

# RAM BREWERY (PHASE 1), RAM STREET, LONDON BOROUGH OF WANDSWORTH (SITE CODE: RBR14): GEOARCHAEOLOGICAL FIELDWORK AND DEPOSIT MODEL REPORT

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## INTRODUCTION

This report summarises the findings arising out of the geoaerchaeological fieldwork and deposit modelling undertaken by Quaternary Scientific (University of Reading) in connection with the proposed development of land at Ram Brewery (Phase 1), Ram Street, London Borough of Wandsworth (National Grid Reference: TQ 256 747; Site Code: RBR14; Figure 1). This report refers to the work conducted in the area of the site outlined in Figure 2, referred to as Phase 1. Quaternary Scientific were commissioned by CgMs Consulting to undertake the geoaerchaeological investigations. The site is located in the valley of the River Wandle, a right bank tributary of the tidal River Thames. It is about 600m upstream from the confluence with the Thames, the modern ground level lying at between ca. 5.5 and 4.5m OD. The British Geological Survey (BGS; 1:50,000 Sheet 270 South London 1998) shows the site as Made Ground overlying Alluvium, resting on London Clay bedrock.

During previous geotechnical (Soils Ltd., 2000; MoLA, 2012) and archaeological investigations at the site (Anthony, 2007) variable thicknesses of between ca. 2.5 and 3.0m of Made Ground were recorded across the site. In the three geotechnical boreholes the Made Ground directly overlay gravel at between 2.0 and 2.5m OD; the Gravel surface was recorded in only one of the archaeological test pits at 2.6m OD (TP316). No Alluvium was recorded in the boreholes or test pits, and as identified by Anthony (2007), the level of the Gravel surface recorded across the site (2.0 to 2.6m OD) suggests that the site lies on the Kempton Park Terrace. Around 400m to the north of the site at Osiers Road (Green & Young, 2010; Figure 1) and ca. 500m to the northwest at the Morganite site (Branch *et al.*, 2007; Figure 1) sequences of Alluvium overlying Gravel were recorded, at the former between 2.50 and -0.40m OD and at the latter between 2.20m and -0.81m OD (Branch *et al.*, 2007). The sequence to the east of the Morganite site, and across much of the Osiers Road site was thought to occupy a north-south channel cut down into the Gravels of the Kempton Park Terrace, which were seen to rise westward to levels between 3m and 5m OD. The build-up of Made Ground above the palaeochannel sediments in the Morganite site can then be seen as bringing the ground surface up to the level of the Kempton Park Terrace, immediately to

the west. At its base the alluvial sequence rested on Gravel which should probably be regarded as part of the Wandle Gravel of Gibbard (1985), and equivalent to the Shepperton Gravel of the Thames valley and therefore of late last glacial (Devensian) age.

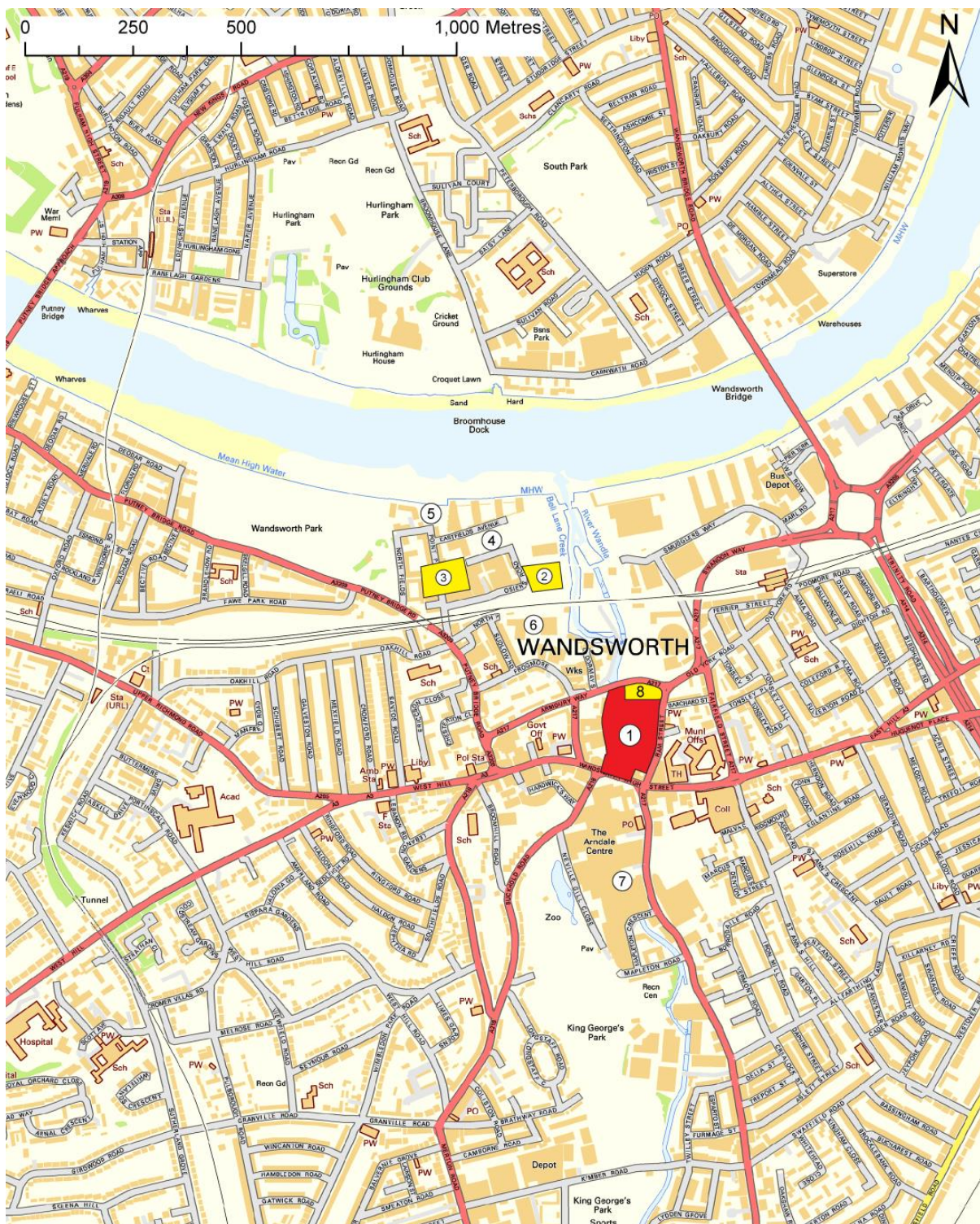
The alluvial sequence at the Morganite site consisted of silty sands with scattered clasts of flint (up to 25mm). These silty sands overlay Peat and slightly gravelly organic silts which passed down into calcareous sands including remains of molluscs and ostracods, with a second peaty horizon at the base of the sequence resting directly on the underlying gravel. This sequence was dated from at least 4780-4420 to 1570-1410 cal BP (Branch *et al.* 2007; Jarrett *et al.*, 2010). Other investigations nearby confirm the presence of organic sediments associated with the prehistoric River Wandle close to its confluence with the Thames. At the Former Shell Oil Terminal, Point Pleasant (Perry & Skelton, 1995a; Figure 1), these have been radiocarbon dated to 3640-3380 cal BP and 2920-2500 cal BP (-1.2 to -0.7m OD). At the Prospect Reach Foreshore site, Point Pleasant (Perry & Skelton, 1995b; Figure 1), a radiocarbon-dated Peat and alluvial sequence is of Roman and post-Roman age. To the south of the Morganite site at the Frogmore Depot, Dormay Street site, an alluvial sequence including organic-rich sediments and peat dated from at least 2460-2160 to 910-700 (Site Code: FDD04; Spurr, 2004; Figure 1).

Around 250m to the south and upstream of the Ram Brewery site, at Garratt Lane, the Museum of London Archaeology Service (site code: GLW01; Howe *et al.*, 2002) recorded an undulating gravel surface that lay at ca. 3.6m OD in the centre and east of the site, but falling to below 2.0m OD in the western part of the site, indicative of a north-south aligned palaeochannel. The gravel was overlain by prehistoric mineral-rich and organic sediments, recorded as post-Bronze Age in date (2780-2370 cal BP). Around 500m south of the Ram Brewery site, Gibbard (1985) illustrates a borehole transect across the valley showing ca. 1.7m of gravel overlying London Clay at ca. 0.55m OD. The gravel is overlain by ca. 1.1m of Alluvium with an upper surface at ca. 3.3m OD.

