

**Geoarchaeological Monitoring during Site Investigation Works, Land at Vauxhall Square
London Borough of Lambeth.**

NGR: 530220, 177740

Planning Ref: 11/04428/FUL

**ASE Project No: 160906
Site Code: WDH17**

**ASE Report No: 2017262
OASIS id: 286907**

**By Alice Dowsett and Kristina Krawiec
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Abstract

In February and April 2017 Archaeology South East were commissioned to undertake geoarchaeological monitoring during site investigation works at Vauxhall Square, London Borough of Lambeth. The works comprised a cable percussive borehole survey carried out on areas of hardstanding and within existing buildings. The results of the monitoring demonstrated the presence of a thin layer of made ground lying directly over the Kempton Park Gravels. In the western part of the site, this deposit overlay a large gravel and sand filled Scour feature up to 14.10m in depth. In two locations, fine-grained deposits were recovered from within the scour feature.

The site is part of the wider landscape of the now buried Battersea Channel which was previously suggested to be present at the site. However, the borehole survey has demonstrated that the channel does not extend onto the site.

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1.0 INTRODUCTION

1.1 Site Background

1.1.1 Archaeology South-East (ASE), the contracting division of The Centre for Applied Archaeology at the Institute of Archaeology, University College London, was commissioned by Waterman Infrastructure & Environment Ltd. (Hereafter referred to as 'the client') to undertake geoarchaeological monitoring during site investigation works at Vauxhall Square, London Borough of Lambeth (Figure 1, NGR 530220, 177740).

1.1.2 The site is bounded by Wandsworth Road to the west, Parry Street to the north, Bondway to the east and Miles Street to the south in Vauxhall, London. The deposits at Vauxhall Square were modelled as part of another site at neighbouring Wendle Court (ASE 2016).

1.2 Geology and Topography

1.2.1 According to the British Geological Survey (BGS 2017), superficial deposits comprise sands and gravels of the Kempton Park Gravel Formation. These overlie the clays and silts of the London Clay Formation.

1.2.2 The Battersea Channel Project research design and method statement (Batchelor et al 2014) discusses deposits in the local area in more detail. Alluvium in the area of the site has been recognised by Morley (2010) as representing the Battersea Channel, part of a network of braided channels dating to the Late Devensian leaving gravel islands known as 'eyots'. The site is currently thought to be situated on the eastern bank of a channel and may be located on an eyot or more substantial terrain (ASE 2016).

1.2.3 The 1:10,000 scale BGS map indicated the presence of a scour feature underlying the Kempton Park Gravels, the 'Berry Scour', which was shown extending onto the western portion of the site to the west of Wandsworth Road (Waterman 2016a). This feature has been found to the west of the site, and extended to a depth of 30m bgl, truncating the London Clay and was comprised of mostly gravels with some clay lenses (Waterman 2016a). It was therefore expected to extend into the Vauxhall Square site with similar characteristics.

1.2.4 The site lies on relatively flat low lying ground. Deposit modelling derived from local boreholes available through the BGS suggested ground levels between 3.0 and 5.0 m AOD.

1.3 Planning Background

1.3.1 The proposed redevelopment of the wider Vauxhall Square site was granted planning consent in May 2016 (referenced 15/05619/VOC) with a number of conditions. Planning Condition 30 relates to the management of land contamination and states:

"Prior to the commencement of below ground works within each phase (or such other date or stage in development as may be agreed in writing with the Local Planning Authority), the following components of a scheme to deal with

the risks associated with contamination of the site within that phase shall each be submitted to and approved, in writing, by the Local Planning Authority:

1 - A desktop study, site investigation scheme and intrusive investigation, based on the above report, to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off site. The desk study will identify all previous site uses, potential contaminants associated with those uses, a conceptual model of the site indicating sources, pathways and receptors and any potentially unacceptable risks arising from contamination at the site. The site investigation scheme will provide information for an assessment of the risk to all receptors that may be affected, including those off site. The risk assessment will assess the degree and nature of any contamination on site and to assess the risks posed by any contamination to human health, controlled waters and the wider environment;

2 - The results of the site investigation and detailed risk assessment referred to in (1) and, based on these, an options appraisal and remediation strategy giving full details of the remediation measures required and how they are to be undertaken;

3 - A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in the remediation strategy in (2) are complete and identifying any requirements for longer term monitoring of pollutant linkages, maintenance and arrangements for contingency action.” This report has been prepared for the Wendle Court area of the Site and it is intended to assist in the discharge of Condition 30.

1.3.2 The planning application has been approved for the redevelopment of Vauxhall Square, as follows:

London Borough of Lambeth, planning application reference 11/04428/FUL: “Variation of condition 2 (list of approved plans) of planning permission 11/04428/FUL, as amended by planning permission 14/03477/VOC (Demolition of existing buildings (except for the listed buildings on the site) to provide a mixed use scheme comprising nine blocks ranging between 3, 6, 9, 10, 11, 21, 32, 48 and 50 storeys, which includes 520 dwellings (56,158 sqm Gross Internal Area (GIA)) , 22,044 sqm of new office floor space (B1), 2,443 sqm GIA of A1-A5 retail, 251 bedroom hotel and 123 suite hotel (C1), 50 bedroom replacement homeless hostel (sui generis), 454 student bed spaces, 2,972 sqm new multi-screen cinema (D2), 1,317sqm GIA Gym (D2), 67sqm Community Building associated basement car parking and servicing; new public square and children's play area and associated public realm improvements) granted 02.09.2014. The changes include: alterations to the Vauxhall Square East hotel (reducing the no. of bedrooms from 278 to 251 and the provision of ballroom and conferences facilities in the basement); changes to the office building; revised servicing strategy; revised and expanded basement levels; revised ground floor arrangement to suite hotel and increase in no of bedrooms from 123 to 186; revised entrance to the cinema; and various changes to the elevations of the buildings.”

As a result, planning condition 35, on planning consent 11/04428/FUL, is as follows:

“No development of the relevant part (other than demolition) shall take place until the developer has secured the implementation of a programme of archaeological work in accordance with a written scheme for investigation which has been submitted to and approved in writing by the local planning authority. The archaeological works shall be carried out by a suitably qualified investigating body acceptable to the local planning authority.”

Following consultation with the Greater London Archaeological Advisory Service (GLAAS) a watching brief on the geotechnical investigations was carried out. The SI works comprised 24 cable percussive boreholes (to between 10m and 65m bgl) and 21 test pits.

1.4 Aims and Objectives

1.4.1 The primary aims of the monitoring exercise were:

- To determine the presence or absence of archaeological remains and/or geoarchaeological deposits on site
- To assess the character, extent, preservation, significance, date and quality of any remains and deposits
- To assess how they might be affected by the proposed development
- To establish the extent to which previous groundworks and/or other processes have affected archaeological deposits at the site
- To assess what options should be considered for further evaluation/mitigation

1.4.2 Primary objectives of the monitoring exercise comprise:

- Recording and understanding the sedimentary sequence at the site through the monitoring of geotechnical boreholes (24) and test pits (21)
- Recording and understanding the evidence for past environmental conditions of the site and to create an interpretation of changing conditions over time
- Identifying deposits with palaeoenvironmental potential
- Recovering, where possible, samples for laboratory analysis

1.4.3 Project aims identified by The Battersea Channel Project, Nine Elms (English Heritage 2014) project comprise:

- to create an understanding of the environment of the land involved through field evaluation, excavation and reporting
- to identify areas of higher potential for the survival of archaeological remains within a development area that can then be targeted following the evaluation stage of a project to mitigate the impact of development

1.4.4 Specific research questions identified by The Battersea Channel Project, Nine Elms (Batchelor et al 2014) project comprise:

- What was the location, orientation, size and depth of the Battersea Channel and associated smaller channels?

