

FAIRCHARM CREATIVE QUARTER, CREEKSIDE, DEPTFORD, LONDON BOROUGH OF LEWISHAM (SITE CODE: FCM14): GEOARCHAEOLOGICAL FIELDWORK AND DEPOSIT MODEL REPORT

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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 land at Faircharm Creative Quarter, Creekside, Deptford, London Borough of Lewisham (National Grid Reference: TQ 375 772; Site Code: FCM14; Figure 1). Quaternary Scientific were commissioned by CgMs Consulting to undertake the geoarchaeological investigations. The site lies in the valley of the Ravensbourne, a minor right bank tributary of the River Thames that rises in Bromley (Barton, 1992). The site is within the tidal reach of the River, known here as Deptford Creek, around 500m upstream from its confluence with the Thames. British Geological Survey (BGS) mapping (1:50,000 Sheet 270 South London 1998) shows the valley of the Ravensbourne cutting down into the Upper Chalk and the floor of the valley occupied by Alluvium, with terrace gravel (the Kempton Park Gravel) present on both sides of the valley. BGS boreholes (www.bgs.ac.uk/opengeoscience) in the area of the site confirm the presence of Alluvium, with variable thickness between ca. 1.85 and 0.42m OD. In borehole TQ37NE1534 the alluvium is described as organic, and in TQ37NE142 as 'peaty clay' (Figure 2). The alluvium overlies gravel at between 0.9 and 0.42m OD; the sequence is capped in all three boreholes by between 1.52 and 3.66m of made ground.

The aims of the geoarchaeological investigations at the site were (1) to clarify the nature of the sub-surface stratigraphy, in particular the presence and thickness of alluvium (including 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, four geoarchaeological boreholes were put down at the site and a programme of deposit modelling undertaken, as outlined in the written scheme of investigation for the site (Young, 2014). This process incorporated:

1. Recording the lithostratigraphy of the new geoaerchaeological borehole sequences to clarify the nature of the subsurface stratigraphy at the site, and to provide a preliminary reconstruction of the sedimentary history;
2. To use the stratigraphic data from the new locations and existing records to produce a new deposit model of the major depositional units across the site.

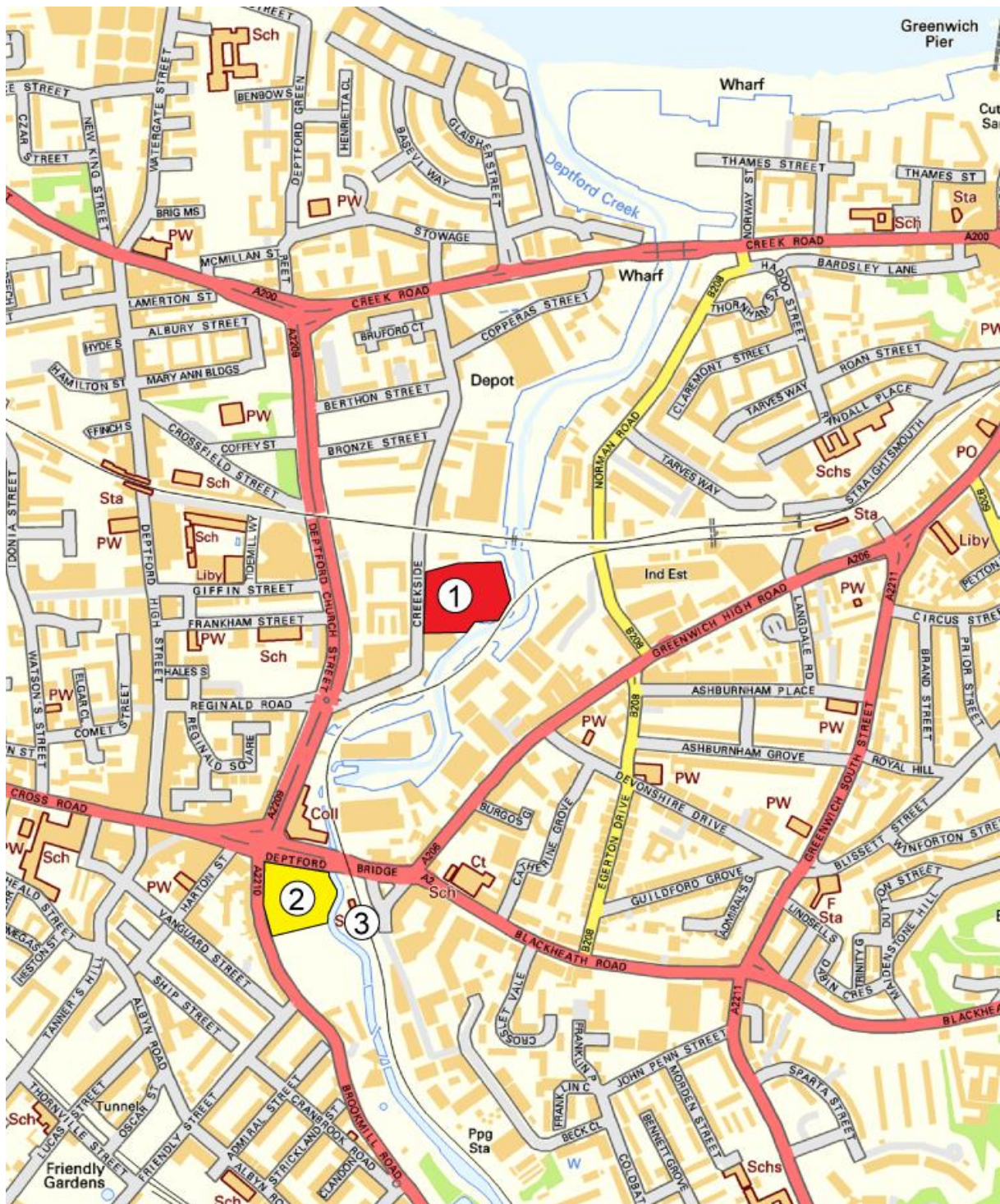


Figure 1: Location of (1) Faircharm Creative Quarter, Creekside, Deptford; (2) Old Seagers Distillery (DEG00; Batchelor *et al.*, 2009) and the DLR Lewisham Extension site (DXK96; Sidell *et al.*, 1999). *Contains Ordnance Survey data © Crown copyright and database right [2014].*