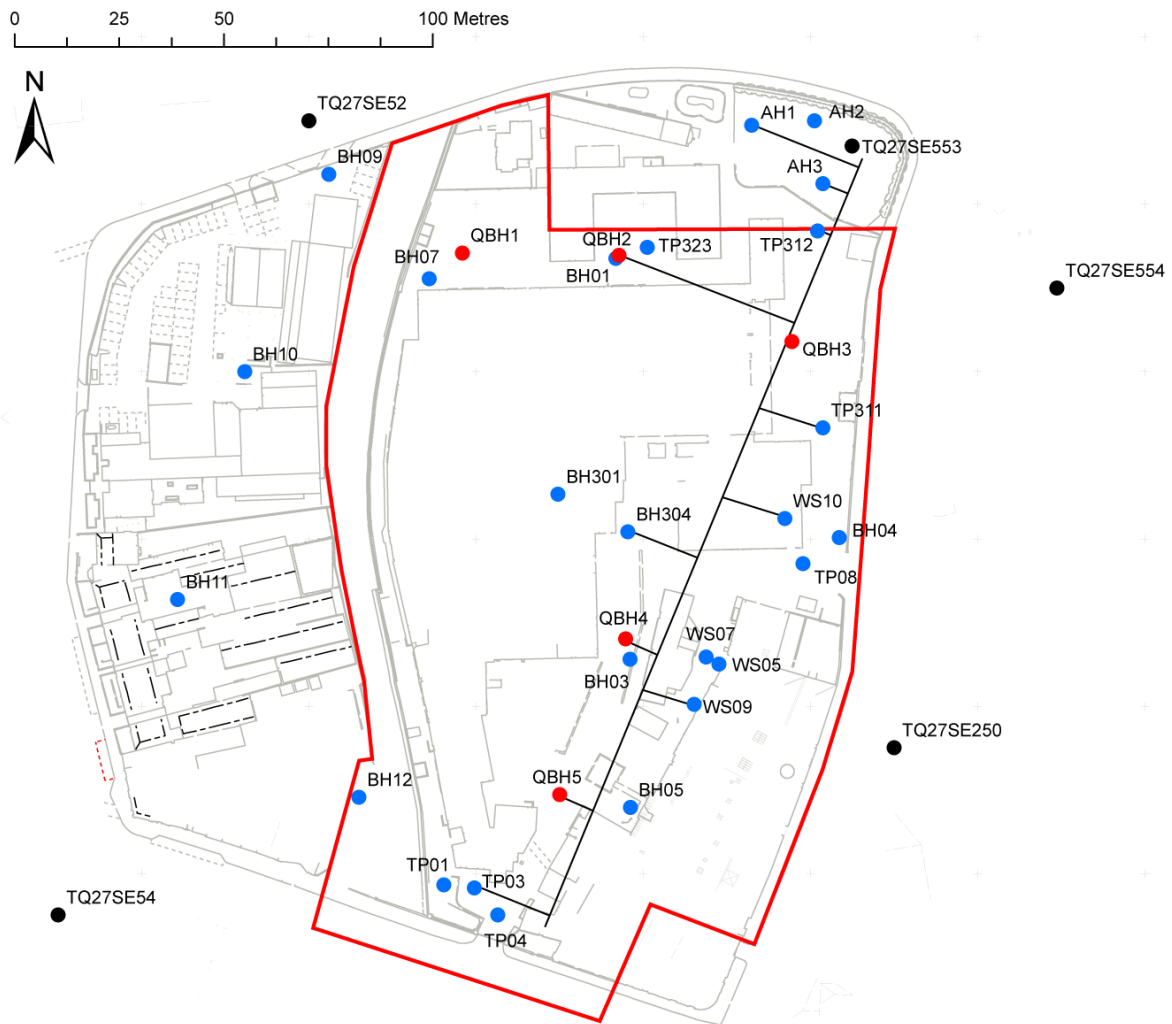
The aims of the geoarchaeological investigations at the Ram Brewery (Phase 1) site were thus: (1) to clarify the nature of the sub-surface stratigraphy, in particular the presence and thickness of Alluvium (including Peat) in this part of the Wandle valley, and (2) to evaluate the potential of the sedimentary sequences for reconstructing the environmental history of the site and its environs. In order to achieve this aim, five geoarchaeological boreholes were put down at the site forming approximately north-south and east-west transects. A

programme of deposit modelling was then undertaken, as outlined in the written scheme of investigation for the site (Young, 2014). This process incorporated:

1. Recording the lithostratigraphy of the new geoarchaeological borehole sequences to clarify the nature of the subsurface stratigraphy at the site, and to provide a preliminary reconstruction of the sedimentary history;
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.



**Figure 1: Location of the Ram Brewery (Phase 1) site, Ram Street, London Borough of Wandsworth (Site Code: RBR14) and other sites of geoarchaeological interest: (2) Osiers Estate (Green & Young, 2010); (3) Morganite Site (Branch *et al.*, 2007); (4) Former Shell Oil Terminal (Perry & Skelton, 1995a); (5) Prospect Reach Foreshore (Perry & Skelton, 1995b); (6) Frogmore Depot (Spurr, 2004) (7) Garratt Lane (Howe *et al.*, 2002) and (8) Ram Brewery – Phase 1 (MoLA, 2012). Contains Ordnance Survey data © Crown copyright and database right [2012].**



**Figure 2: Location of the new Quest geoaerchaeological boreholes (red) and existing geoaerchaeological and geotechnical boreholes (blue), including existing BGS borehole records (black) at the Ram Brewery (Phase 1) site. Contains Ordnance Survey data © Crown copyright and database right [2012].**

## **METHODS**

### ***Field investigations and lithostratigraphic descriptions***

Five geoarchaeological boreholes (boreholes QBH1 to QBH5) were put down at the site in August 2014 (Figure 2) by Quaternary Scientific. 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 recorded using a Leica GS09 Differential GPS (Table 1). The lithostratigraphy of the retained 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 descriptions of the boreholes are displayed in Tables 2 to 6. The spatial attributes of the boreholes are displayed in Table 1 and in Figure 2.

### ***Deposit modelling***

The deposit model was based on a review of 35 borehole records, incorporating the five new Quest geoarchaeological boreholes, three Museum of London Archaeology Service (MoLA) geoarchaeological boreholes, 22 geotechnical boreholes or test pits (Concept/Peter Brett Associates) and five BGS borehole records ([www.bgs.ac.uk/opengeoscience](http://www.bgs.ac.uk/opengeoscience)) within or around the site (Figure 2; Table 1). Modelling was undertaken using RockWorks 16 geological utilities software. The term 'deposit modelling' describes any method used to depict the sub-surface arrangement of geological deposits, but particularly the use of computer software to create contoured maps or three dimensional representations of contacts between stratigraphic units. The first requirement is to classify the recorded borehole sequences into uniformly identifiable stratigraphic units. At the Ram Brewery (Phase 1) site sedimentary units from the boreholes were classified into five groupings: (1) Gravel, (2) Lower Alluvium, (3) Peat, (4) Upper Alluvium and (5) Made Ground. Models of surface height (using a nearest neighbour routine) were generated for the Gravel, Peat and Upper Alluvium (Figures 5, 6 and 8). Thickness of the Peat (Figure 7), combined Alluvium

(incorporating the Lower Alluvium, Peat and Upper Alluvium (Figure 9) and Made Ground (Figure 10) was also modelled (also using a nearest neighbour routine).