- How did these channels shape the prehistoric landscape and to what extent was the landscape impacted by processes such as changes in sea level/salinity?
- How did the floodplain and dryland vegetation evolve over time?
- What was the nature of human occupation during the prehistoric and historic periods?
- How did environmental change affect human occupation during the prehistoric and historic periods and what was the impact of human occupation on the landscape?

1.4.5 Research aims that may be considered as part of the project with reference to the research framework for London Archaeology (Museum of London, 2002) are:

- *P1, Understanding the many and changing roles of the River Thames through the periods of prehistory since Oxygen [Marine] Isotope Stage (OIS [MIS]) 12 (478,000–423,000 BP), and the relationship between the many fluvial and terrestrial environments, between the floodplains and the gravel terraces, and between inner and outer parts of the Thames Estuary*
- *TL1, Conducting baseline surveys, and use these to develop models for understanding the significance of geomorphology, ecology, ecosystems and climate, hydrology, and vegetational and faunal development, on human lives*
- *TL2, Understanding London's hydrology and river systems and tributaries and, in particular, understanding the role of the River Thames (as boundary, communication route, resource, ritual focus, barrier, link, etc) in shaping London's history, and the relationships between rivers and floodplains*

1.5 Scope of Report

1.5.1 This report details the results of the geoarchaeological watching brief carried out on the site between 23rd February 2017 and 21st April 2017 and has been prepared in accordance with the WSI (ASE 2017a).

2.0 ARCHAEOLOGICAL BACKGROUND

2.1 Overview

- 2.1.1 The local geoarchaeological landscape has been highlighted by Batchelor et al (2014) as being significant on the basis of 'potential of the Thames riverside and of the former marshlands, channels and gravel islands associated with the Battersea Channel, a former river channel situated on the wider Thames floodplain, located within the Nine Elms area.'
- 2.1.2 Alluvium mapped as extending southward across the Nine Elms area and then narrowing in a southwesterly direction, parallel with and slightly to the north of the Wandsworth Road, is recognised by Morley (2010) as marking the course of the Battersea Channel. Batchelor et al (2014, 5) note that the alluvium sits above gravels of the Shepperton Gravel Member, and that whilst the alluvial sequence is frequently incomplete, the Lower Alluvium often preserves organic material (detrital plant remains, wood, Mollusca) and is in places overlain by peat.
- 2.1.3 Batchelor et al (2014) record a wide range of prehistoric Holocene radiocarbon dates on the peat formation, inferring peat growth in abandoned channel remnants on an actively developing floodplain.
- 2.1.4 The Battersea Channel Project area 'incorporates the eastern portion of the Battersea Channel, its margin and the very eastern portion of the eyot between it and the current course of the Thames that in the main is occupied by Battersea Park. Limited archaeological evidence has been recorded from the former channel area while the Thames southern foreshore along this stretch of London has produced considerable archaeological evidence 'from the Mesolithic to Iron Age in particular' (Batchelor et al 2014). The site lies within this zone of interest and therefore this report contributes to the overall aims of the Battersea Channel Project.
- 2.1.5 For more detailed discussion of the local archaeological background, and the Battersea Channel Project see Batchelor et al 2014 and English Heritage 2014.

2.2 Recent Archaeological Investigation

- 2.2.1 In 2016 a report was produced by Archaeology South-East on the creation and analysis of a geoarchaeological deposit model, on the land at Wendle Court, London Borough of Lambeth (ASE 2016). The results indicated that two alluvial units were present on the site, which contained organic evidence, and a possible calcareous clay was also present at the site. It indicated a high potential for sealed prehistoric deposits with potential for palaeoenvironmental preservation in the landscape.
- 2.2.2 In April 2017 a report was produced by Archaeology South-East on an archaeological watching brief undertaken at Wendle Court (ASE 2017b). London Borough of Lambeth. The results indicated that few archaeological remains survived at the site due to extensive modern truncation.

3.0 ARCHAEOLOGICAL METHODOLOGY

3.1 Fieldwork Methodology

- 3.1.1 The work comprised the monitoring, and recovery of samples, during the drilling of 22 cable percussive boreholes as detailed in Appendix 1 (Waterman 2016b). The works were monitored by a trained geoarchaeologist.
- 3.1.2 It was decided that none of the hand-excavated foundation inspection pits required monitoring by an archaeologist because they were only to reach the base of the existing foundations, or to 1.4m maximum and all impacted on made ground.
- 3.1.3 Utilisation was made of the previously created deposit model for the nearby site of Wendle Court (ASE 2016). This made it possible to infer what deposits may be encountered at Vauxhall Square.
- 3.1.4 Due to the large number of boreholes being undertaken and after having monitored a wide scope of the site and finding mostly geoarchaeologically unproductive gravel deposits, it was decided that some of the cable percussive boreholes would not need monitoring by a geoarchaeologist. Out of 22 cable percussive boreholes undertaken at Vauxhall Square, a total of 15 were monitored to full depth.
- 3.1.5 The sedimentary sequence for each borehole was logged from the top of the sequence. All deposits observed during the drilling of boreholes were recorded according to standard Archaeology South-East practice, in line with the GLAAS Standards (Historic England 2015c) and the Historic England Guidelines for Environmental Archaeology and Geoarchaeology (Historic England 2015a and b). The lithology for the non-gravel component was recorded using the Troels-Smith system of sediment recording (1955). The scheme breaks down a sediment sample into four main components and allows the inclusion of extra components that are also present, but that are not dominant. Key physical properties of the sediment layers are also identified according to darkness (Da), stratification (St), elasticity (El), dryness of the sediment (Dr) and the sharpness of the upper sediment boundary (UB).
- 3.1.6 The facility to recover U100 samples during cable percussive boreholing was agreed with the Waterman supervising engineer and was facilitated by the SI contractor, ESG. Where deposits with potential for environmental and/or scientific analysis were noted, samples were taken for subsequent laboratory analysis (Table 3). Sleeved cores recovered from the purposive boreholes were split at ASE offices and a detailed lithological record made. These cores have been retained pending potential sub-sampling, to be determined following the submission of the report. These samples have the potential to be analysed for particle size, micromorphology, pollen, diatom, mollusc, ostracod, foraminifera, micro-mammalian and other microfaunal remains.

3.2 Fieldwork Constraints

- 3.2.1 Services were present throughout the site and it was difficult, and took time, to find suitable locations for each borehole. During BH100 a pipe was

encountered at 0.70m and therefore had to be moved and a second borehole was dug (100A). BH100A and BH202 were contaminated by hydrocarbons for their entire depth. BH305 was moved due to concrete at 0.50m and repositioned at BH305A at a later date. Three boreholes were positioned outside the site boundary, on the pavement of Wandsworth Road. The normal cable percussive rigs could not fit through the gate so a special deconstructed rig had to be ordered. This delayed proceedings due to the modified rig having to be taken completely apart and put back together each time it was moved into a new position.

3.3 The Site Archive

3.3.1 ASE informed LAARC prior to the commencement of fieldwork that a site archive would be generated. The site archive is currently held at the offices of ASE and will be deposited at LAARC in due course. LAARC does not give out archive accession numbers. The contents of the archive are tabulated below (Table 1).

