

SOUTHALL GASWORKS SOUTHALL LONDON BOROUGH OF EALING

Geoarchaeological Fieldwork Report

NGR: TQ 1173 7979

Site code: GAW17

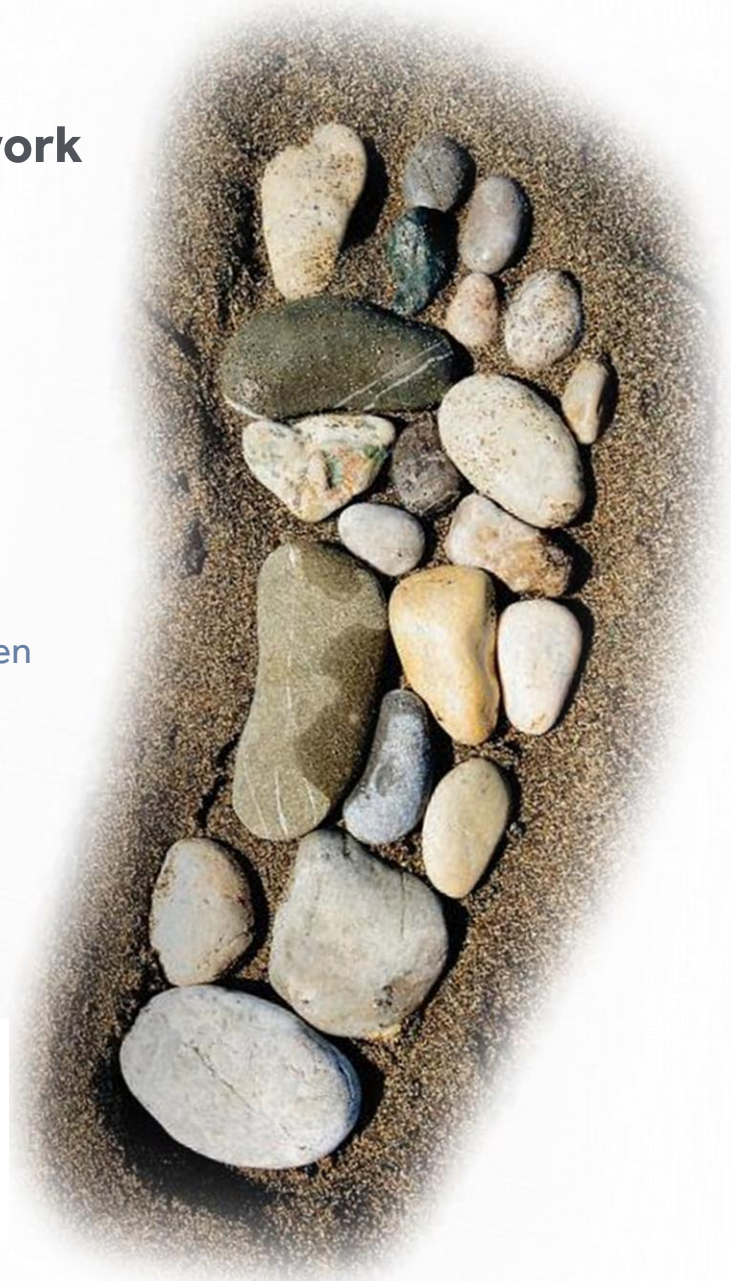
Date: 8th November 2017

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DOCUMENT HISTORY:

REVISION	DATE	PREPARED BY	SIGNED	APPROVED BY	SIGNED	REASON FOR ISSUE
v1	19/10/17	C.R. Batchelor		C.R. Batchelor		First edition

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1. NON-TECHNICAL SUMMARY

A program of geoarchaeological fieldwork was carried out by Quaternary Scientific (University of Reading) in connection with the proposed development of land at Southall Gasworks, Southall, London Borough of Ealing. The work was commissioned and carried out on behalf of CgMs Consulting. The aim of the geoarchaeological investigations were to: (1) clarify the nature of the sub-surface stratigraphy across the site; (2) investigate whether the sequences contain any artefact or ecofact evidence for prehistoric or historic human activity, and (3) investigate whether the sequences contain any ecofact evidence with the potential for palaeoenvironmental reconstruction.

The results of the combined field and laboratory-based investigations have revealed a sequence of Lynch Hill Gravels overlain by thin horizons of clayey sand substantially altered by near surface processes, capped by Made Ground. No definitive Langley Silt ('brickearth') or alluvial deposits were recorded. In addition not only has previous development led to the truncation of much of the natural sequence across much of the site, but all test-pits were contaminated – often severely. Thus, on the basis of the combined findings of the desk-based geoarchaeological deposit model (Green & Batchelor, 2017) and fieldwork, no further work is recommended.

