

# HOPE WHARF, GREENWICH HIGH ROAD, ROYAL BOROUGH OF GREENWICH

## Geoarchaeological Deposit Model Report

**NGR:** TQ 37583 77026

**Site Code:** HOP17

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## 1. NON-TECHNICAL SUMMARY

The aim of the geoarchaeological investigations at the Hope Wharf site was to (1) clarify the nature of the sub-surface stratigraphy across the site, (2) to investigate the nature, depth, extent and likely date of any alluvium and peat deposits; and (3) to make recommendations for any further environmental archaeological assessment. In order to achieve this aim, three geoarchaeological boreholes were put down at the site and a programme of deposit modelling undertaken, incorporating the results of existing geotechnical investigations.

The results of the geoarchaeological investigation have confirmed the presence of Peat deposits in the north-western area of the site, within a sequence of generally organic-rich alluvium across much of the site. However, further work is not recommended because the peat is thin and isolated to a small part of the site. This suggests localised peat formation over a short period of time (ca. 100 years) only.

## 2. INTRODUCTION

### 2.1 Site Context

This report summarises the findings arising out of the geoarchaeological investigations undertaken by Quaternary Scientific (University of Reading) in connection with the proposed development of land at Hope Wharf, Greenwich High Road, Royal Borough of Greenwich (National Grid Reference TQ 37583 77026; Figure 1). Quaternary Scientific were commissioned by CgMs Consulting to undertake the geoarchaeological investigations. The area of investigation lies in the valley of the Ravensbourne, a minor right bank tributary of the River Thames that rises in Bromley (Barton, 1992). The site is within the tidal reach of the River, known here as Deptford Creek, around 600m upstream from its confluence with the Thames. British Geological Survey (BGS) mapping (1:50,000 Sheet 270 South London 1998) shows the valley of the Ravensbourne cutting down into the Upper Chalk and the floor of the valley occupied by Alluvium, with a narrow strip of terrace gravel (the Kempton Park Gravel) present on both sides of the valley.

A total of twelve geotechnical boreholes were put down within the area of the site in March 2016 (CGL, 2016; Figure 2). Of these, all twelve recorded the surface of the Pleistocene Gravels, recording it at between approximately 1.75 and -1.3m OD. In general, the surface of the Gravel falls sharply across the site from southeast to northwest, recorded at between 1.70 and 1.75m OD in the area of boreholes D102, D103 and S04, falling as low as -1.07 to -1.30m OD in the area of boreholes RW01, RW02 and D101. Given the range of elevations of the Gravel surfaces, it is possible that both the higher Kempton Park Gravel (Early-Middle Devensian) terrace and lower Shepperton Gravel (Late Devensian) can be identified at the site.

The overlying alluvial deposits were found in nine of the 12 boreholes, and are between 0.4 and 2.2m thick; in three of the boreholes towards the southeast of the site (D102, D103 and S04) no alluvium was recorded, and Made Ground directly overlies the Gravel. Where alluvium is recorded, it is generally described as a variably organic, sandy, occasionally gravelly clay. At both Greenwich

Creekside East (300m to the north; Batchelor, 2015), and the Faircharm Creative Quarter (100m to the north; Young, 2014), geoarchaeological investigations revealed a sequence of dominantly inorganic alluvium overlying Shepperton Gravel (recorded between ca. 0 and -3m OD), capped by Made Ground. However, at Greenwich Creekside East, an apparent depression (potentially indicative of a former channel) was recorded, orientated approximately south-west to north-east across the site. One of the boreholes towards the centre of this depression also contained a concentration of waterlogged wood remains at the interface between the Gravel and alluvium, but otherwise, no other organic remains or peat were recorded on either site.

At Kent Wharf meanwhile (ca. 200m to the north; Batchelor, 2015) the results of an environmental archaeological assessment revealed a Shepperton Gravel surface resting at between -1.64 and -2.23m OD, overlain by a sequence of alluvium that included in places a peat horizon up to 2m thick. Radiocarbon dating of the peat at Kent Wharf (Batchelor, 2015) indicated that it accumulated between at least 6660-6490 and 3160-2960 cal BP, spanning the late Mesolithic to late Bronze Age cultural periods. Throughout this period, the peat surface was initially colonised by alder-dominated carr woodland with an understorey of grasses, sedges and ferns, whilst during the latter period of accumulation, the dominant growth of grasses and sedges, with a diverse range of herbs, aquatics and spores was suggestive of a more open and wet floodplain environment (Batchelor, 2015). Throughout the period of peat accumulation, the surrounding dryland was occupied by mixed deciduous woodland dominated by oak and lime; the decline of these taxa and a more open environment is indicated during the latter period of peat accumulation (Batchelor, 2015). Significantly, an apparent reduction in elm pollen values is recorded towards the base of the sequence, suggestive of the early Neolithic elm decline, which is recorded across the Lower Thames Valley and British Isles around this time (Batchelor *et al.*, 2014; Parker *et al.*, 2002). Furthermore, this decline coincided with the occurrence of a possible cereal grain, suggestive of an anthropogenic influence around the same time (Batchelor, 2015).

Further upstream of the Ravensbourne at Old Seager Distillery (Batchelor *et al.*, 2009; 2014), peat (overlying gravel) was recorded between 0.44 and 1.80m OD and radiocarbon dated between 7200-6440 and 5580-5320 cal BP (late Mesolithic to Neolithic). Significantly, this peat also contained a lithic assemblage of ten struck flints including blades, truncated blades and flakes, thought to represent tool use and discard during the Mesolithic or Early Neolithic. The biostratigraphic record indicates that during the earlier part of this period of peat formation (between ca. 6800 and 5450 cal BP) the wetland was dominated by fen woodland, whilst the dryland was occupied by mixed deciduous woodland. Significantly, a decline in elm woodland is recorded after 6740-6540 cal BP, which could be linked to human activity (Batchelor *et al.*, 2009, 2014). Following a long hiatus, a second phase of peat formation occurred between 1940-1810 and 1020-930 cal BP (Roman and Medieval periods). During this period, the wetland was dominated by aquatics and emergent plants, with a much reduced woodland cover, while the dryland was open and dominated by herbaceous communities (Batchelor *et al.*, 2009, 2014). The DLR Lewisham Extension site (Sidell *et al.*, 1999; Figure 1) indicated a similar sedimentary sequence to Old Seager Distillery; basal alluvial silt/clays were overlain by peat from 7430-7030 cal BP (Late Mesolithic) that accumulated between ca. 0 and

0.5m OD. A hiatus in peat formation of unknown duration also occurred here, represented by a weakly organic clay indicating deposition under aquatic conditions.

## **2.2 Geoarchaeological, Palaeoenvironmental and Archaeological potential**

Given the potentially organic nature of the alluvium in places at the Hope Wharf site, it thus offers an opportunity to contribute to our understanding of landscape evolution in this part of the Ravensbourne tributary and Lower Thames Valley. The palaeoenvironmental potential of the sequences at the site thus requires further investigation. On the basis of the radiocarbon dates from sites elsewhere in this area of the Ravensbourne tributary, it is possible that organic units may have been accumulating at the site during the late Mesolithic through to the medieval cultural periods. In addition, the existing records from the nearby area indicate a variable sequence of Holocene alluvial deposits resting on a highly variable Gravel surface. The different deposits recorded are significant as they represent different environmental conditions that would have existed in a given location. For example: (1) variations in the topography of the River Terrace Gravels could indicate the position of former channels and islands on the floodplain; (2) the presence of soils and peat represent former terrestrial or semi-terrestrial land-surfaces, and (3) the less organic alluvial deposits of sands/silts/clays represent periods of varying hydrological conditions on the floodplain. At present, our understanding is that the Hope Wharf site lies at the interface between the elevated surface of the Kempton Park Gravel terrace, and the deeper surfaces of the Late Devensian Shepperton Gravel, potentially indicative of a channel-marginal setting, overlain by variably organic alluvial deposits. By studying the sub-surface stratigraphy across the site in greater detail, it will be possible to build a greater understanding of the former landscapes and environmental changes that took place over space and time at this location.

