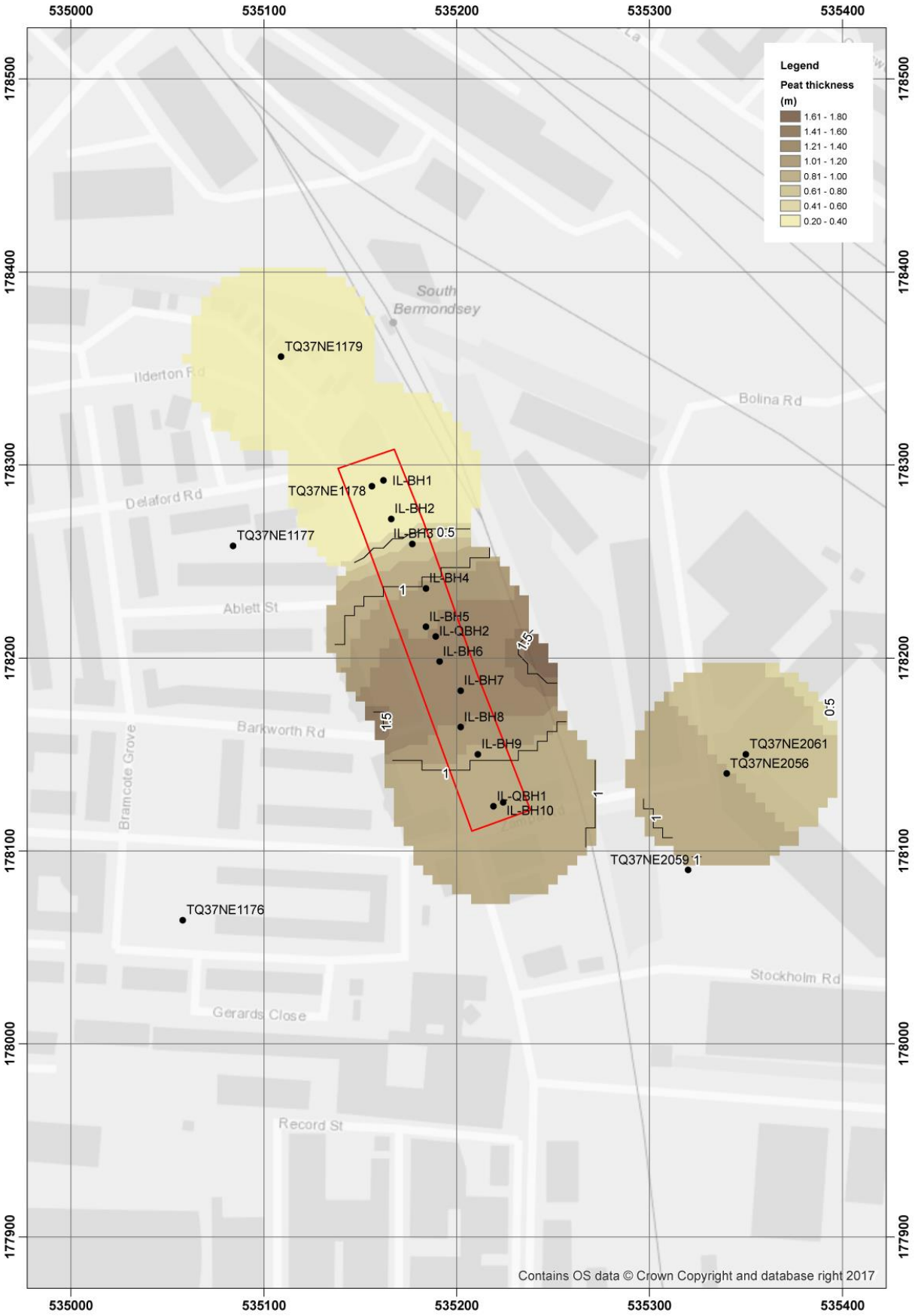

Figure 7: Thickness of the Peat (m) (site outline in red).