How effectively Rockworks portrays the relief features of stratigraphic contacts or the thickness of sediment bodies depends on the number of data points (boreholes/test pits) per unit area and the extent to which these points are evenly distributed across the area of interest. The portrayal is also affected by the significance assigned to these data points, in terms of the extent of the area around the point to which the data are deemed to apply. This can be predetermined for each data set, and in the present case the value chosen each data point (borehole) is equivalent to an area of 50m radius around each borehole. Although the boreholes are well distributed at the present site, the boreholes are not uniformly distributed over the area of investigation and the reliability of the models is variable. This is particularly true of the western area of the site, where compared to the east relatively few borehole records are available. In general, reliability improves from the boundaries of the site, where edge effects adversely influence the reconstructions, towards the core area of the site where mutually supportive data are likely to be available from several adjacent boreholes.

Reliability is also affected by the quality of the stratigraphic records which in turn are affected by the nature of the sediments and/or their post-depositional disturbance during previous stages of land-use on the site. Quality is also affected where boreholes have been 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 geoarchaeological boreholes put down by Quaternary Scientific and MoLA represent the most detailed record of the sediment sequences. Finally, 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.

**Table 1: Borehole attributes for those records used in the deposit model, Ram Brewery (Phase 1), Ram Street, London Borough of Wandsworth**

<b>Borehole</b>	<b>Easting</b>	<b>Northing</b>	<b>Elevation (m OD)</b>
<i>Quest geoarchaeological boreholes</i>			
QBH1	525596.77	174828.41	4.50
QBH2	525634.00	174828.00	4.50
QBH3	525675.58	174807.17	4.30
QBH4	525635.76	174736.04	4.20
QBH5	525620.00	174698.82	4.50
<i>Concept boreholes/test pits</i>			
BH01	525633.90	174827.30	4.42
BH03	525636.80	174731.20	4.02
BH04	525686.90	174760.30	4.67
BH05	525636.90	174695.80	4.18
BH07	525588.80	174822.20	4.48
BH09	525564.80	174847.20	4.91
BH10	525544.60	174800.00	5.25
BH11	525528.60	174745.50	4.60
BH12	525572.00	174698.20	5.18
WS05	525658.10	174730.00	4.42
WS07	525655.00	174731.70	4.37
WS09	525652.20	174720.40	4.20
WS10	525673.90	174764.90	4.54
TP01	525592.30	174677.20	5.51
TP03	525599.60	174676.50	5.27
TP04	525605.20	174670.00	5.25
TP08	525678.20	174754.10	4.49
<i>Peter Brett Associates test pits/boreholes</i>			
TP311	525683.01	174786.58	4.37
TP312	525681.77	174833.65	4.35
TP323	525641.00	174829.71	4.46
BH301	525619.57	174770.72	4.53
BH304	525636.29	174761.70	4.38
<i>BGS boreholes</i>			
TQ27SE52	525560.00	174860.00	4.12
TQ27SE54	525500.00	174670.00	6.09
TQ27SE553	525690.00	174854.00	4.80
TQ27SE554	525739.00	174820.00	4.79
TQ27SE250	525700.00	174710.00	5.46
<i>MoLA geoarchaeological boreholes</i>			
AH1	525666.00	174859.00	5.04
AH2	525681.00	174860.00	4.95
AH3	525683.00	174845.00	4.84



## **RESULTS, INTERPRETATION AND DISCUSSION OF THE LITHOSTRATIGRAPHIC DESCRIPTIONS AND DEPOSIT MODELLING**

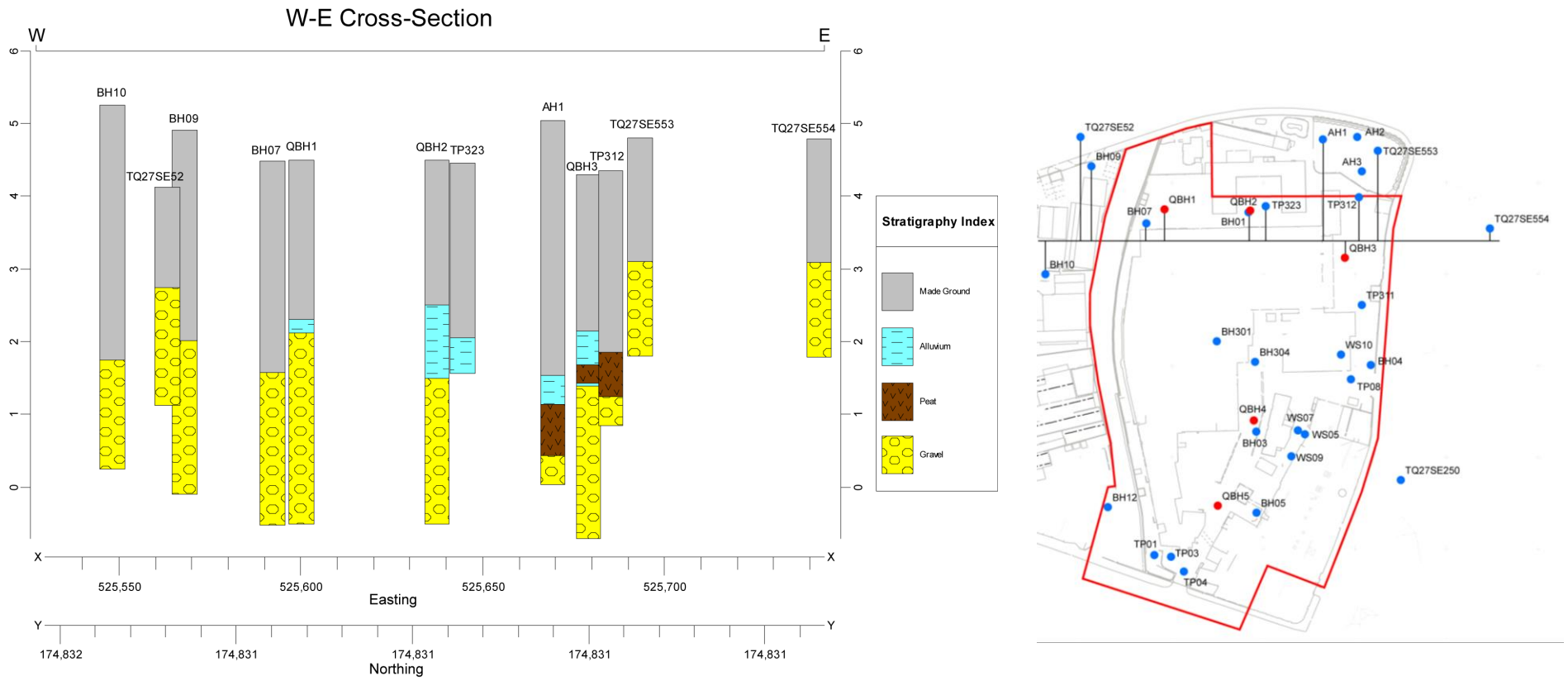
The geoarchaeological investigations (Tables 2 to 6) have permitted a programme of deposit modelling of the surface elevation and thickness of each major stratigraphic unit (Figures 3 to 10). The basal unit at the site is a horizon of sand and gravel, which across the majority of the site lies at between ca. 0.5 and 3.0m OD. The surface of the sand and gravel is generally lower towards the middle of the site, where it is recorded below ca. 2.0m OD, and from where it rises to both the west and east (see Figures 3 and 5) to between ca. 2.0 and 3.0m OD. Towards the middle of the site the surface of the sand and gravel is recorded at 0.44 (AH1), 0.95 (AH2), 0.52 (BH01) and 1.32m OD (QBH4 and BH03); to the east it rises to 3.09m OD in BGS borehole TQ27SE554 and to the west to 2.75m OD in TQ27SE52. The depression in the Gravel surface appears to be broadly linear, aligned approximately northeast-southwest, and may be indicative of a former channel associated with the River Wandle. Where the sand and gravel surface lies below ca. 2.0m OD it is probably equivalent to the Wandle Gravel of Gibbard (1985) (equivalent to the Shepperton Gravel of the Thames valley), deposited during the Late Devensian (10-15,000 years before present) within a high energy braided river environment. Towards the western, eastern and southern extents of the site, where the gravel rises above ca. 2.0m OD, it is most likely equivalent to the Kempton Park Gravel, deposited during the Early to Middle Devensian (30-120,000 years before present).