Context sheets	0
Section sheets	0
Plans sheets	0
Colour photographs	0
B&W photos	0
Digital photos	14
Context register	0
Drawing register	0
Watching brief forms	23
Test Pit Record forms	16

Table 1: Quantification of site paper archive

Bulk finds (quantity e.g. 1 bag, 1 box, 0.5 box 0.5 of a box)	0
Registered finds (number of)	0
Flots and environmental remains from bulk samples	0
Palaeoenvironmental specialists samples (e.g. columns, prepared slides)	2x 45 cm U4 tubes, 16 bulk samples
Waterlogged wood	0
Wet sieved environmental remains from bulk samples	0

Table 2: Quantification of artefact and environmental samples

3.3.2 The finds and environmental samples ultimately deposited as part of the archive are dependent on specialist recommendations and regional archive requirements.

Borehole	Type	Depth (m)	Sample Size (L)	Reason for Sample
BH209	bulk	4.00-10.00	1	alluvium
BH209	bulk	6.50-7.00	10	alluvium
BH209	bulk	7.00-7.50	10	alluvium
BH209	bulk	7.50-7.95m	0.25	alluvium
BH209	bulk	8.50	0.25	alluvium
BH209	bulk	9.50	0.25	alluvium
BH209	bulk	9.50-9.95	0.25	alluvium
BH209	bulk	10.00	2	alluvium
BH209	bulk	10.00-10.50	15	alluvium
BH209	bulk	10.10	2	alluvium
BH209	U100 core	11.00-11.15	-	alluvium
BH209	bulk	11.50	2	alluvium
BH209	bulk	12.00	2	alluvium
BH209	U100 core	12.50-12.95	-	alluvium
BH209	bulk	13.00-13.50	1	alluvium
BH209	bulk	13.50	2	alluvium
BH209	bulk	13.50-14.00	2	alluvium
BH307	Bulk	1.80	0.5	pocket of clay with charcoal

Table 3: List of environmental samples.

4.0 RESULTS

4.1 Cable Percussive Borehole Summary

- 4.1.1 A total of 15 boreholes were monitored by a geoarchaeologist to their full depth: BH100A, BH103, BH104, BH201, BH202, BH203, BH205, BH206, BH207, BH209, BH210, BH306, BH307, BH308, BH311 (Figure 2). Detailed lithological records can be found in Appendix 1.
- 4.1.2 With the exception of the layer of made ground found across the site, which included fragments of stoneware mineral water bottles dating to the late 19th century, no archaeological remains were encountered at Vauxhall Square during these SI works.
- 4.1.3 Although there were stark differences in the depth of deposits, overall the site was fairly homogeneous in its sediment composition (Figure 3). The sediments are therefore grouped by type and summarised in Table 4.
- 4.1.4 The bedrock that was encountered was London Clay, which consisted of a stiff brown clay. This was overlain by the Kempton Park Gravel formation; a greyish brown sandy gravel with rounded to angular flint, quartz and quartzite, and occasionally occurred as bands of a yellowish brown gravelly sand with sub-rounded flint gravel. In the western part of the site the London Clay was truncated by a large scour feature up to 14.10m in depth (Figure 4). This feature consisted of a coarse-grained yellowish brown angular to sub-rounded gravel with sand. This coarse scour deposit occasionally contained pockets of stiff brownish grey clay or bands of coarse orange brown gravelly sand which is interpreted as reworked London Clay.
- 4.1.5 In one instance fine-grained deposits were present within the scour feature, BH209. This comprised a laminated silt clay and fine sand deposit which may represent reworked Pleistocene sediment. These deposits were overlain by the Kempton Park Gravel which in turn was sealed by the made ground deposit. The data gathered from this site was added to the existing Wendle Court deposit model to generate Figures 3 and 4, and will ultimately contribute to the Battersea Channel Project deposit model.

Context	Type	Interpretation	Deposit Thickness Range (m)
01	Layer	Concrete	0.30-0.60
02	Layer	Made Ground	0.20-3.50
03	Layer	Scour Deposits (fine grained)	0.00-7.50
04	Layer	Scour Deposits (coarse grained)	4.75-12.30
05	Layer	Kempton Park Gravel	3.60-11.90
06	Layer	London Clay	>1.00

Table 4: List of recorded contexts for the site.

5.0 THE FINDS

5.1 Summary

- 5.1.1 A small assemblage of post-medieval pottery was recovered during the geoarchaeological watching brief at Vauxhall Square, London Borough of Lambeth. All finds were washed and dried or air dried as appropriate. They were subsequently quantified by count and weight and were bagged by material and context (Table 5). All finds have been packed and stored following ClfA guidelines (2014).

Context	Pottery	Weight (g)
201	5	558
Total	5	560

Table 5: Quantification of finds

5.2 The Pottery by Luke Barber

- 5.2.1 The archaeological monitoring recovered just five sherds of pottery from the site, all deriving from overburden deposit [201]. All consisted of late English stonewares. There are three sherds (76g) from three different bottles that have iron washed, salt glazed exterior surfaces, two of which also have grey Bristol glazed interiors. One example has a multiple ringed blob-topped rim. All three sherds have adhering hard grey cement suggesting they were incorporated into a floor or other structure at one time. There is a further late English stoneware sherd from a necked/shouldered mineral water bottle (8g), with exterior iron wash and salt glaze, with partial stamping of '...EL...' around its shoulder. By far the largest piece consists of 95% of a further necked/shouldered mineral water bottle with exterior iron wash and salt glaze, with grey Bristol glaze on the interior (476g: 67mm diameter base and measuring 126mm from base to shoulder). The bottle has two stamps near its base. The first is of the pottery: 'STIFF // 1 // LAMBETH (equating to James Stiff & Sons, High Street, Lambeth). The other is larger and is of the mineral water company. This has the wording 'THE PROPERTY OF // H. J. ROYDANT & Co' above a shield within which is a curious trademark of a sash or tied-back draped curtain. Below the shield is the address: '75 ACRE LANE // LONDON S.W.' The company were at this address between c. 1897 and 1908.
- 5.2.2 The pottery assemblage is of well-known types and is from an unstratified deposit. The material is not considered to hold any potential for further analysis and has been discarded.

6.0 THE ENVIRONMENTAL SAMPLES

- 6.1 The samples recovered from the site are detailed in Table 4 and have been recorded in detail at ASE facilities. No sub-sampling has been undertaken and samples will be retained for a maximum of two years before being discarded.

7.0 DISCUSSION AND CONCLUSIONS

7.1 Overview of stratigraphic sequence

7.1.1 The sequence recorded at the Vauxhall Square site demonstrated a homogeneity across the area. The London Clay was truncated in the western half of the site by a large Scour feature infilled with coarse grained deposits. This was then overlain by the Kempton Park Gravels which in turn were overlain by a thin made ground deposit.

7.1.2 The survey did not record any intact archaeological deposits and the made ground was mostly devoid of cultural material. A single sherd of stoneware beer bottle was recovered.

7.2 Deposit survival and existing impacts

7.2.1 The post-medieval and modern development at the site has likely truncated any earlier deposits although the borehole survey only represents small interventions over a large area and isolated pockets of undisturbed sediment may survive.

7.2.2 The survey did not record the presence of any alluvial deposition at the site and it is likely it lies too far from the course of the Battersea Channel for substantial thicknesses of such deposits to have developed.

7.2.3 The most significant feature recorded at the site was the large scour feature which was recorded up to 14.10m in depth. This feature was infilled by coarse-grained material for the most part although fine-grained sand silt-clay deposits were recorded in BH209.

7.3 Discussion of the deposits

7.3.1 When comparing the deposit model of Wendle Court (ASE 2016) and the results from the Vauxhall Square investigation, it is apparent that the local landscape is dramatically heterogeneous and that the Wendle Court deposit model is not indicative of the deposits at Vauxhall Square. This is mostly due to the presence of a large scour feature which truncates the western half of the site.