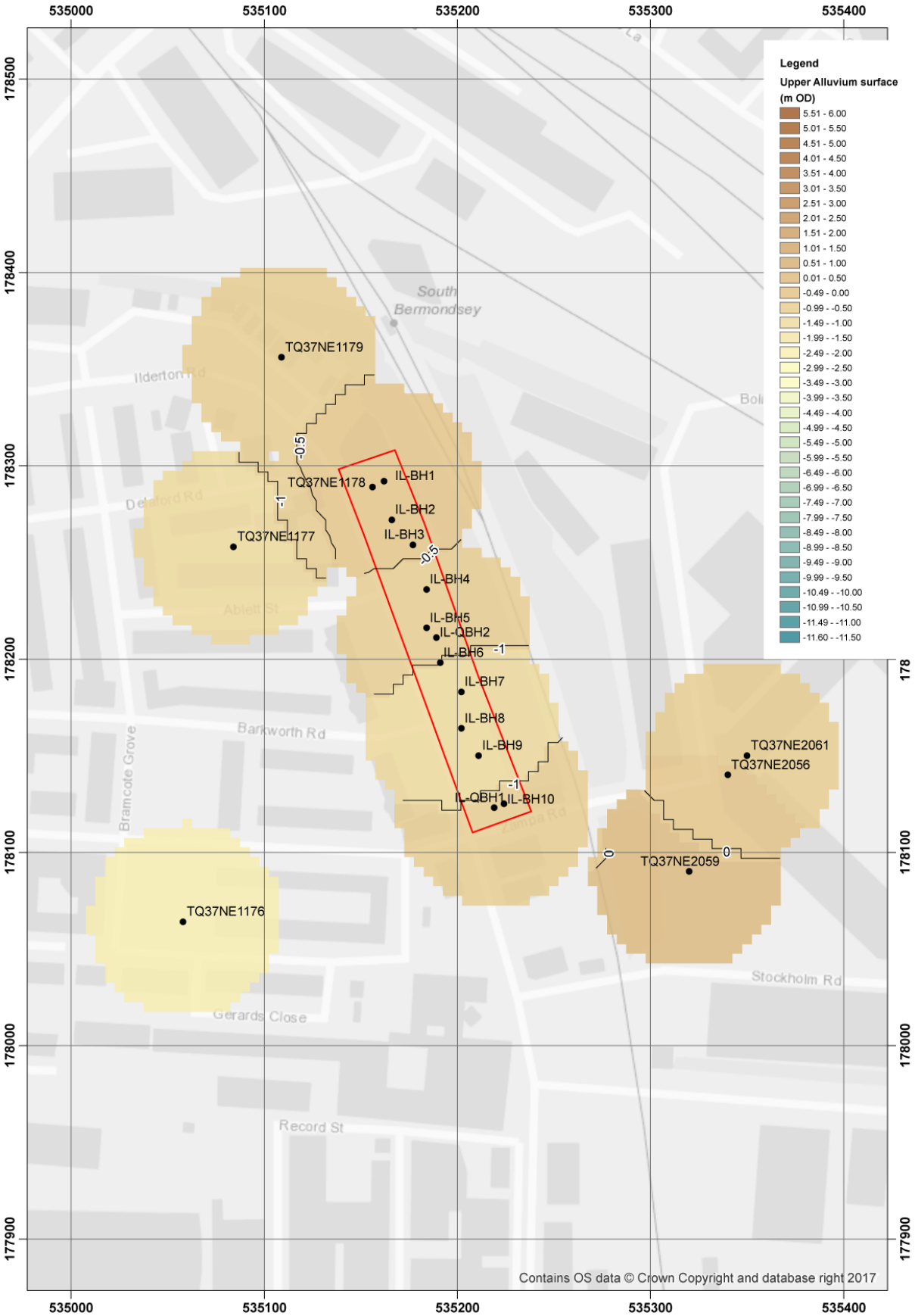

Figure 8: Top of the Upper Alluvium (m) (site outline in red).

