BATTERSEA POWER STATION PHASE 1, LONDON BOROUGH OF WANDSWORTH (NGR: TQ 290 775): GEOARCHAEOLOGICAL FIELDWORK REPORT

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NON-TECHNICAL SUMMARY

The numerous boreholes put down at the Battersea Power Station Phase 1 site have enabled the production of a deposit model, which in turn has made possible a reconstruction of the main features of the underlying stratigraphy and sequence of Holocene sedimentation at the site. The model indicates the accumulation of mainly inorganic Alluvium within a Late Glacial/Early Holocene channel which underlies the entire Phase 1 area. A thin unit of Peat was recorded within the Alluvium in two borehole records. The Gravel surface within this area is highly variable, and lies at between -0.3 and -3m OD. The sequence of Alluvium overlying it is truncated across the Phase 1 area by between 4 and 5m of Made Ground, to a depth of between 1 and -2m OD; the present day surface of the site lies at approximately 3.5 to 5m OD.

The Battersea Power Station site lies at the confluence between the River Thames and two former channels, whilst the bedrock geology to the south consists of a former terrace of the Thames, and to the west a former 'island' (eyot) composed of Langley Silt. The deposit model of the wider Battersea Power Station site indicates that thicker Peat horizons lie to the east of the Phase 1 area (towards this confluence), where the Gravel surface is deeper and the total Alluvial sequence is thicker. Due to the absence of significant organic horizons within the Phase 1 area, further geoarchaeological investigation of this part of the site is not recommended.

INTRODUCTION

This report summarises the findings arising out of the geoarchaeological fieldwork and deposit modelling undertaken by Quaternary Scientific (University of Reading) in connection with the proposed development of the Phase 1 area of Battersea Power Station, London Borough of Wandsworth (National Grid Reference: *centred on* TQ 290 775; Figure 1). Quaternary Scientific were commissioned by CgMs Consulting to undertake the geoarchaeological investigations. The investigations are focussed on the Phase 1 area of Battersea Power Station; a strip of land on the western side of the Power Station itself. The site is located on the south bank of the River Thames, occupying an area of land that

extends back to *ca*. 300m from the present waterfront (Figure 1). The site is mapped by the BGS as Alluvium obscured by Made Ground and can be regarded therefore as part of the historic floodplain of the River Thames. Beneath the floodplain in this area, up to 7.6m of Made Ground and Alluvium has been recorded resting on Shepperton Gravel. A series of geoarchaeological (Perry & Skelton, 1997; Dawson *et al*., 2009; Branch *et al*., 2010) and geotechnical investigations (Figure 2) have been carried out at the site, which reveal considerable variation in the height of the Shepperton Gravel surface. Indeed, the work carried out by Dawson *et al.* (2009) indicates that the site lies at the confluence between the River Thames, the Battersea Channel and a small subsidiary channel. Furthermore, the site is thought to be located at the eastern end of an eyot composed of Langley Silt, and to the north of a larger eyot composed of Kempton Park Gravel. The thickness of the overlying Alluvial and Peat deposits is also recorded as being considerably variable across the site (Branch *et al*., 2010). This is in part due to the variable height of the Shepperton Gravel, but is also related to successive stages of industrial development that have caused truncation of the stratigraphic sequence.

Existing geotechnical borehole logs highlight the variability in the height of the Shepperton Gravel surface, Alluvial/Peat deposits and Made Ground for the Phase 1 area of the Battersea Power Station site. The sand/gravel surface tends to be located at *ca*. -2.0m OD across much of the Phase 1 area, but appears to rise towards the river (-1.0m OD; BH2017, BH1100 and BH2016), and towards the south-east (0.30m OD; FESBH105). BH201 also indicates what may be a relatively high gravel surface at -0.30m OD. The overlying Alluvium is generally inorganic, consisting of clays, silts and sands with intermittent gravels. Organic/peaty material is sporadically recorded, but appears to have no spatial pattern; only in one existing borehole is a distinct unit recorded, and this is thin (<10cm; FESBH115). The Made Ground is thick across the site, ranging between 1.5 and >6m. In some cases, this truncates the entire alluvial sequence (e.g. BH2011; BH2019; apparently BH201 and possibly BH1100).

The aims of the geoarchaeological investigations were outlined in the Written Scheme of Investigation for the site (Batchelor, 2013), specifically: (1) to clarify the nature of the sub-surface stratigraphy, in particular the presence and thickness of Alluvium (including Peat) across the site, and to better understand the site's location in relation to the various river channels and eyots in this area; 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 these aims, four geotechnical boreholes put down along a broadly north-south

transect across the Phase 1 area (QBH1 to QBH4) were monitored by Quaternary Scientific. These locations were selected for the following reasons:

1. QBH1- to investigate the sedimentary sequence in this area of the site, within which there are a limited number of existing records. Those which have been put down indicate a higher gravel surface and 'slightly peaty' Alluvium;
2. QBH2- to elucidate whether Alluvium is present in this area of the site, or whether it is entirely truncated by Made Ground;
3. QBH3- to investigate the apparently high Shepperton Gravel surface located in this area of the site, and to determine whether the made ground entirely truncates the Alluvium;
4. QBH4- previous borehole SMBH117 indicates that this borehole contains an alluvial sequence up to 4m in thickness. It is thought likely that this thickness comprises Made Ground, but should be investigated, particularly as organic remains and partially decayed vegetation is indicated.