7.3.2 Scour features are often referred to as 'buried hollows' and comprise zones of disturbed ground that lay beneath superficial cover, usually found in association with London Clay (Banks et al 2015). These features occur beneath the Kempton Park Gravel Member and are normally infilled with sand and gravels of probable Devensian age, with bedrock inclusions. Their general characteristics are that they are normally 90-475m wide and are usually steep-sided and can reach from 15-33m in depth (Banks et al 2015). These features are usually associated with channels and are often found near the mouths of tributaries to the main river (Berry 1979). It is thought that these buried hollows may be associated with old river terraces, but many remain unmapped (Banks et al 2015, 62). Due to this association they are interpreted as forming during the growth and decay of permafrost, through fluvial or glacio-fluvial processes. A more recent interpretation is that they are scars of hydraulic pingos; periglacial ice mounds developed in areas of permafrost (Gurney 1998). The

formational environment for these scour features is still not well understood (Banks et al 2015).

- 7.3.3 The deposits recorded included the recovery of laminated silt-clay and sand deposits from BH209. These are likely to be reworked from possible Pleistocene deposits although further work is required to ascertain this for certain.
- 7.3.4 The site did not record any alluvial deposits associated with the Battersea Channel and the area is likely to represent a higher terrace above the reach of alluvial deposition. The survey was not able to identify any archaeological remains but the boreholes were small interventions and trenching would be required to establish the likely presence of such deposits. The site did demonstrate a thin layer of made ground, mostly c0.60-1.40m, which may suggest the site has not experienced extensive truncation.

7.4 Consideration of research aims

- 7.4.1 The monitoring has established the nature and depth of the deposits at the site and has established that no alluvial deposition is present at the site. The survey did not identify archaeological remains but the interventions were too small to conclusively dismiss the presence of such remains.
- 7.4.2 The only feature of note was the large scour hollow which underlies the Kempton Park Gravels. A short sequence of fine-grained material was recovered in two U4 tubes which has the potential to preserve palaeoenvironmental remains. In order to establish its origin and the formation processes responsible for its deposition further microfossil assessment would be required (ostracods, forams and pollen).

7.6 Conclusions

- 7.6.1 The monitoring has demonstrated that the site does not have thick alluvial sequences and that the made ground directly overlies the Kempton Park Gravels. The scour feature did record fine-grained material and further work would be needed in order to establish the age and origin of this deposit.

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ASE would like to thank Waterman Infrastructure & Environment Ltd. for commissioning the work and for their assistance throughout the project, and Mark Stevenson (GLAAS) for their guidance and monitoring.

HER Summary

HER enquiry no.	N/A					
Site code	WDH17					
Project code	160906					
Planning reference	11/04428/FUL					
Site address	Vauxhall Square, SW8 4SR					
District/Borough	Lambeth					
NGR (12 figures)	530220, 177740					
Geology	Kempton Park river terrace gravels; Berry Scour feature; London Clay					
Fieldwork type	Eval	Excav	WB	HBR	Survey	Other
Date of fieldwork	23/2/17-21/4/17					
Sponsor/client	Waterman Infrastructure & Environment Ltd.					
Project manager	Jon Sygrave					
Project supervisor	Kristina Krawiec					
Period summary	Palaeolithic	Mesolithic	Neolithic	Bronze Age	Iron Age	
	Roman	Anglo-Saxon	Medieval	Post-Medieval	Other	
Project summary (100 word max)	<i>ASE carried out geoarchaeological monitoring at Vauxhall Square during SI works in 2017. The survey comprised 22 cable percussive boreholes, the results of which were integrated into an existing deposit model and demonstrated that the site did not contain deep alluvial sequences. The Kempton Park Gravels were recorded as overlying a large Scour feature which truncated the London Clay.</i>					
Museum/Accession No.	LAARC					

Finds summary

Find type	Material	Period	Quantity
Ceramic	Stoneware	Post medieval	5 sherds

OASIS Form

OASIS ID: [archaeol6-286907](#)

Project details

Project name	Geoarchaeological Monitoring during Site Investigation Works, Land at Vauxhall Square London Borough of Lambeth.
Short description of the project	Monitoring of geotechnical boreholes with sample recovery through sediments associated with the Battersea Channel.
Project dates	Start: 23-02-2017 End: 21-04-2017
Any associated project reference codes	160906 - Contracting Unit No.
Type of project	Recording project
Current Land use	Industry and Commerce 2 - Offices
Investigation type	"Watching Brief"
Prompt	Planning condition

Project location

Country	England
Site location	GREATER LONDON LAMBETH LAMBETH Vauxhall square
Postcode	SW8 4SR
Site coordinates	TQ 30220 77740 51.483102444053 -0.124412891193 51 28 59 N 000 07 27 W Point

Project creators

Name of Organisation	Archaeology South East
Project brief originator	Archaeology South East
Project design originator	Archaeology South-East
Project director/manager	JON SYGRAVE
Project supervisor	Kristina Krawiec
Type of sponsor/funding body	Waterman CPM Ltd

Project archives

Digital Archive recipient	LAARC
Digital Contents	"Environmental"

Digital Media available "GIS","Images raster / digital photography","Text"

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	Geoarchaeological Monitoring during Site Investigation Works, Land at Vauxhall Square London Borough of Lambeth.
Author(s)/Editor(s)	Krawiec, K
Other bibliographic details	2017262
Date	2017

Appendix 1. Vauxhall Square Core Logs from Cable Percussive Boreholes, all hand dug to 1.2m

BH100a

0-0.30m	concrete
0.30-0.80m	dark grey brown silty sand with infrequent subrounded flint gravel, CBM, bone, metal, nails, flooring material, Made Ground
0.80-1.20m	orangey brown silty sand with infrequent subrounded flint gravel, CBM, Made Ground
1.20-3.50m	orangey brown sandy silty gravel, 50% sand, 50% gravel, mixed flint gravel angular-rounded, 10-50mm. Contaminants from 2.2m.
3.50-4.70m	As above but with clasts of grey sandy clay (reworked London Clay)
4.70-5.20m	60% coarse gravel, 20% fine gravel, 10% coarse sand
5.20-5.50m	Finer grey sand and gravel (<1cm gravel)
5.50-5.70m	Coarse subangular gravel and coarse sand
5.70m	London Clay, weathered at the top

BH103

0-0.38m	concrete
0.38-0.50m	orangey brown silty sand, CBM, glass, slag, Made Ground
0.50-1.30m	dark orangey brown sandy clayey gravel, 40% rounded and subrounded flint gravel, 60% clayey sand
1.30-2.00m	orangey brown sandy gravel with clay pockets, 80% rounded-subangular flint gravel 5-60mm, 20% silty sand
2.00-6.00m	silty sandy gravel, 80% mixed flint gravel 20-70mm, 20% silty sand
6.00-7.00m	silty sandy gravel, 60% sand, 40% subangular-subrounded flint gravel 5-40mm, occasional pink/red flint.
7.00-9.00m	sandy gravel, 70% sand, 30% gravel subrounded-subangular 10-50mm
9.00-10.00m	40% sand, 60% gravel 5-60mm rounded-angular mixed flint gravel
10.00-11.40m	80% large rounded-subrounded flint gravel, 80mm pebbles
11.40m	Purplish brown hard clay, London Clay