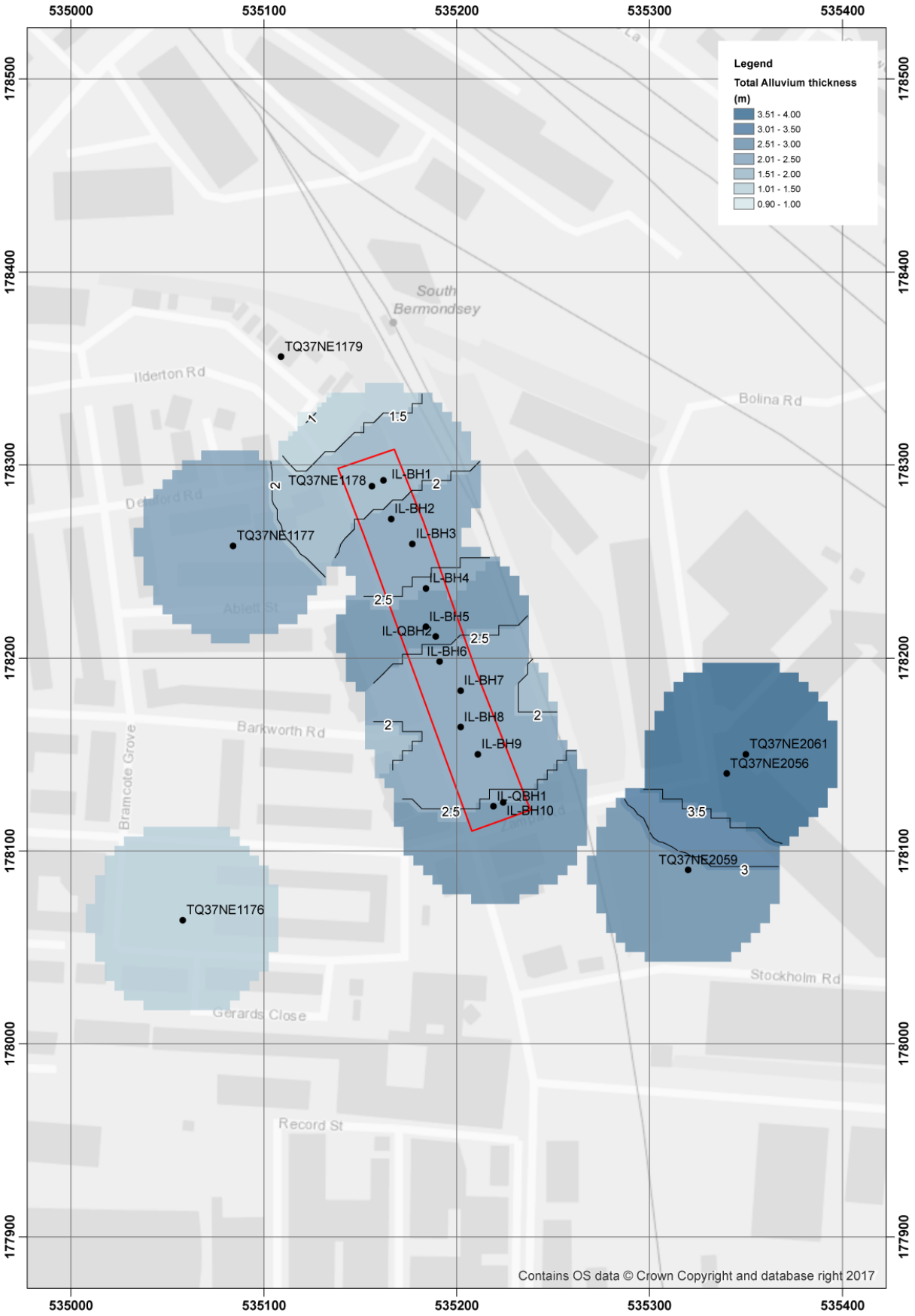

Figure 9: Thickness of the Holocene alluvial sequence (Lower Alluvium, Peat and Upper Alluvium) (m) (site outline in red).

