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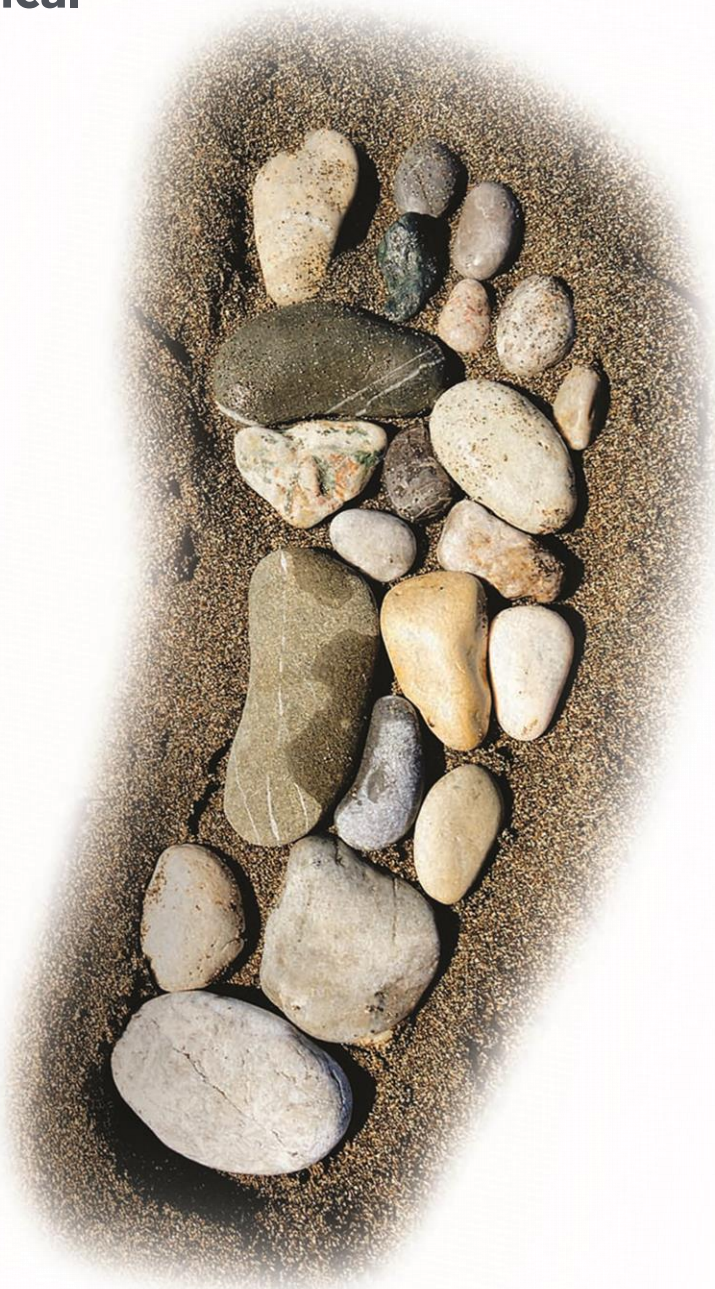
COCKREED LANE, NEW ROMNEY, KENT

Environmental Archaeological Assessment Report



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1 NON-TECHNICAL SUMMARY

An environmental archaeological assessment was carried out subsequent to geoarchaeological investigations (Young, 2016) at the Cockreed Lane, New Romney site in order to (1) to investigate the age of the peat horizon at the site, and its relationship with the peat recorded in the wider area of Romney Marsh; (2) to provide a provisional reconstruction of the environmental history of the site, (3) to highlight any evidence of human activity, and (4) to make recommendations for further analysis.

The results of the previous geoarchaeological investigations revealed that the sequence at the site consists of predominantly sandy Tidal Flat Deposits to a level of between -1.95 and -0.6m OD,

overlain by generally silty and clayey Alluvium, possibly related to salt-marsh formation (cf. Long & Innes 1993), to a level of between *ca*. 1.8 and 2.9m OD. A thin horizon of peat that began accumulating during the Late Bronze Age/Early Iron Age (2760 to 2870 cal BP) was recorded, generally at elevations between 0.0 and 0.5m OD, and present in thicknesses of between 0.05 and 0.2m across the site. These results are consistent in terms of both age and elevation with investigations by Long *et al*. (2006), who show peat horizons up to *ca*. 2m thick in the area of Romney Marsh, generally lying at between *ca*. -1 and 1m OD, but relatively thin or absent towards New Romney. The peat is relatively late however in the broader chronology of peat formation in the Romney Marsh area. Elsewhere, where peat is recorded it is generally radiocarbon dated to between *ca*. 6000 and 1700 cal. BP, the lower sand units underlying the peat accumulating from *ca*. 7800 cal. BP onwards (Long *et al*., 2006). The palaeobotanical assessments of the peat are indicative of sedge fen and reed swamp communities during its accumulation, with relatively open environments on both the floodplain and dryland. No definitive anthropogenic indicators were recorded, although the open dryland environment is suggestive of a cleared landscape, consistent with the early Iron Age date of the sequence. No further environmental archaeological analysis of the peat was recorded on the basis of its relatively thin nature in comparison to peat horizons elsewhere in the area of Romney Marsh.

2 INTRODUCTION

2.1 Site Context

This report summarises the findings arising out of the environmental archaeological assessment undertaken by Quaternary Scientific (University of Reading) in connection with the proposed development of land at Cockreed Lane, New Romney, Kent (National Grid Reference centred on: TR 06600 25640; Figures 1 and 2). The site lies approximately 2km from the coast of the English Channel, on the western outskirts of the town of New Romney and covering an area of approximately 3.15ha. British Geological Survey (BGS) mapping (www.bgs.ac.uk/opengeoscience) shows the superficial geology across the area of the site as Tidal Flat Deposits (described as clay and silt) of Quaternary age, overlying the sandstone, siltstone and mudstone of the Cretaceous Hastings Beds bedrock. Storm Beach Deposits (described as gravel) are recorded as the superficial geology on the southeastern margin of the site, and beyond that Blown Sands, both of which are of Quaternary age.

2.2 Previous geoarchaeological investigations

Recent geoarchaeological investigations at the site (Young, 2016) revealed that the sedimentary sequence consists of predominantly sandy Tidal Flat Deposits to a level of between -1.95 and -0.6m OD, overlain by generally silty and clayey Alluvium, possibly related to salt-marsh formation (cf. Long & Innes 1993), to a level of between *ca*. 1.8 and 2.9m OD across much of the site. A thin horizon of peat was recorded in seven of the 21 boreholes, generally at elevations between 0.0 and 0.5m OD, and present in thickness of between 0.05 and 0.2m. The results were consistent with investigations by Long *et al*. (2006), who show peat horizons up to *ca*. 2m thick in the area of Romney Marsh, generally lying at between *ca*. -1 and 1m OD but relatively thin or absent towards New Romney.

Where peat is recorded it is generally radiocarbon dated to between *ca*. 6000 and 1700 cal. BP, the lower sand units underlying the peat accumulating from *ca*. 7800 cal. BP (Long *et al*., 2006). In one geotechnical borehole peat was recorded at a lower elevation of -0.15 to -0.85m OD; however, the reliability of this borehole is unclear given its close proximity to geoarchaeological borehole QBH2, in which the depth and thickness of the peat is consistent with those boreholes elsewhere. Significantly, the peat horizons recorded at the site represent a (perhaps synchronous) transition to semi-terrestrial conditions, supporting the growth of wetland vegetation and forming a land surface which might have been utilised by prehistoric people.

2.3 Palaeoenvironmental and archaeological significance

Organic-rich sediments (in particular peat) have high potential to provide a detailed reconstruction of past environments on both the wetland and dryland from the Mesolithic to Late Bronze Age periods. In particular, there is the potential to increase knowledge and understanding of the interactions between relative sea level, human activity, vegetation succession and climate in this area of Romney Marsh. Significant vegetation changes include the Mesolithic/Neolithic decline of elm woodland, the Neolithic colonisation and decline of yew woodland; the Late Neolithic/Early Bronze Age growth of elm on Peat, and the general decline of wetland and dryland woodland during the Bronze Age. Such investigations are carried out through the assessment/analysis of palaeoecological remains (e.g. pollen, plant macrofossils & insects) and radiocarbon dating. In addition, areas of high sandy topography, soils and Peat represent potential areas that might have been utilised or even occupied by prehistoric people, evidence of which may be preserved in the archaeological (e.g. features and structure) and palaeoenvironmental record (e.g. changes in vegetation composition).

2.4 Aims and objectives

The peat recorded at the site is relatively thin, but has good potential to reconstruct the environmental history of the site and its environs. A limited environmental archaeological assessment of borehole QBH3 was therefore recommended, consisting of: (1) radiocarbon dating of the base of the peat, to establish a chronological framework for the environmental archaeological assessment; (2) organic matter determinations to aid identification of the sedimentary units; (3) assessment of the palaeobotanical remains (pollen, waterlogged wood and seeds) to provide a provisional reconstruction of the vegetation history; and (4) assessment of the diatoms to provide an indication of the palaeohydrology (e.g. marine, brackish or freshwater) of the site. The aims of this assessment were as follows: (1) to investigate the age of the peat horizon at the site, and its relationship with the peat recorded in the wider area of Romney Marsh; (2) to provide a provisional reconstruction of the environmental history of the site, (3) to highlight any evidence of human activity, and (4) to make recommendations for further analysis (if required).