BH104

0-0.30m	concrete
0.30-1.80m	sandy clay, CBM, coal, tile, gravel, Made ground
1.80-2.10m	Medium reddish brown sand with infrequent gravel subangular-subrounded
2.10-7.20m	Sandy gravel, mixed rounded – angular beach gravel 10-60mm. Becoming more sandy with smaller gravel and pockets of clayey sand @ 3.00m. The gravel becomes larger again @ 4.50m.
7.20m	Hard purplish brown clay, London Clay

BH201

0-0.30m	concrete
0.3-0.90m	dark brown sandy gravel, broken stoneware jars and cement, glass slag, CBM
0.90-1.00m	orange mottled grey brown fine sand, disturbed at the top
1.00-5.50m	orangey brown sandy silty gravel, subangular-subrounded mixed flint gravel 10-50mm with pockets of sandy clay balls, gets slightly sandier with depth
5.50m	Hard purplish brown clay, London Clay

BH202

0-0.30m	concrete
0.30-0.80m	orange sand, clean, Made Ground?
0.80-1.00m	light orange gravelly sand
1.00-1.05m	chalky clay, very thin horizon
1.05-1.20m	pale orange, buff gravelly sand
1.20-4.20m	coarse flint gravel, occasional sand, subrounded-subangular, <4cm balls of reworked orange sandy clay (weathered London Clay), hydrocarbon smell @ 4.20m
4.20-5.70m	coarse subangular gravel 50%, coarse sand 30%, fine gravel 20%, sandy clay clasts @ 4.80m, contaminated
5.70-15m	London Clay, weathered at top

BH203

0-0.04m	Paving slab
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0.04-0.12m	orange sand with large gravel
0.12-0.15m	grey brown silty sand, soil with roots
0.15-0.40m	orangey brown sandy silt with large stones, brick, metal, concrete, Walkman wires, modern Made Ground
0.40-0.60m	dark orangey brown compact clayey sand, linear inclusions of darker silty bands, some rooting
0.60-0.90m	dark orangey brown sandy clay with gravel 10% subrounded-subangular gravel 20-60mm, rooting
0.90-1.10m	silty sand with occasional small coal/charcoal, 30% flint gravel subrounded-subangular 10-50mm
1.10-2.20m	dark orangey brown silty sand with 50% angular-subangular gravel 5-40mm, rare rootlets
2.00-3.00	orangey brown gravelly sand
3.00-5.20m	orangey brown gravelly clayey sand
5.20-8.00m	orangey brown sandy gravel getting slightly silty at 7.00m
8.00-10.70m	orangey brown sandy flinty gravel
10.70-11.20m	firm stiff clay with lenses of orangey brown sand
11.20m	Stiff clay, London Clay

NB this borehole was still quite silty/sandy to 13.5m

BH205

0-0.30m	concrete
0.30-1.20m	red-brown soft slightly silty-sand, darker at top
1.20-3.50m	medium-coarse gravel 70%, coarse sand 30%
3.50-4.00m	becoming coarser, subangular gravel
4.00-5.70m	fine rounded gravel 10%, fine sharp gravel 50%, coarse sand 40%, clasts of clay, more frequent with depth
5.70m	Weathered London Clay

BH206

0-0.03m	paving slab
0.03-0.15m	orange sand
0.15-0.30m	orangey brown silty sand, CBM, concrete, coal, Made Ground

0.30-0.50m	orangey brown silty sandy clay with rooting, CBM, charcoal, coal, concrete, small gavel, Made Ground
0.50-0.70m	orangey brown sandy silt with 10% gravel 50-100mm subrounded, CBM, less rooting
0.70-1.00m	orangey brown silty sand with 2-40mm gravel (20%) subrounded-subangular
1.00-2.00m	orangey brown silty sand with 60% 10-40mm gravel rounded-subangular
2.00-2.50m	orangey brown coarse sand with 60% 20-100mm subrounded gravel and occasional balls of clay
2.50-3.70m	same as above but no clay balls
4.00-4.50m	flint gravel with greenish grey balls of clay, 80% 20-50mm subrounded-subangular flint gravel with 20% sand
4.50-7.20m	as above but no clay balls
	@ 5.80-6.00m hard clay balls, a mixed deposit of weathered London Clay and blue silts with occasional flint gravel
	@6.70-7.00m it is siltier

BH 207

0-0.60m	concrete
0.60-1.20m	orangey brown silty sand with gravel, 20% subrounded gravel 10-50mm, burnt material, little CBM, conglomerate
1.20-1.95m	orangey brown sandy gravel, 70% rounded-subangular 10-60mm flint gravel, occasional red flint
1.95-2.50m	orangey brown silty sand with 80% rounded-subangular 10-50mm gravel
2.50-3.50m	as above but smaller gravel
3.50-6.00m	as above but larger gravel
6.00-7.00m	sandy gravel, 70% mixed gravel 5-40mm, subrounded-angular
7.00-8.00m	as above but siltier
8.00-9.80m	orangey brown sand with gravel, 10% 5-10mm angular gravel
9.80-14.40m	coarse sub angular gravel 70%, fine gravel 20%, coarse sand 10%
14.40-14.80m	London clay

BH209 – U4s taken at 11-11.45m and 12.5-12.95m

0-0.05m	paving slab
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0.05-3.5m	silty sand, CBM, metal, concrete, Made Ground
3.50-4.00m	orangey brown sand with 40% subangular-subrounded 10-60mm gravel
4.00-5.00m	medium sand with 30% 20-50mm subrounded gravel
5.00-5.50m	as above but more gravelly
5.50-6.50m	medium sand with 30% 5-20mm subangular-subrounded gravel with infrequent small lenses of clay
6.50-11.50m	dark slightly greenish grey brown silty clay, with very occasional organics and small gravel, getting more compact with depth. Some lenses of orangey brown silty clay at 7-7.50m.
11.50-11.95m	greenish grey silty clay with fine sand, alluvium
12.00-13.00m	dark greyish brown sandy silty clay, getting more compact with depth
-	SPT TAKEN FROM 13.00-13.45m SO RECORDED IN DETAIL AND PHOTOGRAPHED -
13.00-13.20m	bluish grey sandy silt, fine sediment, compact
13.20-13.35m	orangey brown fine silty sand
13.35-13.38m	greeny grey silty sand with crushed molluscs, compact
13.38-13.41m	purplish brown hard clay
13.41-13.45m	greenish grey soft clayey sand
-	
13.45-15.50m	dark grey brown medium sand
15.50-17.00m	yellow-brown medium pure sand, slightly silty
17.00-18.50m	same as above but with occasional flint gravel 5-10mm
18.50-28.00m	sands and flint gravels 10-60mm, orangey brown
28.00-30.00m	gravels with some clay reworking, complete absence of London Clay
30.00m	The Lambeth Group shelly beds

BH210

0-0.30m	concrete
0.30-0.60m	dark brown mixed sand and rounded gravel, silt and clay clasts, Made Ground
0.60-1.50m	orange coarse sand and rounded gravel, sandier with depth
1.50-3.50m	orangey brown silty sandy gravel with 50% subangular- subrounded 10-50mm gravel

3.50-4.00m	orangey brown silty sandy gravel with clay balls, 70% subangular-rounded gravel 20-60mm
4.00-7.95m	orangey brown sandy gravel subrounded-rounded 80-90% 10-70mm, getting sandier with depth
7.95-8.50m	sand with 20% gravel subrounded small white flint inclusions
8.50-9.00m	sand and 90% gravel 10-70mm subrounded
9.00-9.45m	sand with 20% rounded-subrounded 5-40mm gravel
9.45-13.00m	sand with 70% rounded-subrounded 10-40mm gravel
13.00-17.90m	sand with 90% subrounded 20-50mm gravel, getting a little more sandy with depth and occasional balls of London Clay at depth. Ragstone at 17.80m
17.90m	Hard purplish brown clay, London Clay