Organic-rich sediments (in particular peat) also have high potential to provide a detailed reconstruction of prehistoric environments on both the wetland and dryland. In particular, there is the potential to increase knowledge and understanding of the interactions between hydrological change, human activity, vegetation succession and climate in this area of the Lower Thames Valley. Significant vegetation changes include the early Holocene/early Mesolithic transition from pine-dominated to mixed-deciduous dominated woodland; the late Mesolithic/Neolithic decline of elm woodland, the Neolithic colonisation and decline of yew woodland; the late Neolithic/early decline of wetland and dryland woodland. Such investigations are carried out through the assessment/analysis of palaeoecological remains (e.g. pollen, plant macrofossils & insects) and radiocarbon dating. So called palaeoenvironmental reconstructions have been carried out on the sedimentary sequences from elsewhere in this general area, including at Kent Wharf (KWF15; Batchelor, 2016), Greenwich Creekside East (RAS15; Batchelor, 2015), Old Seager Distillery (DEG00; Batchelor *et al.*, 2009a) and the DLR Lewisham Extension site (DXK96; Sidell *et al.*, 1999). 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).

## **3.4 Aims & Objectives**

On the basis of the above, further borehole records are required in order to enhance our understanding of the sub-surface stratigraphy of the Hope Wharf site, and for any further assessment/analysis of the deposits (if necessary). Five significant research aims relevant to the geoarchaeological investigations were outlined within the WSI for the Hope Wharf site (Young, 2017):

1. To clarify the nature of the sub-surface stratigraphy across the site;
2. To investigate the nature, depth, extent and date of any alluvium and 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);
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, the following objectives were undertaken:

1. To retrieve three geoarchaeological borehole sequences at selected locations on the site (Figure 2);
2. To use the stratigraphic data from the new locations, and existing records to produce a deposit model of the major depositional units across the site.
3. To produce a report on the geoarchaeological and palaeoenvironmental potential of the site, and to make recommendations for any further assessment.



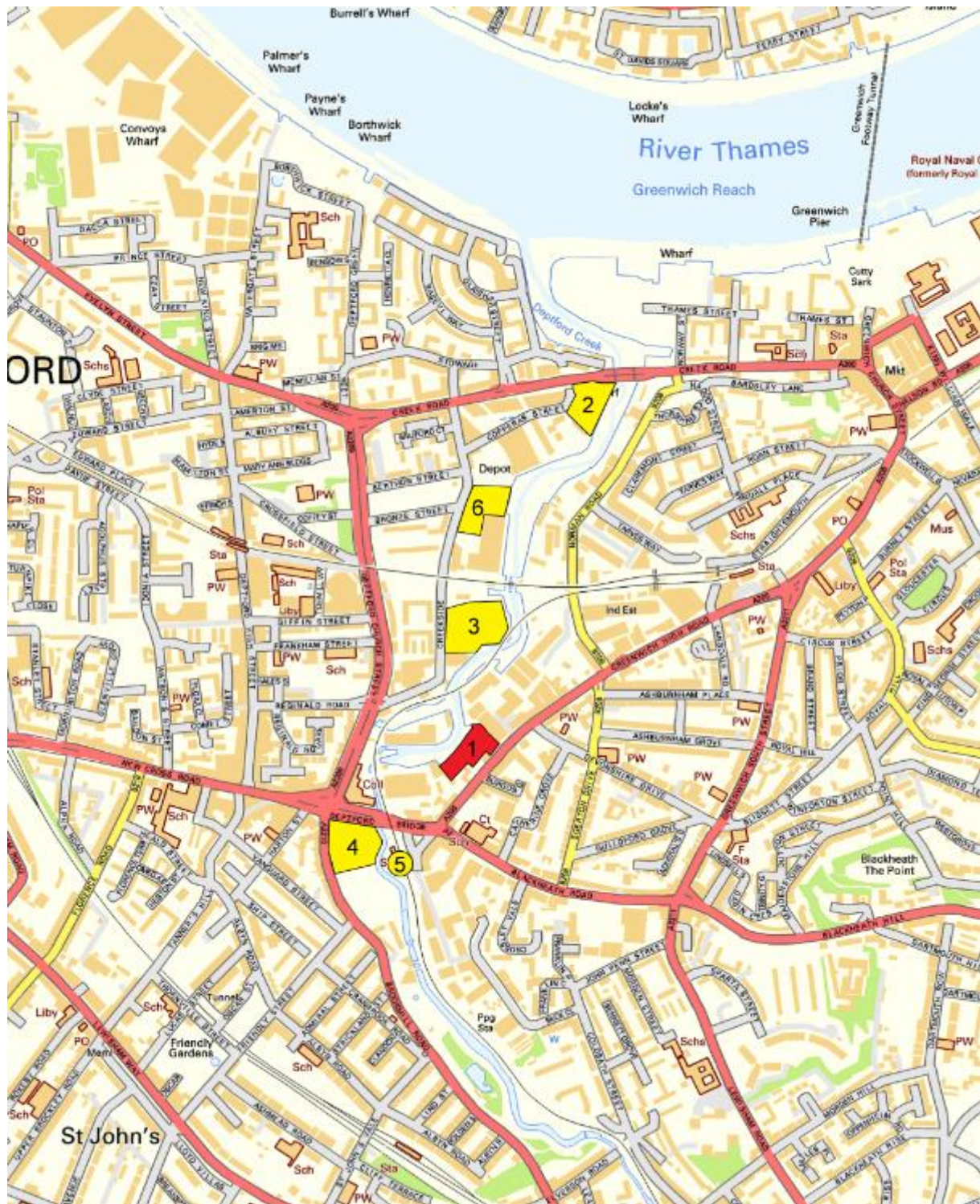


Figure 1: Location of (1) Hope Wharf, Greenwich High Road, Royal Borough of Greenwich and nearby sites discussed in the text: (2) Greenwich Creekside East (RAS15; Batchelor, 2015); (3) Faircharm Creative Quarter (FCM14; Young, 2014); (4) Old Seager Distillery (DEG00; Batchelor *et al.*, 2009a); (5) the DLR Lewisham Extension site (DXK96; Sidell *et al.*, 1999) and (6) Kent Wharf (KWF15; Batchelor, 2016). Contains Ordnance Survey data © Crown copyright and database right [2015].