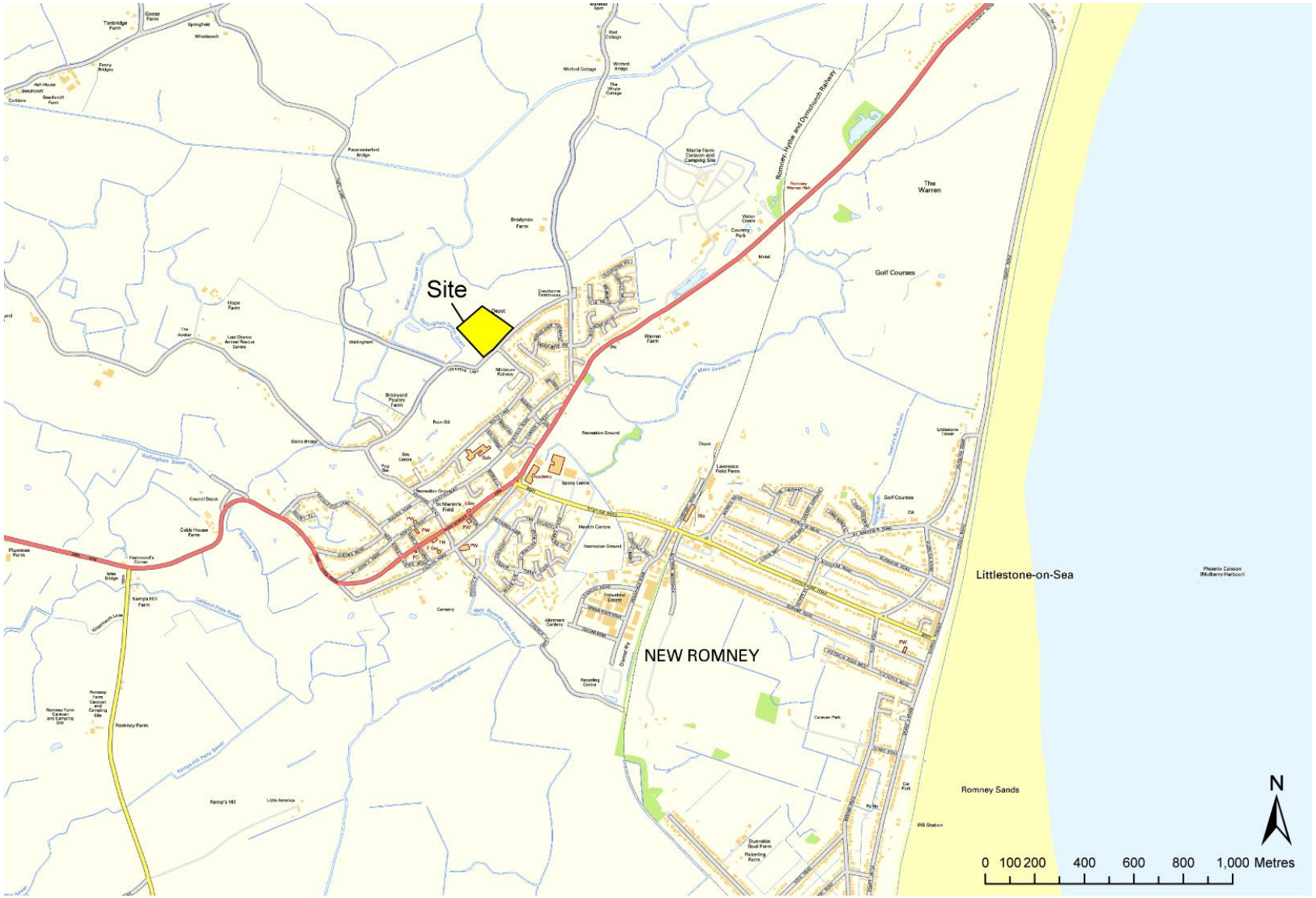

Figure 1: Location of Cockreed Lane, New Romney, Kent. ***Contains ordnance survey data © Crown copyright and database right [2015].***

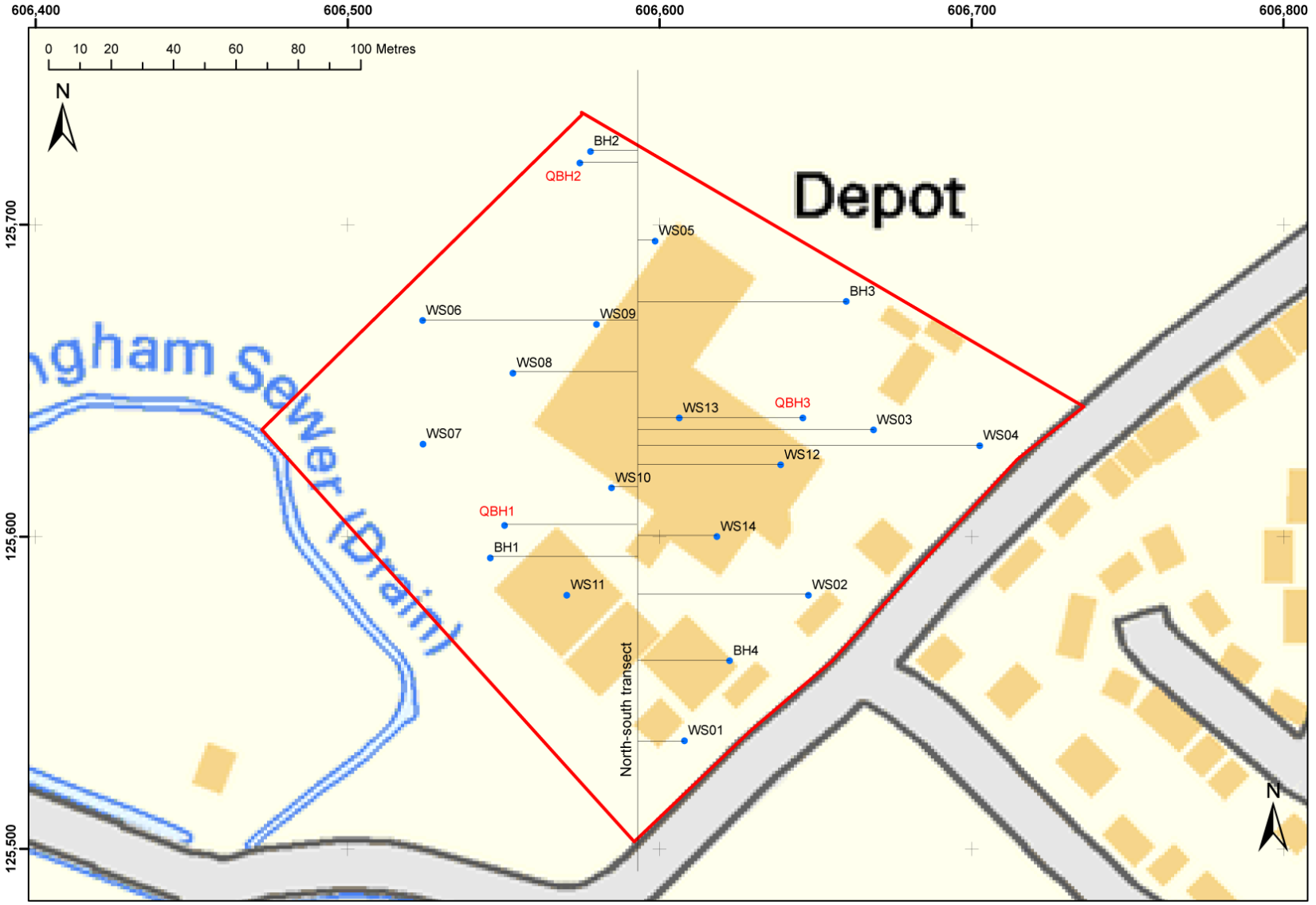

Figure 2: Location of the new geoarchaeological (QBH1 to QBH3) and existing geotechnical boreholes at Cockreed Lane, New Romney, Kent. Selected boreholes in Figure 8 also shown. *Contains Ordnance Survey data © Crown copyright and database right [2012].*

3 METHODS

3.1 Previous investigations (Fieldwork, lithostratigraphic descriptions and Deposit modelling)

Three geoarchaeological boreholes (boreholes QBH1 to QBH3) were put down at the site in February 2016 by Quaternary Scientific. The borehole core samples were recovered using an Eijkelkamp window sampler and gouge set using an Atlas Copco TT 2-stroke percussion engine. This coring technique is a suitable method for the recovery of continuous, undisturbed core samples and provides sub-samples suitable for not only sedimentary and microfossil assessment and analysis, but also macrofossil analysis. The borehole locations were recorded using a Leica GS09 Differential GPS (Table 1). The lithostratigraphy of the retained core samples was described in the laboratory using standard procedures for recording unconsolidated sediment and organic sediments, noting the physical properties (colour), composition (gravel, sand, clay, silt and organic matter) and inclusions (e.g. artefacts) (Tröels-Smith, 1955). The procedure involved: (1) cleaning the sample using a scalpel; (2) recording the physical properties, most notably colour using a Munsell Soil Colour Chart; (3) recording the composition; gravel (Grana glareosa; Gg), fine sand (Grana arenosa; Ga), silt (Argilla granosa; Ag) and clay (Argilla steatoides); (4) recording the degree of peat humification and (5) recording the unit boundaries e.g. sharp or diffuse. The results of the geoarchaeological descriptions of the boreholes are displayed in Tables 2 to 4.