Within the possible channel feature and towards the north of the site, the Gravel is overlain by very organic Alluvium or Peat in three boreholes, between 0.7 (AH1) and 0.25m thick (QBH3; see Figure 7) and generally lying at between 0.5 and 1.85m OD. In borehole QBH4, directly overlying the Gravel, an organic clayey silt with indications of soil formation is recorded between 1.51 and 1.32m OD; a similar possible soil horizon was recorded in borehole AH2 between 0.95 and 1.10m OD (MoLA, 2014). Peat was also recorded in borehole AH3 at a higher elevation of between 2.39 and 2.64m OD (MoLA, 2014). Significantly, the highly organic Alluvium and Peat horizons are indicative of a transition towards a semi-terrestrial environment, supporting the growth of wetland vegetation and which may have been utilised by prehistoric people. Where possible soil horizons are identified, these are indicative of drier, more terrestrial environments which again may have been utilised by prehistoric people.

In boreholes QBH4, AH1, AH2 and AH3 (towards the north of the site) the organic horizons

described above are overlain by tufa-rich deposits, up to 0.33m thick (QBH4) and recorded at between 1.10 and 1.84m OD. The tufa is of varying grain size (silt to gravel) and is indicative of the accumulation of calcareous sediment in a low energy and probably shallow aquatic environment.

The organic horizons (Peat/possible soils) and tufa-rich deposits appear to be confined to the northern area of the site, within the possible channel feature. Where present, they are overlain by a horizon of silty and clayey Alluvium, which in places is sandy and contains detrital organic material. Elsewhere, this horizon directly overlies the Gravel in selected boreholes, but is more common within the area of the possible channel feature. This horizon is considered to represent the Upper Alluvium, indicative of sediment accumulation on the floodplain at a distance from any active channels but with occasional input of coarser material during higher-energy flood events. The surface of the Upper Alluvium generally lies at between ca. 2.0 and 3.0m OD (Figure 8). In general the total thickness of the Holocene Alluvium (incorporating the Peat/organic horizons (where present) and Upper Alluvium) is greatest within the possible channel feature and towards the north of the site, where it is generally greater than 1.0m thick (Figure 9). In places, predominantly to the west of the possible channel feature and towards the south of the site Made Ground directly overlies the Gravel, and Holocene Alluvium is absent. In such instances the recorded depth of the Gravel can only be used as an indication of the minimum elevation of the Gravel surface due to possible truncation. In general, the Made Ground is thicker towards the west and south of the site (Figure 10), where it is recorded at up to 3.0m thick in BH301, 3.5m thick in BH12 and 2.9m thick in BH07. The modern surface elevation of the site is relatively even, generally lying at between 4.5 and 5.0m OD.



**Figure 3: West-East transect of selected boreholes across the site at Ram Brewery (Phase 1), Ram Street, London Borough of Wandsworth**

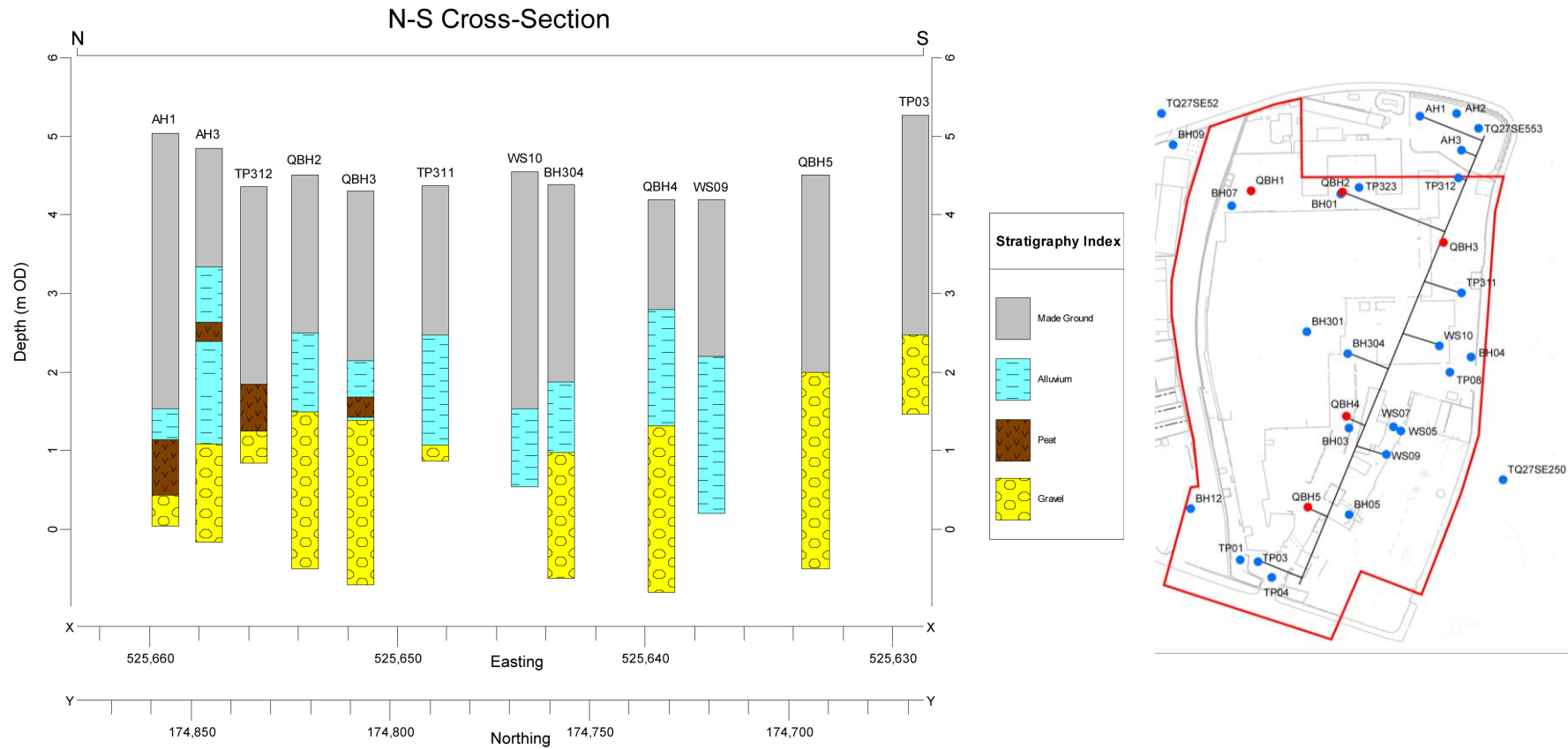


Figure 4: North-South transect of selected boreholes across the site at Ram Brewery (Phase 1), Ram Street, London Borough of Wandsworth

**Table 2: Lithostratigraphic description of borehole QBH1, Ram Brewery (Phase 1), Ram Street, London Borough of Wandsworth**

Depth (m OD)	Depth (m bgs)	Description
4.50 to 2.44	0.00 to 2.06	Made Ground
2.44 to 2.30	2.06 to 2.20	Made Ground/Redeposited Alluvium
2.30 to 2.12	2.20 to 2.38	7.5YR 3/2; As1 Ag1 Sh1 Ga1 Gg+; dark brown organic clay, silt and sand with occasional gravel clasts. Sharp contact in to:
2.12 to 1.95	2.38 to 2.55	2.5Y 3/2; Gg2 Ga1 Ag1; dark olive brown silty sandy gravel. Diffuse contact in to:
1.95 to 1.50	2.55 to 3.00	Gg3 Ga1; sandy gravel. Flint clasts sub-angular to sub-rounded, up to 30mm in diameter.

**Table 3: Lithostratigraphic description of borehole QBH2, Ram Brewery (Phase 1), Ram Street, London Borough of Wandsworth**

Depth (m OD)	Depth (m bgs)	Description
4.50 to 2.50	0.00 to 2.00	Made Ground
2.50 to 2.15	2.00 to 2.35	7.5YR 4/1; Ag2 As1 Ga1 Gg+; dark grey sandy clayey silt with occasional gravel clasts and Mollusca. Diffuse contact in to:
2.15 to 1.82	2.35 to 2.68	7.5YR 4/1; Ga2 Ag2 As+; dark grey sand and silt with a trace of clay. Frequent Mollusca. Diffuse contact in to:
1.82 to 1.50	2.68 to 3.00	7.5YR 3/2; Ga2 As1 Ag1; dark brown silty clayey sand with fine horizontal bedding. Occasional Mollusca.
1.50 to 0.50	3.00 to 4.00	Gg3 Ga1 Ag+; sandy gravel with a trace of silt. Flint clasts sub-angular to sub-rounded, up to 50mm in diameter.