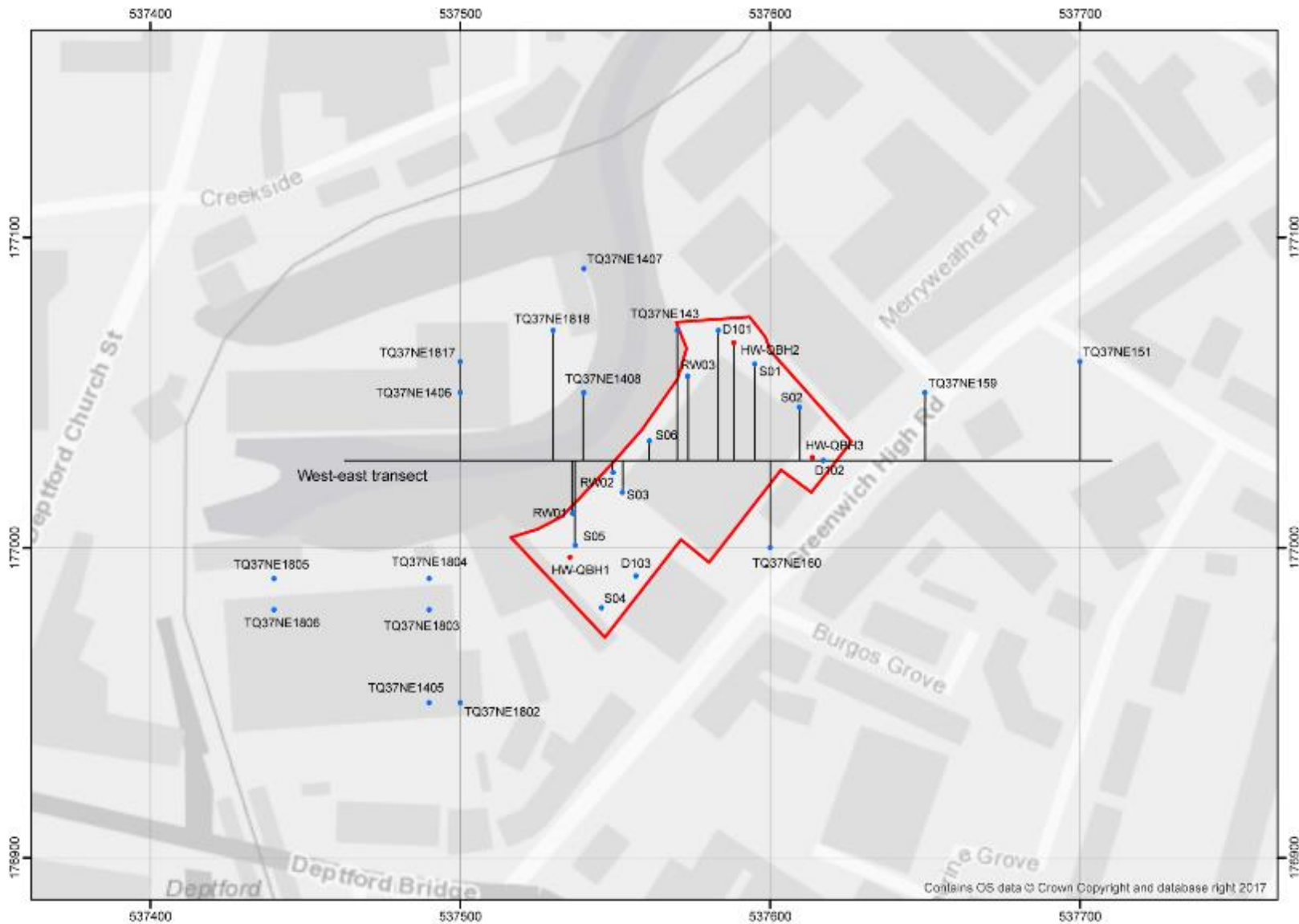


Figure 2: Location of the new geoarchaeological boreholes (red) and existing geotechnical boreholes (blue) at Hope Wharf, Greenwich High Road, Royal Borough of Greenwich. West-east transect (Figure 3) also shown.



## 3. METHODS

### 3.1 Field investigations

Three geoarchaeological boreholes (HW-QBH1 to HW-QBH3) were put down at the site in June 2017 by Quaternary Scientific (Figure 2). The borehole core samples were recovered using an Eijkelpamp window sampler and gouge set using an Atlas Copco TT 2-stroke percussion engine. This coring techniques provide 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. Unfortunately two of the geoarchaeological boreholes could not penetrate beyond the base of the Made Ground; borehole HW-QBH1 stopped in redeposited Gravel at 3.6m below ground level (bgl), whilst HW-QBH3 hit an obstruction in the Made Ground at 3.0m bgl. Spatial co-ordinates for each borehole were obtained using a Leica Differential GPS (Table 1).

### 3.2 Lithostratigraphic description

Field and laboratory-based lithostratigraphic descriptions of the new borehole samples was carried out using standard procedures for recording unconsolidated sediment and peat, noting the physical properties (colour), composition (gravel, sand, clay, silt and organic matter) and inclusions (e.g. artefacts). The procedure involved: (1) cleaning the samples with a spatula or scalpel blade and distilled water to remove surface contaminants; (2) recording the physical properties, most notably colour; (3) recording the composition e.g. gravel, fine sand, silt and clay; (4) recording the degree of peat humification, and (5) recording the unit boundaries e.g. sharp or diffuse. The results are displayed in Tables 2 to 4.

### 3.3 Deposit modelling

The deposit model for the Hope Wharf site and the wider area was based on a review of 30 borehole records, including the three new geoarchaeological boreholes, 12 geotechnical records (CGL, 2016) and fifteen British Geological Survey archive boreholes (<http://www.bgs.ac.uk/geoindex>) (Figure 2). Sedimentary units from the boreholes were classified into five groups: (1) Bedrock, (2) Gravel, (3) Peat, (4) Upper Alluvium and (5) Made Ground. The classified data for groups 1-5 were then input into a database within the RockWorks 16 geological utilities software, the output from which was generated using ArcMap 10. A west to east borehole transect across the site and the wider area is displayed in Figure 3. Models of surface height were generated for the Gravel, Peat and Upper Alluvium using an Inverse Distance Weighted algorithm (Figures 4, 5, and 7). Thickness of the Peat, total Holocene alluvium (incorporating the Peat and Upper Alluvium) and Made Ground (Figures 6, 8 and 9) were also modelled (also using an Inverse Distance Weighted algorithm).

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 from site. 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.

**Table 1: Borehole attributes for those records used in the deposit model, Hope Wharf, Greenwich High Road, Royal Borough of Greenwich.**

Name	Easting	Northing	Elevation (m OD)	Total Depth (m)
<i>Geoarchaeological boreholes</i>				
HW-QBH1	537535.44	176996.95	4.98	3.60
HW-QBH2	537588.29	177066.01	4.71	6.00
HW-QBH3	537613.66	177029.04	4.67	3.00
<i>Geotechnical records (CGL, 2016)</i>				
D101	537583.40	177070.10	4.83	24.45
D102	537617.20	177028.10	5.15	21.38
D103	537556.70	176990.90	5.70	21.38
RW01	537536.30	177011.10	4.90	15.50
RW02	537549.40	177024.20	5.10	15.45
RW03	537573.50	177055.30	4.80	15.50
S01	537595.10	177059.20	5.05	5.00
S02	537609.50	177045.30	5.17	5.45
S03	537552.40	177017.80	5.10	5.45
S04	537545.60	176980.60	5.45	5.00
S05	537537.20	177000.80	5.10	6.15
S06	537561.10	177034.40	5.14	6.45
<i>British Geological Survey archive boreholes (<a href="http://www.bgs.ac.uk/geoindex/">http://www.bgs.ac.uk/geoindex/</a>)</i>				
TQ37NE160	537600.00	177000.00	5.29	6.25
TQ37NE1406	537500.00	177050.00	4.45	9.30
TQ37NE159	537650.00	177050.00	5.11	6.09
TQ37NE1408	537540.00	177050.00	4.66	9.60
TQ37NE1817	537500.00	177060.00	4.64	24.00
TQ37NE143	537570.00	177070.00	2.65	16.36
TQ37NE1818	537530.00	177070.00	5.17	8.40
TQ37NE1407	537540.00	177090.00	4.71	9.50
TQ37NE1802	537500.00	176950.00	5.23	9.35
TQ37NE1804	537490.00	176990.00	4.92	7.60
TQ37NE1803	537490.00	176980.00	4.97	7.50
TQ37NE1805	537440.00	176990.00	4.88	7.60
TQ37NE1806	537440.00	176980.00	4.98	7.50
TQ37NE151	537700.00	177060.00	5.14	6.70
TQ37NE1405	537490.00	176950.00	4.85	9.20

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

The results of the deposit modelling are displayed in Figures 3 to 9. Figure 3 is a two-dimensional west-east transect of selected boreholes across the area of the site, whilst Figures 4 to 9 are surface elevation and thickness models for each of the main stratigraphic units at the site. 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 certainty across the site.