The deposit model was based on a review of 21 borehole records, including the three new geoarchaeological boreholes and 18 existing geotechnical records (GES, 2015). No BGS archive boreholes (www.bgs.ac.uk/opengeoscience) with sufficient spatial data for modelling were found within the vicinity of the site. Modelling was undertaken using RockWorks 16 geological utilities software and displayed using ArcMAP 10. The term 'deposit modelling' describes any method used to depict the sub-surface arrangement of geological deposits, but particularly the use of computer software to create contoured maps or three dimensional representations of contacts between stratigraphic units. The first requirement is to classify the recorded borehole sequences into uniformly identifiable stratigraphic units. At the Cockreed Lane site, the sedimentary units were classified into four groupings: (1) Sand, (2) Peat, (3) Alluvium and (4) Made Ground. Models of surface height (using a nearest neighbour routine) were generated for the Sand, Peat and Alluvium (Figures 3 to 5). Thickness of the Peat (Figure 6) and Made Ground (Figure 7) was also modelled (also using a nearest neighbour routine). A north-south two-dimensional transect of boreholes across the site is shown in Figure 8.

How effectively Rockworks portrays the relief features of stratigraphic contacts or the thickness of sediment bodies depends on the number of data points (boreholes/test pits) per unit area, and the extent to which these points are evenly distributed across the area of interest. The portrayal is also affected by the significance assigned to these data points, in terms of the extent of the area around the point to which the data are deemed to apply. This can be predetermined for each data set, and in the present case the value chosen for each data point (borehole) is equivalent to an area of 50m radius for all models. The boreholes are relatively well distributed over the area of investigation. In general, reliability improves towards the core area of boreholes where mutually supportive data are

likely to be available from several adjacent data points. Reliability is also affected by the quality of the stratigraphic records, which in turn are affected by the nature of the sediments and/or their post-depositional disturbance during previous stages of land-use on the site. Quality is also affected where boreholes have been put down at different times and recorded using different descriptive terms and subject to differing technical constraints in terms of recorded detail including the exact levels of the stratigraphic boundaries. Of the records used in the deposit model, the cores from the geoarchaeological boreholes put down by Quaternary Scientific represent the most detailed record of the sediment sequences. Finally, because of the 'smoothing' effect of the modelling procedure, the modelled levels of stratigraphic contacts may differ slightly from the levels recorded in borehole logs.

Table 1: Borehole attributes for the records used in the deposit model, Cockreed Lane, New Romney, Kent.

Borehole	Easting	Northing	Elevation (m OD)
Geoarchaeological boreholes			
QBH1	606550.3	125603.5	2.5
QBH2	606574.4	125719.7	2.8
QBH3	606645.9	125638.0	2.8
Geotechnical boreholes (GES, 2015)			
BH1	606545.7	125593.2	2.8
BH2	606577.8	125723.4	2.65
BH3	606659.8	125675.3	2.55
BH4	606622.4	125560.2	3.3
WS01	606608.0	125534.6	3.0
WS02	606647.8	125581.2	3.5
WS03	606668.5	125634.1	3.3
WS04	606702.7	125629.1	3.2
WS05	606598.5	125694.7	2.6
WS06	606523.9	125669.2	2.6
WS07	606524.1	125629.6	2.5
WS08	606553.0	125652.4	2.8
WS09	606579.7	125668.0	3.0
WS10	606584.6	125615.6	2.8
WS11	606570.3	125581.2	3.1
WS12	606638.8	125622.9	3.2
WS13	606606.3	125637.9	3.2
WS14	606618.4	125600.0	3.1

3.2 Organic matter determinations

A total of 13 subsamples from borehole QBH3 were taken for determination of the organic matter content (Table 5 and Figure 8). These records were important as they can identify increases in organic matter possibly associated with more terrestrial conditions. The organic matter content was

determined by standard procedures involving: (1) drying the sub-sample at 110^{0}C for 12 hours to remove excess moisture; (2) placing the sub-sample in a muffle furnace at 550°C for 2 hours to remove organic matter (thermal oxidation), and (3) re-weighing the sub-sample obtain the 'loss-on-ignition' value. The samples were then re-weighed after 2 hours at 950°C for determination of the calcium carbonate content (see Bengtsson and Enell, 1986).

3.3 Radiocarbon dating

One subsample waterlogged aerial (culm) sedge remains were extracted from base of the peat horizon in borehole QBH3 for radiocarbon dating. The samples were submitted for AMS radiocarbon dating to the BETA Analytic Radiocarbon Dating Facility, Miami, Florida. The results have been calibrated using OxCal v4.0.1 (Bronk Ramsey, 1995; 2001 and 2007) and the IntCal13 atmospheric curve (Reimer *et al*., 2013). The results of the radiocarbon dating are shown in Table 6 and in Figure 8.

3.4 Pollen assessment

Six sub-samples from QBH3 were extracted for pollen assessment. The pollen was extracted as follows: (1) sampling a standard volume of sediment (1ml); (2) adding two tablets of the exotic clubmoss *Lycopodium clavatum* to provide a measure of pollen concentration in each sample; (3) deflocculation of the sample in 1% Sodium pyrophosphate; (4) sieving of the sample to remove coarse mineral and organic fractions (>125µ); (5) acetolysis; (6) removal of finer minerogenic fraction using Sodium polytungstate (specific gravity of 2.0g/cm^3); (7) mounting of the sample in glycerol jelly. Each stage of the procedure was preceded and followed by thorough sample cleaning in filtered distilled water. Quality control is maintained by periodic checking of residues, and assembling sample batches from various depths to test for systematic laboratory effects. Pollen grains and spores were identified using the University of Reading pollen type collection and the following sources of keys and photographs: Moore *et al* (1991); Reille (1992). The assessment procedure consisted of scanning the prepared slides, and recording the concentration and preservation of pollen grains and spores, and the principal taxa on four transects (10% of the slide) (Table 7).

3.5 Diatom assessment

A total of four sub-samples were extracted from borehole QBH3 for the assessment of diatoms. 0.5g of sediment was processed for the diatom sample preparation. Due to the high silt and clay content of most samples, all samples chosen for analysis were first treated with sodium hexametaphosphate and left overnight, to assist in minerogenic deflocculation. Samples were then treated with hydrogen peroxide (30% solution) and/or weak ammonia (1% solution) depending on organic and/or calcium carbonate content, respectively. Samples were finally sieved using a 10µm mesh to remove fine minerogenic sediments. The residue was transferred to a plastic vial, from which a slide was prepared for subsequent assessment. A minimum of four slide traverses were undertaken across each slide sample. When encountered, diatom species ware identified with reference to van der Werff and Huls (1958-74), Hendy (1964) and Krammer & Lange-Bertalot (1986-1991). However, due to the nature of the rapid assessment, many taxa were only identified to genera level. The results of the assessment are displayed in Table 8.

3.6 Macrofossil assessment

A total of four small bulk samples were extracted from borehole QBH3 for the recovery of macrofossil remains including waterlogged plant macrofossils, wood, insects and Mollusca. The extraction process involved the following procedures: (1) removing a sample of either 5 or 10cm in thickness; (2) measuring the sample volume by water displacement, and (3) processing the sample by wet sieving using 300µm and 1mm mesh sizes. Each sample was scanned under a stereozoom microscope at x7-45 magnifications, and sorted into the different macrofossil classes. The concentration and preservation of remains was estimated for each class of macrofossil (Tables 21 and 22). Preliminary identifications of the waterlogged seeds have been made using modern comparative material in the University of Reading reference collection and reference atlases (e.g. Cappers *et al*., 2006). Nomenclature used follows Stace (2005) (Table 9).

4 RESULTS AND INTERPRETATION OF THE GEOARCHAEOLOGICAL BOREHOLE INVESTIGATIONS, ORGANIC CONTENT DETERMINATIONS AND RADIOCARBON DATING

The results of the geoarchaeological investigations have been reported previously (Young, 2016) and are shown in Tables 2 to 4, with the resultant deposit models shown in Figures 3 to 8. The results of the organic content analysis and radiocarbon dating are shown in Tables 5 and 6 respectively.