2. INTRODUCTION

2.1 Site context

This report summarises the findings arising out of the desk-based deposit modelling exercise undertaken by Quaternary Scientific (QUEST), University of Reading in connection proposed development at Southall Gasworks, Southall, London Borough of Ealing (NGR: TQ 1173 7979; Figure 1). Quaternary Scientific were commissioned by CgMs Consulting to undertake the geoarchaeological investigations. A desk-based geoarchaeological deposit modelling exercise has already been carried out for the site (Green, 2017); this was aimed at: (1) clarifying the nature of the sub-surface stratigraphy, in particular the presence and thickness of any Langley Silt across the site, (2) providing a rational basis for the ongoing watching brief programme in terms of geoarchaeological and archaeological potential. In order to address these aims, the stratigraphic data from existing records were used to produce a deposit model of the major depositional units across the site. The results were set in the context of past geoarchaeological and archaeological investigations within and near the site and in the broader context of the Pleistocene and Palaeolithic record in southern Britain. The findings of this exercise were as follows:

The Langley Silt at the Southall Gasworks site is in general thin, patchily preserved and often gravelly. In addition at the western end of the site, the development of the Holocene floodplain of the Yeading Brook has led to the removal of the Langley Silt and its replacement by Holocene Alluvium. In the central part of the site, west of the NGR Easting 1200, records of the Langley Silt are almost completely absent. This area largely coincides with the historic location of the Gasworks production and storage facilities. The Langley Silt appears to be best preserved close to the site boundary. Elsewhere the results indicate a complex spatial pattern of disturbed and relatively undisturbed ground juxtaposed in small areas of indeterminate size and shape, making the planning of a realistic programme to monitor groundwater difficult or impossible. To the east of NGR Easting TQ1200, the extent of disturbance appears to be less significant, but, as elsewhere across much of the site, the ground was occupied in the 19th century by brickpits in which the Langley Silt, then known as 'brickearth' was very actively exploited and largely removed. There are also areas on the western part of the site, where continuous areas of relatively undisturbed alluvium may be present.

A plan illustrating the locations where conditions appear to be most favourable for the preservation of the deposits that overlie the Lynch Hill Gravel is provided (Figure 2). These areas include those that are most likely to represent undisturbed Langley Silt or at the western end of the site, the alluvium of the Yeading Brook. These areas of greatest preservation potential have been further narrowed with reference to maps of the historic use of the site. From this it was recommended that seven locations are targeted for further geoarchaeological/archaeological investigation across the site. Three of these are probably in the area underlain by alluvium of the Yeading Brook; the remainder are probably underlain by Langley Silt. In the first instance, it was recommended that test-pits are be dug enabling recording of the sedimentary sequence (but not sampling), with this data integrated into the existing deposit model. Should the exercise indicate undisturbed sedimentary sequences of Langley Silt, it was recommended that more detailed geoarchaeological/archaeological investigations are carried out as a subsequent exercise.

2.3 Palaeolithic Archaeological setting and Pleistocene Mammalia

The Lynch Hill Gravel to the west of London and the overlying Langley Silt have been fairly rich sources of Lower and Middle Palaeolithic material, notably west of the Gasworks site and west of the River Crane around Yiewsley and West Drayton (e.g. Collins 1978); and east of the Gasworks site and east of the River Brent in Ealing (e.g. Brown 1887). In general, where Lower Palaeolithic artefacts and mammalian remains have been recovered in these localities from the Lynch Hill Gravel, they have come from the base and lower part of the gravel and are all in a more or less rolled condition. Where Levallois material has been recovered it has come mainly from the 'brickearth' or the surface of the underlying gravel, e.g. at Creffield Road in Ealing (Brown 1887) and some of it is in mint condition and probably primary context with refitting material present.

On the ground between the Crane and the Brent, where the Gasworks site is located, relatively few Palaeolithic artefacts have been recorded. Wymer (1999) identifies only three find spots, all of which are among the nine localities identified by Blinkhorn (2016) from the Greater London HER and within a 2km radius from the Gasworks site. Of these nine sites, six are between the Crane and the Brent and two are within or very close to the Gasworks site. The remainder lie to the south of the site. The number of artefacts recorded is small. Roe (1968) records 21 handaxes and six unretouched flakes from Southall Gasworks. Of the other six Southall localities listed by Roe, only three yielded handaxes and only six implements are listed in all, including three Levallois flakes. However, the two sites within or close to the Gasworks site are of particular interest because in both cases the artefacts were associated with mammoth remains.