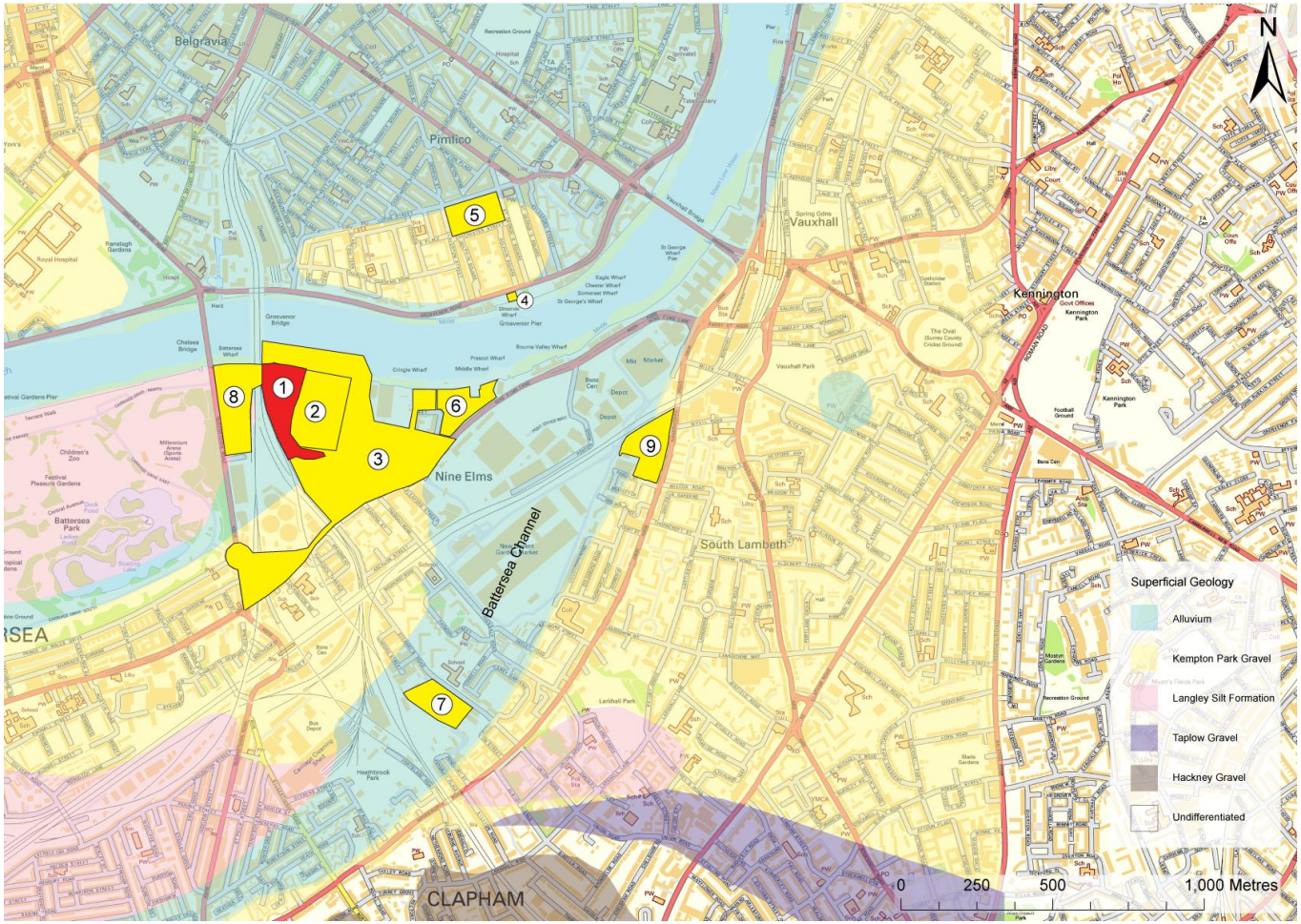

Figure 1: Location of (1) Battersea Power Station Phase 1, London Borough of Wandsworth; (2) Battersea Power Station (Branch *et al*., 2010); (3) Battersea Power Station (Dawson *et al*., 2009); (4) 135 Grosvenor Road, Pimlico (Green & Young, 2012); (5) Lupus Court (Green, 2008); (6) Tideway Wharf (Green & Young, 2011); (7) 102-104/120-146 Stewarts Road (Morley, 2009/2010); (8) Chelsea Bridge Wharf (Corcoran *et al*., 2007) and (9) Wandsworth Road and Pascal Street (Young & Green, 2013). Superficial geology is shown as mapped by the British Geological Survey, Dawson *et al*. (2009) and Corcoran *et al*. (2007). *Contains Ordnance Survey data © Crown copyright and database right [2012]*

Figure 2: Detailed site map incorporating the location of the new geotechnical boreholes, existing geoarchaeological and geotechnical boreholes and BGS borehole records. The alignment of the N-S-SE transect (Figure 3) is also shown. Battersea Power Station Phase 1, London Borough of Wandsworth. ***Contains Ordnance Survey data © Crown copyright and database right [2012]***

METHODS

Field investigations

Four geotechnical boreholes were put down at the site using cable percussion (boreholes QBH1 to QBH4), each of which was monitored on-site by Quaternary Scientific. The lithostratigraphy of those boreholes was described 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) (Troels-Smith, 1955). The procedure involved: (1) examining grab samples from the geotechnical boreholes where possible; (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 are displayed in Figure 3 and in Tables 2 to 5. The spatial attributes of each borehole are shown in Table 1 and in Figure 2.

Table 1: Borehole attributes for those records used in the deposit model, Battersea Power Station Phase 1, London Borough of Wandsworth (Q=Quest, A=ArchaeoScape, FES= Foundation & Exploration Service, G= Geotechnics, SM= Soil Mechanics)

Borehole	Easting	Northing	Elevation (m OD)
New geotechnical boreholes			
QBH1	528775.41	177659.56	5.35
QBH2	528791.01	177576.53	4.11
QBH3	528816.91	177485.36	4.92
QBH4	528912.01	177382.55	4.30
Existing geoarchaeological boreholes			
ABH2	529013.00	177584.00	4.30
ABH3	528809.00	177475.00	3.27
ABH7	529022.00	177461.00	3.94
ABH8	528828.00	177453.00	3.27
Existing geotechnical boreholes			
FESBH108	529026.00	177620.00	4.38
FESBH109	529054.00	177620.00	4.96
FESBH203	529051.00	177506.00	3.96
FESBH204	529039.00	177454.00	3.91
FESBH105	528977.00	177370.00	3.87
FESBH112	528810.00	177609.00	3.99
FESBH113	528820.00	177540.00	4.17
FESBH115	528819.00	177466.00	3.37
FESBH2011	528887.00	177421.00	3.85
FESBH2012	528858.00	177367.00	3.40
FESBH2012A	528855.00	177366.00	3.25
FESBH2016	528768.00	177631.00	4.65
FESBH2017	528842.00	177685.00	5.30
FESBH2018	528873.00	177657.00	5.35
FESBH2019	528807.00	177554.00	4.20
FESBH2019A	528808.00	177562.00	4.25

FESBH2020	528835.00	177496.00	4.10
FESBH2021	528817.00	177448.00	3.25
SMBH12	528849.00	177650.00	1.27
SMBH13	528873.00	177617.00	1.06
SMBH14	528885.00	177671.00	5.25
SMBH15	528873.00	177663.00	0.91
SMBH17	528921.00	177393.00	3.63
GBH201	528797.00	177504.00	3.23
GBH202	528785.00	177556.00	3.30
GBH203	528853.00	177528.00	4.30
GBH302	528922.00	177414.00	4.67
GBH302B	528924.00	177413.00	4.68
GBH302C	528920.00	177412.00	4.82
GBH901	528926.00	177629.00	4.98
GBHR201A	528796.00	177504.00	3.22
GBHPS17	528846.00	177466.00	3.80
GBH2038	528849.00	177588.00	4.00
BH2008	528954.00	177408.00	3.75
BH1100	528810.00	177634.00	4.44
BGS borehole records			
TQ27NE1393	528850.00	177660.00	5.43
TQ27NE1396	528830.00	177700.00	-1.52
TQ27NE1400	528930.00	177700.00	-3.05
TQ27NE1402	529020.00	177680.00	-2.44
TQ27NE1411	529050.00	177640.00	3.00
TQ27NE1420	529229.00	177159.00	3.30
TQ27NE1421	529143.00	177450.00	4.50
TQ27NE1422	529088.00	177634.00	5.10
TQ27NE150	528930.00	177870.00	-1.99
TQ27NE151	528930.00	177780.00	-4.80
TQ27NE152	528920.00	177720.00	-4.07
TQ27NE1673	529190.00	177500.00	3.00
TQ27NE1856	529120.00	177570.00	5.11
TQ27NE1860	529160.00	177550.00	5.33
TQ27NE1861	529120.00	177600.00	5.18
TQ27NE1865	529120.00	177630.00	0.61
TQ27NE1872	529160.00	177500.00	5.30
TQ27NE188	529100.00	177200.00	3.96
TQ27NE250a	528500.00	177900.00	5.18
TQ27NE250b	528600.00	177700.00	6.33
TQ27NE329	528680.00	177180.00	4.27

Deposit modelling

The deposit model was based on a review of 64 borehole records incorporating the four new geotechnical boreholes, four existing geoarchaeological boreholes (Branch *et al*., 2010), 35 existing geotechnical records (Perry & Skelton, 1997; Dawson *et al*., 2009) and 21 BGS borehole records (www.bgs.ac.uk/opengeoscience).