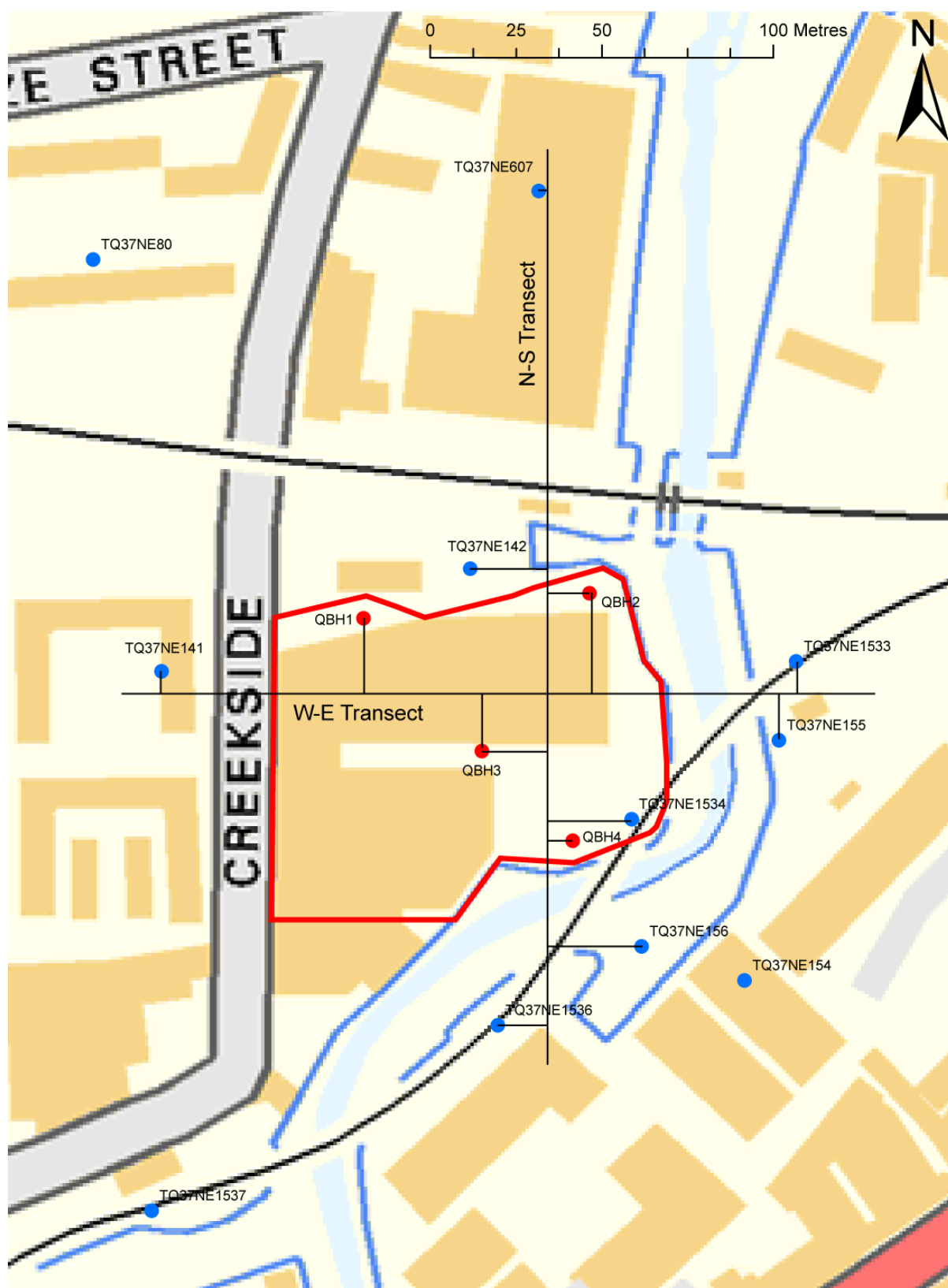


Figure 2: Detailed site map incorporating the location of the new geoaerchaeological boreholes (red) and existing BGS borehole records (blue) at or near to Faircharm Creative Quarter, Creekside, Deptford. *Contains Ordnance Survey data © Crown copyright and database right [2012].*

METHODS

Field investigations

Four geoarchaeological boreholes were put down at the site using cable percussion (boreholes QBH1 to QBH4; Figure 2). An additional borehole (QBH5) was proposed in the south-western corner of the site, but a height restriction in this area meant that the drilling rig could not be erected safely. A replacement borehole was not put down elsewhere due to height or access restrictions and underground services in other areas of the site. The boreholes were monitored in the field by Quaternary Scientific, and the resultant core samples retained for laboratory description. The borehole locations were recorded using a Leica GS09 Differential GPS (Table 1).

Table 1: Borehole attributes for those records used in the deposit model, Faircharm Creative Quarter, Creekside, Deptford.

Borehole	Easting	Northing	Elevation (m OD)
<i>Geoarchaeological boreholes</i>			
QBH1	537558.87	177285.54	3.70
QBH2	537624.80	177292.79	4.20
QBH3	537593.30	177246.78	4.15
QBH4	537619.82	177220.71	4.55
<i>BGS borehole records</i>			
TQ37NE1534	537637	177227	4.42
TQ37NE142	537590	177300	4.86
TQ37NE141	537500	177270	3.37
TQ37NE156	537640	177190	3.00
TQ37NE607	537610	177410	5.18
TQ37NE80	537480	177390	5.20
TQ37NE1537	537497	177113	4.51
TQ37NE154	537670	177180	3.90
TQ37NE155	537680	177250	3.00
TQ37NE1533	537685	177273	4.12
TQ37NE1536	537598	177167	5.31

Lithostratigraphic descriptions

The lithostratigraphy of the retained core samples was described in the laboratory using standard procedures for recording unconsolidated sediment and organic sediments, noting the physical properties (colour), composition (gravel, sand, clay, silt and organic matter) and inclusions (e.g. artefacts) (Tröels-Smith, 1955). The procedure involved: (1) cleaning the sample using a scalpel; (2) recording the physical properties, most notably colour using a Munsell Soil Colour Chart; (3) recording the composition; gravel (*Grana glareosa*; Gg), fine sand (*Grana arenosa*; Ga), silt (*Argilla granosa*; Ag) and clay (*Argilla steatoides*); (4) recording the degree of peat humification and (5) recording the unit boundaries e.g. sharp or diffuse. The results are displayed in Figures 3 (west-east transect) and 4 (north-south

transect) and in Tables 2 to 5.