The basal unit recorded across the site consists of variably silty sand with occasional Mollusca considered to represent Tidal Flat Deposits of Holocene age deposited within an intertidal environment. This unit is recorded in the three new geoarchaeological boreholes (QBH1 to QBH3) and in four of the geotechnical boreholes (BH1 to BH4). The surface of this unit is highest in the area of boreholes QBH2, QBH3 and BH2, where it lies at -0.8, -0.6 and -1.15m OD respectively; elsewhere, it lies at between -1.23 and -1.95m OD (Figure 3). The variability in the surface of this unit is most likely indicative of the small channel features and intervening sand bars that are typical of tidal flat environments. This unit is recorded to a depth of 20m bgl (-16.7 to -17.45m OD) in the four geotechnical boreholes; no evidence was found within these logs for any finer-grained or organic deposits that might have palaeoenvironmental potential, their composition being dominantly sandy throughout the sequence and generally composed of less than 5% organic matter (see Table 5).

The sandy deposits are overlain by generally clayey, silty, occasionally sandy and in places organic material (generally up to 5% organic content), most likely deposited within a low energy alluvial environment, probably at a distance from any active channels and perhaps related to salt-marsh formation (cf. Long & Innes 1993). A horizon of peat (55-75% organic content) is recorded in selected boreholes within this unit (QBH2, QBH3, BH2, WS03, WS06, WS12 and WS14), in most cases recorded at elevations between 0.0 and 0.5m OD (Figure 4) and present in thicknesses of between 0.7 (BH2) and 0.05m (WS14; Figure 5). Significantly, the peat represents a transition to semi-terrestrial conditions supporting the growth of wetland vegetation at these locations.

Radiocarbon dating of the base of the peat in borehole QBH3 indicates that accumulation began during the Late Bronze Age/Early Iron Age (2760 to 2870 cal BP). Given the relatively consistent elevation of the peat horizons recorded, it seems likely that this transition occurred at approximately the same time across the site. Noticeably however, the peat recorded in geotechnical borehole BH2 lies at a lower elevation to that recorded elsewhere (-0.15 to -0.85m OD; best illustrated in Figure 8). However, the sequence recorded in geoarchaeological borehole QBH2 (within 5m of BH2) is more consistent with the deposits recorded elsewhere.

The surface of the silty clay alluvial deposits is generally recorded at between 1.82 and 2.9m OD across the site, but in one borehole (BH3) it lies at 0.35m OD (Figure 6). Here it is truncated by Made Ground, which at this location is 2.2m thick; elsewhere it is generally between 0.25 and 1.0m thick (Figure 7).

Table 2: Lithostratigraphic description of borehole QBH1, Cockreed Lane, New Romney, Kent.

Depth (m OD)	Depth (m bgs)	Composition
2.50 to 1.82	0.00 to 0.68	Made Ground
1.82 to 0.63	0.68 to 1.87	10YR 5/3; As3 Ag1 Ga+; brown silty clay with a trace of sand. Thin layer of detrital organic matter/charred plant material at 0.81 to 0.79m OD. Diffuse contact in to:
0.63 to 0.29	1.87 to 2.21	10YR 5/2; Ag2 As1 Ga1; greyish brown sandy clayey silt. Frequent iron staining. Sharp contact in to:
0.29 to -0.14	2.21 to 2.64	2.5Y 3/1; Dh2 Ag1 As1 Sh+; very dark grey silt and clay with very frequent detrital herbaceous material and a trace of organic matter. Sharp contact in to:
-0.14 to -0.50	2.64 to 3.00	10YR 5/1; As2 Ag1 Dh1; grey silty clay with detrital herbaceous material. Frequent vertical rooting (mainly of sedges).
-0.50 to -1.23	3.00 to 3.73	2.5Y 5/1; Ag2 As1 Ga1 Dh+; grey clayey sandy silt with a trace of detrital herbaceous material. Frequent vertical rooting (mainly of sedges). Diffuse contact in to:
-1.23 to -1.50	3.73 to 4.00	2.5Y 5/1; Ga4 Ag+; grey sand with a trace of silt. Occasional Mollusca.

Table 3: Lithostratigraphic description of borehole QBH2, Cockreed Lane, New Romney, Kent.

Depth (m OD)	Depth (m bgs)	Composition
2.80 to 0.40	0.00 to 0.40	Made Ground
0.40 to 1.57	0.40 to 1.23	10YR 5/3; As3 Ag1 Ga+; brown silty clay with a trace of sand. Frequent iron staining. Sharp contact in to:
1.57 to 1.54	1.23 to 1.26	10YR 2/1; Sh3 As1; humo. 4; black very well humified silty peat. Sharp contact in to:
1.54 to 1.18	1.26 to 1.62	10YR 5/2; As2 Ag2 Ga+; greyish brown silt and clay with a trace of sand. Diffuse contact in to:
1.18 to 0.87	1.62 to 1.93	Gley 1 5/10Y; Ag2 As2; greenish grey silt and clay. Sharp contact in to:
0.87 to 0.80	1.93 to 2.00	10YR 2/1; Sh3 Th^{3}1; humo. 3; black well humified herbaceous peat.
0.80 to 0.57	2.00 to 2.23	10YR 4/1; Ag2 As1 Dh1; dark grey clayey silt with detrital herbaceous material. Diffuse contact in to:
0.57 to -0.04	2.23 to 2.84	10YR 5/1; As2 Ag2 Dh+; grey silt and clay with a trace of detrital herbaceous material. Diffuse contact in to:
-0.04 to -0.20	2.84 to 3.00	10YR 5/1; Ag2 Ga1 As1 Dh+; grey sandy clayey silt with a trace of detrital herbaceous material.
-0.20 to -0.80	3.00 to 3.60	Gley 1 4/10Y; Ag2 Ga2; dark greenish grey sand and silt. Diffuse contact in to:

-0.80 to -1.20	3.60 to 4.00	Gley 1 5/10Y; Ga4 Ag+; greenish grey sand with a trace of silt. Occasional Mollusca becoming more frequent with depth.

Table 4: Lithostratigraphic description of borehole QBH3, Cockreed Lane, New Romney, Kent.

Depth (m OD)	Depth (m bgs)	Composition
2.80 to 2.40	0.00 to 0.40	Made Ground
2.40 to 1.15	0.40 to 1.65	10YR 5/4; As2 Ag1 Ga1; yellowish brown sandy silty clay. Diffuse contact in to:
1.15 to 0.93	1.65 to 1.87	10YR 5/4; As3 Ag1 Ga+; yellowish brown silty clay with a trace of sand. Detrital organic layer at 1.04 to 1.02m OD (As2 Ag1 Sh1 Dh+). Diffuse contact in to:
0.93 to 0.50	1.87 to 2.30	10YR 5/2; Ag2 As1 Ga1; greyish brown sandy clayey silt. Sharp contact in to:
0.50 to 0.33	2.30 to 2.47	10YR 2/1; Sh3 Th^{2}1; humo. 2; black humified herbaceous peat. Diffuse contact in to:
0.33 to -0.60	2.47 to 3.40	Gley 1 5/10Y; As2 Ag2 Dh+; greenish grey silt and clay with a trace of detrital herbaceous material. Diffuse contact in to:
-0.60 to -1.20	3.40 to 4.00	Gley 1 5/10Y; Ga3 Ag1; greenish grey silty sand.

Table 5: Results of the borehole QBH3 organic matter determinations, Cockreed Lane, New Romney, Kent.

Depth (m OD)		Organic matter content (%)
From	To	
0.77	0.76	1.59
0.69	0.68	4.61
0.61	0.60	3.09
0.53	0.52	3.60
0.45	0.44	74.08
0.37	0.36	56.01
0.29	0.28	12.06
0.21	0.20	9.98
0.13	0.12	4.44
0.05	0.04	4.55
-0.03	-0.04	4.36
-0.11	-0.12	3.70
-0.19	-0.20	4.62

Table 6: Results of the radiocarbon dating of borehole QBH3, Cockreed Lane, New Romney, Kent.