Sedimentary units from the boreholes were classified into five groupings: (1) Gravel; (2) Alluvium; (3) Peat; (4) Alluvium, and (5) Made Ground. The classified data for groups 1-5 were then input into a database with the RockWorks 2006 geological utilities software. Models of surface height (using a nearest neighbour routine) were generated for the Gravel, Peat and Upper Alluvium (Figures 4 to 6). It was not possible to identify the surface of the Lower Alluvium in the majority of the existing geotechnical boreholes (due to the different descriptive terms and level of recorded detail), and thus the surface of this unit was not modelled. Thickness of the Peat (Figure 7), combined alluvial units (Figure 8) and Made Ground (Figure 9) were also modelled (also using a nearest neighbour routine). Because the boreholes are not uniformly distributed over the area of investigation, the reliability of the models generated using RockWorks is variable. In general, reliability improves from outlying areas where the models are largely supported by scattered archival records towards the core area of commissioned boreholes.

Because of the 'smoothing' effect of the modelling procedure, the modelled levels of stratigraphic contacts may differ slightly from the levels recorded in the borehole logs. In addition, the reliability of individual models is 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 development on the site. 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 of 15% is applied to all deposit models except the Peat, where a maximum distance cut-off filter of 5% is applied, since these horizons are present in only a limited number of boreholes. In addition, it is important to recognise that several sets of boreholes are represented, put down at different times and recorded using different descriptive terms and subject to differing technical constraints in terms of recorded detail including the exact levels of the stratigraphic boundaries. Of the records used in the deposit model, the cores from the boreholes observed by Quaternary Scientific, and the existing geoarchaeological boreholes (Branch *et al*., 2010) represent the most detailed record of the sediment sequences.

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

The combined results of the geoarchaeological investigations (Tables 2 to 5) have enhanced the previous geotechnical and geoarchaeological investigations, and permitted a programme of deposit modelling of the surface elevation and thickness of each major stratigraphic unit (Figures 3 to 9).

The basal unit recorded at the site is a horizon of sand and gravel (Figure 4). Gibbard (1984, P73 Fig. 44) shows the surface of the Shepperton Gravel at or slightly above OD in this area of the Thames floodplain, and thus any gravel below this level within the Phase 1 area of the site is likely to equate to the Shepperton Gravel. Where the Gravel surface rises above OD in the southern part and south of the site, it is likely to equate to the Kempton Park Gravel, a former terrace of the Thames deposited during the Middle Devensian. The Shepperton Gravel itself was deposited during the Late Devensian within a high energy braided river system, in a channel that at this time was either subsidiary or tributary to the Thames. The entire Phase 1 area appears to lie within this former channel, where the Gravel surface is recorded at between *ca*. -0.30 and -3.00m OD. The variability in the Gravel surface across the Phase 1 area is indicative of sedimentary deposition within a braided river system, where during the process of lateral channel movement and accretion, bar formation has resulted in areas of higher gravel surfaces (e.g. in the area of boreholes QBH2 (-0.29m OD) and BH201 (-0.30m OD). The deepest areas of Gravel surface appear to be located towards the south of the Phase 1 area (towards the main axis of the former channel), where it is recorded at -3.06 (ABH8), -2.30 (FESBH115) and -2.20m OD (ABH3). Beyond the Phase 1 area but within the limits of the former channel, the Shepperton Gravel surface falls eastward toward the modern course of the Thames, where it is recorded at between *ca*. -2.0 and -4.5m OD (Figure 4). To the south of the site and beyond the southern margins of the former channel, the Gravel surface rises towards the Kempton Park Gravel terrace to 1.22m OD (TQ27NE188) and 4.27m OD (TQ27NE329), whilst northeast of the site it rises to at least 0.69m OD (TQ27NE250b; Figure 4). North of the Thames, the Kempton Park Gravel surface is recorded in borehole TQ27NE250a at 0.61m OD.

Succeeding the surface of the Shepperton Gravel across the Phase 1 site is a sequence of Alluvium which in places contains a Peat horizon (Figures 6 and 7). The mineral-rich sediments indicate deposition within a fluvial environment, confirmed by the presence of fine-grained sediments (clay and silt) that would have been deposited from a suspended sediment load. In general, a horizon of variably sandy silt overlies the Gravel surface, often

containing occasional gravel clasts and detrital herbaceous material. This unit is generally 0.5 to 1.0m thick in the new boreholes (QBH1 to QBH4), the surface lying at between *ca*. -1.0 and 0.0m OD. This unit is similar in composition to sediments recorded in the lower part of the Alluvium elsewhere in the Lower Thames Valley, deposited during the Early to Mid-Holocene as the energy of flow decreased and the Thames and its tributaries became confined to single meandering channels. The base of this unit in ABH3 was radiocarbon dated during previous investigations at the Battersea Power Station site (Branch *et al.,* 2010) to 3980-3730 cal BP (Early Bronze Age).

Whilst Peat horizons were recorded in boreholes FESBH115 (-1.08 and -1.15m OD) and ABH8 (-2.92 to -2.97m OD; 6310-6180 cal BP (Early Neolithic)), these horizons are thin and are recorded at different depths, indicating that synchronous Peat horizons are not laterally extensive in the Phase 1 area (Figure 3; not shown in Figure 5 due to the modelling procedure employed and the thin nature of the Peat). The presence of thicker Peat horizons appears to be limited to the eastern part of the Battersea Power Station site (Figures 5 and 7). Here, Peat horizons were recorded in boreholes ABH7 (-1.52 to -1.56m OD), ABH2 (-2.10 to -2.16m OD), FESBH108 (-0.22 and -0.87m OD); in boreholes TQ27NE1856, TQ27NE1860 and TQ27NE1861 Peat horizons up to 3.0m thick were recorded between *ca*. 0.30 and -3.5m OD. However, in borehole TQ27NE1856 the Peat was intercalated with mineral-rich deposits, and the thick nature of the Peat here may be exaggerated due to the nature of the drilling method employed and the differing technical constraints in terms of recorded detail. In general, the surface of the Peat lies at between *ca*. 0.30 and -1.80m OD (Figure 5). Significantly, this Peat horizon represents a transition to a semi-terrestrial land surface; in the majority of cases, the Peat is silty, indicating frequent inundation of the Peat surface by mineral-rich sediment deposited during periods of higher energy flow.

Overlying the sandy lower horizon of Alluvium and the Peat where present is a horizon of variably silty clay Alluvium. In the Phase 1 area the surface of the Alluvium lies at between *ca*. -0.50 and 1.00m OD (Figures 3 and 6), so that the combined Alluvium across the site (incorporating the sandier lower Alluvium, Peat and silty clay upper Alluvium) is generally between 1.0 and 2.0m thick (Figure 8). In general, the previous geotechnical records demonstrate that the Alluvium is thickest towards the south of the Phase 1 area (e.g. borehole SMBH117). In borehole QBH4 however, adjacent to SMBH117 (Figures 2 and 3) redeposited/disturbed Alluvium was recorded to a level of 0.50m OD, indicating that the Made Ground extends to a deeper level than previously identified in this area of the Phase 1 site. It is evident that the thickness of Alluvium present across the Phase 1 area is related to

the depth of truncation by Made Ground, which is generally between 4.0 and 5.0m thick across the site (Figure 9).