There seems to be some duplication of localities in the HER with one of the Gasworks localities entered twice. Nevertheless, the record appears to indicate the recovery of artefacts associated with mammoth remains on two occasions: Nr White Street 'during the 1860s' (HER 052862/00/00), and again in 1890 'when excavations were made for the gasholder' (Wymer 1968) (this is possibly a duplicated entry in the HER which lists: Southall Gasworks, Southall 050023/00/00 'handaxes and elephant bones'; and Nr White Street 052861/00/00 'palaeolithic flint implements ... discovered during 19th century excavations for a gas holder').

A more spectacular discovery of mammoth remains in the Southall spread of Lynch Hill Gravel is recorded by Brown (1889) who describes a mammoth skeleton, complete and articulated, found at a depth of 13 feet (3.96m) at a site in Norwood Lane (now Tentalow Lane) about two kilometres to the SE of the Gasworks site.

Finally, it is worth highlighting the PhD work of Juby (2011); a very useful compilation, scrutinising the associated museum collections of artefacts and mammalian remains of a large number of published accounts of sites in London and London suburbs. A chapter on the areas of Hanwell, Southall, Norwood Green and Osterley contains contextual sites referred to in our report; there are also separate chapters on West Drayton and Yiewsley and Creffield Road. These chapters discuss the same sites as outlined above.

2.3 Aims & Objectives

Additional sedimentary records are required to enhance our understanding of the sub-surface stratigraphy at the site, and to assess its palaeoenvironmental and Palaeolithic archaeological potential. Three significant research aims relevant to the geoarchaeological investigation at the site were outlined within the Written Scheme of Investigation as follows (Batchelor, 2017):

1. To clarify the nature of the sub-surface stratigraphy across the site;
2. To investigate whether the sequences contain any artefact or ecofact evidence for prehistoric or historic human activity.
3. To investigate whether the sequences contain any ecofact evidence with the potential for palaeoenvironmental reconstruction

In order to address these aims, the following objectives are proposed:

1. To open and describe seven geoarchaeological test-pits in the previously identified area of greatest potential
2. To update the existing deposit model with the results of the field investigations
3. To make recommendations for any further archaeological/palaeoenvironmental investigations at the site (if necessary).



Figure 1: Location of Southall Gasworks, Southall, London Borough of Ealing. The locations of the borehole and test pit logs, and developmental areas is also shown.