Laboratory code / Method	Material and location	Depth (m OD)	Uncalibrated radiocarbon years before present (yr BP)	Calibrated age BC/AD (BP) (2-sigma, 95.4% probability)	δ13C (‰)
BETA 438394	Sedge culm; base of Peat	0.35 to 0.37	2720 ± 30 BP	920 to 810 cal BC (2870 to 2760 cal BP)	-26.3

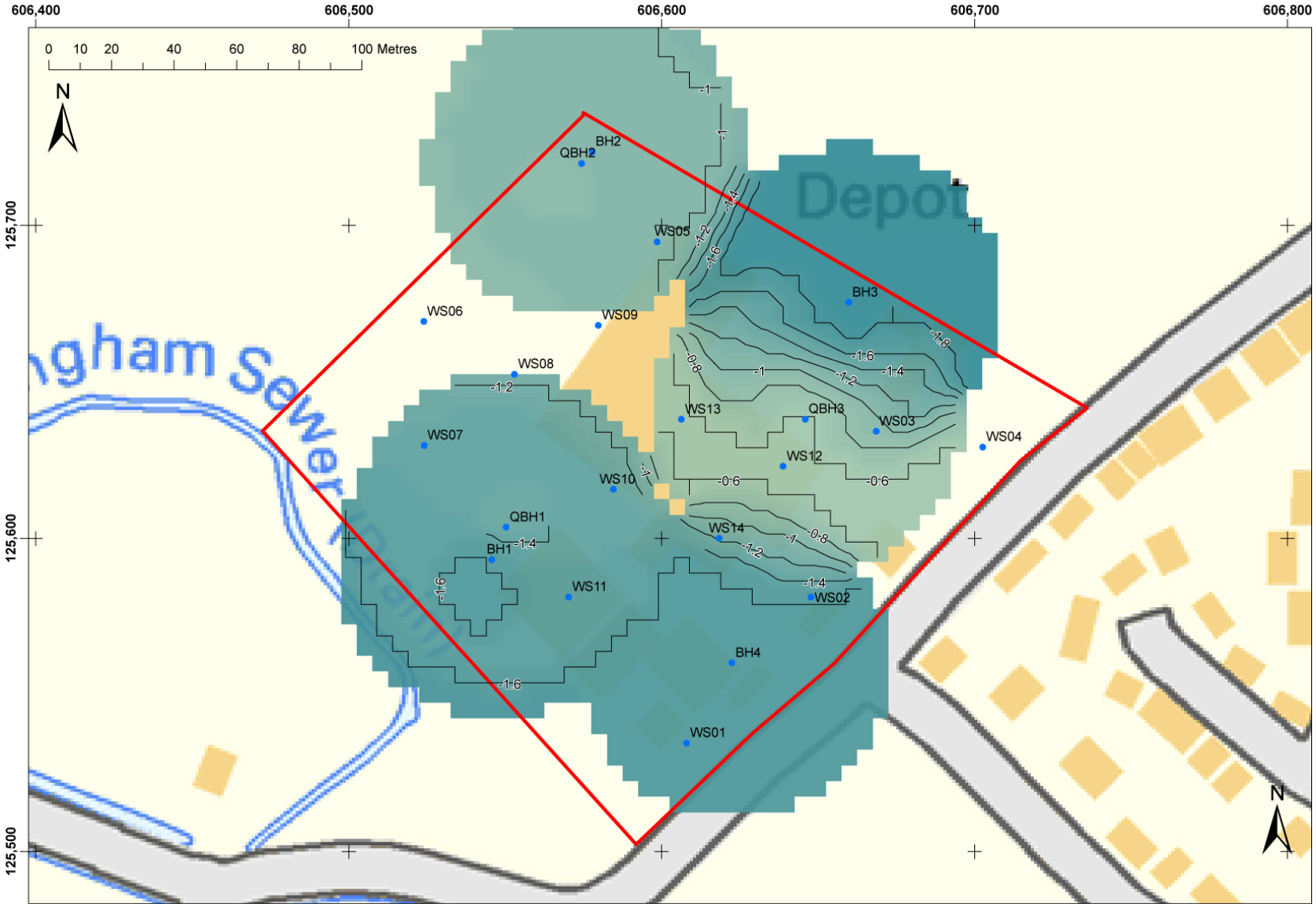

Figure 3: Modelled surface of the Sandy Tidal Flat Deposits (contour heights in metres OD).

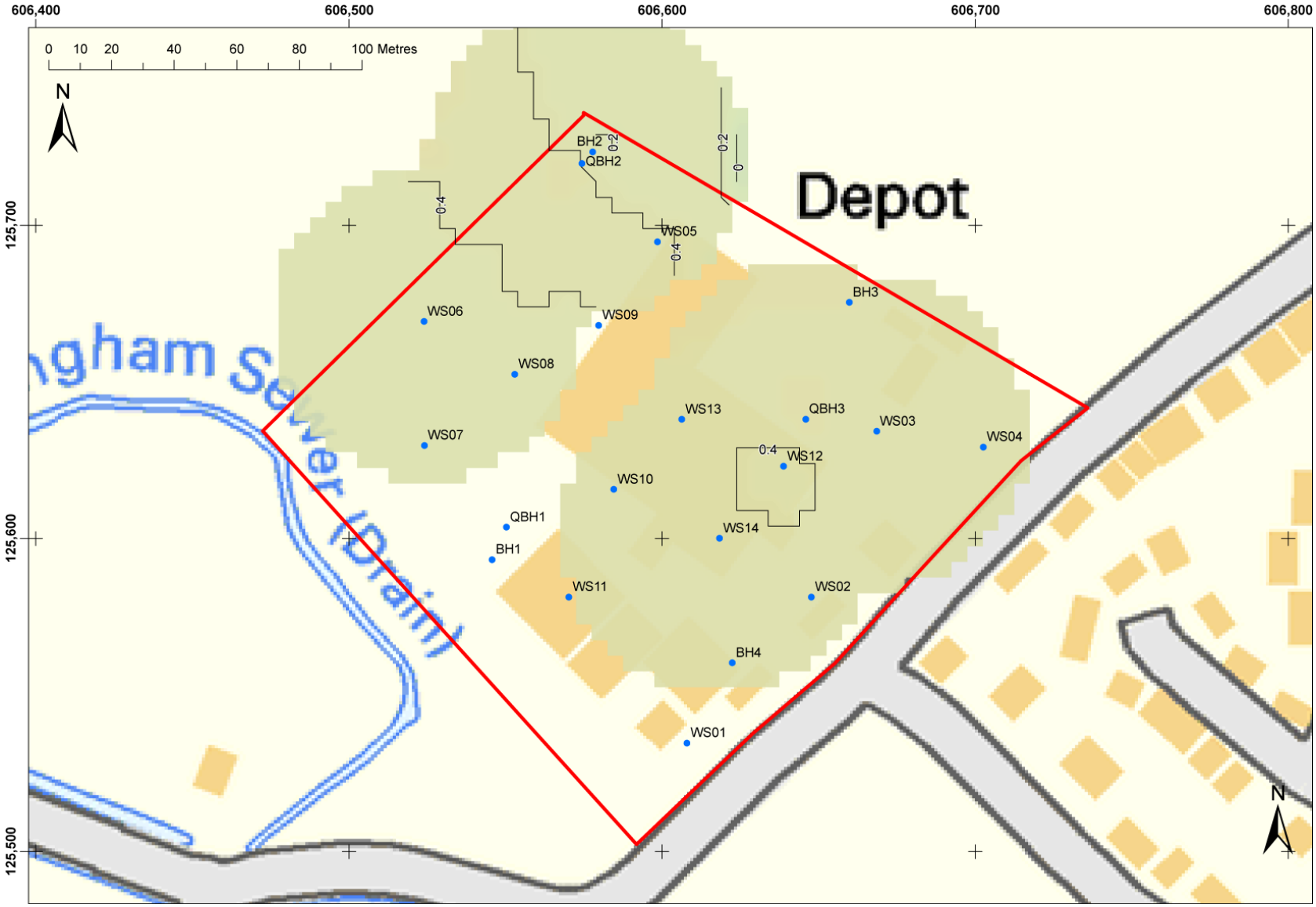

Figure 4: Modelled surface of the Peat (contour heights in metres OD).