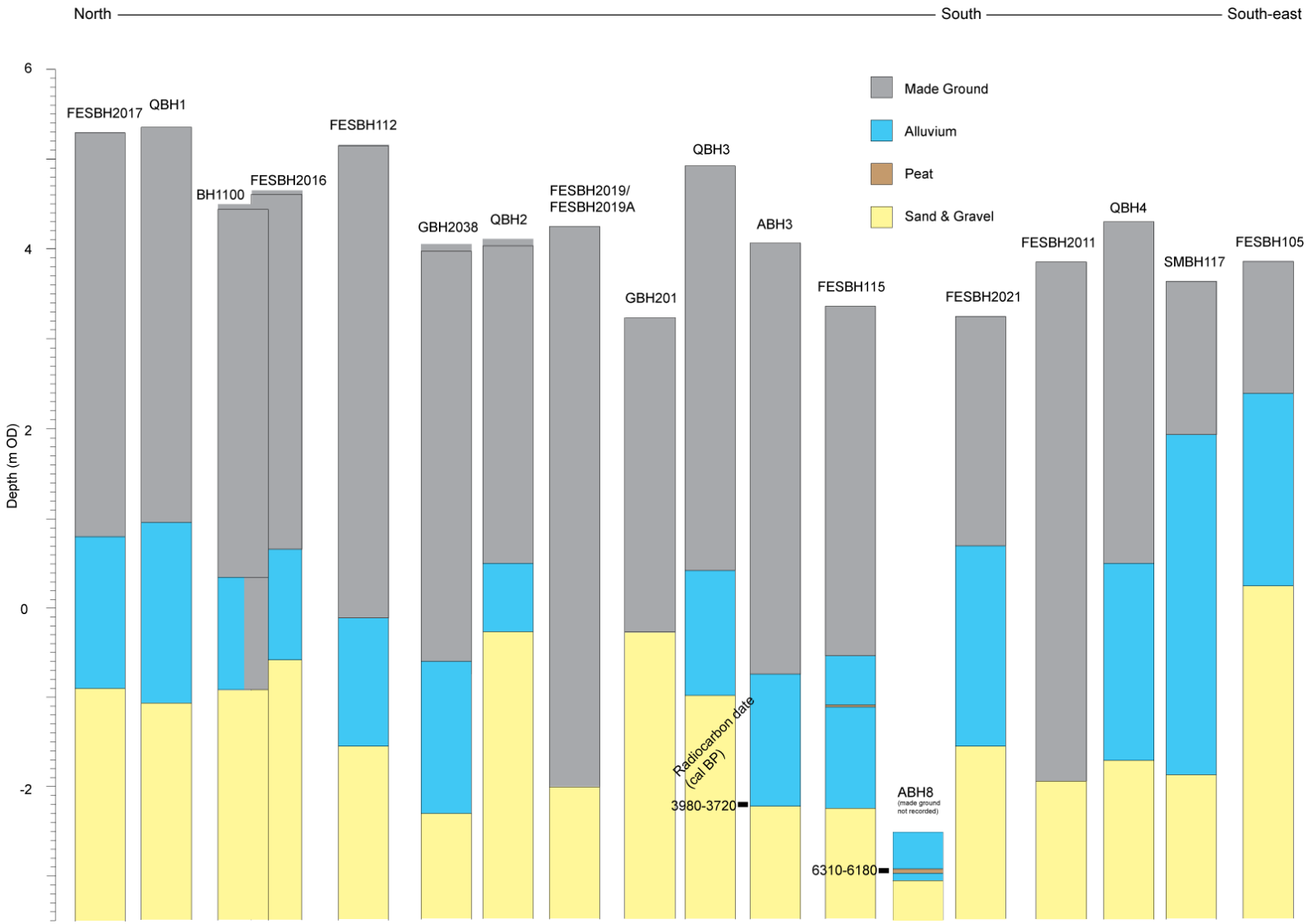

Figure 3: North-South/South-east transect of selected boreholes across the Battersea Power Station Phase 1 site, London Borough of Wandsworth

Table 2: Geotechnical and geoarchaeological description of Borehole QBH1, Battersea Power Station Phase 1, London Borough of Wandsworth

Depth (m bgs)		Depth (m OD)		Geotechnical description	Additional Geoarchaeological description (m bgs)	Stratigraphic interpretation
Top	**Base**	**Top**	**Base**			
0.00	4.30	5.35	1.05	Made ground	Made ground	MADE GROUND
4.30	5.00	1.05	0.35	Dark grey silty clay with organic and shell fragments	Ag3 As1 Ga+ Dh+; dark grey clayey silt with traces of sand and detrital herbaceous material. Some fine horizontal bedding	ALLUVIUM
5.00	5.50	0.35	-0.15		Ag3 As1 Ga+ Dh+; dark grey clayey silt with traces of sand and detrital herbaceous material; frequent Mollusca fragments	ALLUVIUM
5.50	6.00	-0.15	-0.65		Ag3 Ga1 Dh+; dark grey sandy silt with traces of detrital herbaceous material; occasional Mollusca fragments	ALLUVIUM
6.00	6.40	-0.65	-1.05		Ag3 As1 Dh+ Ga+ Gg+; dark grey clayey silt with traces of sand, detrital herbaceous material and occasional gravel clasts	ALLUVIUM
6.40	9.40	-1.05	-4.05	Dark grey sandy angular to sub-rounded flint gravel	Gg3 Ga1; sandy flint gravel	SHEPPERTON GRAVEL

Table 3: Geotechnical and geoarchaeological description of Borehole QBH2, Battersea Power Station Phase 1, London Borough of Wandsworth

Depth (m bgs)		Depth (m OD)		Geotechnical description	Additional Geoarchaeological description (m bgs)	Stratigraphic interpretation
Top	**Base**	**Top**	**Base**			
0.00	3.60	4.11	0.51	Made ground	Made ground	MADE GROUND
3.60	4.40	0.51	-0.29	Grey sandy silty clay with laminations of organic material	As2 Ag1 Ga1 Dh+; dark grey sandy silty clay with traces of detrital herbaceous material. Occasional fine horizontal bedding.	ALLUVIUM
4.40	8.60	-0.29	-4.49	Grey sandy angular to sub-rounded flint	Gg3 Ga1; sandy flint gravel	SHEPPERTON

				gravel		GRAVEL

Table 4: Geotechnical and geoarchaeological description of Borehole QBH3, Battersea Power Station Phase 1, London Borough of Wandsworth