The full sequence of sediments recorded in the boreholes comprises:

- Made Ground
- Alluvium – widely present, frequently described as organic or 'peaty'
- Peat – only locally present
- Gravel – widely present

### 4.1 Gravel

The Shepperton Gravel was present in all the boreholes that penetrated to the bottom of the Holocene sequence (only geoarchaeological boreholes HW-QBH1 and HW-QBH3 did not reach this unit). 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.

Within the area of the site, the surface of the Gravel lies at between -1.30 (RW01) and 1.75m OD (D102) (Figures 3 and 4). In general it falls from between 1.75 and 0.72m OD towards the southeast (SO4, D103, D102 and S02), to between -0.09 and -1.30 towards the northwest and the modern channel of Deptford Creek (RW01, RW02, D101 and HW-QBH2). This general pattern continues towards the east of the site, where it rises to 3.37m OD in borehole TQ37NE151; this elevated surface probably represents the higher terrace of the Kempton Park Gravel. The surface topography is thus uneven within the area of the site, the Gravel surfaces recorded indicating that it lies on the eastern margin of the valley of the Deptford Creek and at the interface between the deeper deposits of the floodplain and higher, drier ground of the Kempton Park Terrace.

### 4.2 Peat

Peat was recorded in two boreholes in the north-western area of the site (geoarchaeological borehole HW-QBH2 and BGS archive borehole TQ37NE143). Although limited to a very small area of the site, the Peat is indicative of a transition towards semi-terrestrial (marshy) conditions, supporting the growth of sedge fen/reed swamp and/or woodland communities at this location. The

surface of the Peat in borehole HW-QBH2 lies at 0.01m OD, whilst in boreholes and TQ37NE143 and TQ37NE1405 (ca. 50m to the southeast) it is recorded much higher at between 1.71 and 1.85m OD respectively (Figure 5). Only 0.1m of Peat was recorded in HW-QBH2, whilst in TQ37NE143 and TQ37NE1405 1.4 and 1.9m was recorded (Figure 6).

The localised nature of the Peat at the Hope Wharf site may indicate that peat formation was confined to small floodplain hollows; alternatively, subsequent fluvial activity may have eroded what was once a more widespread Peat unit. In many places the Alluvium at the site is described either as organic, 'peaty' or containing peat lenses (see below), perhaps indicating that the former scenario is more likely on the basis that coarser-grained sediments would be identified across the site if erosion had been widespread.

### 4.3 Alluvium

A unit of silty, clayey and frequently organic Alluvium was recorded in the majority of boreholes, overlying the Gravel or where present, the Peat (HW-QBH2 and TQ37NE143). 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 deposits of the Alluvium at the Hope Wharf site are described as predominantly silty or clayey, with frequent organic units or lenses. The surface of this unit (Figure 7) is variable within the area of the site, recorded at between 0.10 (RW02) and 2.17m OD (S02); beyond the margins of the site it rises to the west to 3.85m OD in the area of TQ37NE1817.

The thickness of the Holocene alluvial sequence (incorporating the Peat and Alluvium) is displayed in Figure 8. This thickness tends to reflect the topography of the underlying Gravel surface, with greater thicknesses recorded in areas of lower Gravel topography towards the northwest. Within the area of the site this thickness is variable, with some areas where Made Ground directly overlies the Gravel (D102, D103 and S04), and up to 2.2m (RW01) recorded towards the west and the main axis of the valley of Deptford Creek.

### 4.4 Made Ground

Between 2.9 (RW03) and 5m (RW02 and S05) of Made Ground caps the Holocene alluvial sequence across the site (Figure 9).



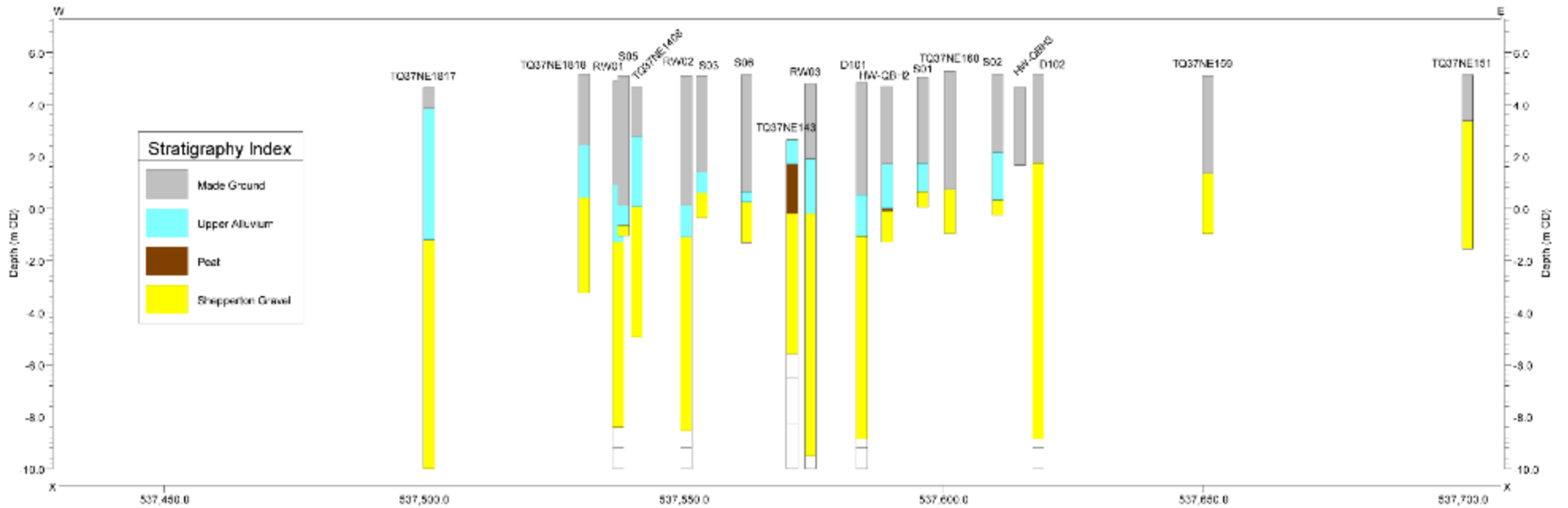


Figure 3: West-East transect of selected boreholes across the site at Hope Wharf, Greenwich High Road, Royal Borough of Greenwich.