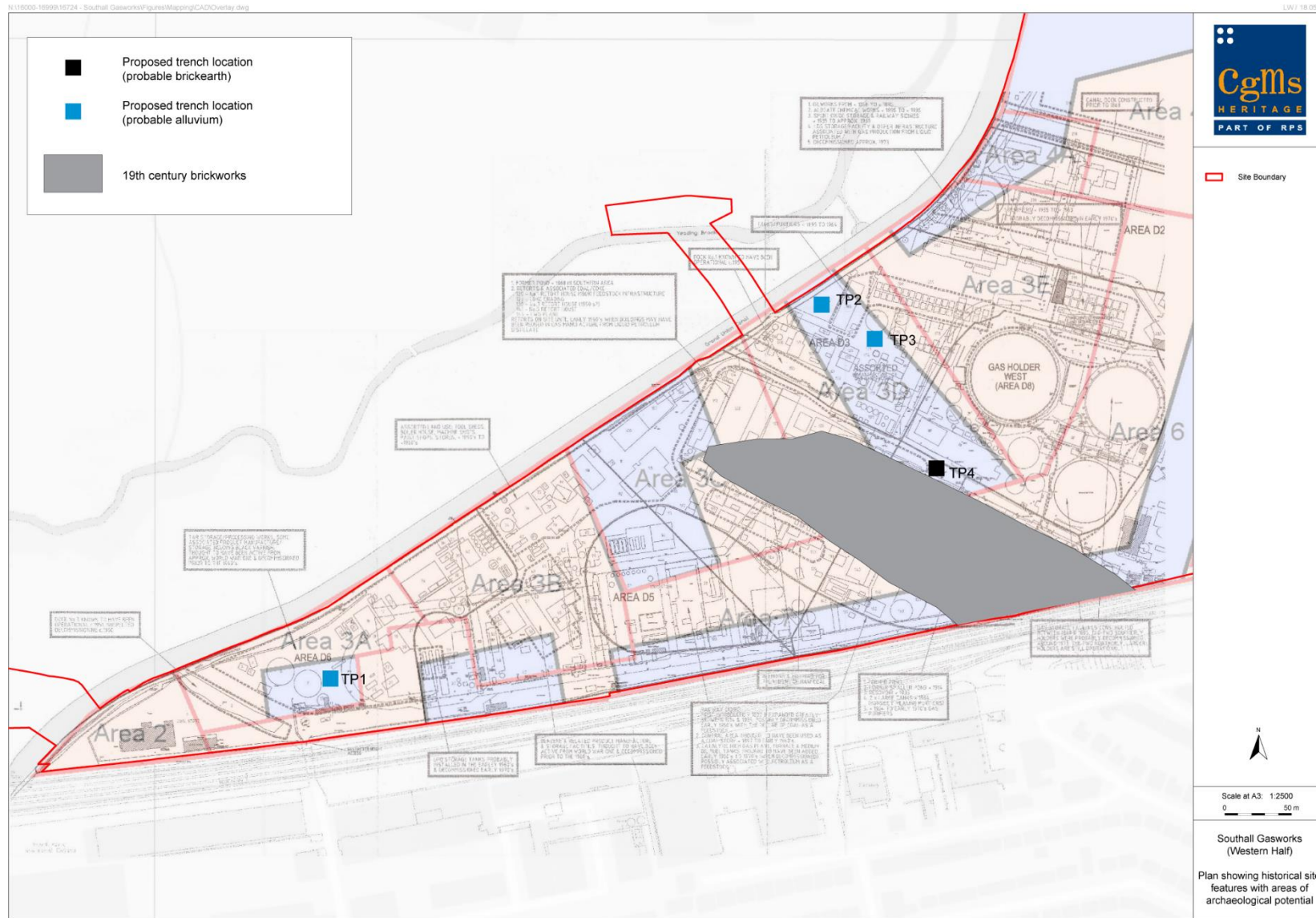


Figure 2: Geoarchaeological test-pit locations

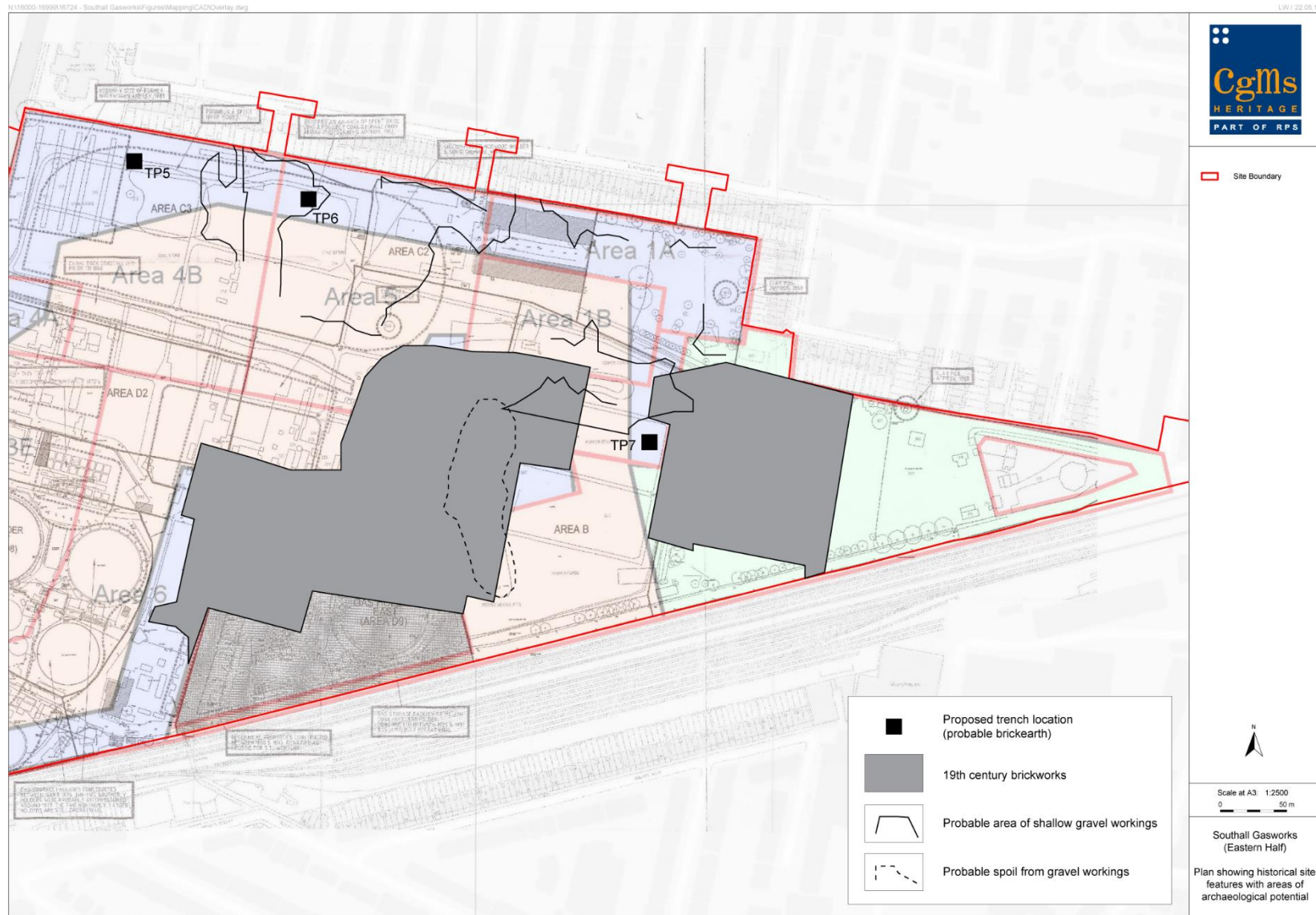


Figure 2: Geoarchaeological test-pit locations

3. METHODS

A site walkover was carried out on 11th October 2017 between Rob Batchelor (Quest geoarchaeologist), Richard von Kalinowski-Meager (CgMs Consulting) and John Raftery (Berkeley Group). During this exercise the approximate location of each test-pit was visited and constraints not displayed on existing plans identified. An eighth test-pit originally proposed for investigation during the DBA stage (Green, 2017) was abandoned at this stage due to the disturbance and obvious evidence of services both at surface and below ground.

Seven geoarchaeological test-pits were proposed in the previously identified area of greatest potential. Each test-pit was put down within 5m of the proposed locations as explicitly stated must happen in the WSI. The exceptions to this were: TP6 which moved 47m west as the area had already been dug down to natural, and TP2 which moved 9m north due to onsite traffic movements. The proposed and actual locations are displayed in Table 1 below.

Table 1: Geoarchaeological test-pit locations, Southall Gasworks, Southall, London Borough of Ealing

Test pit number	Proposed locations		Actual locations		
	Easting	Northing	Easting	Northing	Elevation (m OD)
TP1	511132	179519	511133.063	179517.406	30.790
TP2	511498	179799	511500.400	179808.136	31.507
TP3	511537	179772	511538.403	179773.282	31.201
TP4	511583	179678	511583.951	179680.289	30.751
TP5	511741	180031	511741.200	180030.481	31.598