BH305

0-0.30m	concrete
0.30-0.50m	sandy gravel with rubble, CBM, cinder brick
0.50m	concrete

ABANDONED DUE TO CONCRETE

BH306

0-0.30m	concrete
0.30-0.50m	grey brown sandy silt with 10% 5-50mm subangular-subrounded gravel, charcoal, CBM
0.50-1.30m	orangey brown medium sand, very occasional 5mm subangular gravel
1.30-2.00m	orangey brown silty sand with 80% angular-subangular 2-40mm gravel
2.00-3.50m	orangey brown silty sand with 90% subangular gravel 20-60mm
3.50-5.00m	orangey brown silty sand with 50% gravel 5-40mm subrounded and occasional sandy clay balls - 50mm. Getting more gravelly with depth.
5.00-6.00m	weathered London Clay, abundant 50-100mm gravelly sandy clay balls
6.00m	London Clay

BH307

0-0.30m	concrete
0.30-1.00m	grey brown silty sand with gravel, CBM, bricks with a purplish slag-like centre, big pieces of metal
1.00-1.20m	reddish brown clayey sand (medium) with 30% mixed gravel 10-40mm
1.20-1.80m	orangey brown medium sand with 50% subangular gravel 5-50mm
1.80-10.10m	orangey brown clayey sand with 70% subangular-subrounded flint gravel, clay/sand pockets 50-100mm, one containing small charcoal at 1.80m (sampled). Gravel gets larger with depth.
10.10m	Purplish brown hard clay, London Clay

BH308

0-0.30m	concrete
0.30-0.50m	dark grey brown silty sand, pottery, CBM, CTP, bone, 5% gravel 20-40mm subrounded, Made Ground
0.50-1.20m	orangey brown medium sand, slightly clayey, infrequent rounded gravel
1.20-1.40m	dark orangey brown sandy clay with gravel, quite compact, 30% subangular – subrounded gravel
1.40-5.80m	orangey brown sandy gravel, slightly clayey with infrequent clay pockets, 60% gravel 5-50mm. @ 2.5-4.5m becomes more silty. @4.5m gravel becomes larger.
5.80m	London Clay

BH311

0-0.30m	concrete
0.30-0.60m	dark brown-orange sand and rounded gravel, Made Ground
0.60-1.20m	orange coarse sand and gravel
1.20-3.50m	coarse sand and gravel, subrounded gravel 30%, coarse sand 30%, fine gravel 40%, balls of reworked London Clay @3.00m
3.50-4.80m	coarse gravel 50%, coarse sand 30%, fine gravel 20%
4.80-5.50m	smaller gravel 50%, coarse sand 40%, fine gravel 10%
5.50-6.00m	coarse gravel 10%, sand 40%, fine gravel 50%
6.00-9.00m	coarse gravel 40%, fine gravel 50%, sand 10%

9.00-10.00m sand 80%, small gravel 20%

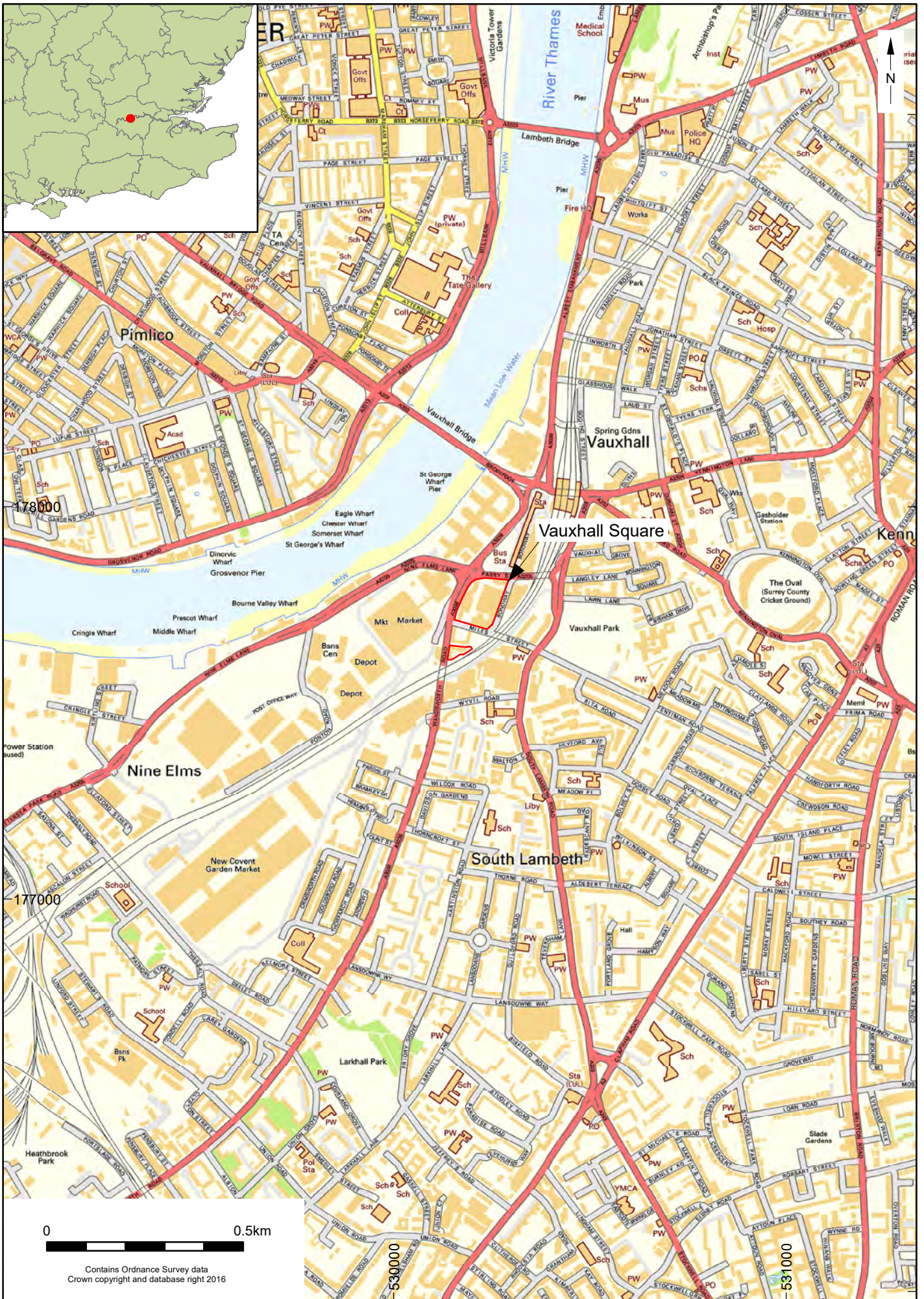
10.00-10.50m sand 50%, mixed gravel 50% 10-50mm