Deposit modelling

The deposit model was based on a review of 15 borehole records, incorporating the four new geoarchaeological boreholes, and eleven BGS borehole records within or around the site (Figure 2). Sedimentary units from the boreholes were classified into three groupings: (1) Gravel, (2) Alluvium and (3) Made Ground. The classified data for groups 1-3 were then input into a database with the RockWorks 16 geological utilities software. Models of surface height (using a nearest neighbour routine) were generated for the Gravel and Alluvium (Figures 5 and 6). Thickness of the Alluvium (Figure 7) and Made Ground (Figure 8) was 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 borehole logs and section drawings.

As a consequence of this the modelling procedure has been manually adjusted so that only those areas for which sufficient stratigraphic data is present will be modelled. In order to achieve this, a maximum distance cut-off filter equivalent to a 50m radius around each record is applied to all deposit models. In addition, it is important to recognise that at least two 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 put down by Quaternary Scientific represent the most detailed record of the sediment sequences.

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

The geoarchaeological investigations (Tables 2 to 5) have permitted a programme of deposit modelling of the surface elevation and thickness of each major stratigraphic unit (Figures 3 to 8). The basal unit at the site is a horizon of sand and gravel, probably equivalent to the Shepperton Gravel that underlies the Holocene alluvium of the Thames (Gibbard, 1985), deposited during the Late Devensian (15,000 to 10,000 years before present) within a high

energy braided river environment. The surface of the Gravel is relatively even across the site, lying at between 0.23 (QBH4) and 0.40m OD (QBH1) in the geoarchaeological boreholes, and recorded at 0.42m OD in BGS borehole TQ37NE1534 (Figures 3 to 5). The Gravel surface rises to the north of the site to 0.9 (TQ37NE142) and 1.18m OD (TQ37NE607), and to the west to 0.63m OD (TQ37NE141). To the east and south of the site the Gravel surface falls towards the modern course of Deptford Creek, where it is recorded at -1.08 (TQ37NE1533) and -1.27m OD (TQ37NE156). To the northwest it rises to 3.4m OD in borehole TQ37NE80, most likely representing Gravel of the Kempton Park terrace.

The Gravel is overlain in the majority of boreholes across the site by a horizon of silty clay Alluvium, in places with detrital plant material, representing Holocene floodplain sedimentation. The surface (Figure 6) and thickness (Figure 7) of this unit is variable across the site, most likely as a result of the extent of ground-raising reflected in the variable depth of Made Ground across the site (Figure 8). The Alluvium is 1.87m thick in borehole QBH2, 1.62m thick in QBH4 and 0.5m thick in QBH1. In borehole QBH3 no Alluvium was recorded, with redeposited material (including disturbed Alluvium and Gravel) directly overlying the Gravel surface at 0.35m OD. Elsewhere, the surface of the Alluvium within the area of the site is recorded at between 2.88 (QBH1) and 0.82m OD (QBH1) (Figure 6).

Thicker sequences of Alluvium are recorded north of the site in borehole TQ37NE607 (2.2m) and southeast of the site in boreholes TQ37NE154 (3.2m), TQ37NE1536 (1.9m) and TQ37NE156 (1.83m). No Peat horizons were recorded in any of the boreholes with the exception of TQ37NE1536, where 'fibrous Peat' was recorded between 3.41 and 2.61m OD. However, this unit is directly overlain by Made Ground, and it is significantly higher than that recorded elsewhere in the Ravensbourne valley (Batchelor *et al.*, 2009; Sidell *et al.*, 1999); it is therefore possible that it represents redeposited Peat no longer in situ.

The sequence across the site is capped by variable thicknesses of Made Ground (Figure 8). Within the area of the site it is between 3.8 (QBH3) and 2.0m thick (QBH2). The modern surface of the site lies at between ca. 4.5 and 3.5m OD.