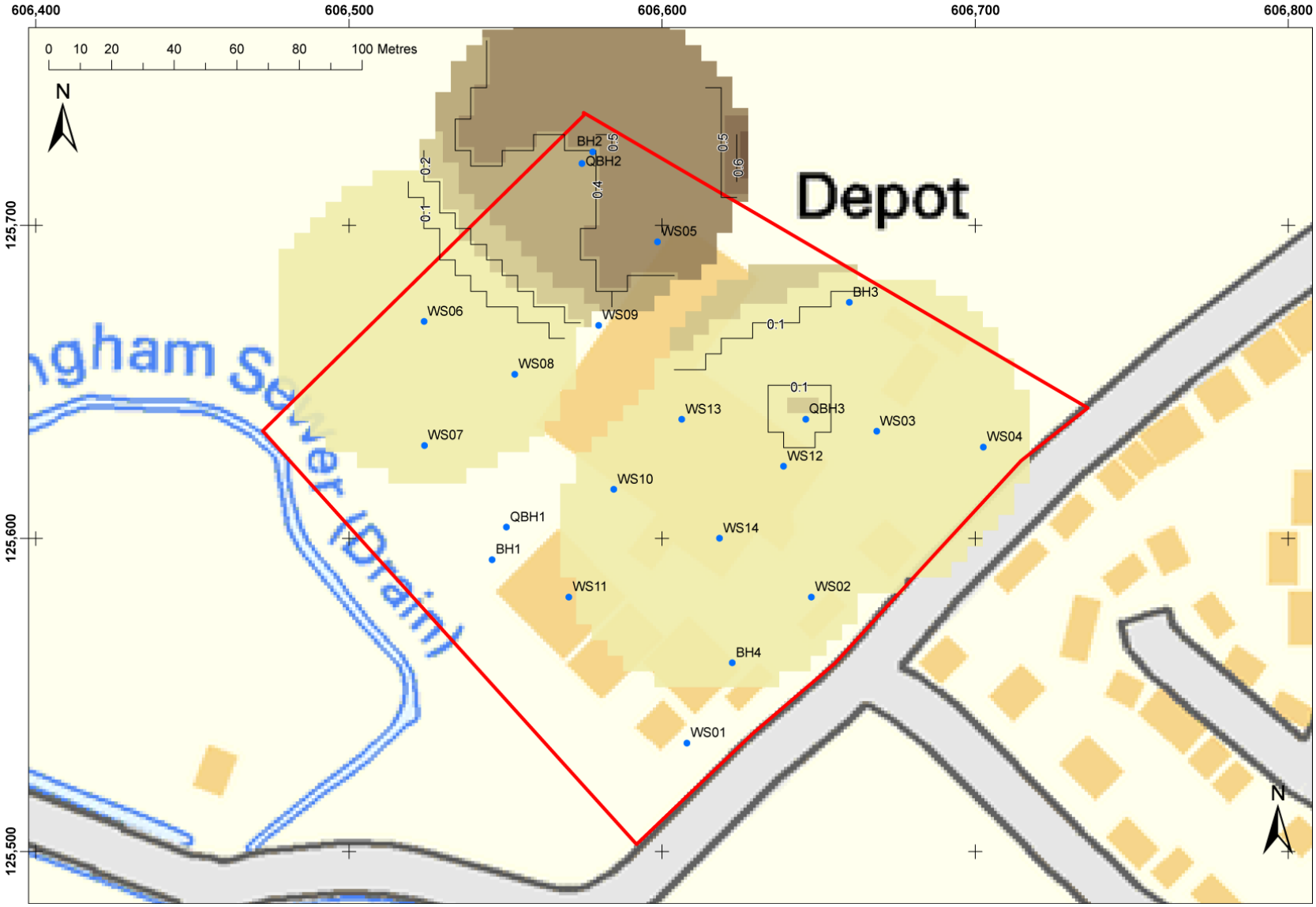

Figure 5: Modelled thickness of the Peat (contours in metres).

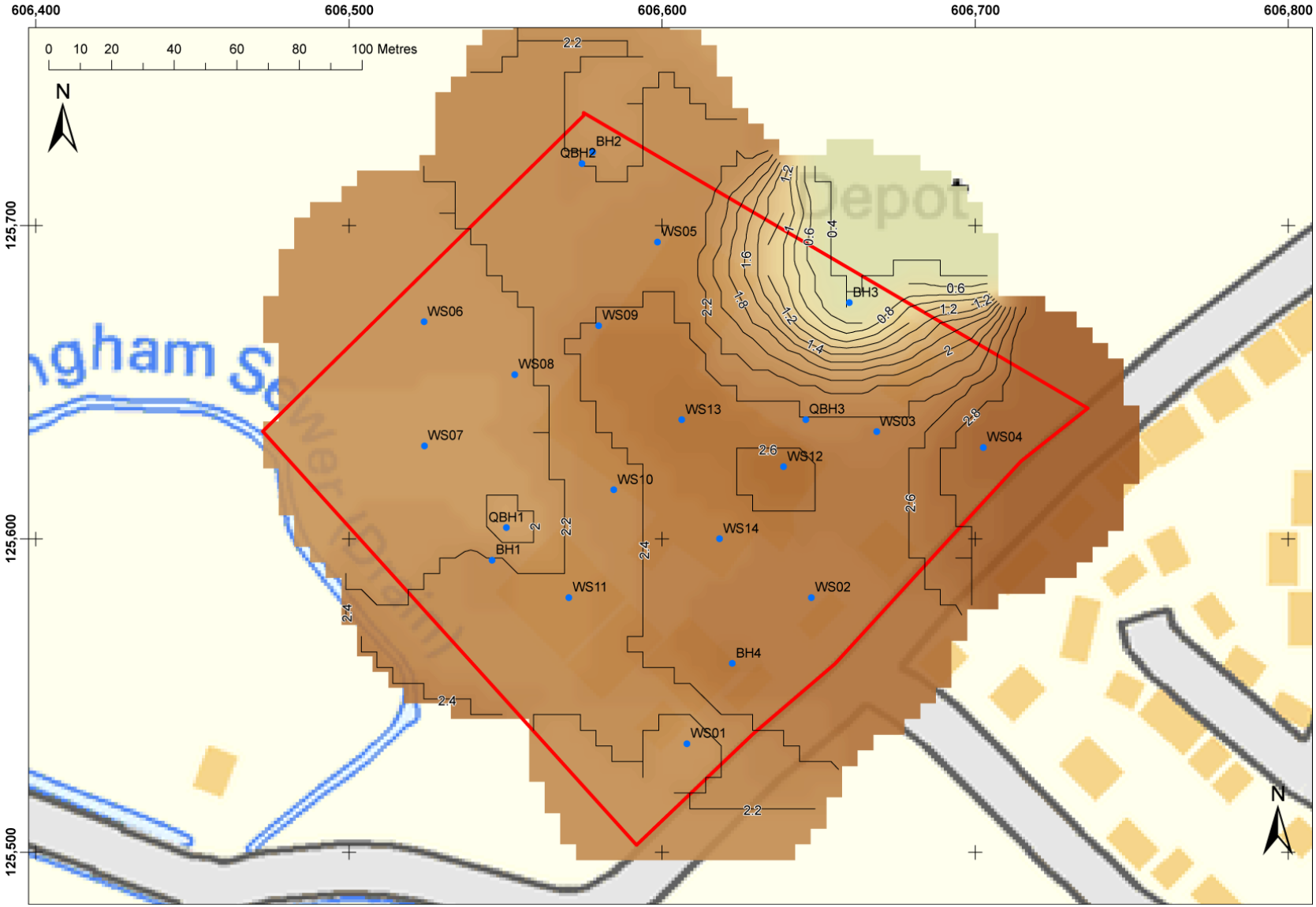

Figure 6: Modelled surface of the Alluvium (contour heights in metres OD).

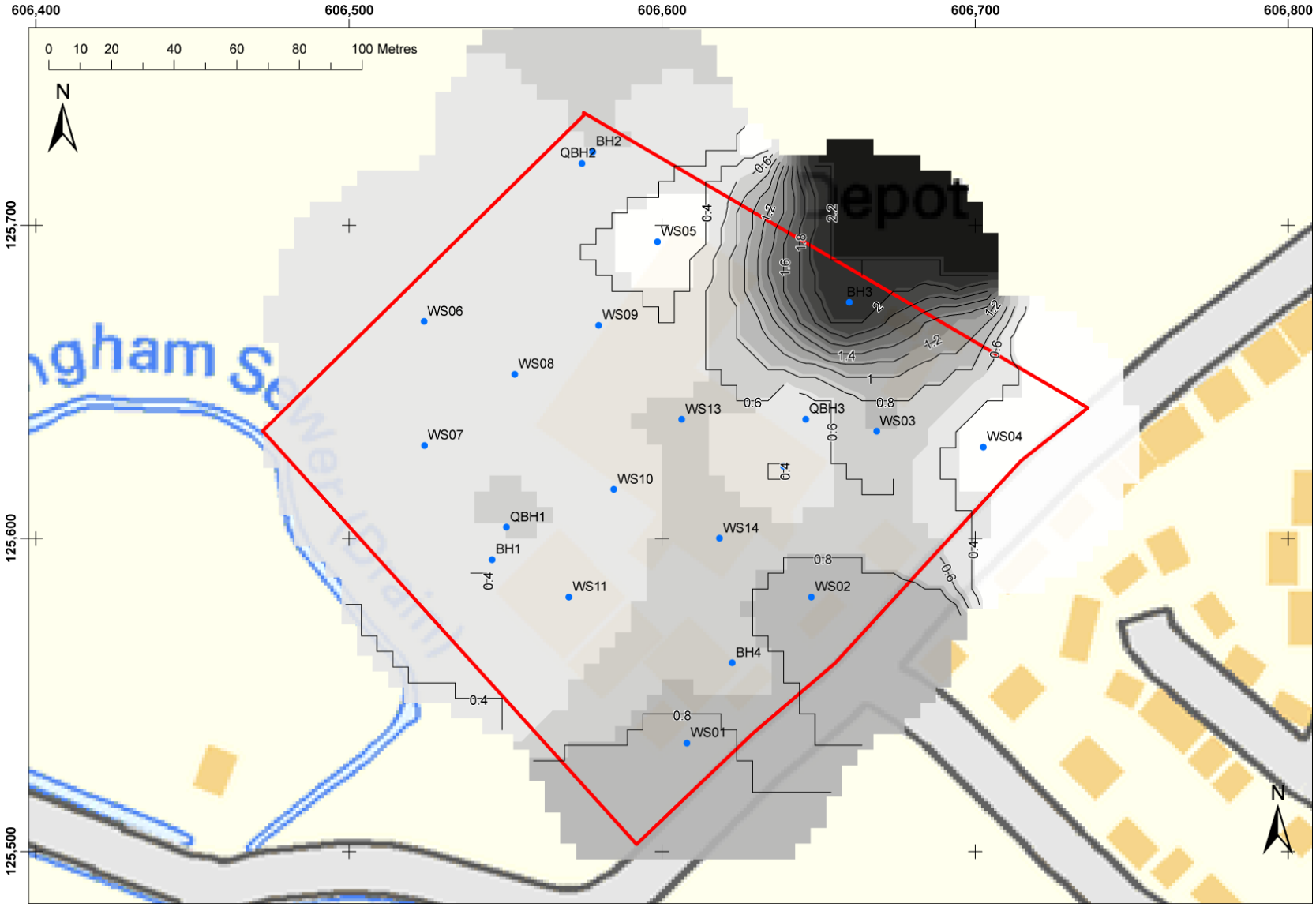

Figure 7: Modelled thickness of the Made Ground (contours in metres).