Depth (m bgs)		Depth (m OD)		Geotechnical description	Additional Geoarchaeological description (m bgs)	Stratigraphic interpretation
Top	Base	Top	Base			
0.00	4.40	4.92	0.52	Made ground	Made ground	MADE GROUND
4.40	4.50	0.52	0.42		Ag2 As1 Gg1 Sh+; blue grey clayey gravelly silt with traces of organic matter; appears redeposited/disturbed	MADE GROUND
4.50	5.00	0.42	-0.08	Black silty organic clay/brown silty clay	Ag2 As2 Dh+ Sh+ Ga+ Gg+; grey brown silt and clay with traces of sand, organic matter and detrital herbaceous material; occasional gravel clasts. Some fine horizontal bedding	ALLUVIUM
5.00	5.20	-0.08	-0.28	Brown clayey silt with wood fragments and laminations of organic material	Ag3 Ga1 Gg+ As+ Dl+; blue grey sandy silt with traces of clay, detrital herbaceous material and occasional gravel clasts	ALLUVIUM
5.20	5.45	-0.28	-0.53	Greenish grey sandy clayey silt with occasional gravel	Ga2 Ag2 Gg+; blue grey silt and sand with occasional gravel clasts	ALLUVIUM
5.45	5.90	-0.53	-0.98		Ga2 Ag2 Gg+; brown silt and sand with occasional gravel clasts	ALLUVIUM
5.90	9.60	-0.98	-4.68	Grey sandy sub-angular to rounded gravel	Gg3 Ga1; sandy flint gravel	SHEPPERTON GRAVEL

Table 5: Geotechnical and geoarchaeological description of Borehole QBH4, Battersea Power Station Phase 1, London Borough of Wandsworth

Depth (m bgs)		Depth (m OD)		Geotechnical description	Additional Geoarchaeological description (m bgs)	Stratigraphic interpretation
Top	Base	Top	Base			
0.00	3.20	4.30	1.10	Made ground	Made ground	MADE GROUND
3.20	3.80	1.10	0.50		Redeposited alluvium/made ground	MADE GROUND
3.80	4.00	0.50	0.30	Green blue silty clay with detrital	Ag2 As2; dark grey clay and silt	ALLUVIUM

4.00	5.25	0.30	-0.95	organic material	Ag2 As2 Gg+ Dh+; dark grey clay and silt with traces of detrital herbaceous material and occasional gravel clasts	ALLUVIUM
5.25	6.00	-0.95	-1.70		Ag2 As1 Ga1 Gg+ Dh+; dark grey clayey sandy silt with traces of detrital herbaceous material and occasional gravel clasts; silt becoming coarser with depth	ALLUVIUM
6.00	11.20	-1.70	-6.90	Brown sandy angular to sub-rounded gravel	Gg3 Ga1; sandy flint gravel	SHEPPERTON GRAVEL

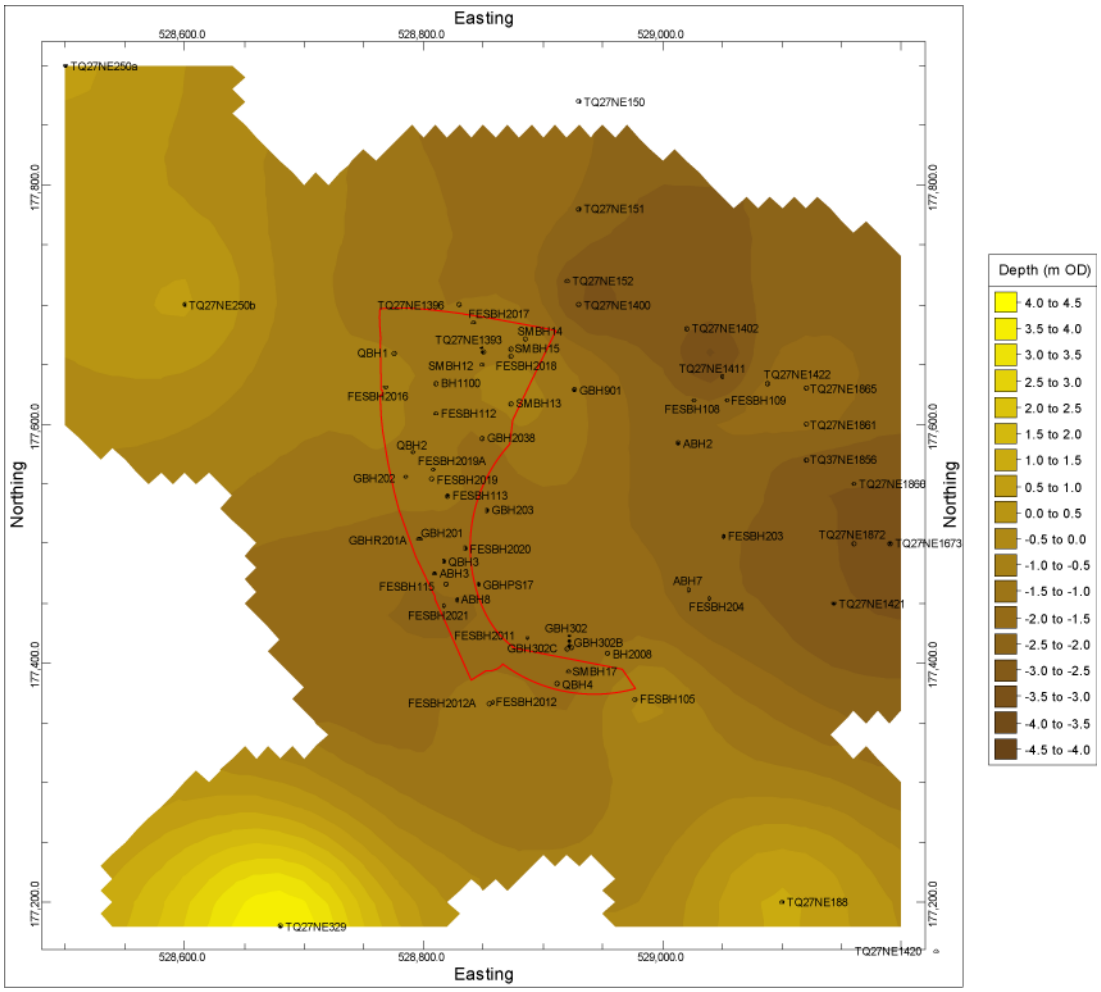

Figure 4: Top of the Gravel / Base of the Alluvium (m OD)