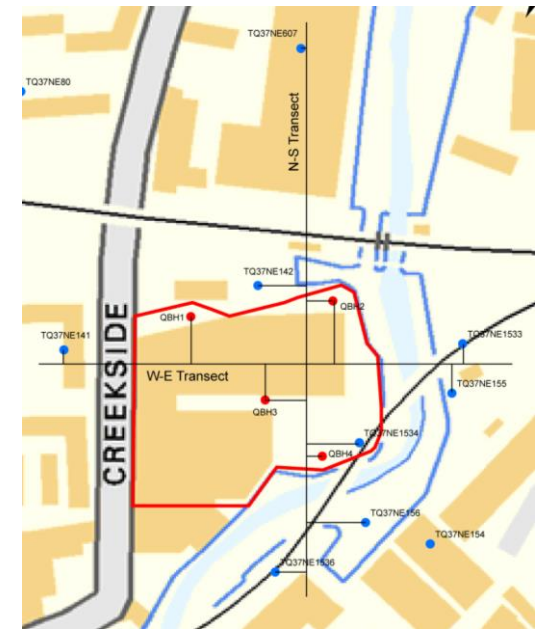
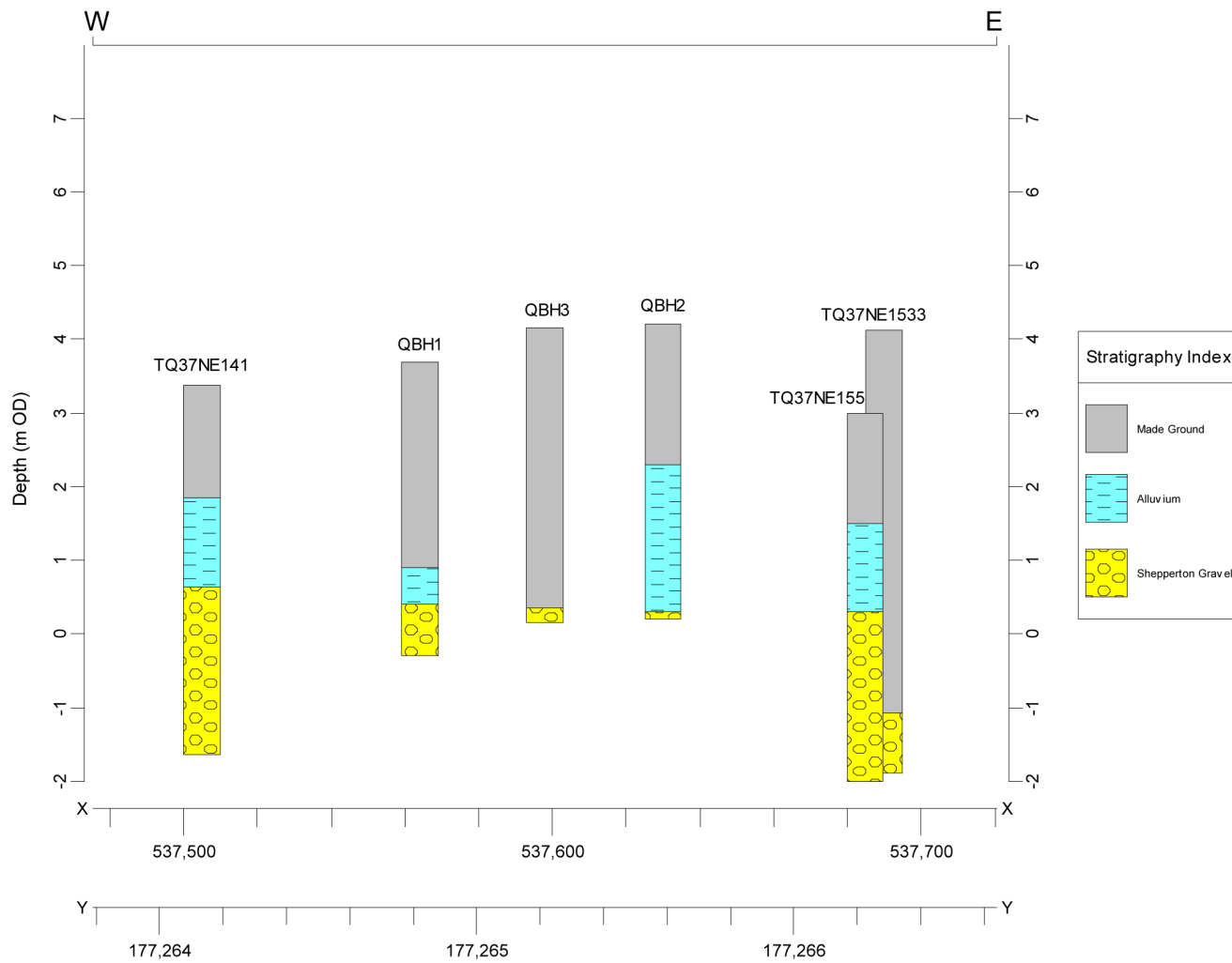


Figure 3: West-East transect of selected boreholes across the site at Faircharm Creative Quarter, Creekside, Deptford, London Borough of Lewisham

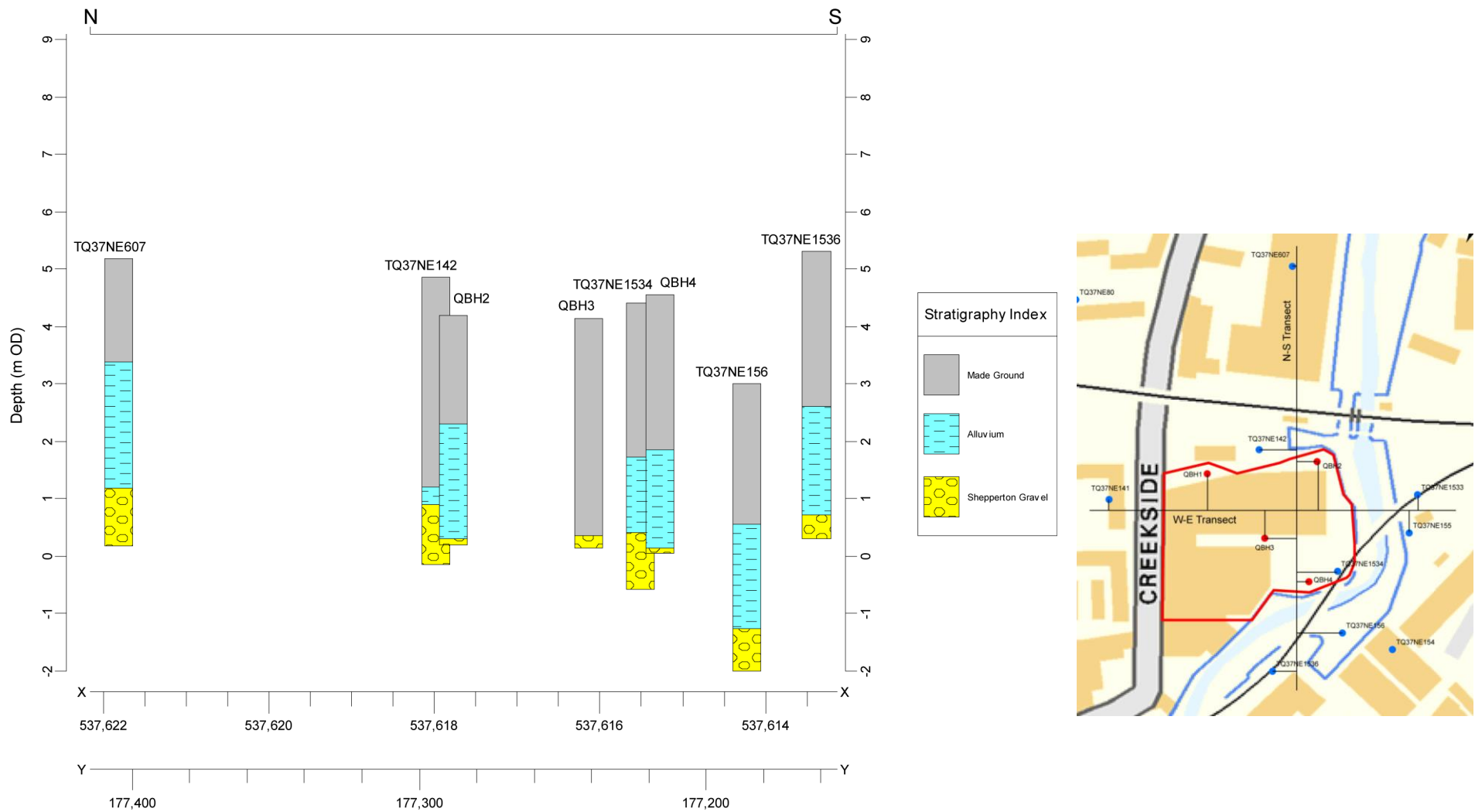


Figure 4: North-South transect of selected boreholes across the site at Faircharm Creative Quarter, Creekside, Deptford, London Borough of Lewisham