TP6	511915	179998	511868.663	180007.049	31.284
TP7	512130	179824	512130.649	179828.584	31.035

The test-pits were be opened by a JCB using a toothless bucket, supervised by an experienced geoarchaeologist (Dr Rob Batchelor). Each test-pit measured around 1x1m at surface and extended down to the surface of the Lynch Hill Gravels. All Made Ground was removed and placed in a single large pile. Within the WSI it was stated that any natural clean deposits encountered would be removed from the pit in spits and placed in individual piles. In reality, this often this simply wasn't possible due to the contaminated nature of the Made Ground above. Works stopped when services were encountered.

Field-based descriptions of the sequences was carried out, noting composition, colour boundary types (sharp or diffuse) and (where relevant) degree of humification. These were carried out from observations of the test-pit sections from the surface (the test-pits were not be entered at any time) and material excavated. As above, due to the contaminated nature of the Made Ground, test-pits were kept open for as short a period as possible, and thus the field-based descriptions were not as detailed as would normally be the case. However, spot samples of uncontaminated natural material were taken for more detailed investigation under laboratory-based conditions. The results of the investigations are displayed in Tables 2 to 8 and Figures 3 to 9.

4. RESULTS AND DISCUSSION OF THE FIELD AND LABORATORY-BASED INVESTIGATIONS

The results of the fieldwork and laboratory-based investigations are displayed in Tables 2-8, and Figures 3-9.