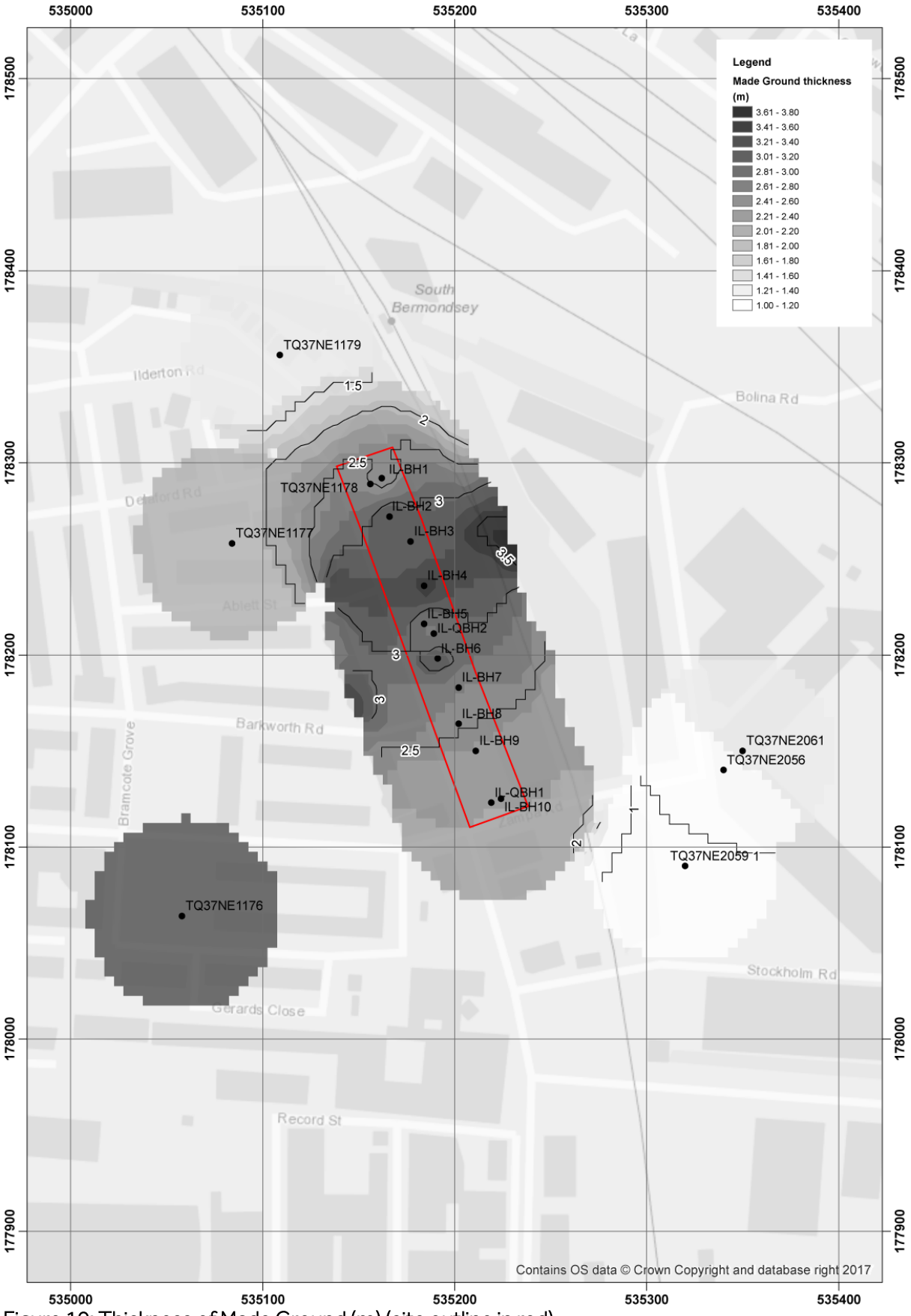

Figure 10: Thickness of Made Ground (m) (site outline in red).

Table 2: Lithostratigraphic description of borehole QBH1, Ilderton Road, Southwark

Depth (m OD)	Depth (m bgl)	Description	Stratigraphic group
1.20 to -0.80	0.00 to 2.00	Made Ground of tarmac over concrete and brick rubble.	MADE GROUND
-0.80 to -0.94	2.00 to 2.14	2.5Y 4/2; As3 Ag1; dark greyish brown silty clay with some orange mottling. Very diffuse contact in to:	UPPER ALLUVIUM
-0.94 to -1.11	2.14 to 2.31	10YR 3/1; Ag3 Sh1; very dark grey organic silt. Diffuse contact in to:	
-1.11 to -1.80	2.31 to 3.00	10YR 2/1; Sh2 $Th^3$1 Ag1; humo. 3; black well humified herbaceous, silty peat.	PEAT
-1.80 to -2.80	3.00 to 4.00	VOID	VOID
-2.80 to -3.42	4.00 to 4.62	10YR 3/1; Lc2 Ag1 As1 Ga+; very dark grey clayey, silty marl with a trace of sand. Frequent Mollusca fragments. Sharp contact in to:	LOWER ALLUVIUM/MARL
-3.42 to -3.53	4.62 to 4.73	10YR 3/1; Ag3 As1 Sh+ Lc+; very dark brown clayey silt with traces of organic matter and calcareous lake mud. Some Mollusca fragments. Sharp contact in to:	
-3.53 to -3.78	4.73 to 4.98	2.5Y 5/2; Ag3 As1 Ga+; greyish brown clayey silt with a trace of sand. Diffuse contact in to:	
-3.78 to -3.80	4.98 to 5.00	Gg2 Ag2; silt and gravel. Clasts are flint, sub-angular to rounded, up to 15mm in diameter.	SHEPPERTON GRAVEL

Table 3: Lithostratigraphic description of borehole QBH2, Ilderton Road, Southwark