Table 2: Lithostratigraphic description of borehole QBH1, Faircharm Creative Quarter, Creekside, Deptford, London Borough of Lewisham

Depth (m OD)	Depth (m bgs)	Description
3.70 to 0.90	0.00 to 2.80	Made Ground.
0.90 to 0.82	2.80 to 2.88	VOID
0.82 to 0.53	2.88 to 3.17	Gley 1 3/N; Ag2 As2; very dark grey silt and clay. Diffuse contact in to:
0.53 to 0.40	3.17 to 3.30	Gley 1 2.5/N; As2 Ag1 Dh1; black silty clay with detrital herbaceous material. Diffuse contact in to:
0.40 to 0.20	3.30 to 3.50	Gley 1 3/N; Gg2 Ga1 As1; very dark grey sandy clayey gravel. Flint clasts 6-30mm in diameter, sub-angular to sub-rounded.

Table 3: Lithostratigraphic description of borehole QBH2, Faircharm Creative Quarter, Creekside, Deptford, London Borough of Lewisham

Depth (m OD)	Depth (m bgs)	Description
4.20 to 2.20	0.00 to 2.00	Made Ground.
2.20 to 2.12	2.00 to 2.08	VOID
2.12 to 1.91	2.08 to 2.29	10YR 5/1; As3 Ag1; grey silty clay. Sharp contact in to:
1.91 to 1.75	2.29 to 2.45	10YR 4/1; As3 Ag1 Dh+; dark grey silty clay with a trace of detrital herbaceous material. Diffuse contact in to:
1.75 to 1.59	2.45 to 2.61	Gley 1 5/10Y; As2 Ag2; greenish grey silt and clay. Occasional calcareous nodules. Sharp contact in to:
1.59 to 1.41	2.61 to 2.79	10YR 4/1; As3 Ag1 Sh+ Dl+ Dh+; dark grey silty clay with a trace of organic matter, detrital wood and detrital herbaceous material. Rare calcareous nodules. Diffuse contact in to:
1.41 to 1.25	2.79 to 2.95	Gley 1 5/10Y; As2 Ag2; greenish grey silt and clay. Some calcareous nodules and small lenses of chalk. Diffuse contact in to:
1.25 to 0.96	2.95 to 3.24	Gley 1 5/10Y; As3 Ag1; greenish grey silty clay/ Some calcareous nodules. Sharp contact in to:
0.96 to 0.75	3.24 to 3.45	Gley 1 4/10Y; greenish grey As3 Ag1; silty clay. Diffuse contact in to:
0.75 to 0.27	3.45 to 3.93	10YR 5/2; Ag2 As2; greyish brown silt and clay. Thin bed of sand at 0.93m OD. Sharp contact in to:
0.27 to 0.25	3.93 to 3.95	10YR 4/6; Ga4; dark yellowish brown sand.
0.25 to 0.20	3.95 to 4.00	Gley 1 3/N; Gg2 Ga1 As1; very dark grey sandy clayey gravel. Flint clasts 6-30mm in diameter, sub-angular to sub-rounded.

Table 4: Lithostratigraphic description of borehole QBH3, Faircharm Creative Quarter, Creekside, Deptford, London Borough of Lewisham

Depth (m OD)	Depth (m bgs)	Description
4.15 to 1.95	0.00 to 2.20	Made Ground.
1.95 to 1.80	2.20 to 2.35	7.5YR 5/2; As3 Ag1 Gg+; brown silty clay with occasional gravel clasts and brick fragments (Made Ground/redeposited Alluvium). Sharp contact in to:
1.80 to 0.35	2.35 to 3.80	7.5YR 5/2; Gg3 As1; brown clayey gravel. Flint clasts 5-60mm in diameter; sub-angular to well-rounded;

Depth (m OD)	Depth (m bgs)	Description
		occasional brick fragments (Made Ground/redeposited Gravel).
0.35 to 0.15	3.80 to 4.00	7.5YR 5/2; Gg3 As1; brown clayey gravel. Flint clasts 5-60mm in diameter; sub-angular to well-rounded.

Table 5: Lithostratigraphic description of borehole QBH4, Faircharm Creative Quarter, Creekside, Deptford, London Borough of Lewisham

Depth (m OD)	Depth (m bgs)	Description
4.55 to 1.85	0.00 to 2.70	Made Ground.
1.85 to 1.05	2.70 to 3.50	7.5YR 4/1; As3 Ag1 DI+; dark grey silty clay with a trace of detrital wood. Diffuse contact in to:
1.05 to 0.23	3.50 to 4.32	7.5YR 4/1; As2 Ag2 DI+; dark grey silt and clay with a trace of detrital wood. Sharp contact in to:
0.23 to 0.10	4.32 to 4.45	10YR 3/2; Gg3 As1 Ga+; very dark greyish brown clayey gravel with a trace of sand. Flint clasts 10-60mm in diameter, sub-angular to well-rounded.