10.50-10.95m silty sand 30%, mixed gravel 5-70mm 70%

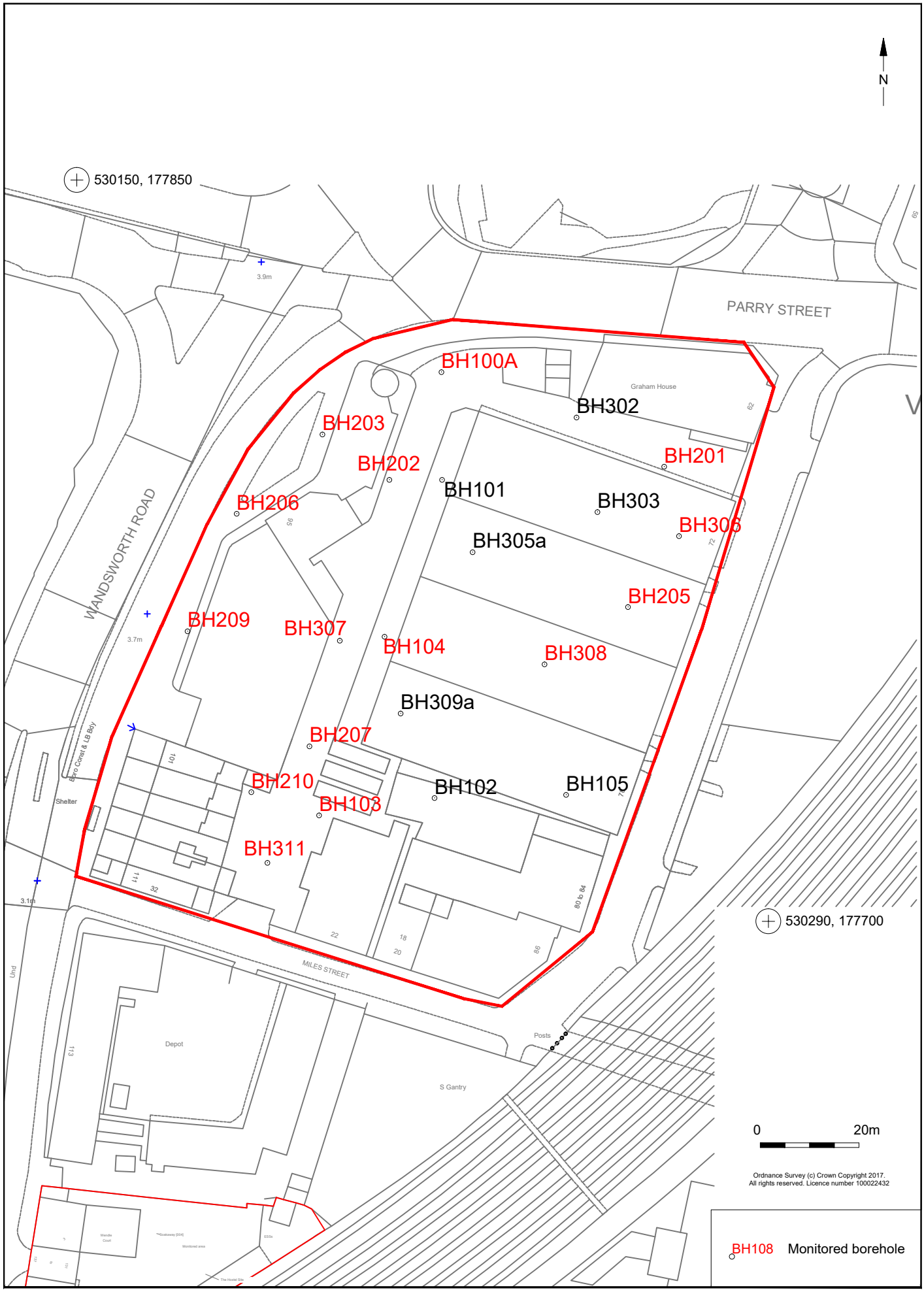
11.50-12.00m sand 20%, gravel 10-40mm 80%