Depth (m OD)	Depth (m bgl)	Description	Stratigraphic group
1.20 to -0.80	0.00 to 2.00	Made Ground of tarmac over concrete and brick rubble in matrix of grey silty clay.	MADE GROUND
-0.80 to -1.08	2.00 to 2.28	10YR 4/1; As2 Ag2; dark grey clay and silt. Very diffuse contact in to:	UPPER ALLUVIUM
-1.08 to -1.80	2.28 to 3.00	10YR 2/1; Sh2 $Th^2$1 Ag1 Tl+; humo. 2; black moderately humified silty, herbaceous peat with occasional woody material.	PEAT
-1.80 to -2.38	3.00 to 3.58	10YR 2/2; Sh2 $Tl^2$1 Ag1; humo. 2/3; very dark brown moderately to well humified woody, silty peat. Diffuse contact in to:	
-2.38 to -2.54	3.58 to 3.74	2.5Y 3/2; Ag2 As1 Sh1 Ga+ Dl+; very dark greyish brown organic, clayey silt with a trace of sand and detrital wood. Diffuse contact in to:	LOWER ALLUVIUM/MARL
-2.54 to -2.80	3.74 to 4.00	2.5Y 3/2; Ag3 As1 Ga+; very dark greyish brown clayey silt with a trace of sand. Diffuse contact in to:	
-2.80 to -2.95	4.00 to 4.15	10YR 3/1; Ag3 Sh1 Ga+; very dark grey organic silt with a trace of sand. Diffuse contact in to:	
-2.95 to -3.11	4.15 to 4.31	2.5Y 5/2; Ld3 Ag1 Ga+; greyish brown silty marl with a trace of sand. Frequent Mollusca. Sharp contact in to:	
-3.11 to -3.27	4.31 to 4.47	10YR 3/1; Ag3 Sh1 Ga+; very dark grey organic silt with a trace of sand. Sharp contact in to:	

Depth (m OD)	Depth (m bgl)	Description	Stratigraphic group
-3.27 to -3.35	4.47 to 4.55	2.5Y 5/2; Ld3 Ag1 Ga+; greyish brown silty marl with a trace of sand. Frequent Mollusca. Sharp contact in to:	
-3.35 to -3.52	4.54 to 4.72	2.5Y 3/1; Ld2 Ag1 Sh1; very dark grey silty, organic marl with frequent Mollusca. Some fine (<5mm) to coarse (<20mm) horizontal bedding. Diffuse contact in to:	
-3.52 to -3.70	4.72 to 4.90	Gley1 5/10Y; Ag3 As1; grey clayey silt. Diffuse contact in to:	
-3.70 to -3.80	4.90 to 5.00	Gg2 Ag2; silt and gravel. Clasts are flint, sub-angular to rounded, up to 15mm in diameter.	SHEPPERTON GRAVEL

5. CONCLUSION & RECOMMENDATIONS

The aim of the geoarchaeological investigations at the site were: (1) to clarify the nature of the sub-surface stratigraphy, and (2) to clarify the nature, depth, extent and possible date of any alluvium and organic/peat deposits. In order to address these aims, two geoarchaeological boreholes were put down at the site, and the stratigraphic data from existing geotechnical and geoarchaeological boreholes from the site and the wider area used to produce a deposit model of the major depositional units. The results of the deposit modelling indicate that the sediments recorded at the site are similar to those recorded elsewhere in the Lower Thames Valley, and specifically within the area of Bermondsey Lake, where organic or calcareous-rich deposits of Late Devensian and Holocene age have previously been recorded (e.g. Thomas & Rackham, 1996).

The new deposit model indicates that the Ilderton Road site lies on the margins of the lower Gravel topography that characterises Bermondsey Lake: The Late Devensian Shepperton Gravel surface falls from *ca*. -1.3m OD towards the north, to *ca*. -3.9m OD towards the south. In the southern area of the site the Gravel is overlain by a sequence of Late Devensian/Holocene alluvial sediments, including marl and peat; towards the north however the Made Ground directly overlies the Sand or Gravel, probably truncating the alluvial sequence. Previous work in this area of Bermondsey Lake (Thomas & Rackham, 1996) indicates that the organic-rich sediments at the Ilderton Road site may date from both the Late Devensian and Early to Middle Holocene, with the potential to improve our understanding of the chronology and palaeoenvironmental history of these periods. Furthermore, wooden structures dated to the Bronze Age have been identified in this area, including *ca*. 150m to the west at Bramcote Green (3995-4080 cal BP; Thomas & Rackham, 1996), whilst at the Bricklayer's Arms (Jones, 1991) two Neolithic flint axes, a wooden platform, hearths and horse bones were identified on the margins of the Bermondsey eyot and out in to the adjacent lake basin *ca*. 500m to the west (Sidell *et al*., 2002). The archaeological potential in the area of the elevated Gravel topography towards the north of the site is therefore considered to be relatively high; it should be noted however that in places the Gravel surface may be truncated by the overlying Made Ground, and it is relatively deeply buried at between 2.1 and 4.5m bgl.

Given the potential of the sediments for reconstructing the environmental history of the site and its environs, and the uncertain nature of the chronology of the sediments, a programme of environmental archaeological assessment is recommended on the sequence from borehole IL-QBH2. This assessment should incorporate: (1) organic matter and calcium carbonate determinations to aid identification of the sedimentary units; (2) assessment of the palaeobotanical remains (pollen, waterlogged wood and seeds) to provide a provisional reconstruction of the vegetation history, (3) assessment of the diatom remains in order to investigate the hydrology of the site in more detail (e.g. water depth, quality and salinity), and (4) radiocarbon dating of selected units to gain an understanding of the chronology of the sequence.