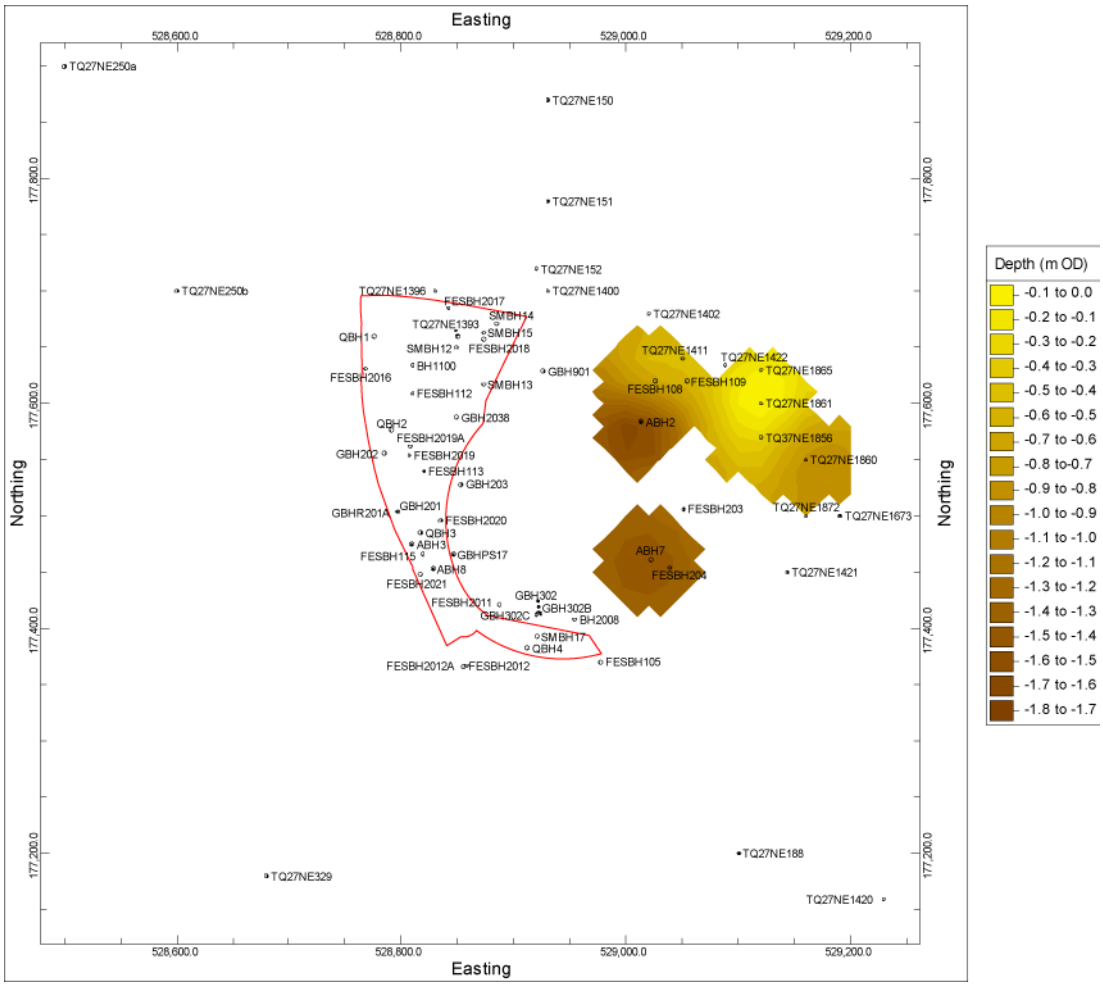

Figure 5: Top of Peat (m OD)

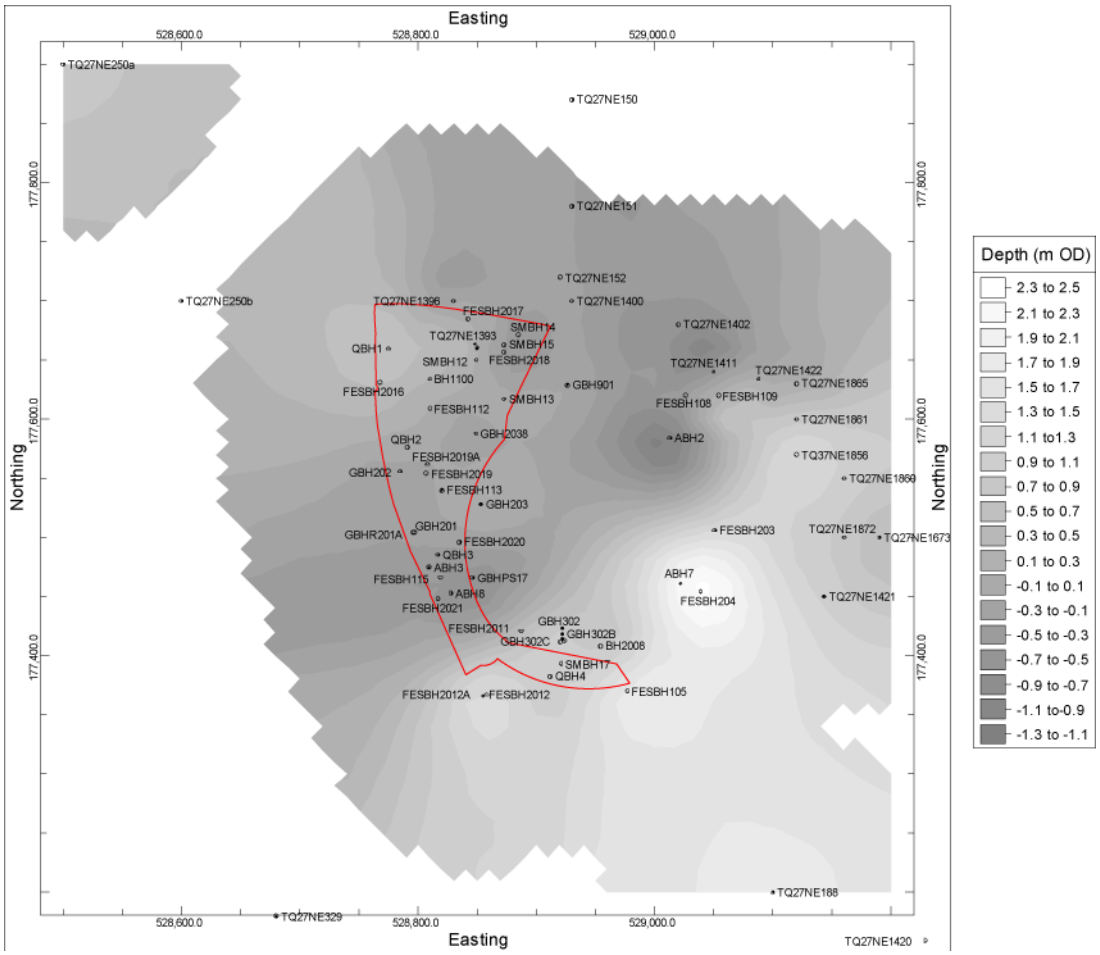

Figure 6: Top of Alluvium / Base of Made Ground (m OD)