**Table 4: Lithostratigraphic description of borehole QBH3, Ram Brewery (Phase 1), Ram Street, London Borough of Wandsworth**

Depth (m OD)	Depth (m bgs)	Description
4.30 to 2.90	0.00 to 1.40	Made Ground
2.90 to 2.15	1.40 to 2.15	Made Ground/redeposited Alluvium
2.15 to 1.68	2.15 to 2.62	2.5Y 3/1; Ag2 As2 Dh+; very dark grey silt and clay with a trace of detrital herbaceous material. Occasional Mollusca; frequent vertical roots. Diffuse contact in to:
1.68 to 1.55	2.62 to 2.75	7.5YR 3/2; Sh2 Ag1 As1 Ga+ Th+; humo. 2/3; dark brown humified very organic silt and clay with traces of sand and herbaceous material. Occasional Mollusca fragments. Diffuse contact in to:
1.55 to 1.43	2.75 to 2.87	7.5YR 4/2; Ag2 As1 Dh1 Ga+ Sh+; brown clayey silt with detrital herbaceous material and traces of sand and organic matter. Sharp contact in to:
1.43 to 1.39	2.87 to 2.91	2.5Y 3/2; Ga3 Ag1; very dark greyish brown silty sand. Sharp contact in to:
1.39 to 1.30	2.91 to 3.00	Gg3 Ga1; sandy gravel. Flint clasts sub-angular to well-rounded, up to 20mm in diameter.

**Table 5: Lithostratigraphic description of borehole QBH4, Ram Brewery (Phase 1), Ram Street, London Borough of Wandsworth**

Depth (m OD)	Depth (m bgs)	Description
4.20 to 2.80	0.00 to 1.40	Made Ground
2.80 to 2.20	1.40 to 2.00	7.5YR 4/1; As2 Ag2 Ga+; dark grey silt and clay with a trace of sand and frequent Mollusca.
2.20 to 1.84	2.00 to 2.36	7.5YR 4/1; Ag2 As1 Ga1; dark grey sandy clayey silt with occasional Mollusca fragments. Diffuse contact in to:
1.84 to 1.61	2.36 to 2.59	7.5YR 3/1; As2 Ag1 Ga1 Gg+; very dark grey sandy silty clay with occasional gravel clasts and tufa fragments. Diffuse contact in to:
1.61 to 1.51	2.59 to 2.69	7.5YR 2.5/1; As2 Ag1 Ga1 Gg+; black sandy silty clay with occasional gravel clasts. Frequent tufa fragments up to 20mm in diameter. Diffuse contact in to:
1.51 to 1.32	2.69 to 2.88	7.5YR 2.5/1; Ag2 As1 Sh1 Ga+ DI+; black organic clayey silt with traces of sand and detrital wood. Possible soil horizonation. Sharp contact in to:
1.32 to 1.20	2.88 to 3.00	Gg3 Ga1; sandy gravel. Flint clasts sub-angular to well-rounded, up to 40mm in diameter.

**Table 6: Lithostratigraphic description of borehole QBH5, Ram Brewery (Phase 1), Ram Street, London Borough of Wandsworth**

Depth (m OD)	Depth (m bgs)	Description
4.50 to 2.90	0.00 to 1.60	Made Ground
2.90 to 1.99	1.60 to 2.51	Made Ground/redeposited Alluvium
1.99 to 1.90	2.51 to 2.60	Gg3 Ga1; sandy gravel. Flint clasts sub-angular to well-rounded, up to 30mm in diameter.

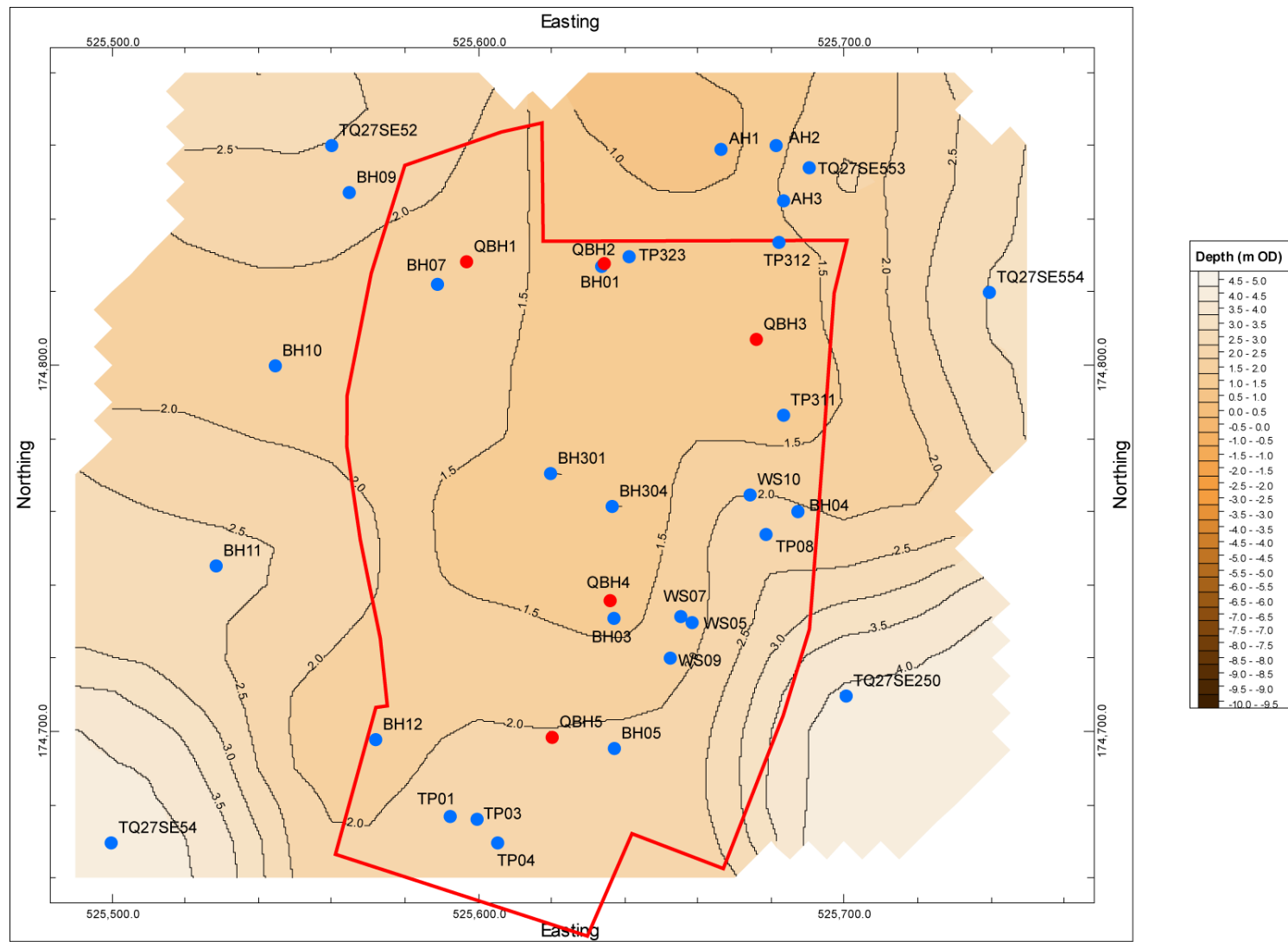


Figure 5: Top of the Gravel (m OD) (site outline in red)