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. Such investigations are routinely carried out (where required) as part of planning conditions across the Lower Thames Valley and its tributaries, instructed by the LPA Archaeological Advisor.

6. REFERENCES

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7. APPENDIX 1: GLHER DATA

RPS No	ListEntry / MONUID	LegacyUID / PrefRef	Record Type	Name	MonType	Date Range	Period Range	Finds	Summary
1	1385687	471091	LBII*	CHURCH OF ST AUGUSTINE					
2	1378456	470757	LBII	7 AND 8, CANAL GROVE					
3	1378457	470758	LBII	9, CANAL GROVE					
4	1385688	471092	LBII	FORMER VICARAGE TO CHURCH OF ST AUGUSTINE					
5	1385743	471153	LBII	STATUE OF GEORGE LIVESEY IN THE FORECOURT OF THE GAS WORKS OFFICES					
6	1385919	471339	LBII	FORMER CLARE COLLEGE MISSION CHURCH					
7	1000838	1834	RPG II	SOUTHWARK PARK					
8	DLO35341		LSQ	Verney Road/Bramcote Road, [Varcoe Road]					
9	DLO35764	DLO35764	APA	Bermondsey Lake					
10	DLO35767	DLO35767	APA	Old Kent Road					
11	DLO35839	DLO35839	APA	Thames Alluvial Floodplain					The extensive peat and clay deposits across North Southwark and North Lewisham are up to 12m thick a
12	DLO35840	DLO35840	APA	Thames and Ravensbourne Terrace Gravels					The terrace gravels fringing the Thames are commonly associated with evidence of successive prehisto
13	MLO104864	MLO104864	MON	Old Kent Road [Southwark Integrated Waste Management Facility], Southwark, SE15 {Peat}	PEAT?	500000 BC to 42 AD	Prehistoric		A possible deposit of peat was observed during a watching brief carried out by Wessex Archaeology at the Southwark Integrated Waste Management Facility between October and December 2008.
14	MLO74893	093223/00/000	MON	Silwood Street, SE16 {Prehistoric peat layer}	PEAT	500000 BC to 42 AD	Prehistoric		Peat and waterlain deposits, all probably of prehistoric date, were observed during a watching brief undertaken by the Museum of London Archaeology Service, in 2000.
15	MLO103254	MLO103254	FS	Old Kent Road [South Eastern Gas Works], Southwark {Palaeolithic Mammalian Fossils}	FINDSPOT	130000 BC to 115000 BC	Middle Palaeolithic	ANIMAL REMAINS (Middle Palaeolithic)	An assemblage of palaeolithic mammalian fossils were uncovered on the site of the gas works on Old Kent Road.
16	MLO60722	091709/00/00	FS	Sharratt Street, London, SE15 {Prehistoric flint}	FINDSPOT	10000 BC to 2201 BC	Early Mesolithic to Late Neolithic	CORE (Early Mesolithic to Late Neolithic), FLAKE (Mesolithic)	Residual Mesolithic to Neolithic worked flint fragments were found during an evaluation at Sharatt Street by the Museum of London Archaeology Service in 1994.
17	MLO63987	MLO63987	MON	Varcoe Road/Verney Road, Bermondsey {Bronze Age trackway and palaeo-environmental sequence}	TRACKWAY, PEAT	7500 BC to 701 BC	Early Mesolithic to Late Bronze Age		Excavations by the Museum of London Archaeology in 1995 revealed a series of peat and alluvial deposits, with two phases of Bronze Age trackway.
18	MLO76325	MLO76325	MON	Oldfield Grove, [Silwood Estate], SE16 {Peat}	PEAT	10000 BC to 701 BC	Early Mesolithic to Late Bronze Age		
19	MLO77143	MLO77143	FS	Corbett's Lane [Silwood Estate] SE16 {Neolithic core}	FINDSPOT	4000 BC to 2201 BC	Neolithic	CORE (Neolithic)	A single dark brown single platform flint core weighing 92gm was found.
20	MLO104805	MLO104805	MON	Silwood Street, Bermondsey, Lewisham/Southwark, SE16 {Peat Deposit}	PEAT	2200 BC to 701 BC	Bronze Age		Peat deposits were found during a watching brief by the Museum of London Archaeology Service at Silwood Street between April and May 2000.
21	MLO105227	MLO105227	MON	Varcoe Road, Southwark, SE16 {Peat deposit}	PEAT	1600 BC to 701 BC	Middle Bronze Age to Late Bronze Age	SCRAPER (TOOL) (Early Neolithic to Late Bronze Age)	A peat deposit was found during a geoarchaeological excavation by Museum of London Archaeology at Varcoe Road between August and October 2009.
22	MLO19469	MLO19469	MON	New Cross Gate/Lewisham/Beckenham {Roman Road London-Lewes}	ROAD	101 AD to 199 AD	Roman		The London-Lewes Roman Road from Lewisham cuts across Bromley and forms the border with Croydon. It was probably constructed in the early 2nd century.
23	MLO8743	090774/00/00	FS	OLD KENT RD	FINDSPOT, FINDSPOT	43 AD to 409 AD	Roman	FIND UNCLASSIFIED (Roman), LAMP (Roman)	
24	MLO4264	090287/00/00	MON	Ruby Street/Old Kent Road, SE15	MANOR HOUSE	1066 AD to 1539 AD	Medieval		
25	MLO71139	092623/00/00	MON	64-74 QUEENS RD SE15	WELL	1540 AD to 1900 AD	Post Medieval		
26	MLO8709	090707/00/00	MON	ROTHERHITHE NEW RD	WINDMILL, TOWER MILL	1540 AD to 1900 AD	Post Medieval		
27	MLO101129	MLO101129	BLD	Rotherhithe New Road, [Rotherhithe New Road bridge] {19th century road bridge}	ROAD BRIDGE	1868 AD to 2050 AD	19th Century to Modern		Rotherhithe New Road bridge, which carries the road over the East London Railway line, was constructed by 1868.
28	MLO101131	MLO101131	BLD	Surrey Canal Road, [Surrey Canal Road bridge] {19th century railway bridge}	RAILWAY BRIDGE	1868 AD to 2050 AD	19th Century to Modern		The Surrey Canal bridge was constructed to carry the East London Railway line over the Surrey Canal. It was constructed by 1868.
29	MLO59259	213477/00/00	PK	Lower Road, [Southwark Park], Southwark {19th century public park}	PUBLIC PARK	1865 AD to 2050 AD	19th Century to Modern		19th century public park, extended by c.4 ha (King's Stairs Gardens) in the 1980s.
30	MLO77539	MLO77539	MON	SILWOOD ESTATE (PHASE 2), SE1	BUILDING RUBBLE	1801 AD to 1900 AD	19th Century		
31	MLO89367	MLO89367	BLD	Catlin Street [Former Bricklayers Arms Goods Depot], Bermondsey, Southwark {19th century stables and forge}	STABLE, COURTYARD, FORGE, HORSE HOSPITAL	1843 AD to 2050 AD	19th Century to Modern		The stables and forge at Catlin Street are the last surviving structures on the site of the former Bricklayers' Arms Goods Depot owned by Southern Railway.
32	MLO101130	MLO101130	BLD	Trundley's Terrace/Oldfield Grove, [Trundley's Terrace footbridge] {Early 20th century foot bridge}	FOOTBRIDGE	1914 AD to 2050 AD	World War One to Modern		Trundley's Terrace foot bridge crosses the East London Railway line between Oldfield Grove and Trundley's Terrace. It was constructed by 1914 to connect what was then known as Oldfield Road with Lee Terrace, renamed Trundley's Terrace in 1933.
33	MLO101393	MLO101393	PK	Verney Road/Bramcote Road, [Varcoe Road] {19th century recreation ground}	PUBLIC PARK?, RECREATION GROUND	1906 AD to 2050 AD	Modern		Protected square designated under the London Squares Preservation Act of 1931.