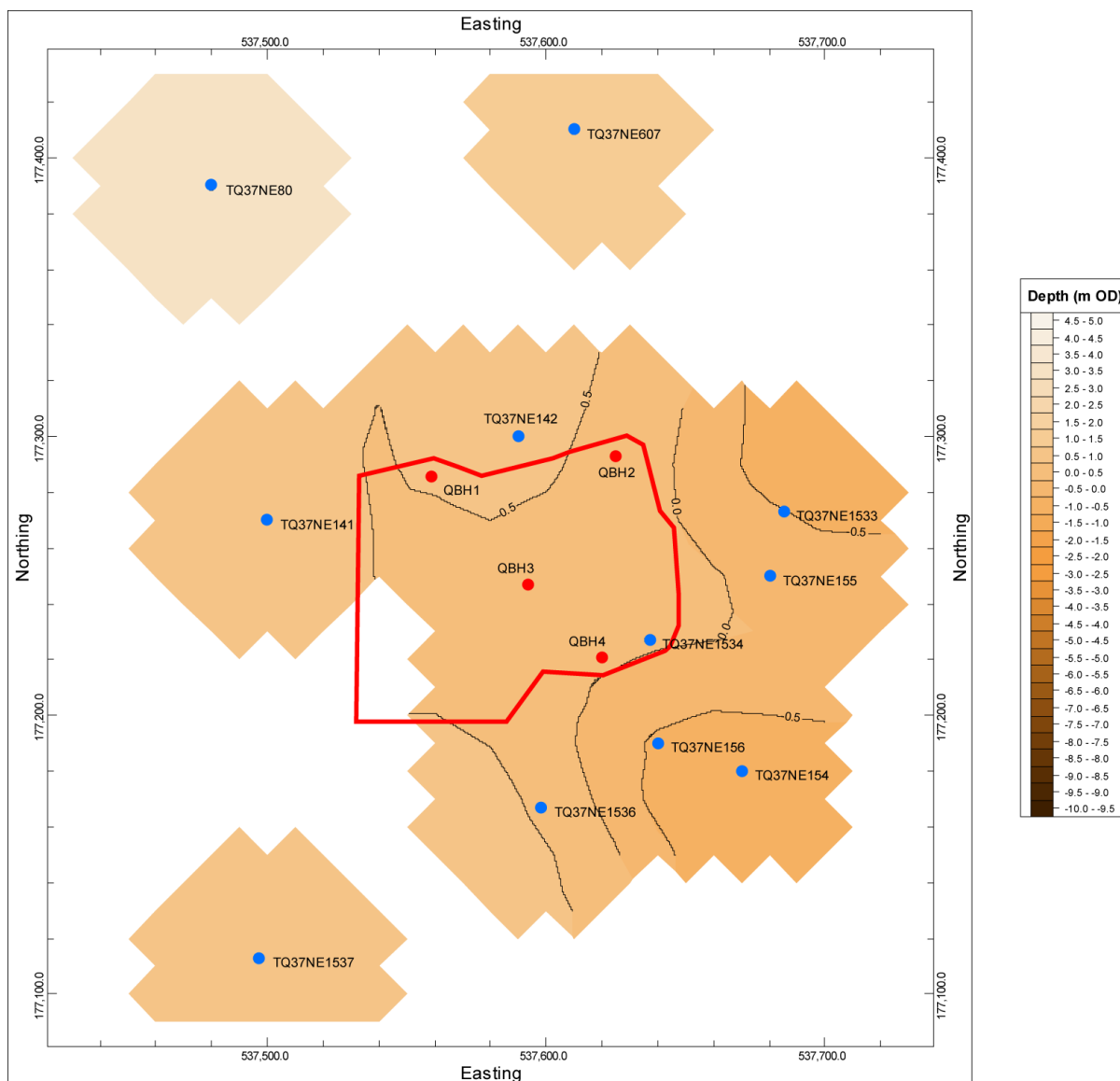


Figure 5: Top of the Gravel (m OD) (site outline in red)