12.00-12.45m sand 50%, mixed gravel 5-60mm 50%, some clay pockets

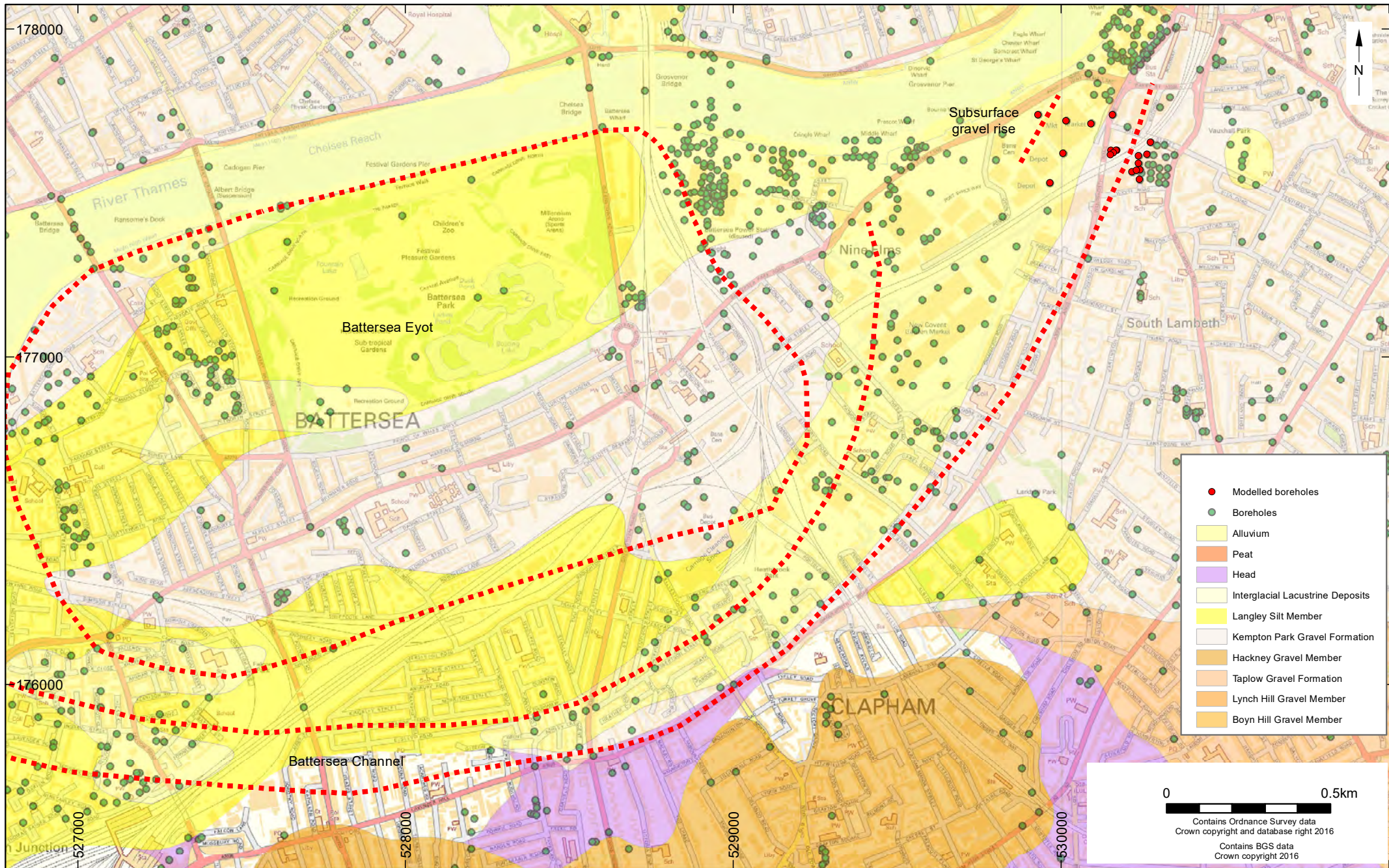
12.45m London clay



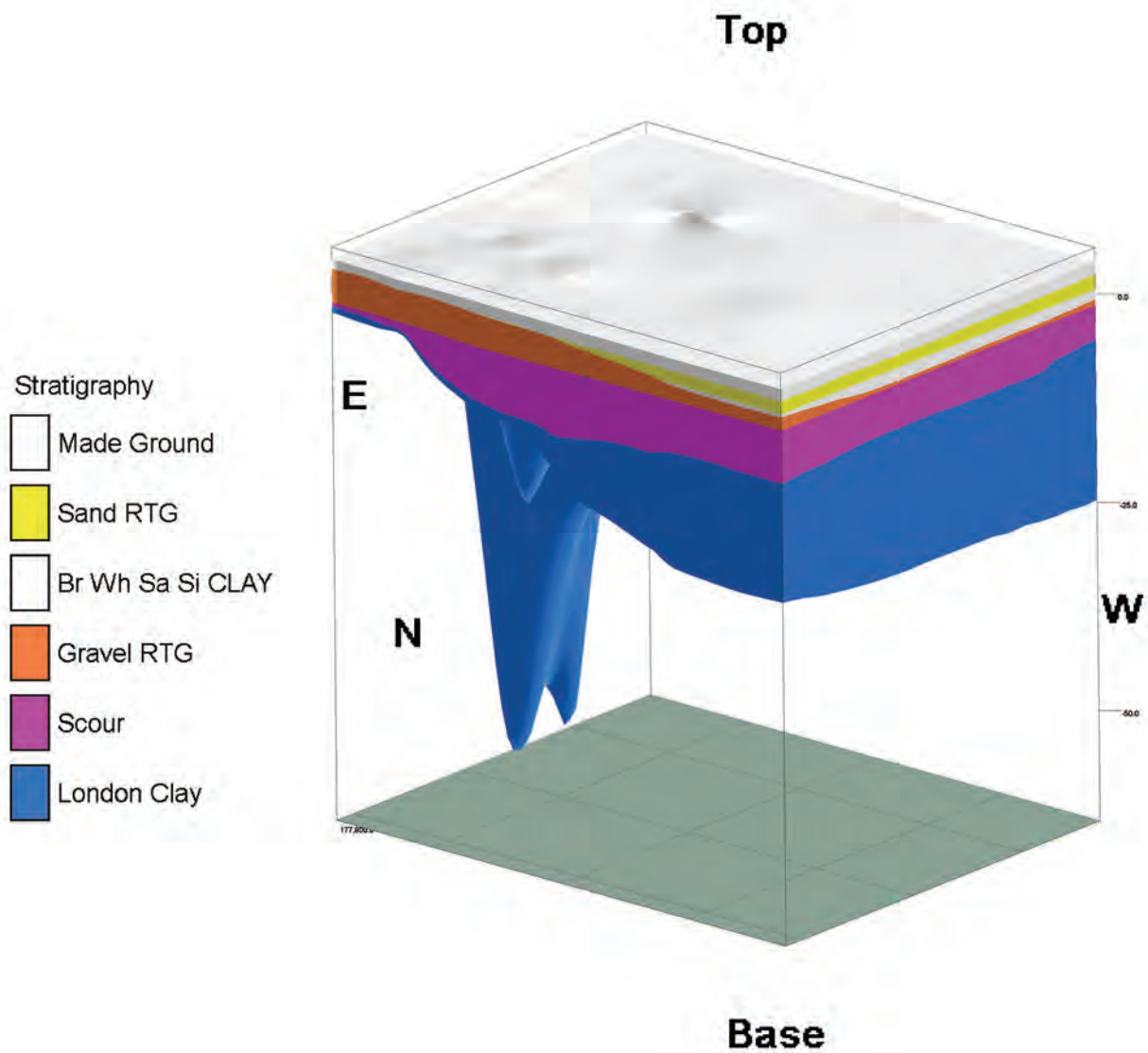
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Project Ref: 160906	November 2017	Site location	
Report Ref: 2017262	Drawn by: JC		

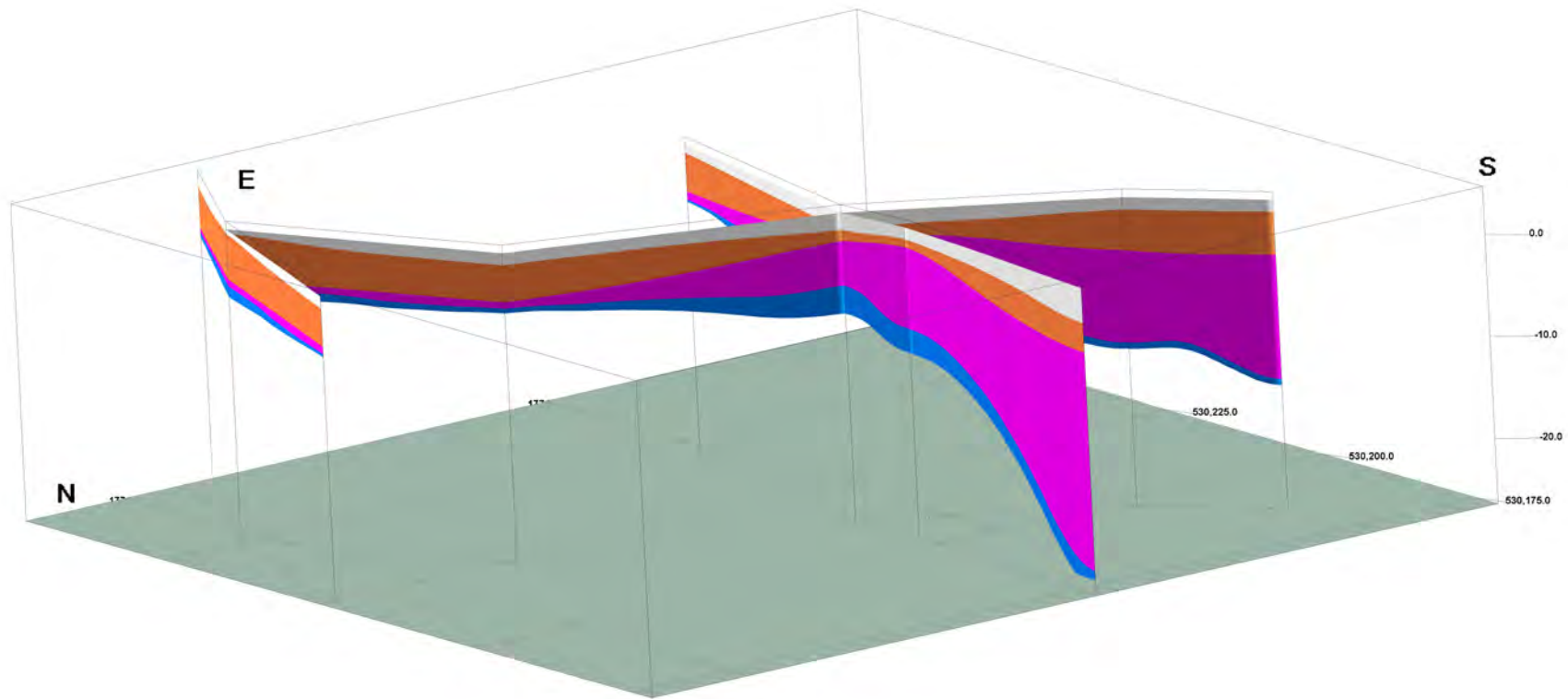


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Project Ref: 160906	October 2017	Borehole location map	
Report Ref: 2017262	Drawn by: JC		



© Archaeology South-East		Vauxhall Square, Lambeth	Fig. 3
Project Ref: 160906	October 2016	Vauxhall Square landscape borehole locations	
Report Ref: 2017262	Drawn by: JC		





- Stratigraphy
- Made Ground
 - Gravel RTG
 - Scour
 - London Clay

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