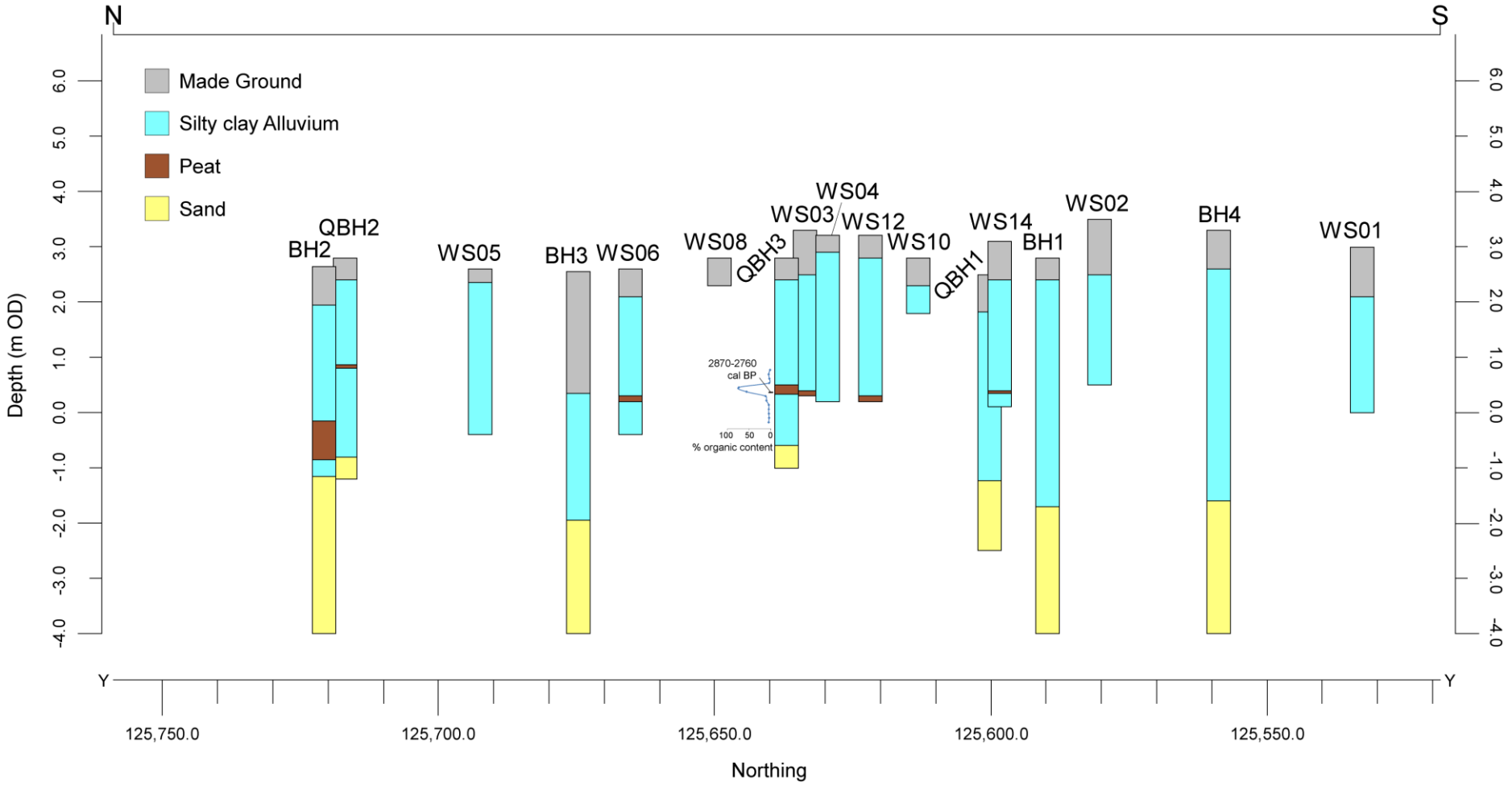

Figure 8: North-south transect of boreholes across the Cockreed Lane, New Romney site.

5 RESULTS AND INTERPRETATION OF THE POLLEN ASSESSMENT

Samples were prepared for pollen assessment through the peat and immediately encompassing mineral-rich sediments in borehole QBH3. The results of this assessment (Table 7) indicate a high concentration and preservation of remains. All six samples contain an analogous assemblage of pollen characterised by high values of herbaceous and aquatic pollen, including: Cyperaceae, Poaceae (grasses) and *Sparganium* type (bur-reed) with *Chenopodium* type (e.g. *Sueada maritima*) towards the base and sporadic occurrences of *Artemisia* (mugwort), *Plantago* sp. (plantain), *Rumex obtusifolius* (dock), *Malva* type (mallow) and *Typha latifolia* (bulrush). Trees and shrubs were generally limited but included *Quercus, Alnus and Corylus* type with sporadic occurrences of *Pinus* (pine) and *Ulmus* (elm). Microcharcoal were either absent or recorded in negligible concentrations throughout these samples.

The quantity of herbaceous and aquatic pollen suggests the dominant growth of sedge fen and reed swamp communities occupying the floodplain environment. There is some suggestion that saltmarsh communities initially existed due to the presence of Chenopodiaceae, but this decreases to be replaced by increasing values of bur-reed. There is limited evidence to indicate the growth of floodplain woodland, though the occurrence of alder pollen may indicate either limited or distal stands of carr woodland. The limited concentrations of arboreal pollen also indicate that the nearby dryland was relatively open, although limited stands of woodland dominated by oak and hazel with occasional elm, lime and birch is also indicated. The openness of the dryland is suggestive of a cleared landscape which corresponds to the early Iron Age date of the sequence; however, no definitive anthropogenic indicators were recorded during the assessment.

Table 7: Results of the pollen assessment of borehole QBH3, Cockreed Lane, New Romney, Kent.

	Depth (m OD)	2.32	2.36	2.40	2.44	2.48	2.52
Latin name	Common name						
Trees							
Alnus	alder	2	2	5	2	5	3
Quercus	oak	4	6	8	7	12	11
Pinus	pine	2		1	1		
Ulmus	elm		1	1		1	
Tilia	lime					1	
Betula	birch				2	1	
Shrubs							
Corylus type	e.g. hazel	20	2	17	6	5	3
Salix	willow						1
Herbs							
Cyperaceae	sedge family	14	30	7	11	25	11
Poaceae	grass family	7	6	12	37	32	11
Artemisia	mugwort					1	
Plantago type	plantain	1					
Plantago lanceolata	ribwort plantain			1			
Chenopodium type	goosefoot family					3	6
Rumex obtusifolius	dock	1					
Rosaceae	rose family	1					
Malva type	mallow				1		
Aquatics							
Potamogeton type	pondweed					1	
Typha latifolia	bulrush				1	1	
Sparganium type	bur-reed	1	17	65	16	2	2
Spores							
Pteridium aquilinum	bracken	1	1		1	1	
Sphagnum	moss					1	
Filicales	ferns	120	71	11	2		
Polypodium vulgare	polypody					1	
Total Land Pollen (grains counted)		52	47	52	67	86	47
Concentration*		5	5	5	5	5	5
Preservation**		3	4	4	4	4	4
Microcharcoal Concentration***		0	0	0	0	0	1
Suitable for further analysis		YES	YES	YES	YES	YES	YES

6 RESULTS AND INTERPRETATION OF THE DIATOM ASSESSMENT

A summary of the diatom assessment results for borehole QBH3 is shown in Table 8. Diatoms are listed in order of abundance (most common at the top of each list). Diatoms were encountered in two of the four samples submitted. Those samples in which diatoms were present were those with the lowest organic content evident during preparation. The upper-most sample (0.53m OD) had diatoms in greatest abundance, whereas the lower-most sample (0.29m OD) yielded a much smaller diatom assemblage. The two organic-rich samples reacted strongly during hydrogen peroxide treatment (especially 0.49m OD), suggestive of a very well humified organic component within the sample. The majority of the diatoms encountered were marine planktonic taxa, with marine and brackish benthic taxa also present (Vos & de Wolf, 1993).