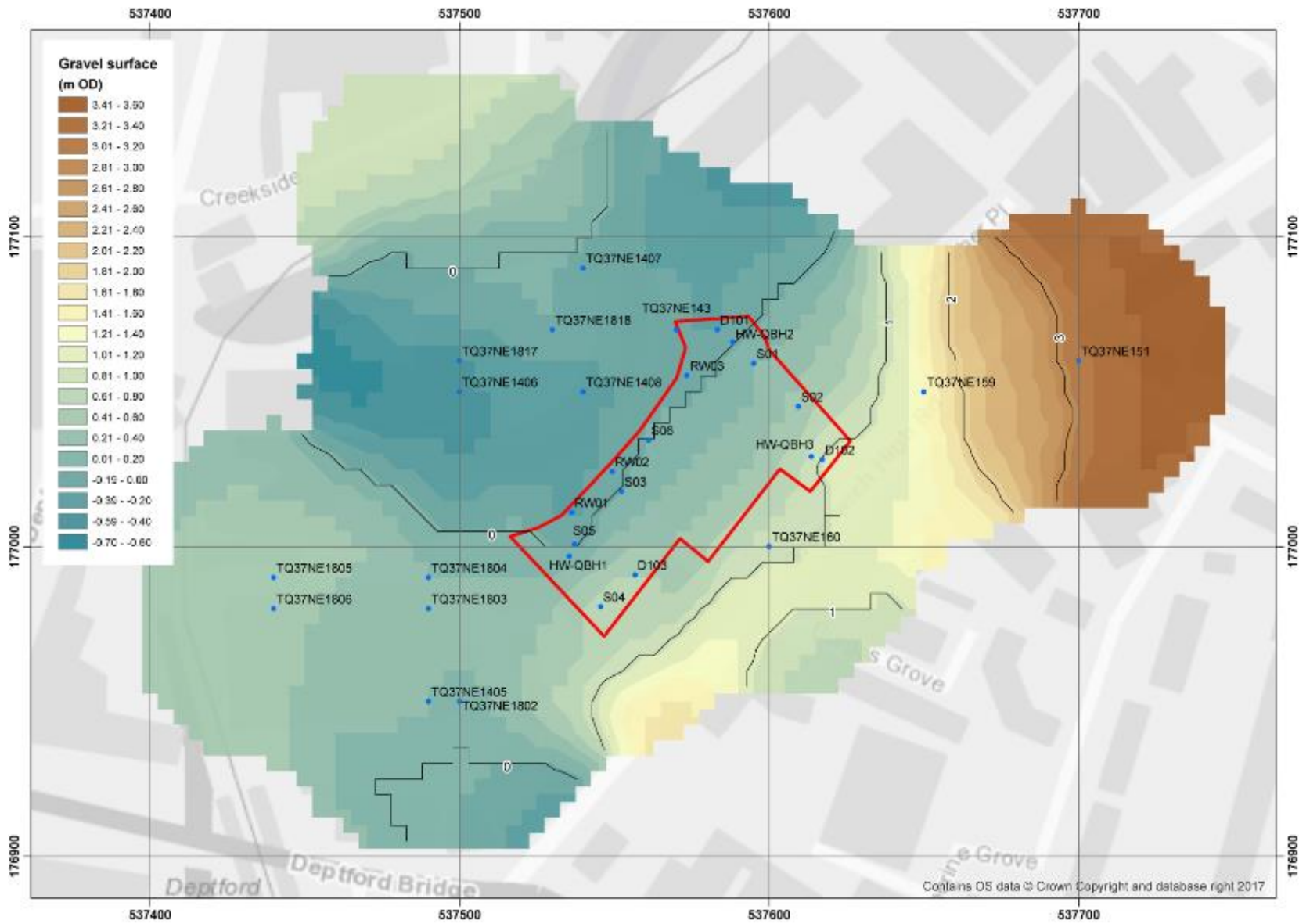


Figure 4: Top of the Shepperton Gravel (m OD) (site outline in red)

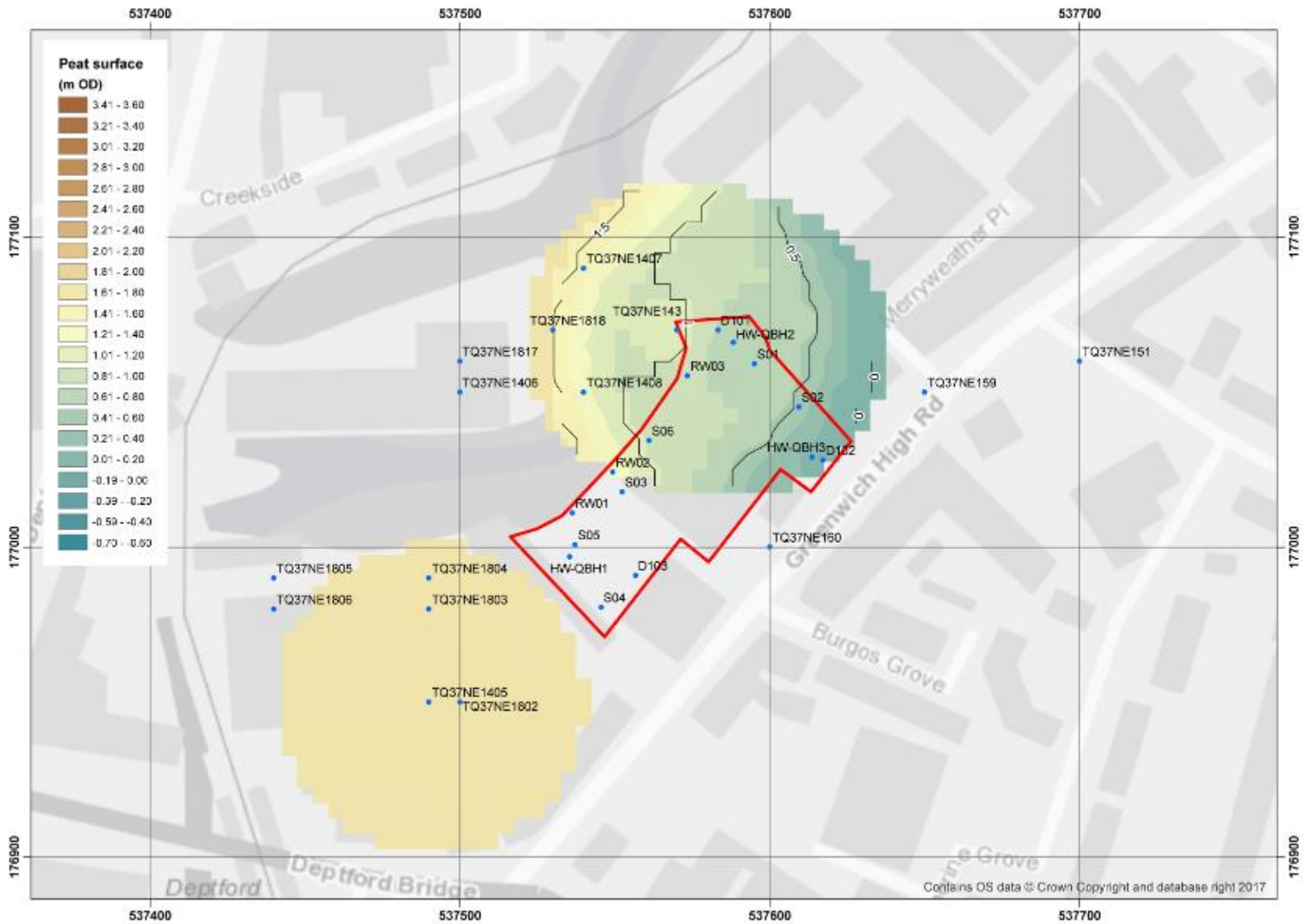


Figure 5: Top of the peat (m OD) (site outline in red)