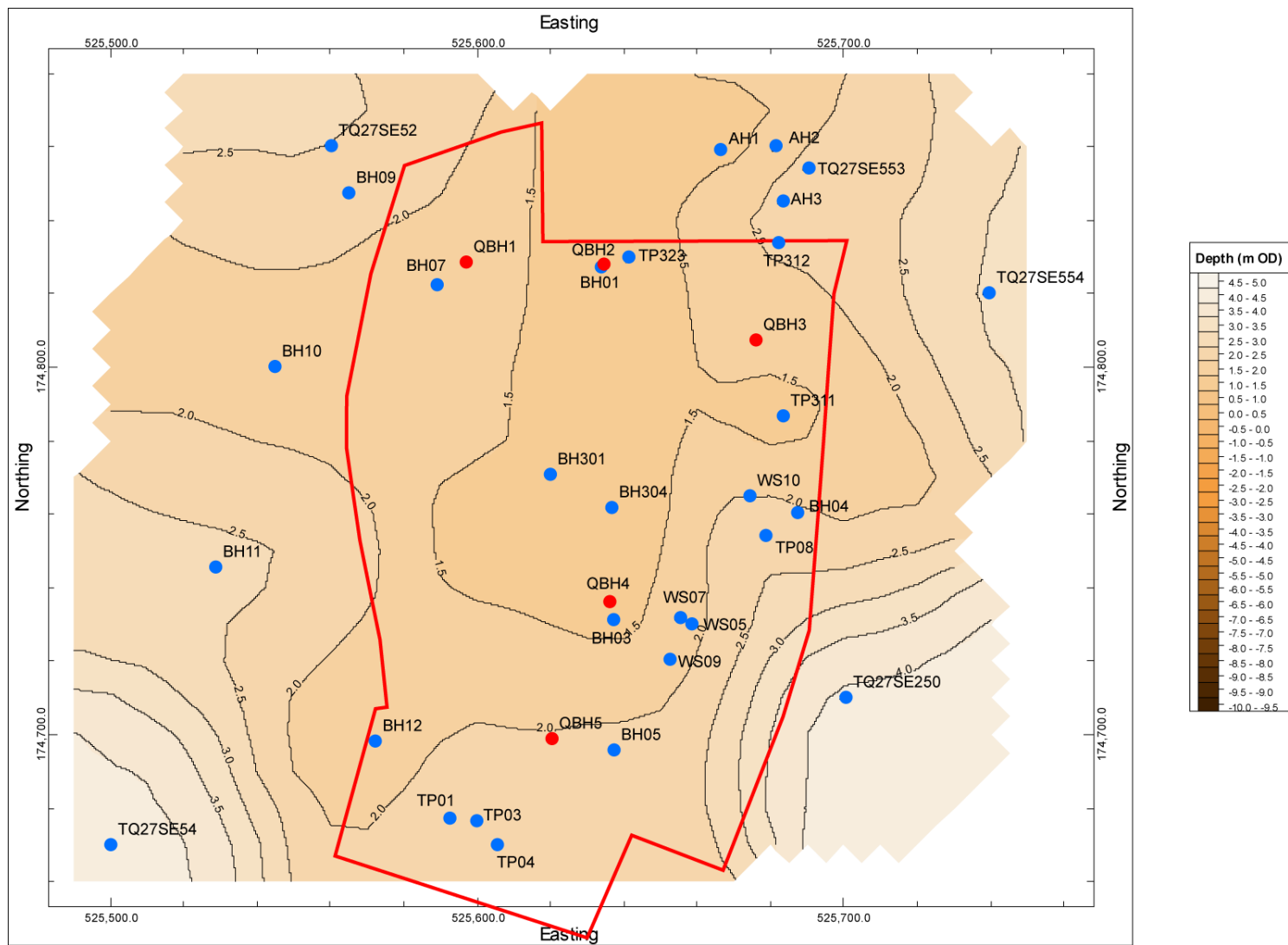


Figure 6: Top of the Peat (m) (site outline in red)



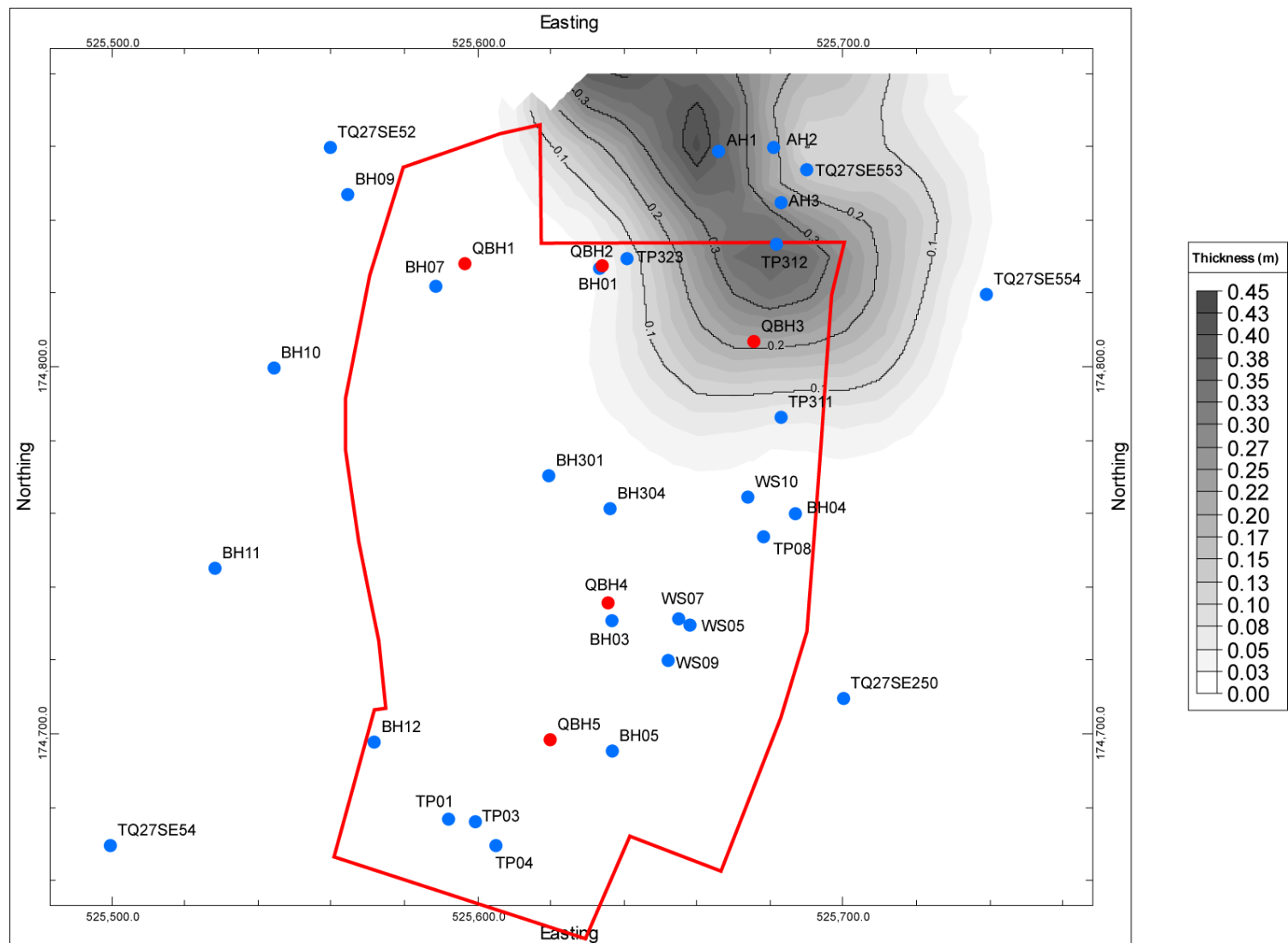


Figure 7: Thickness of the Peat (m) (site outline in red)