Of the seven test-pits dug, two had to be abandoned due to the presence of multiple services at depth (TP3 and TP4). Made Ground rested directly on Lynch Hill Gravels three faces of TP6. Within the remaining four test-pits (TP1, TP2, TP5 & TP7) and north face of TP6, thin horizons of apparently natural material were recorded between the Made Ground and Lynch Hill Gravel. It is highlighted however, that there wasn't a single test-pit opened that wasn't contaminated – often severely. This was largely with hydrocarbons, but cyanide was highlighted as a risk in the area of TP5 and TP6.

Test-pit TP1 contained 0.8m of contaminated grey silty clay, though most likely to represent an alluvial deposit.

Test-pit TP2 contained a 0.7m of dark yellowish brown massive clayey sand with frequent small clasts of flint and quartz.

Test-pit TP5 contained 0.7m brown massive clayey sand with remnants of root channels and scattered root remains.

The north face of test-pit TP6 contained 1.2m of brown massive clayey sand with frequent small clasts of flint and quartz.

Test-pit TP7 contained 0.5m of greyish brown massive clayey sand with scattered clasts of flint, quartz and root remains.

None of the samples displays the classic features of 'brickearth' – i.e. a dense network of tubes and cavities with evidence of clay translocation and/or reprecipitation of calcium carbonate; platiness; brownish yellow colour.

TP2 and TP7 are too sandy to be 'brickearth' and their dark colour and the presence of root remains in TP7 suggests the influence of pedological processes – presumably associated with the soil present beneath the natural ground surface prior to the development of the site for commercial and industrial purposes.

The colour of TP6 is more like the colour of typical brickearth, but the sediment is much too gravelly to be classified as 'brickearth' (although stringers of gravel are fairly common in the classic 'brickearth'). The paler colour (10YR 7/6) looks more like localised bleaching of the sediment rather than mixing in of sediment from a different source – possibly a pedological feature. The presence of root remains suggests that the sediment may have formed part of the C horizon of a former soil.

TP5 looks like a mixture of two different sediments, one similar to TP7, the other similar to TP6 which might include a component of 'brickearth'. The presence of root remains suggests a history involving pedological processes, and the evidence for mixing, suggests near-surface disturbance of the sediment.

Finally, the material in each of these test-pits is described as 'massive' which here means – with no surviving evidence of depositional or post depositional structure, which again points to near-surface disturbance.

Within the desk-based assessment (Green, 2017), the silt-clay sediment resting between the Made Ground and Lynch Hill Gravels was interpreted as Langley Silt ('brickearth') across the majority of the site, and alluvium nearer the Yeading Brook. The two sediment types were distinguished by the presence of more organic-remains in the geotechnical descriptions as well as their distribution (i.e. alluvium close to the Yeading Brook). During the course of the fieldwork however, whilst the sequences identified on the eastern most part of the site contained elements of brickearth as evidenced by the work of Archaeology South East (Blinkhorn, 2016a, b), the sediment recorded in TP1, TP2, TP5, TP6 and TP7 was dominated more by sand and cannot be described as either 'brickearth' or alluvium. Instead, it would appear to represent a mixture of Lynch Hill Gravel and 'brickearth' that has been substantially altered by near surface processes – potentially including periglacial / soil forming processes and bioturbation. Indeed, it is highlighted that: (1) soil must have been present on the site prior to development; (2) soil was identified in 9 of the geotechnical logs during the desk-based study (Green, 2017), and (3) material characteristic of a C-horizon was identified in the material taken from TP6.

5. CONCLUSIONS AND RECOMMENDATIONS

The aim of the geoarchaeological investigations were to: (1) clarify the nature of the sub-surface stratigraphy across the site; (2) investigate whether the sequences contain any artefact or ecofact evidence for prehistoric or historic human activity, and (3) investigate whether the sequences contain any ecofact evidence with the potential for palaeoenvironmental reconstruction.

The results of the combined field and laboratory-based investigations have revealed a sequence of Lynch Hill Gravels overlain by thin horizons of clayey sand substantially altered by near surface processes, capped by Made Ground. No definitive Langley Silt ('brickearth') or alluvial deposits were recorded. In addition not only has previous development led to the truncation of much of the natural sequence across much of the site, but all test-pits were contaminated – often severely. Thus, on the basis of the combined findings of the desk-based geoarchaeological deposit model (Green, 2017) and fieldwork, no further work is recommended.