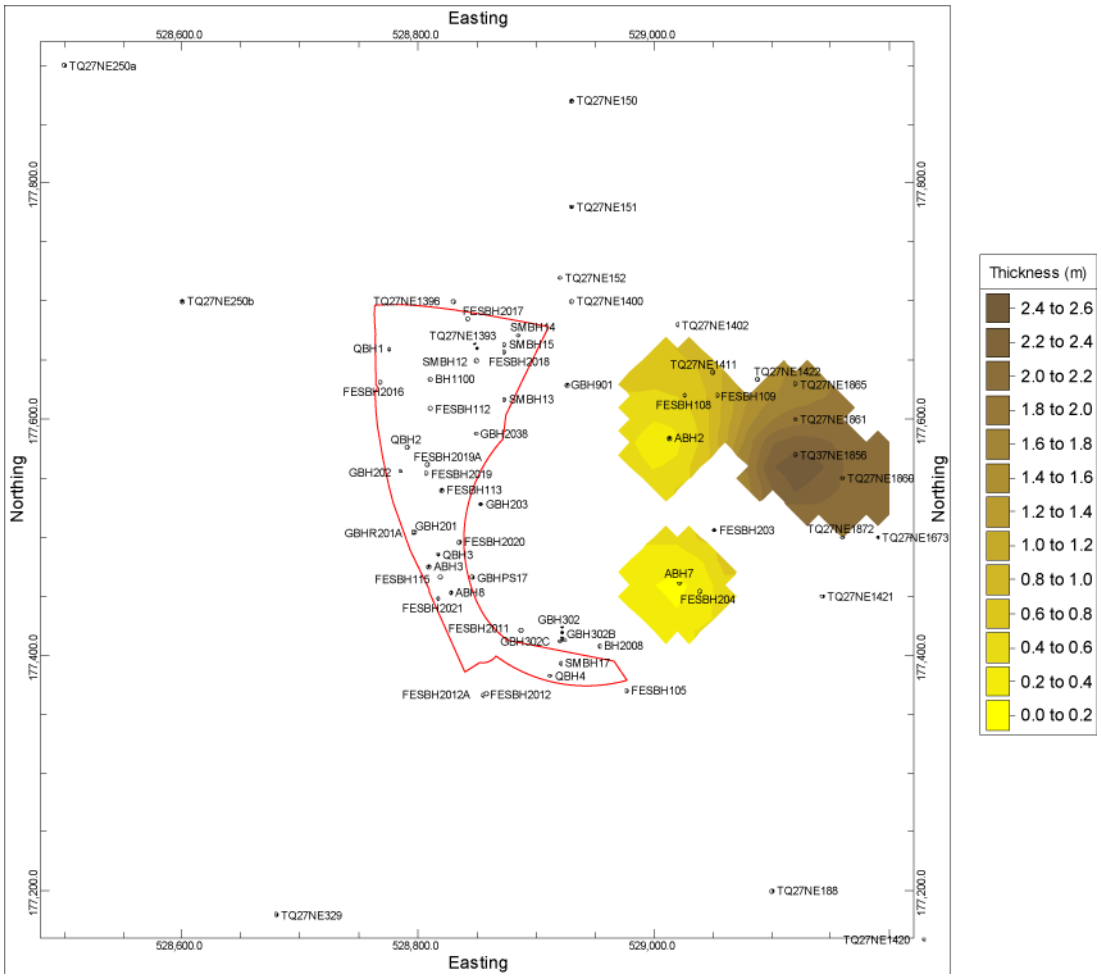

Figure 7: Thickness of the Peat (m)

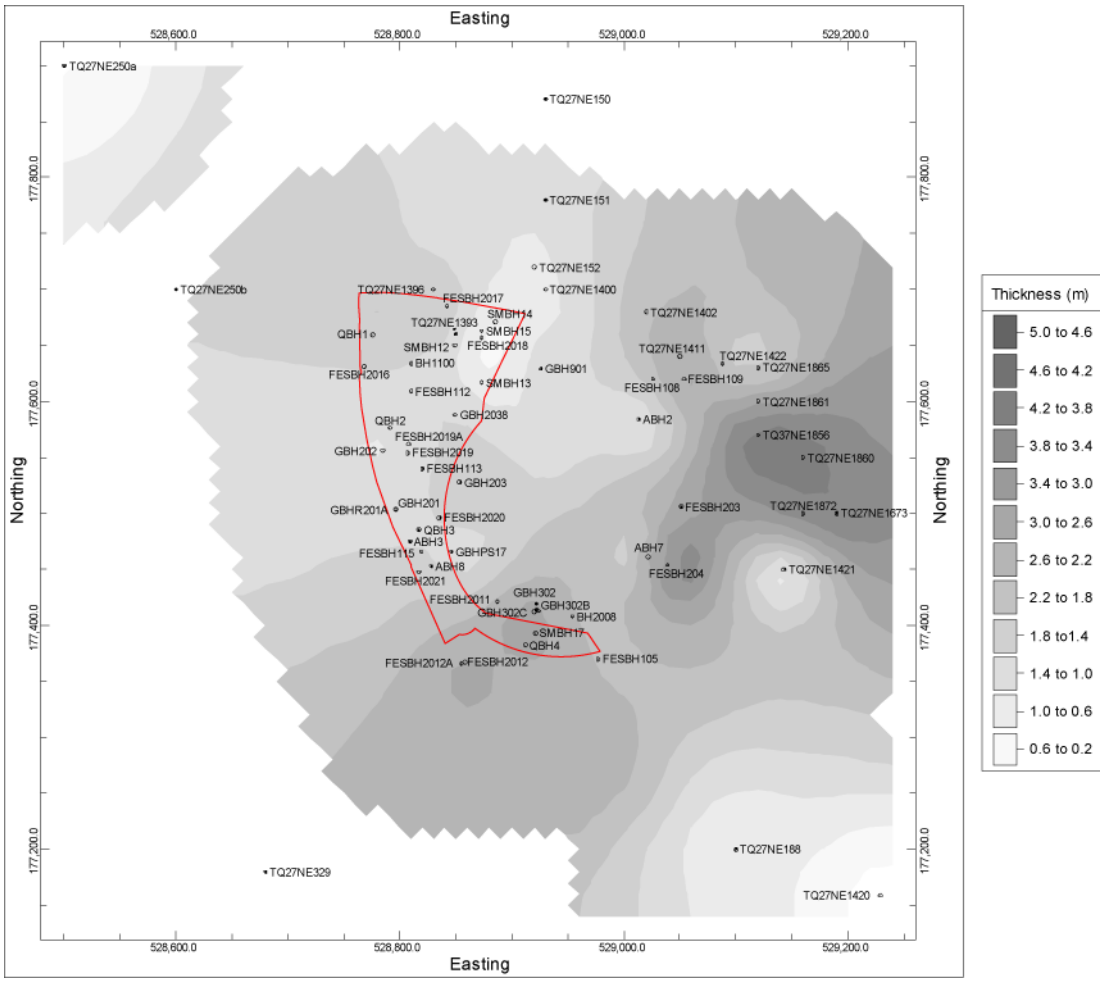

Figure 8: Thickness of Total Alluvium (m)