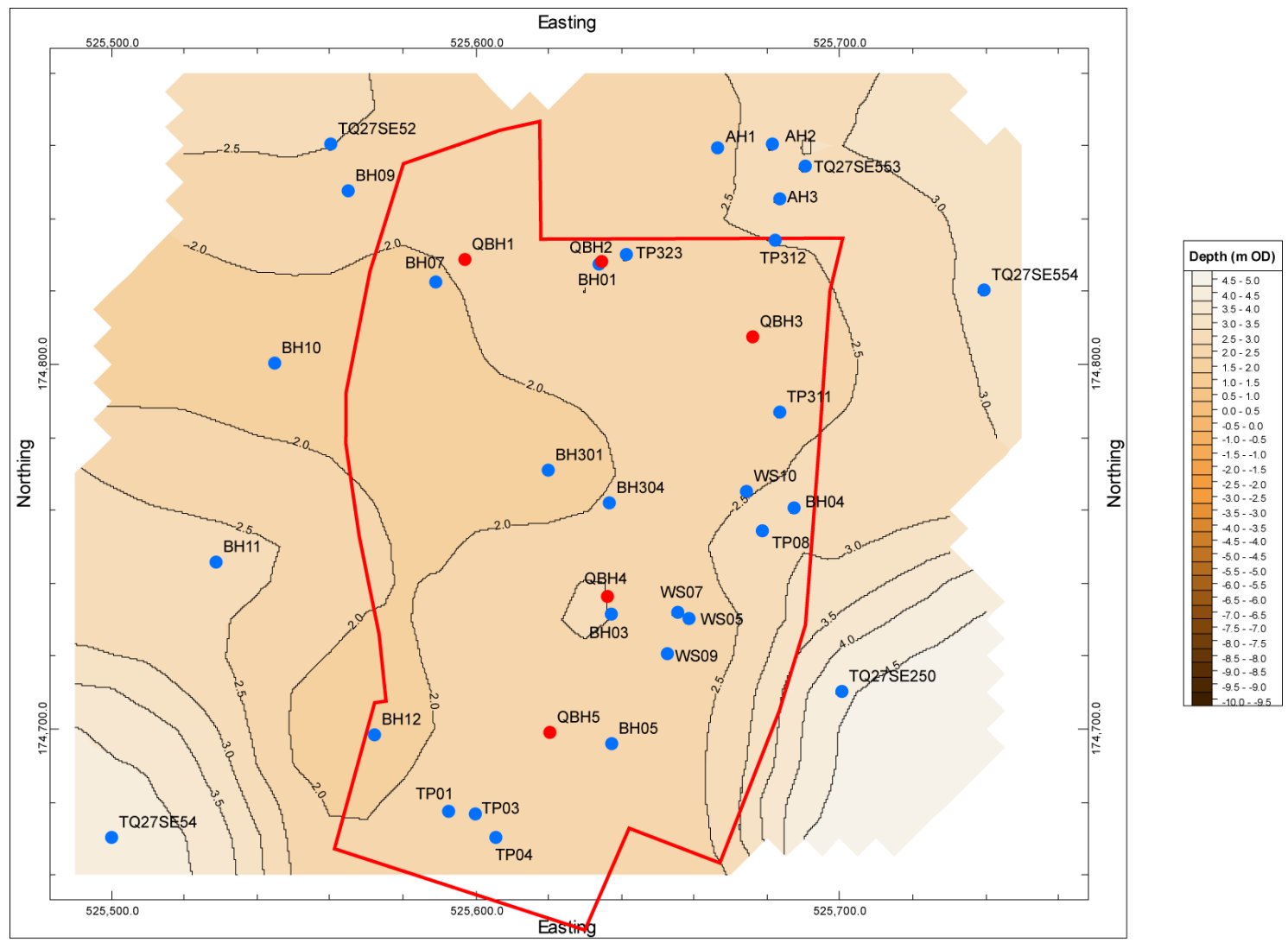


Figure 8: Top of the Upper Alluvium/base of the Made Ground (m OD) (site outline in red)

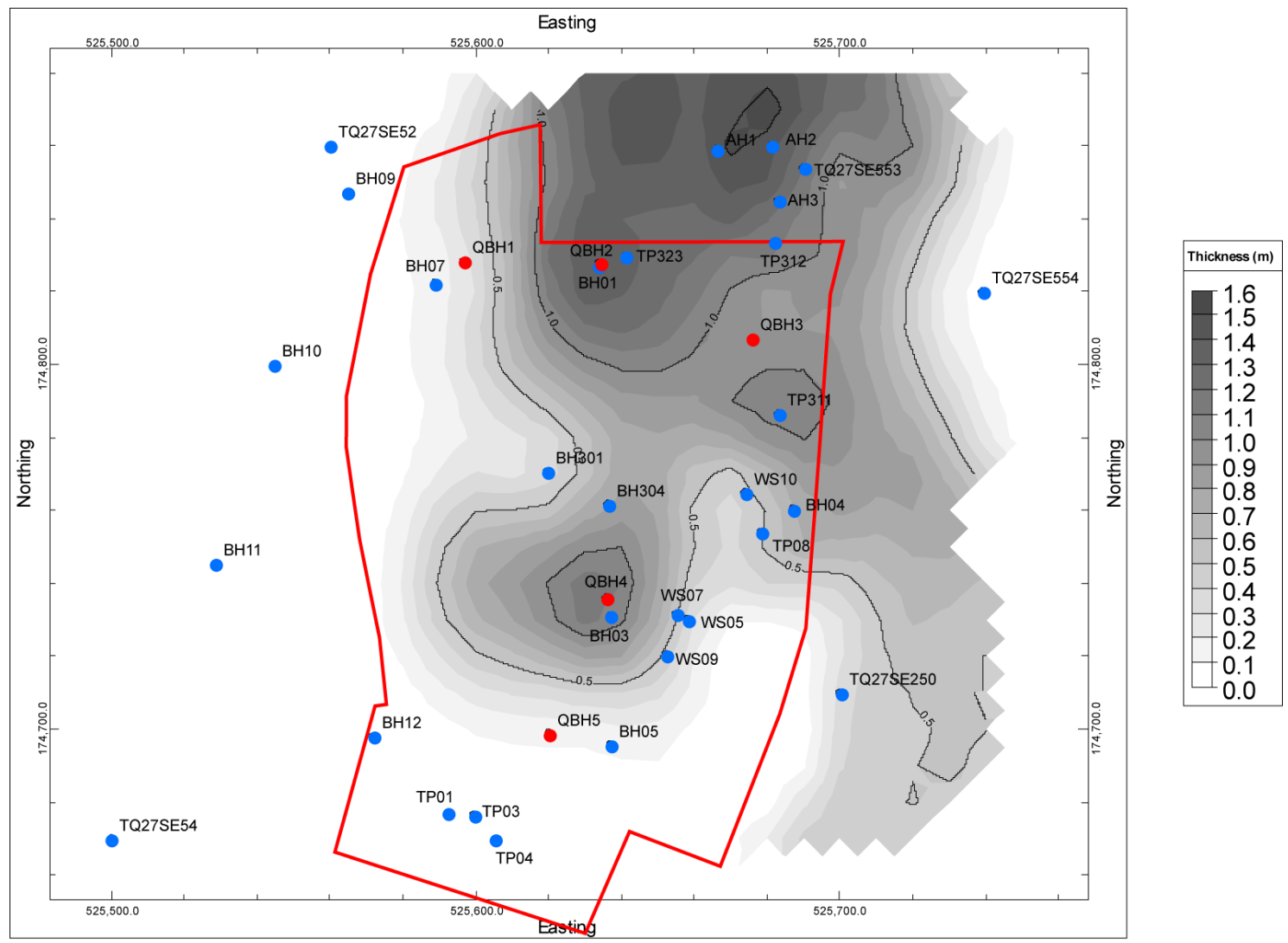


Figure 9: Thickness of the Holocene Alluvium (m) (site outline in red)