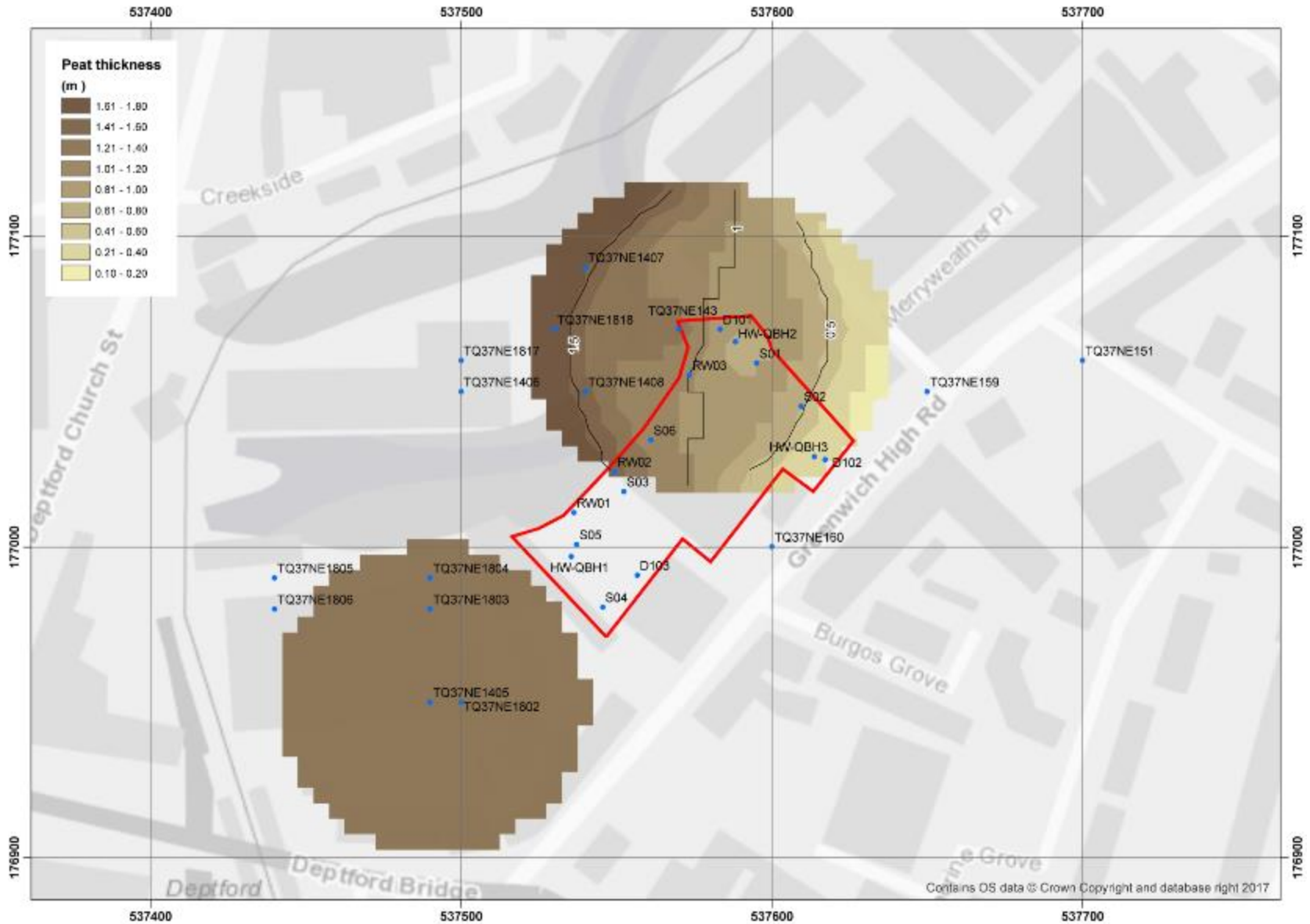


Figure 6: Thickness of the Peat (m) (site outline in red)



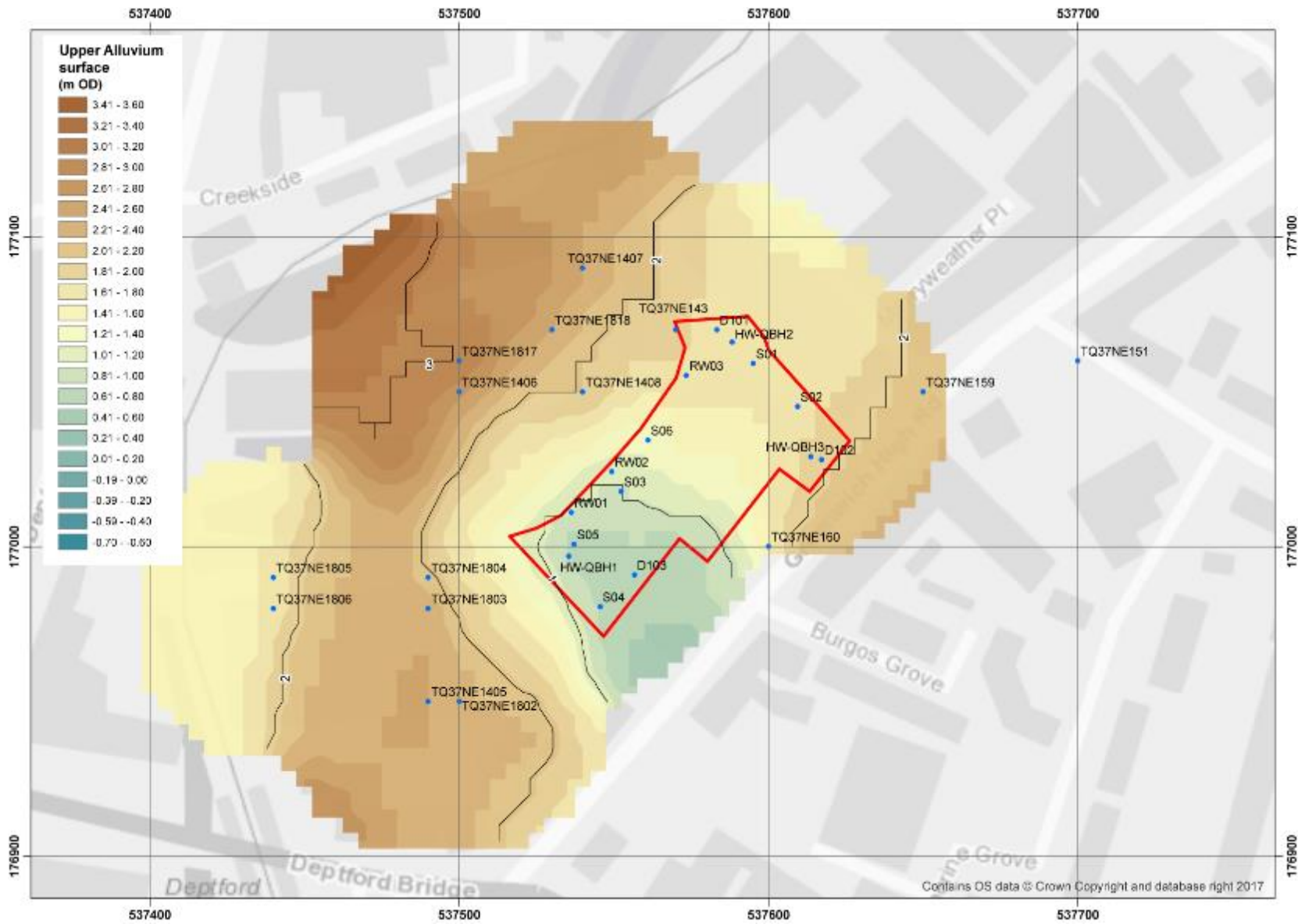


Figure 7: Top of the Upper Alluvium (m OD) (site outline in red)