RPS No	ListEntry / MONUID	LegacyUID / PrefRef	Record Type	Name	MonType	Date Range	Period Range	Finds	Summary
34	MLO68246	300010/00/00	MON	Southwark Park {Second World War Anti-Aircraft Battery}	ANTI AIRCRAFT BATTERY	1940 AD to 1942 AD	World War Two		
35	MLO72777	MLO72777	MON	Surrey Canal Road {Landfill site}	LANDFILL SITE	1901 AD to 1975 AD	Modern		
36	MLO60721	091708/00/00	MON	Ilderton Road, SE15 {Post-glacial stream}	STREAM				At least one post-glacial stream was found through excavation at Ilderton Road during a watching brief by the Museum of London Archaeology Service in 1994.
37	MLO98360	MLO98360	MON	Old Kent Road [Grand Surrey Canal] Camberwel, Peckham, Southwark					Work in progress
38	ELO10560		EVT	Ilderton Road, London, SE15: Watching Brief					
39	ELO10587		EVT	Sharratt Street, London, SE15: Evaluation					
40	ELO11068		EVT	East London Line project, Southern Phase, London, SE11 and SE16: Archaeological and Geoarchaeological Investigations					
41	ELO11150		EVS	East London Line Extension Project [Central Section And Southern Extension],Southwark, E1-SE8 And SE16: Building Survey					
42	ELO11183		EVS	East London Line Extension Project, London, E1-SE8/SE16: Historic Building Recording					
43	ELO11318		EVT	Varcoe Road, London, SE16: Geoarchaeological Excavation					
44	ELO11516		BL	Surrey Canal Road, Hornshay Street [East London Line Southern Extension], London, SE14 and SE15: Historic Building Recording					
45	ELO11976		BL	Surrey Canal Road (Surrey Canal Triangle). Archaeological Desk Based Assessment					
46	ELO13102		EVT	Debnams Road/Corbett's Lane/Silwood [Silwood Estate], Rotherhithe, Southwark, SE1: Evaluation					
47	ELO13293		EVT	Silwood Street, Bermondsey, Lewisham/Southwark, SE16: Watching Brief					
48	ELO13381		EVP	Old Kent Road (No. 709), Southwark, SE15 1JZ					
49	ELO13385		EVT	Old Kent Road [Southwark Integrated Waste Management Facility], Southwark, SE15: Watching Brief					
50	ELO15012		EVT	Ormside Street, SE15: watching brief					
51	ELO15288		BL	Rotherhithe New Road (No.387 - 399), Southwark: Evaluation					
52	ELO1925		EVT	ILDERTON RD SE15					
53	ELO2319		EVT	SILWOOD ESTATE (PHASE 2), SE1					
54	ELO2767		EVT	Bramcote Grove, Bermondsey, SE16: Evaluation, Watching Brief, Excavation					
55	ELO3725		EVT	Gas Pipeline					
56	ELO4533		EVT	Thameslink 2000					
57	ELO6083		EVP	Oldfield Road/Old Kent Road/New Cross Road [East London Line Southern Extension], Lewisham: Desk Based Assessment					
58	ELO6951		EVP	East London Line Project, Southern Extension, Lewisham					
59	ELO6980		EVP	East London Line Project, Southern Exentsion, Lewisham, SE14					
60	ELO7950		EVP	Oldfield Grove and Trundleys Road, [East London Line Project - Silwood Triangle], Lewisham: Desk Based Assessment					
61	ELO853		EVT	Silwood Estate (Phase I)					
62	ELO9316		BL	Romney Road, [National Maritime Museum], Greenwich, Watching Brief					
63	ELO9935		EVP	Somerfield Road/Sketchley G/Reculver Road/Crane M [Silwood Estate], Lewisham, SE16, Desk Based Assessment					
64	ELO9945		EVT	Sharratt Street, Lewisham, SE15: Evaluation					