Table 1: Lithostratigraphic description of trial-pit TP1, Southall Gasworks

Depth (m bgl)	Depth (m OD)	Thickness (m)	Description	Unit
0 to 1.00		1.00	Contaminated Made Ground	MADE GROUND
1.00 to 1.80		0.80	Contaminated grey silty clay	CONTAMINATED ALLUVIUM
>1.80			Grey-brown sandy flint gravel	LYNCH HILL GRAVEL

Table 2: Lithostratigraphic description of trial-pit TP2, Southall Gasworks

Depth (m bgl)	Depth (m OD)	Thickness (m)	Description	Unit
0 to 2.30		2.30	Contaminated Made Ground; sharp contact into:	MADE GROUND
2.30 to 3.00		0.70	10YR 4/4 dark yellowish brown; moderately clayey fine to medium sand with common small (<5mm) clasts of flint and quartz; massive.	ALLUVIUM
>3.00			Grey-brown sandy flint gravel	LYNCH HILL GRAVEL

Table 3: Lithostratigraphic description of trial-pit TP3, Southall Gasworks

Depth (m bgl)	Depth (m OD)	Thickness (m)	Description	Unit
0 to 1.30		>1.30	Made Ground, with services at 0.40, 1.00 and 1.30m depth	MADE GROUND
Location abandoned; no nearby areas clear of services and/or onsite works				

Table 4: Lithostratigraphic description of trial-pit TP4, Southall Gasworks

Depth (m bgl)	Depth (m OD)	Thickness (m)	Description	Unit
0 to 0.60		0.60	Reinforced concrete	MADE GROUND
0.60 to 1.75		1.15	Brown to grey sandy gravel with frequent brick remains	
>1.75			Disused gas-pipe	
Location abandoned; no nearby areas clear of services and/or onsite works Second location attempted but more services uncovered. Nearby area full of located basements and deep drains.				

Table 5: Lithostratigraphic description of trial-pit TP5, Southall Gasworks

Depth (m bgl)	Depth (m OD)	Thickness (m)	Description	Unit
0 to 2.00		2.00	Contaminated Made Ground	MADE GROUND
2.00 to 2.70		0.70	7.5YR 5/8 strong brown mixed with 2.5Y4/3 olive brown; clayey fine to medium sand; very scattered discontinuous remnants of root channels; very scattered root remains; massive.	
>2.70			Grey-brown sandy flint gravel	LYNCH HILL GRAVEL

Table 6: Lithostratigraphic description of trial-pit TP6 north face, Southall

Depth (m bgl)	Depth (m OD)	Thickness (m)	Description	Unit
0 to 1.50		1.50	Contaminated Made Ground	MADE GROUND
1.50 to 2.70		1.20	7.5YR 5/8 strong brown mixed with 10YR 7/6 very pale	

			brown; clayey medium to coarse sand with very common clasts of flint and quartz (up to 35mm); massive.	
>2.70			Grey-brown sandy flint gravel	LYNCH HILL GRAVEL

N.B. West. East and South faces all contaminated Made Ground resting on sandy gravel

Table 7: Lithostratigraphic description of trial-pit TP7, Southall Gasworks

Depth (m bgl)	Depth (m OD)	Thickness (m)	Description	Unit
0 to 1.50		1.50	Contaminated Made Ground	MADE GROUND
1.50 to 2.00		0.50	2.5Y 4/2 dark greyish brown; slightly clayey medium sand with small very scattered clasts of flint and quartz (<3mm); very scattered root remains; massive.	
>2.70			Grey-brown sandy flint gravel	LYNCH HILL GRAVEL