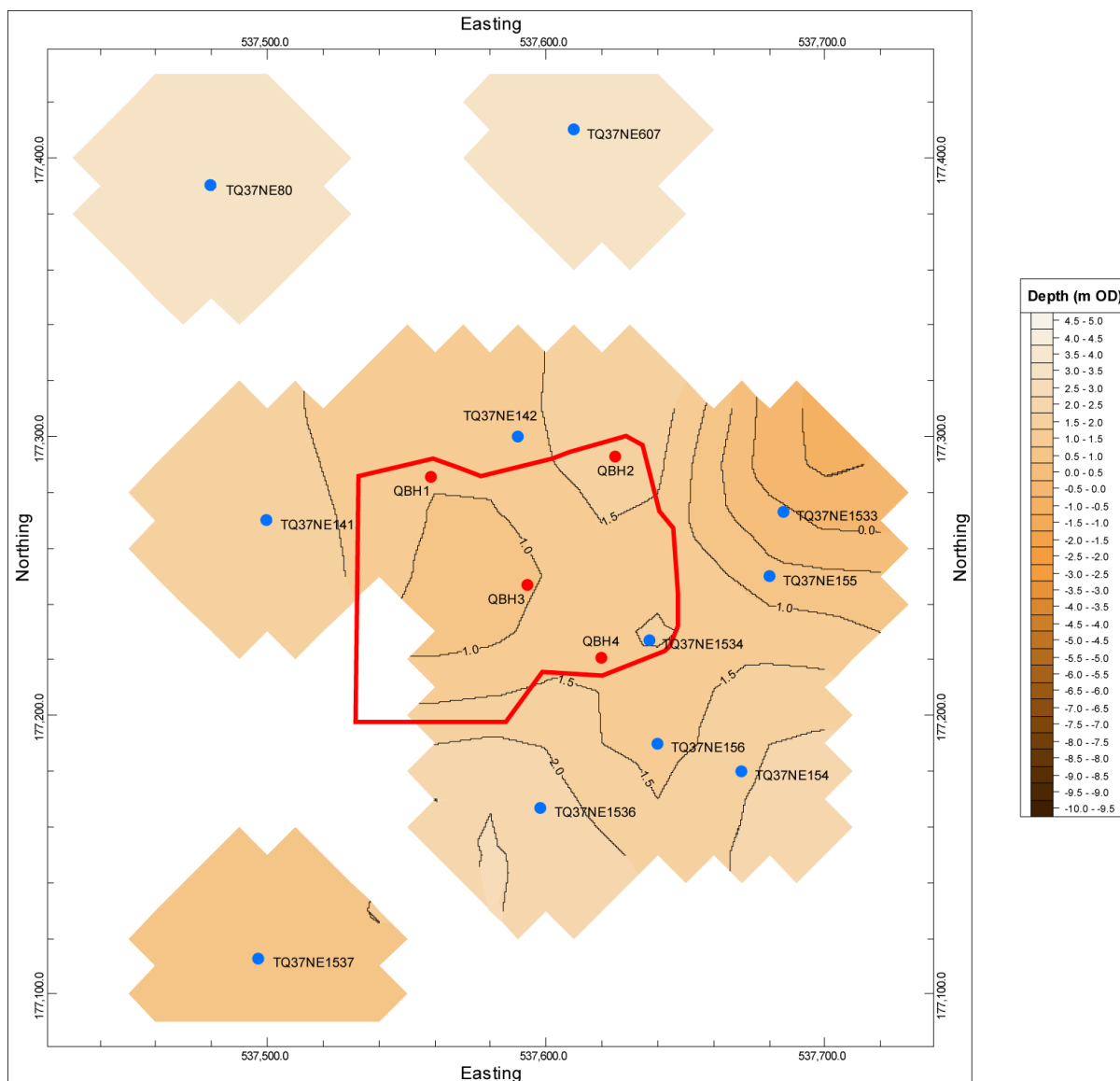


Figure 6: Top of Alluvium / Base of Made Ground (m OD) (site outline in red)

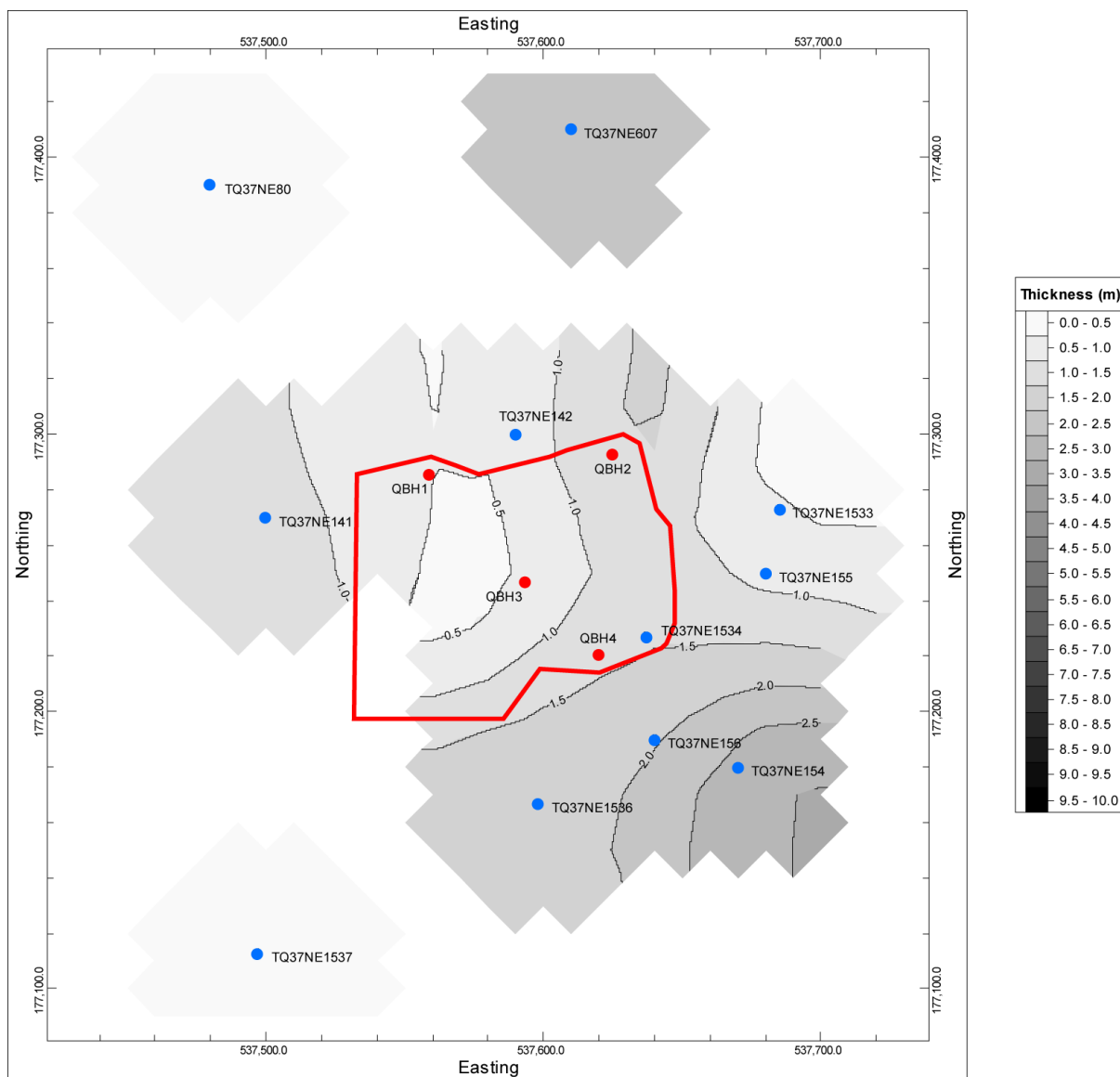


Figure 7: Thickness of Alluvium (m) (site outline in red)