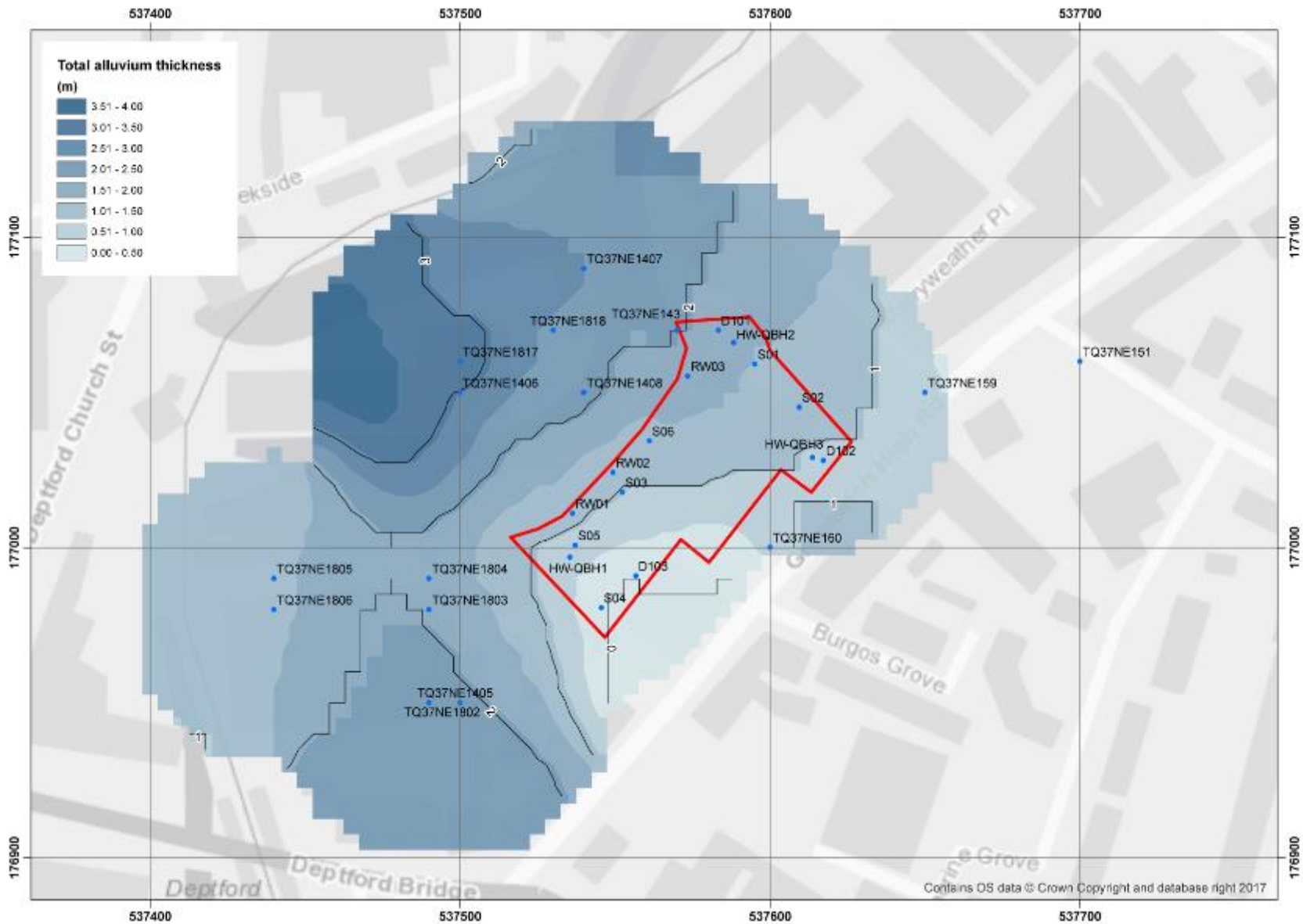


Figure 8: Thickness of the Holocene alluvial sequence, incorporating the Peat and Upper Alluvium (m) (site outline in red)

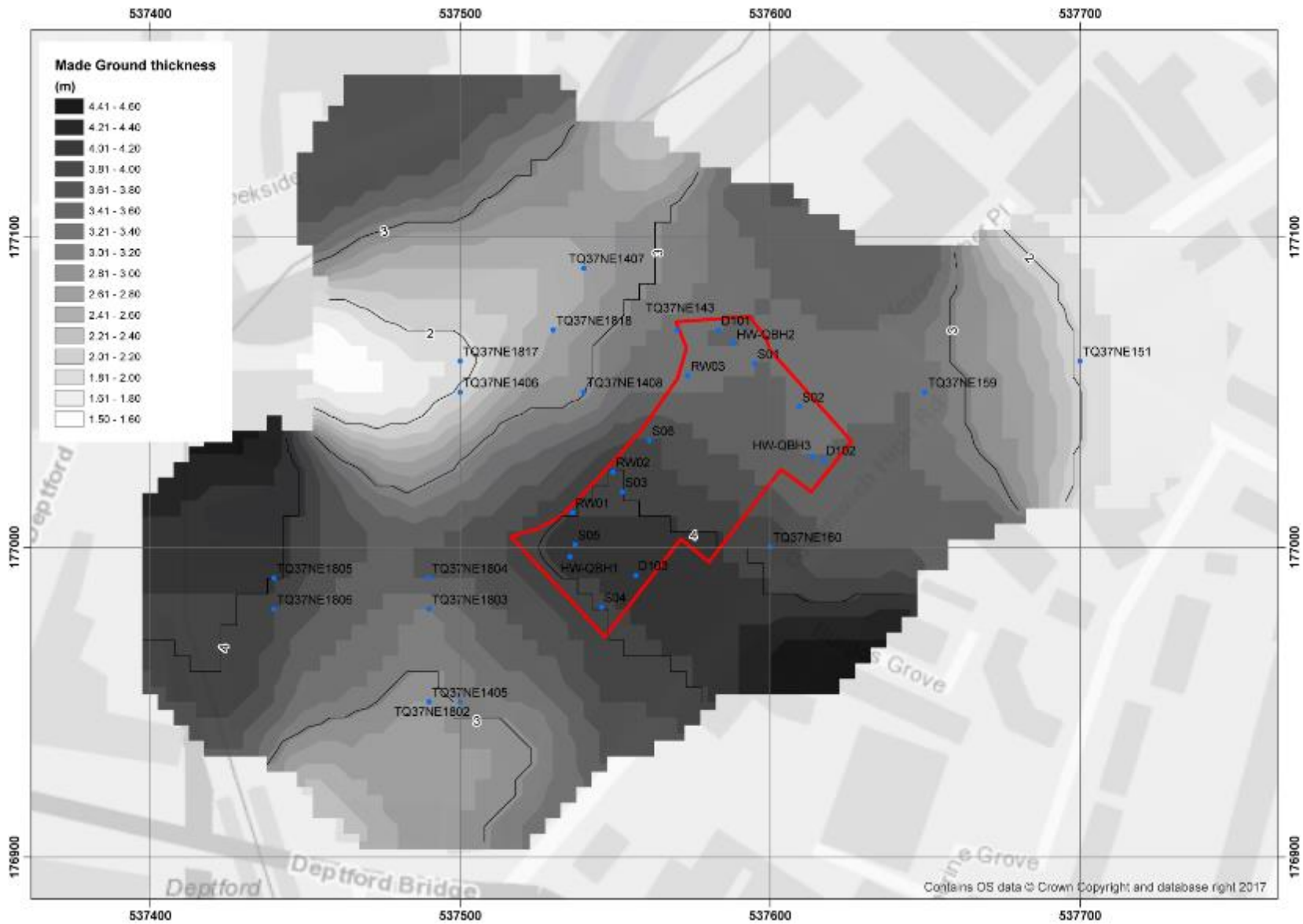


Figure 9: Thickness of the Made Ground (m) (site outline in red)

Table 2: Lithostratigraphic description of borehole QBH1, Hope Wharf, Greenwich High Road, Royal Borough of Greenwich

Depth (m OD)	Depth (m bgs)	Description	Interpretation
4.98 to 2.98	0.00 to 2.00	Made Ground of concrete and brick fragments in matrix of gravelly silty clay.	MADE GROUND
2.98 to 2.38	2.00 to 2.60	Made Ground of concrete and brick fragments.	
2.38 to 1.38	2.60 to 3.60	Redeposited gravel and alluvium with brick fragments	