Due to the variable presence of diatoms within the samples under investigation, reliable palaeoenvironmental results are only realistically possible from the upper most sample. If there are valuable archaeological finds associated with this elevation (and perhaps above), then full analysis would assist in understanding the likely environmental conditions that prevailed at the time. Considering the presence of diatoms typically associated with coastal/estuarine conditions, further analysis has the potential to elucidate the relative influence of sea level at the time of deposition.

Table 8: Results of the diatom assessment of samples from borehole QBH3, Cockreed Lane, New Romney, Kent.

Depth (m OD)	Depth (m bgs)	Diatoms encountered
0.53	2.27	*Pseudomelosira westii* *Diploneis crabro* Scoliopleura sp *Actinoptychus senarius* *Pseudopodosira stelligera* Diploneis spp.
0.49	2.31	n/a
0.33	2.47	n/a
0.29	2.51	*Pseudomelosira westii* *Pseudopodosira stelligera* Diploneis sp.

7 RESULTS AND INTERPRETATION OF THE MACROFOSSIL ASSESSMENT

Four small bulk samples from borehole QBH3 were processed for the recovery of macrofossil remains, including waterlogged plant macrofossils, wood, insects and Mollusca (Table 21). The samples were focussed on the peat horizon within borehole QBH3 only. The results of the macrofossil rapid assessment indicate that no waterlogged or charred wood or seed remains were present in the samples; the waterlogged plant remains recorded were limited to remains of sedges (culms and rhizomes), but no diagnostic epidermal tissues were recorded. No waterlogged seeds, Mollusca or bone were found within the samples. Low concentrations of insect remains were found in the samples from the top of the peat (0.35 to 0.40m OD).

Table 9: Results of the macrofossil assessment of borehole QBH3, Cockreed Lane, New Romney, Kent.

				Charred					Waterlogged			Mollusca		Bone				
Depth (m OD)	Volume sampled (ml)	Volume processed (ml)	Fraction	Charcoal (>4mm)	Charcoal (2-4mm)	Charcoal (<2mm)	Seeds	Chaff	Wood	Seeds	Sedge remains	Whole	Fragments	Large	Small	Fragments	Insects	Artefacts
0.35 to 0.37	0.05	0.05	>300µm	-	-	-	-	-	-	-	3	-	-	-	-	-	1	-
0.37 to 0.40	0.05	0.05	>300µm	-	-	-	-	-	-	-	3	-	-	-	-	-	1	-
0.40 to 0.45	0.05	0.05	>300µm	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-
0.45 to 0.50	0.05	0.05	>300µm	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-

Key: 0 = Estimated Minimum Number of Specimens (MNS) = 0; 1 = 1 to 25; 2 = 26 to 50; 3 = 51 to 75; 4 = 76 to 100; 5 = 101+

8 DISCUSSION & CONCLUSIONS

The aims of the environmental archaeological assessment at the Cockreed Lane site were (1) to investigate the age of the peat horizon at the site, and its relationship with the peat recorded in the wider area of Romney Marsh; (2) to provide a provisional reconstruction of the environmental history of the site, (3) to highlight any evidence of human activity, and (4) to make recommendations for further analysis (if required). The results of the previous geoarchaeological investigations at the site (Young, 2016) revealed that the sequence at the site consists of predominantly sandy Tidal Flat Deposits to a level of between -1.95 and -0.6m OD, overlain by generally silty and clayey Alluvium, possibly related to salt-marsh formation (cf. Long & Innes 1993), to a level of between *ca*. 1.8 and 2.9m OD. A thin horizon of peat was recorded in seven of the 21 boreholes, generally at elevations between 0.0 and 0.5m OD, and present in thicknesses of between 0.05 and 0.2m. The results of the radiocarbon dating of the peat in borehole QBH3 indicate that accumulation began during the Late Bronze Age/Early Iron Age (2760 to 2870 cal BP). These results are consistent in terms of both age and elevation with investigations by Long *et al*. (2006), who show peat horizons up to *ca*. 2m thick in the area of Romney Marsh, generally lying at between *ca*. -1 and 1m OD but relatively thin or absent towards New Romney. Where peat is recorded it is generally radiocarbon dated to between *ca*. 6000 and 1700 cal. BP, the lower sand units underlying the peat accumulating from *ca*. 7800 cal. BP onwards (Long *et al*., 2006).

Significantly, the peat horizons recorded at the site represent a (perhaps synchronous) transition to semi-terrestrial conditions, supporting the growth of wetland vegetation and forming a land surface which might have been utilised by prehistoric people. The initiation of peat formation at Cockreed Lane is relatively late in the broader chronology of peat formation in the Romney Marsh area. Interestingly, it coincides with the sub-Boreal/sub-Atlantic boundary, when a shift from relatively warm continental to wetter oceanic conditions occurred. Waller *et al*. (1999) have suggested that this altered the vegetation communities in existing minerotrophic fens in the Romney Marsh area to assemblages akin to ombrotrophic peatlands. At Cockreed Lane the changing climatic conditions may have been responsible for the initiation of peat formation, with the combined results of the palaeobotanical assessments (pollen, seeds and diatoms) indicating the presence of sedge fen and reed swamp communities during the accumulation of the peat and relatively open environments on both the floodplain and dryland (perhaps with limited stands of alder woodland on the floodplain, and oak and hazel with occasional elm, lime and birch on the dryland). No definitive anthropogenic indicators were recorded during the assessment of the peat, although the open dryland environment is suggestive of a cleared landscape, consistent with an early Iron Age date for the sequence.

There is an indication of saltmarsh communities towards the base of the peat and in the silty clay deposits immediately below it in both the pollen and diatom records, with Chenopodiaceae pollen and marine and brackish benthic diatom taxa recorded. This evidence supports the assertion of Long *et al*. (2006) that the clayey horizons immediately underneath the peat in Romney and Walland Marshes accumulated under intertidal mudflat and saltmarsh environments.

9 RECOMMENDATIONS

On the basis of the relatively thin nature of the peat at the site in comparison to thicker horizons recorded elsewhere in the area of Romney Marsh and the Dungeness foreland, no further environmental archaeological analysis is recommended.

10 REFERENCES

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11 APPENDIX 1: OASIS

OASIS ID: quaterna1-255721

Project details

Project name COCKREED LANE, NEW ROMNEY, KENT (ASSESSMENT)

Short description of the project:

An environmental archaeological assessment was carried out subsequent to geoarchaeological investigations at the Cockreed Lane site in order to investigate the age of the peat horizon, and its relationship with the peat recorded in the wider area of Romney Marsh, and to provide a provisional reconstruction of the environmental history of the site. The results of the previous geoarchaeological investigations revealed that the sequence at the site consists of predominantly sandy Tidal Flat Deposits to a level of between -1.95 and -0.6m OD, overlain by generally silty and clayey Alluvium, possibly related to salt-marsh formation, to a level of between ca. 1.8 and 2.9m OD. A thin horizon of peat that began accumulating during the Late Bronze Age/Early Iron Age (2760 to 2870 cal BP) was recorded, generally at elevations between 0.0 and 0.5m OD, and present in thicknesses of between 0.05 and 0.2m across the site. These results are consistent in terms of both age and elevation with investigations by Long et al. (2006), who show peat horizons up to ca. 2m thick in the area of Romney Marsh, generally lying at between ca. -1 and 1m OD but relatively thin or absent towards New Romney. Elsewhere, where peat is recorded it is generally radiocarbon dated to between ca. 6000 and 1700 cal. BP, the lower sand units underlying the peat accumulating from ca. 7800 cal. BP onwards (Long et al., 2006). The palaeobotanical assessments of the peat are indicative of sedge fen and reed swamp communities during its accumulation, with relatively open environments on both the floodplain and dryland. No definitive anthropogenic indicators were recorded, although the open dryland environment is suggestive of a cleared landscape, consistent with the early Iron Age date of the sequence. No further environmental archaeological analysis of the peat was recorded on the basis of its relatively thin nature in comparison to peat horizons elsewhere in the area of Romney Marsh.

Project dates

Start: 01-12-2015 End: 23-06-2016

Previous/future work Yes / Not known

Type of project Environmental assessment

Significant Finds PEAT Late Bronze Age

Significant Finds	PEAT Early Iron Age
Survey techniques	Landscape

Project location

Country	England
Site location	KENT SHEPWAY NEW ROMNEY Cockreed Lane, New Romney
Postcode	TN28 8TW
Study area	3.15 Hectares
Site coordinates	TR 06600 25640 50.992386411575 0.944371553387 50 59 32 N 000 56 39 E Point

Project creators

Name of Organisation	Quaternary Scientific (QUEST)
Project brief originator	CgMs Consulting
Project design originator	D.S. Young
Project director/manager	C.R. Batchelor
Project supervisor	D.S. Young
Type of sponsor/funding body	Developer

Project archives

Physical Archive Exists?	No
Digital Archive Exists?	No
Paper Archive recipient	Kent
Paper Contents	"Environmental"
Paper Media available	"Report"

Entered by	Daniel Young (d.s.young@reading.ac.uk)
Entered on	23 June 2016