8. APPENDIX 2: OASIS

OASIS ID: quaterna1-302043

Project details

Project name	161 ILDERTON ROAD, LONDON BOROUGH OF SOUTHWARK
Short description of the project	A programme of geoarchaeological fieldwork and deposit modelling was carried out at the Ilderton Road site in order to (1) clarify the nature of the sub-surface stratigraphy, and (2) clarify the nature, depth, extent and date of any alluvium and organic/peat deposits. The results of the deposit modelling indicate that the sediments recorded at the site are similar to those recorded elsewhere in the Lower Thames Valley, and specifically within the area of Bermondsey Lake, where organic or calcareous-rich deposits of Late Devensian and Holocene age have previously been recorded. The site lies on the margins of the lower Gravel topography that characterises Bermondsey Lake, where the Gravel surface falls from ca. -1.3m OD towards the north to ca. -3.9m OD towards the south. In the southern area of the site the Gravel is overlain by a sequence of Late Devensian/Holocene alluvial sediments, including marl and peat; towards the north however the Made Ground directly overlies the Sand or Gravel, probably truncating the alluvial sequence. Given the potential of the sediments for reconstructing the environmental history of the site and its environs, and the uncertain nature of the chronology of the sediments, a programme of environmental archaeological assessment is recommended on the sequence from borehole IL-QBH2. In addition, the archaeological potential of the elevated Gravel surfaces in the northern area of the site is considered to be relatively high.
Project dates	Start: 01-09-2017 End: 24-11-2017
Previous/future work	No / Not known
Type of project	Environmental assessment
Survey techniques	Landscape

Project location

Country	England
Site location	GREATER LONDON SOUTHWARK SOUTHWARK 161 Ilderton Road
Postcode	SE16 3JZ
Site coordinates	TQ 3520 7822 51.486245259586 -0.052544732738 51 29 10 N 000 03 09 W Point

Project creators

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

Project archives

Physical Archive Exists?	No

Digital Archive Exists?	No
Paper Archive recipient	LAARC
Paper Contents	''Environmental'',''Stratigraphic''
Paper Media available	''Report''
Entered by	Daniel Young (d.s.young@reading.ac.uk)
Entered on	23 November 2017