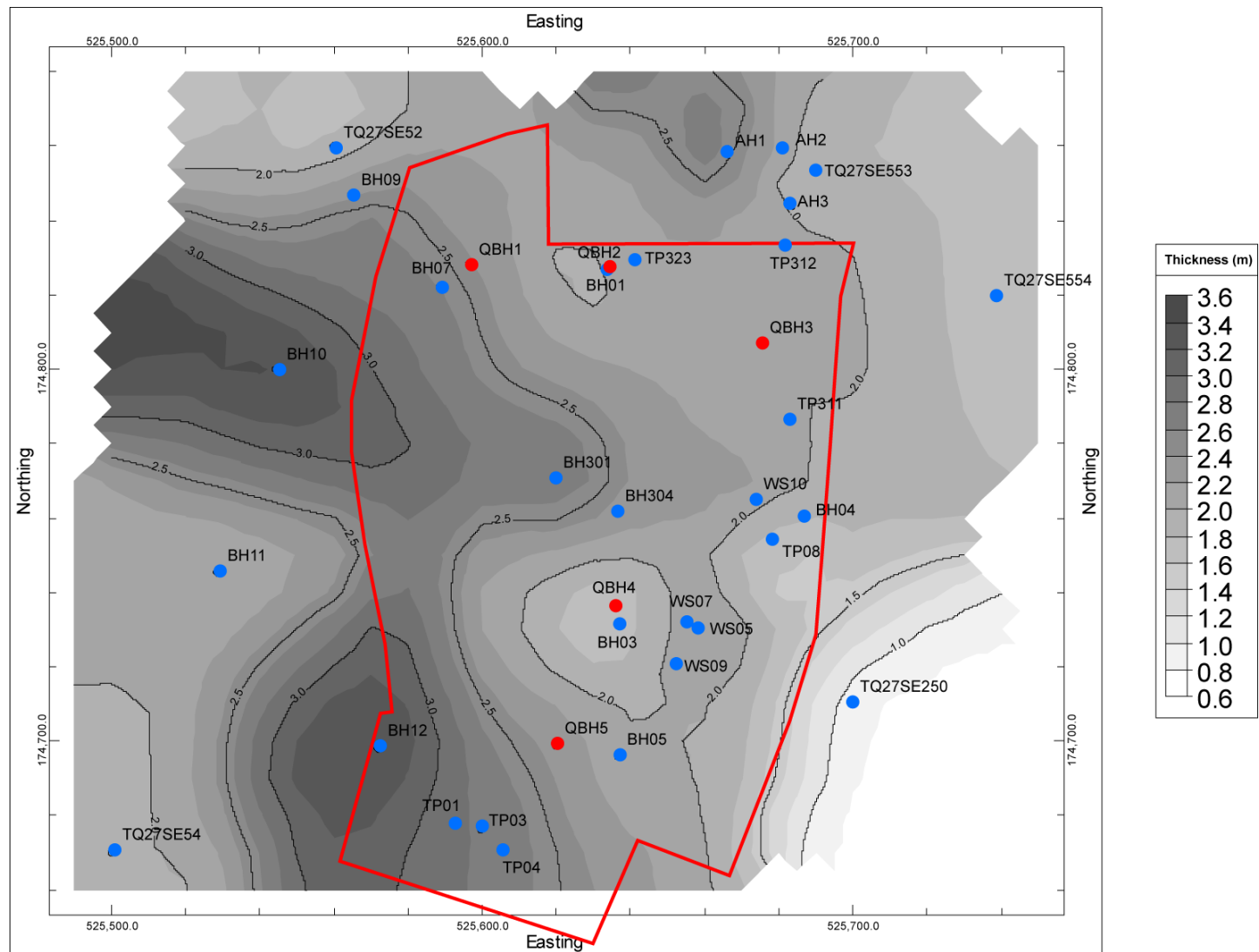


Figure 10: Thickness of the Made Ground (m) (site outline in red)

## DISCUSSION AND CONCLUSIONS

The aim of the geoarchaeological investigations at the Ram Brewery (Phase 1) site was to (1) clarify the nature of the sub-surface stratigraphy, in particular the presence and thickness of Alluvium and Peat across the site, and (2) to evaluate the potential of the sedimentary sequences for reconstructing the environmental history of the site and its environs. In order to achieve this aim, 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 and geoarchaeological borehole descriptions, and records from five new geoarchaeological boreholes.

The results of the geoarchaeological investigations have contributed to our understanding of the Holocene stratigraphic sequence in this area of the Wandle valley. Towards the middle and north of the site a sequence of Wandle/Shepperton Gravel is recorded (deposited during the Late Devensian, 10-15,000 years before present), overlain by variable thicknesses (up to ca. 1.5m) of Holocene Alluvium within a possible palaeochannel associated with the River Wandle. Towards the east, west and south of the site, outside of the limits of the inferred palaeochannel, a sequence of Kempton Park Gravel (deposited during the Early to Middle Devensian (30-120,000 years before present) is overlain in places by thin horizons (generally less than 0.5m) of Holocene Alluvium. Within the palaeochannel the Gravel surface lies at between ca. 0.5 and 1.5m OD, whilst beyond the inferred margins of the channel the Gravel rises to between 2.0 and 3.0m OD. This is consistent with the Gravel surfaces recorded ca. 250m to the south at the Garratt Lane site (Howe *et al.*, 2002), where an undulating Gravel surface was recorded at ca. 3.6m OD in the centre and east of the site, falling to below 2.0m OD towards the west and indicative of a broadly north-south aligned palaeochannel. As might be expected, the Late Devensian Gravel surfaces recorded ca. 500m to the northwest at the Osiers Road (Green & Young, 2010) and Morganite sites (Branch *et al.*, 2007; see Figure 1) are lower (-0.40 and -0.81m OD respectively), but also demonstrate the presence of a north-south aligned channel cut down into the gravels of the Kempton Park Terrace.

Within the possible palaeochannel at the present site the Wandle/Shepperton Gravel is directly overlain in places by Peat or possible soil horizons, up to 0.7m thick and generally recorded at between 0.5 and 1.85m OD. As stated above, the alluvial sequence at the Morganite site consisted of a sequence of silty sands overlying an upper Peat and slightly gravelly organic silts, which passed down into calcareous sands including remains of

molluscs and ostracods, with a second, lower Peat horizon at the base of the sequence resting directly on the underlying Gravel. This sequence was dated from at least 4780-4420 to 1570-1410 cal BP, with age-depth modelling of the sequence suggesting that the Peat overlying the Gravel may be of Mesolithic date, whilst the upper Peat accumulated during the Bronze Age (Branch *et al.* 2007; Jarrett *et al.*, 2010). It is possible that the Peat/soil horizons overlying the Gravel at the Ram Brewery site are contemporaneous with the Mesolithic Peat at the Morganite site, or on the basis of height OD, may be equivalent to the Bronze Age upper Peat recorded at the Morganite site between 0.84 and 0.19m OD.

Other investigations nearby confirm the presence of organic sediments associated with the prehistoric River Wandle close to its confluence with the Thames. At the Former Shell Oil Terminal, Point Pleasant (Perry & Skelton, 1995a), these have been radiocarbon dated to between 3640-3380 and 2920-2500 cal BP (Bronze Age; -1.2 to -0.7m OD). At the Prospect Reach Foreshore site, Point Pleasant (Perry & Skelton, 1995b), a radiocarbon-dated Peat and alluvial sequence is of Roman and post-Roman age. To the south of the Morganite site at the Frogmore Depot, Dormay Street site, an alluvial sequence including organic-rich sediments and Peat dated from at least 2460-2160 to 910-700 (Iron Age to post-Roman; Spurr, 2004). Significantly, the Peat and possible soil horizons identified towards the north of the Ram Brewery (Phase 1) site would have represented semi-terrestrial or terrestrial land surfaces that might have been utilised by prehistoric people. Given their stratigraphic position in the sequence it is possible that this horizon may be of a similar age to the possible Mesolithic Peat horizon recorded at the Morganite site, or may be contemporaneous with the later prehistoric (Bronze Age/Iron Age) Peat horizons recorded elsewhere in the Wandle valley.

## **RECOMMENDATIONS**

Selected boreholes retained from the Ram Brewery (Phase 1) site (QBH3 and QBH4) have the potential to provide suitable palaeobotanical and zooarchaeological remains for reconstructing the past environmental conditions (including evidence for human activity) of the site and its environs. Although relatively thin, the age of the organic horizons recorded in these boreholes is unclear. It is therefore recommended that a basic assessment of the sequences from boreholes QBH3 and QBH4 is undertaken to evaluate this potential. The assessment should incorporate: (1) rangefinder radiocarbon dating, to provide an age for the onset of Peat formation in borehole QBH3, and if possible the onset of soil formation in QBH4; (2) organic matter determinations to aid identification of the sedimentary units; (3)

assessment of the archaeobotanical remains (pollen, waterlogged wood and seeds) to provide a provisional reconstruction of the vegetation history; and (5) assessment of the diatom remains in order to provide information on the hydrological history of the site. The environmental assessment will also highlight any indications of nearby human activity, and provide recommendations for further analysis (if necessary).

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