Table 3: Lithostratigraphic description of borehole QBH2, Hope Wharf, Greenwich High Road, Royal Borough of Greenwich

Depth (m OD)	Depth (m bgs)	Description	Interpretation
4.71 to 2.11	0.00 to 2.60	Made Ground of concrete and brick rubble.	MADE GROUND
2.11 to 1.71	2.60 to 3.00	Redeposited silty/clayey alluvium with brick and concrete fragments	
1.71 to 0.71	3.00 to 4.00	Ag2 As2; dark blueish grey silt and clay. Diffuse contact in to:	ALLUVIUM
0.71 to 0.01	4.00 to 4.70	Ag2 As2 DI+; dark blueish grey silt and clay with a trace of detrital wood. Diffuse contact in to:	
0.01 to -0.09	4.70 to 4.80	Sh2 Ag2; humo. 3; dark reddish brown well humified very organic silt. Sharp contact in to:	PEAT
-0.09 to -1.29	4.80 to 6.00	Gg3 Ga1 Ag+; orange sandy gravel with a trace of silt. Clasts are flint, sub-angular to well-rounded, up to 40mm in diameter.	SHEPPERTON GRAVEL

Table 4: Lithostratigraphic description of borehole QBH3, Hope Wharf, Greenwich High Road, Royal Borough of Greenwich

Depth (m OD)	Depth (m bgs)	Description	Interpretation
4.67 to 1.67	0.00 to 3.00	Made Ground of concrete and brick rubble.	MADE GROUND
1.67	3.00	Obstruction – borehole terminated.	



## 5. DISCUSSION

The aim of the geoarchaeological investigations at the Hope Wharf site was to (1) clarify the nature of the sub-surface stratigraphy across the site, (2) to investigate the nature, depth, extent and likely date of any alluvium and peat deposits; and (3) to make recommendations for any further environmental archaeological assessment. In order to achieve this aim, three geoarchaeological boreholes were put down at the site and a programme of deposit modelling undertaken, incorporating the results of existing geotechnical investigations.

The results of the investigations indicate that the Hope Wharf site lies at the interface between the deeper floodplain deposits of Deptford Creek and the higher, drier ground of the Kempton Park Terrace; the Gravel surface here lies at between -1.30 towards the northwest and 1.75m OD towards the southeast. The Gravel at the site is overlain in places by a Holocene alluvial sequence of up to 2.2m thickness, although in places this has been entirely truncated by the overlying Made Ground. The alluvium is generally organic-rich, and in two places towards the northwest of the site a Peat horizon is recorded; in one geoarchaeological borehole this was only 0.1m in thickness, although in one of the previous geotechnical records it was recorded as 1.4m thick.

Elsewhere in the valley of Deptford Creek, at the Kent Wharf site ca. 300m to the north (Batchelor, 2016), slightly deeper Gravel surfaces were recorded of between -1.64 and -2.23m OD; this was overlain by 0.96-2.2m of generally coarse-grained Alluvium, representing Holocene floodplain sedimentation in a moderate to low energy fluvial or estuarine environment. Towards the south of the site, the Alluvium appeared to be eroded by a former channel or tributary of the Deptford Creek in which a 2m thick horizon of Peat accumulated (Batchelor, 2016). At both Greenwich Creekside East (ca. 650m to the north; Batchelor, 2015), and Faircharm Creative Quarter site (200m to the north; Young, 2014), geoarchaeological investigations were indicative of an inorganic sedimentary sequence similar to that recorded across the majority of the Kent Wharf site.

However, further upstream and ca. 200m to the southwest at Old Seager Distillery (Batchelor *et al.*, 2009; 2014), Peat (overlying gravel) was recorded within a tree-throw hollow between 0.44 and 1.80m OD, and radiocarbon dated to between 7200-6440 and 5580-5320 cal BP (late Mesolithic to Neolithic). Significantly, the Peat also contained a lithic assemblage dating to the Mesolithic or Early Neolithic. The condition of the Peat was relatively poor, limiting the palaeoenvironmental reconstruction of the site, but indicated the growth of fen woodland on the wetland and mixed deciduous woodland on the dryland during this period, with a decline in elm woodland recorded after 6740-6540 cal BP potentially linked to human activity. Following a long hiatus, a second phase of Peat formation occurred between 1940-1810 and 1020-930 cal BP (Roman and Medieval periods). During this period, the wetland was dominated by aquatics and emergent plants, with a much reduced woodland cover, while the dryland was open and dominated by herbaceous communities (Batchelor *et al.*, 2009, 2014). The DLR Lewisham Extension site (Sidell *et al.*, 1999; Figure 1) indicated a similar sedimentary sequence to Old Seager Distillery; basal alluvial silt/clays were overlain by Peat from 7430-7030 cal BP (Late Mesolithic) that accumulated between ca. 0 and 0.5m OD. A hiatus in

Peat formation of unknown duration also occurred here, represented by a weakly organic clay indicating deposition under aquatic conditions.

## 6. CONCLUSIONS AND RECOMMENDATIONS

The results of the geoarchaeological investigation have confirmed the presence of Peat deposits in the north-western area of the site, within a sequence of generally organic-rich alluvium across much of the site. However, further work is not recommended because the peat is thin and isolated to a small part of the site. This suggests localised peat formation over a short period of time (ca. 100 years) only.

## 7. REFERENCES

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## 8. APPENDIX 1: OASIS FORM

**OASIS ID: quaterna1-289587**

### Project details

Project name	Hope Wharf, Greenwich High Road, Royal Borough of Greenwich
Short description of the project	The aim of the geoarchaeological investigations at the Hope Wharf site was to (1) clarify the nature of the sub-surface stratigraphy across the site, (2) to investigate the nature, depth, extent and likely date of any alluvium and peat deposits; and (3) to make recommendations for any further environmental archaeological assessment. In order to achieve this aim, three geoarchaeological boreholes were put down at the site and a programme of deposit modelling undertaken, incorporating the results of existing geotechnical investigations. The results of the geoarchaeological investigation have confirmed the presence of relatively thin Peat deposits in the north-western area of the site, within a sequence of generally organic-rich alluvium across much of the site. Although relatively thin, the deposits in borehole HW-QBH2 have the potential to provide a detailed reconstruction of past environments through the assessment/analysis of palaeoecological remains (e.g. pollen, plant macrofossils and insects) and radiocarbon dating. Furthermore, such investigations have the potential of providing evidence of human activity; unequivocal evidence for which has been recorded at the nearby Old Seager Distillery site. It was therefore recommended that an environmental archaeological assessment of the HW-QBH2 sequence is undertaken.
Project dates	Start: 01-05-2017 End: 07-07-2017
Previous/future work	No / Not known
Any associated project codes	HOP17 - Sitecode reference
Type of project	Environmental assessment
Survey techniques	Landscape

### Project location

Country	England
Site location	GREATER LONDON GREENWICH GREENWICH Hope Wharf



Postcode SE10 8LR  
Site coordinates TQ 37583 77026 51.474938554346 -0.018706458189 51 28 29 N 000 01  
07 W Point

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### Project creators

Name of Quaternary Scientific (QUEST)  
Organisation

Project brief CgMs Consulting  
originator

Project design D.S. Young  
originator

Project C.R. Batchelor  
director/manager

Project supervisor D.S. Young

Type of Developer  
sponsor/funding  
body

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### Project archives

Physical Archive No  
Exists?

Digital Archive No  
Exists?

Paper Archive LAARC  
recipient

Paper Contents "Environmental", "Stratigraphic"

Paper Media "Report"  
available

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Entered by Daniel Young (d.s.young@reading.ac.uk)

Entered on 7 July 2017