NB Contaminated material

Figure 3: Photograph of Test-pit TP1, Southall Gasworks



NB Contaminated material

Figure 4: Photograph of Test-pit TP2, Southall Gasworks



NB Multiple services at depth

Figure 5: Photograph of Test-pit TP3, Southall Gasworks



NB Services at depth

Figure 6: Photograph of Test-pit TP4, Southall Gasworks



Figure 7: Photograph of Test-pit TP5, Southall Gasworks



NB Contamination

Figure 8: Photograph of Test-pit TP6, Southall Gasworks



NB Contamination

Figure 9: Photograph of Test-pit TP7, Southall Gasworks

6. REFERENCES

- Banerjea, R. (2017) *Southall, West London : Micromorphology Report*. Unpublished ASE/Quest Report.
- Batchelor, C.R. (2017) *Southall Gasworks, Southall, London Borough of Ealing: Written Scheme of Investigation for Geoarchaeological Fieldwork*. Quaternary Scientific (QUEST) Unpublished Report October 2017; Project Number 185/16.
- Blinkhorn, E. (2016a) *Southall Gasworks (TSH 16) Geoarchaeological Fieldwork Summary*. Unpublished Archaeology South East Report.
- Blinkhorn, E. (2016b) *Southall Gasworks site, London Boroughs of Hillingdon & Ealing: A post-excavation assessment and updated project design report*. Unpublished Archaeology South East Report no. 2017054.
- Brown, J.A. (1887) *Palaeolithic Man in NW Middlesex*. Macmillan & Co, London.
- Brown, J.A. (1889) On the discovery of *Elephas primigenius* associated with flint implements at Southall. *Proceedings of the Geologists' Association*, **10**, 361-372.
- CgMs (2016) *Land at Southall Gasworks: Written Scheme of Investigation*. Unpublished CgMs Report.
- Collins, D. (1978) *Early Man in West Middlesex*. HMSO, London Museum Archaeological Report.
- Gibbard, P.L. (1985) *The Pleistocene History of the Middle Thames Valley*. Cambridge University Press, Cambridge.
- Gibbard, P.L., Wintle, A.G. and Catt, J.A. (1987) Age and origin of clayey silt 'brickearth' in west London, England. *Journal of Quaternary Science*, **2**, 3-9.
- Green, C.P. (2017) *Southall Gasworks, Southall, London Borough of Ealing: Desk-based geoarchaeological deposit model report*. Quaternary Scientific (QUEST) Unpublished Report August 2017; Project Number 185/16.
- Juby, C. (2011) *London before London: Reconstructing a Palaeolithic landscape*. Unpublished PhD thesis, Royal Holloway, University of Reading.
- MOLA (2011) *Southall Gasworks site*. Unpublished WSI
- Roe, D.A. (1968) *A Gazetteer of British Lower & Middle Palaeolithic sites*. CBA Research Report 8.
- Wymer, J.J. (1968) *Lower Palaeolithic Archaeology in Britain*. John Baker, London.

Wymer, J.J. (1999) *The Lower Palaeolithic Occupation of Britain*. Wessex Archaeology/English Heritage.

7. APPENDIX 1: OASIS

Project details

Project name	Southall Gasworks, Southall, London Borough of Ealing
Short description of the project	Seven test-pits were dug across the site, targeted on the areas of greatest potential identified during a desk-based deposit modelling exercise. The exercise revealed a sequence of Lynch Hill Gravels overlain by thin deposits of clayey sand capped by Made Ground. No Langley Silt (brickearth) or Alluvial deposits were recorded; the sediment was instead substantially altered by near surface processes. The site was substantially contaminated with a history of development leading to truncation widely across the site. No further work is recommended.
Project dates	Start: 30-10-2017 End: 08-11-2017
Previous/future work	Yes / No
Any associated project reference codes	GAW17 - Sitecode
Type of project	Environmental assessment
Monument type	NONE None
Significant Finds	NONE None
Survey techniques	Landscape

Project location

Country	England
Site location	GREATER LONDON EALING SOUTHALL Southall Gasworks
Study area	1000 Square metres
Site coordinates	TQ 11730 79790 51.505492542522 -0.389956938259 51 30 19 N 000 23 23 W Point

Project creators

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

Project archives

Physical Exists?	Archive No
Digital Exists?	Archive No

Paper recipient Archive LAARC

Paper Contents "none"

Paper available Media "Report"

Project bibliography 1

Publication type Grey literature (unpublished document/manuscript)

Title SOUTHALL GASWORKS, SOUTHALL, LONDON BOROUGH OF EALING:
WRITTEN SCHEME OF INVESTIGATION

Author(s)/Editor(s) Green, C.P.

Author(s)/Editor(s) Batchelor, C.R.

Other bibliographic details Quaternary Scientific (QUEST) Unpublished Report October 2017; Project
Number 185/16

Date 2017

Issuer or publisher Quaternary Scientific (QUEST)

Place of issue or publication University of Reading

Project bibliography 2

Publication type Grey literature (unpublished document/manuscript)

Title SOUTHALL GASWORKS, SOUTHALL, LONDON BOROUGH OF EALING

Author(s)/Editor(s) Green, C.P.

Other bibliographic details Quaternary Scientific (QUEST) Unpublished Report August 2017; Project Number
185/16

Date 2017

Issuer or publisher Quaternary Scientific (QUEST)

Place of issue or publication University of Reading

Entered by C.R. Batchelor (c.r.batchelor@reading.ac.uk)

Entered on 8 November 2017