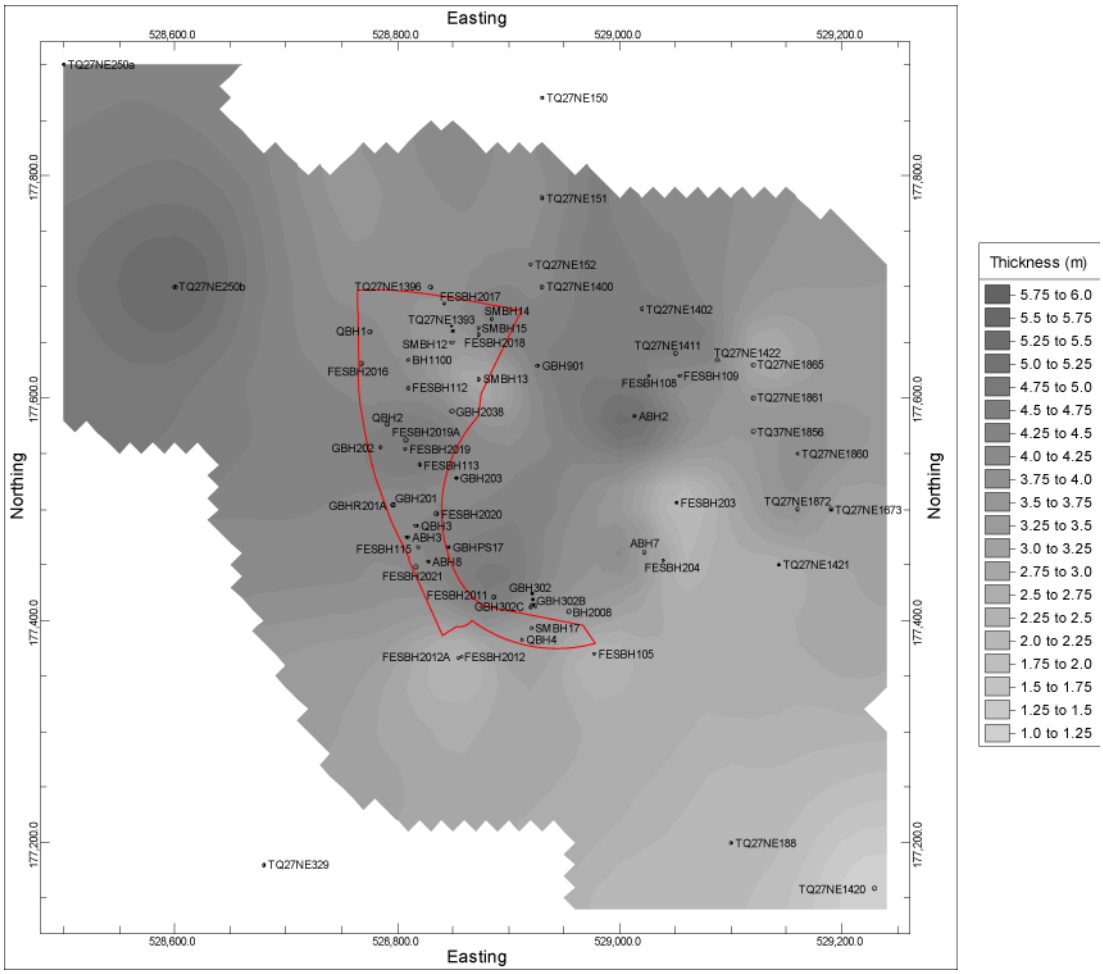

Figure 9: Thickness of Made Ground (m)

DISCUSSION AND CONCLUSIONS

The aim of the geoarchaeological investigations at the Battersea Power Station 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 geotechnical borehole descriptions and records from those boreholes monitored in the field.

Previous geoarchaeological investigations (Dawson *et al*., 2009; Morley, 2009/2010; Corcoran *et al*., 2007; Branch *et al*., 2010; Young & Green, 2013) have revealed that a number of channels, bisecting areas of higher gravel 'islands' (eyots), existed in the Battersea area during the Late Devensian/early Holocene. The Battersea Power Station site lies in an area of low-lying Late Devensian/early Holocene topography previously identified (Branch *et al*., 2010; Perry & Skelton, 1997; Dawson *et al*., 2009) as lying at the confluence between the River Thames, the Battersea Channel and a small subsidiary channel. The Early Holocene topography of this small subsidiary channel dominates the sub-surface stratigraphy of the Phase 1 site, where the Shepperton Gravel surface was recorded at between *ca*. -0.30 and -3.00m OD. To the east of the Phase 1 area the Gravel surface falls to between *ca*. -2.0 and -4.5m OD, whilst to the south it rises towards the Kempton Park Gravel terrace to between 1.22 and 4.27m OD, and to the northeast to at least 0.69m OD. Approximately 1.0km to the east of the Phase 1 site at Wandsworth Road and Pascal Street, Nine Elms (Young & Green, 2013; Figure 1), a site lying near the confluence of the Battersea Channel and River Thames, the Shepperton Gravel surface was recorded at between *ca*. -2.5 and -3.0m OD. This was consistent with investigations at the 120-146 Stewarts Road site (Morley, 2009/2010; Figure 1), where the Gravel surface within the Battersea Channel was recorded at between *ca*. -2.8 and -3.0m OD.

The Shepperton Gravel at the Phase 1 site is overlain by a sequence of Alluvium between 1.0 and 2.0m thick, which below *ca*. 0.0 to 1.0m OD is generally sandy; above this, it is composed of variably silty clay. The sequence recorded is consistent with previous investigations of the Battersea Power Station site (Perry & Skelton, 1997; Dawson *et al*., 2009; Branch *et al*., 2010), and is typical of the sediments found within a braided river system, representing the creation of point-bars, over-bank deposits (levées, crevasse-splay and floodplain deposits) and abandoned channel fills. The sequence indicates that during

the process of lateral channel movement and accretion, bar formation (gravel and sand) was succeeded by finer sediment deposition (silt and clay) under progressively lower energy conditions. These overbank deposits were deposited on top of the former channel and their nature indicates significant variations in water flow velocity during subsequent flood events. During previous work at the Battersea Power Station site (Branch *et al*., 2010) the base of the Alluvium in borehole ABH3 (Figures 2 and 3) was radiocarbon dated to 3980-3730 cal BP (Early Bronze Age), indicating that subsequent erosion of the underlying Shepperton Gravel surface and deposition of Alluvial sediments may have taken place during the Middle Holocene at this location.

Peat horizons indicative of a transition to a more terrestrial environment and stabilisation of the land-surface were not identified in any of the new boreholes, and the deposit model for the wider area indicates that the thicker, more laterally extensive Peat horizons are limited to the areas of lower Gravel surface to the east of the Phase 1 site, present between *ca*. 0.30 and -3.5m OD. During previous work at the Battersea Power Station site (Branch *et al*., 2010) thin Peat horizons radiocarbon dated to the early to late Neolithic were identified at -2.92 to -2.97m OD within the Phase 1 area (ABH8; 6310-6180 cal BP), and at -2.09 to -2.16m OD (ABH2; 5320 to 4960 cal BP) and -1.52 to -1.56m OD (ABH7; 4000 to 3690 cal BP) to the east of the present site. Significantly, these Peat horizons most likely represent different periods of Peat formation, since they are (1) present at different heights OD and (2) are not contemporaneous. At the Wandsworth Road and Pascal Street site (Young & Green, 2013) a Peat horizon was recorded between *ca*. -1.0 and 0.5m OD, whilst at the 120-146 Stewarts Road site (Morley, 2009/2010) Peat was recorded between *ca*. -1.25 and -1.75m OD and subsequently radiocarbon dated to 7670-7510 cal BP (the Mesolithic cultural period). Despite being higher than the Peat recorded at the Battersea Power Station site, this radiocarbon date is indicative of significantly earlier Peat accumulation, and suggests a different sedimentary history in this part of the Battersea Channel.

The Alluvium at the Phase 1 site is truncated by Made Ground to a level of between *ca*. 1.0 and -2.0m OD. The thickness of Made Ground is shallower towards the south of the site (*ca*. 1.0 to 2.0m), but is generally between 4.0 and 5.0m thick across the majority of the Phase 1 area.

RECOMMENDATIONS

The new deposit model for the Battersea Power Station site indicates that sequences of geoarchaeological interest exist within the modelled area. However, given the absence of

Peat horizons across the majority of the Phase 1 site, and the thickness of Made Ground, further geoarchaeological investigations are not recommended within this area.

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