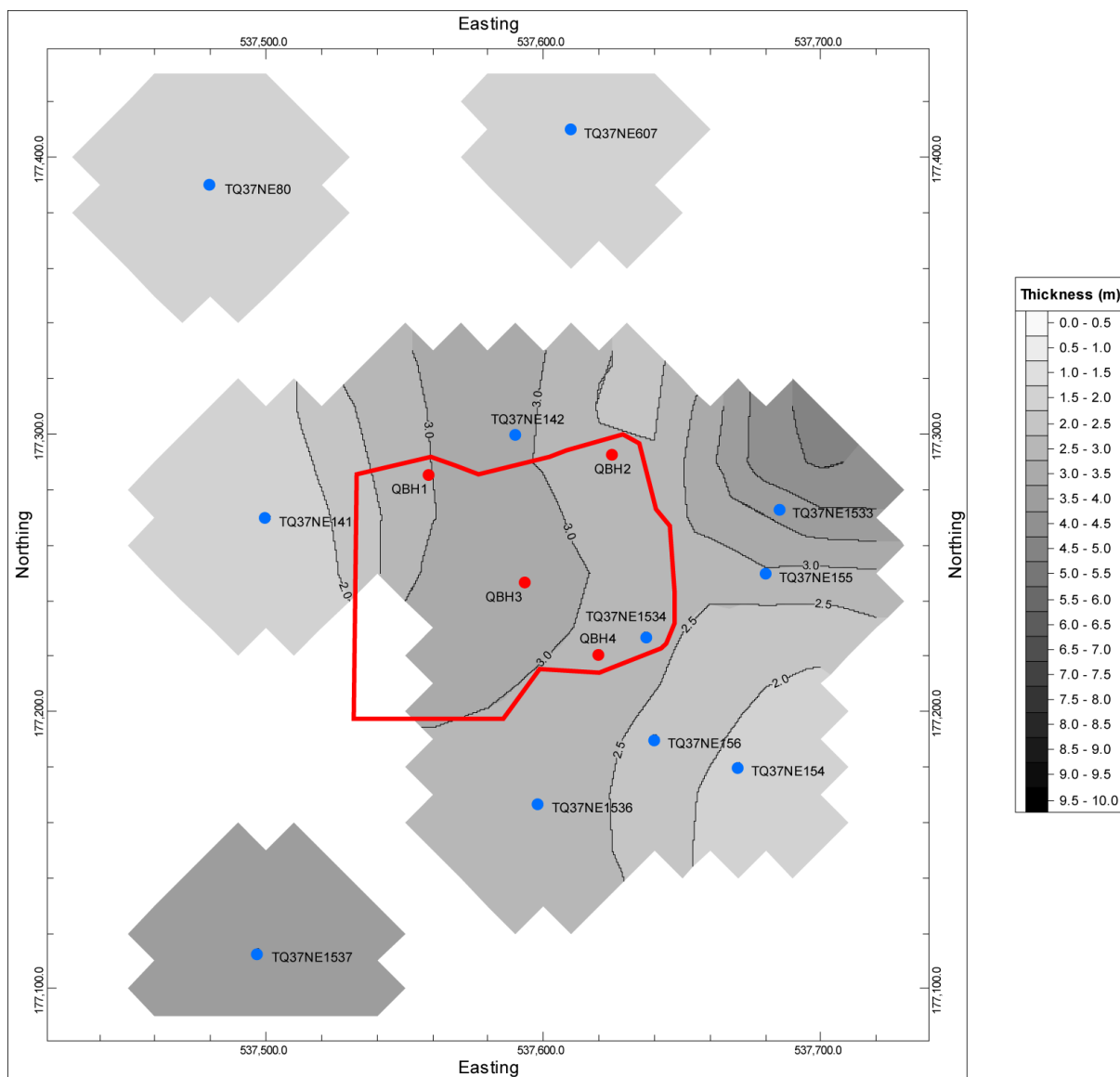


Figure 8: Thickness of Made Ground (m) (site outline in red)

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

The aim of the geoarchaeological investigations at the Faircharm Creative Quarter site was to (1) clarify the nature of the sub-surface stratigraphy, in particular the presence and thickness of Alluvium and Peat across the site, and (2) to evaluate the potential of the sedimentary sequences for reconstructing the environmental history of the site and its environs. In order to achieve this aim, a programme of deposit modelling of the surface elevation and thickness of the major stratigraphic units at the site was carried out, incorporating previous geotechnical borehole descriptions and records from four new geoarchaeological boreholes.

The results of the geoarchaeological investigations have demonstrated that variable thicknesses of silty clay Alluvium (generally between 1.87 and 0.5m thick and lying at between 0.2 and 2.5m OD) are present across the site, overlying a Gravel surface that lies at between 0.23 and 0.42m OD. In places no Alluvium is recorded and Made Ground directly overlies the Gravel. Significantly, no Peat horizons are present within the Alluvium at the Faircharm Creative Quarter site. At the Old Seagers Distillery site (Batchelor *et al.*, 2009; Figure 1), ca. 400m to the south and upstream of the Ravensbourne, Peat (directly overlying Gravel) was recorded between 0.44 and 1.80m OD. Radiocarbon dating indicated that accumulation of this horizon began at ca. 7200-6440 cal BP (late Mesolithic), and continued until 5580-5320 cal BP (Neolithic). The period of peat formation here was followed by a hiatus in the stratigraphic record at ca. 1.1m OD, between 5580-5320 and 1940-1810 cal BP, most likely as a result of erosion or a lack of sedimentary accretion at the site. Peat accumulation began again by 1940-1810 cal BP (Roman) and continued until at least 1020-960 cal BP (Medieval). These results closely correlated with those at the nearby DLR Lewisham Extension site (Sidell *et al.*, 1999; Figure 1). Here, alluvial silt/clays were recorded at the base of the sequence (0.02m OD), and were subsequently overlain by peat from 7430-7030 cal BP (Late Mesolithic) that accumulated to 0.55m OD.

There is no evidence for the Peat horizons recorded elsewhere in the Ravensbourne valley in the boreholes put down at the Faircharm Creative Quarter site. In the absence of organic horizons, no further geoarchaeological investigations are therefore recommended.

REFERENCES

Batchelor, C.R., Allison, E.A., Brown, A., Green, C.P. and Austin, P.A. (2009) Old Seagers Distillery, Deptford Bridge, London Borough of Lewisham: Environmental Archaeological

Assessment (Site Code: DEG00). *Quaternary Scientific Unpublished Report, May 2009.*

Barton, N (1992) *The Lost Rivers of London (2nd edition)*. Historical Publications Ltd, London.

Branch, N., Canti, M., Clark, P. and Turney, C. (2005) *Environmental Archaeology: theoretical and Practical Approaches*. Edward Arnold, London.

Gibbard, P.L. (1985) *The Pleistocene History of the Lower Thames Valley*. Cambridge University Press, Cambridge.

Sidell, E.J., Scaife, R.G., and Gray-Rees, L. (1999) Docklands Light Railway: Lewisham Extension, Broadway Fields, Lewisham, London SE8, a Palaeoenvironmental Report. *MoLAS unpublished report*

Tröels-Smith, J. (1955) Karakterisering af løse jordarter (Characterisation of unconsolidated sediments), *Danm. Geol. Unders.*, **Ser IV 3**, 73.

Young, D.S. (2014) Written scheme of investigation for the geoarchaeological investigation of land at Faircharm Industrial Estate, Lewisham (NGR TQ 375 772). *Quaternary Scientific Written Scheme of Investigation*.