LAND AT NORMAN ROAD (NORTH),

BELVEDERE,

LONDON BOROUGH OF BEXLEY

AN ARCHAEOLOGICAL EVALUATION

JANUARY 2008

PRE-CONSTRUCT ARCHAEOLOGY

DOCUMENT VERIFICATION

LAND AT NORMAN ROAD (NORTH), BELVEDERE, LONDON BOROUGH OF BEXLEY

ARCHAEOLOGICAL EVALUATION

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An Archaeological Evaluation at Land at Norman Road (North), Belvedere, London Borough of Bexley

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Site Code: NNB 07

Central National Grid Reference: TQ 4975 8065

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1 ABSTRACT

1.1 This report details the results and working methods of an archaeological evaluation undertaken by Pre-Construct Archaeology Limited of land at Norman Road (North) Belvedere, London Borough of Bexley.

1.2 The development project has been granted Section 36 consent and deemed planning permission by the Secretary of State following a public inquiry. The permission includes the following planning condition (number 49):

> *'No development shall take place on the site until the Company has secured the implementation of a programme of archaeological work in accordance with a written scheme of investigation which has been submitted by the applicant and approved in writing by the Council.'*

The archaeological evaluation was implemented pursuant to the discharge of planning condition number 49. The proposed development is the construction of an Energy from Waste Power Station entitled Riverside Resource Recovery Facility. The project is overseen by Riverside Resource Recovery Limited.

1.3 Prior to the archaeological fieldwork, Pre-Construct Archaeology Ltd have produced an archaeological Desk Top Assessment of the site (Haslam 2006). The fieldwork followed a Written Scheme of Investigation (Mayo 2007c) that was approved by English Heritage, Archaeology Advisor to the London Borough of Bexley.

1.4 Nine trenches were excavated within the site that revealed a general sequence of gravel, alluvial deposits, peat, alluvial clay and made ground. A continuous column sample was taken from each of the trenches, together with a bulk sample sequence from through the peat, which is likely to be of early-Neolithic to Iron Age date. No culturally sensitive features were encountered although a single rim sherd of Roman pottery was recovered.

2 INTRODUCTION

2.1 Background

2.1.1 Pre-Construct Archaeology Ltd. conducted an archaeological evaluation of land at Norman Road (North), Belvedere, London Borough of Bexley (Figures 1 and 2) between the 3rd September and 14th November 2007 in advance of a proposed development. The fieldwork followed a detailed design procedure, in the process of which a number of documents were submitted to and approved by English Heritage, acting as Archaeology Advisor to the London Borough of Bexley (Mayo 2007 a, b & c). The Written Scheme of Investigation for the evaluation (Mayo 2007c) proposed a four stage approach to the fieldwork, comprising the evaluation of piled wall trenches, a geoarchaeological study of the area of the new jetty, a foreshore survey and then a reporting of the findings.

2.1.2 During the course of the design procedure for the fieldwork, consultation was held with Mark Stevenson and Jane Sidell (both of English Heritage) regarding the practical application of a foreshore survey at the site, both in terms of the likely potential of achieving archaeological results and the health and safety considerations involved. Following this consultation a statement was submitted to English Heritage (Mayo 2007d) with the result that the necessity for the foreshore survey was removed.

2.2 The Site

2.2.1 The development site comprises of a long, narrow strip of land stretching along Norman Road from Picardy Manorway northwards to the riverfront; a block of land immediately north of an existing electricity substation and to the west of Norman Road and a river zone formed of a block of land formerly the Borax Works together with a section of the river itself. The land occupies an area of 9.95 hectares, with a further 12 hectares situated within the River Thames. It is bounded to the north by the River Thames, to the south by Picardy Manorway, to the east by open land and land formerly occupied by the Belvedere Power Station and to the west by open land, a sewage works and an electricity sub station. The central National Grid Reference for this site is TQ 4975 8065.

2.3 The Proposed Development

2.3.1 The development proposals involve the installation of an Energy from Waste facility which is to be known as the Riverside Resource Recovery Facility (RRRF). The main

components of the RRRF installation will be located in the area adjacent to the River Thames, on the site of the former Borax Works, and consist of a main plant building, comprising a waste reception hall, a waste storage bunker, waste combustion grates, gas cleaning equipment, a turbine house a chimney stack and the air cooled condensers. The proposed jetty would be a single pier construction, extending 170m from the bank into the River Thames.

2.3.2 Norman Road itself will be upgraded as part of the proposed scheme; the block of land to the west of Norman Road has previously been subject to a remediation programme and is likely to be used as a construction compound during the development. Areas of land surrounding the RRRF main building and condensers are intended for landscaping and ecological purposes and will not be impacted upon by the development.

2.4 The Evaluation

2.4.1 The archaeological excavation of nine trenches was undertaken on the site across the footprint of the main building and the cooling condensers (Figure 3). Cory Environmental Limited commissioned the evaluation on behalf of Riverside Resource Recovery Limited (RRRL). The project managed was by Chris Mayo and supervised by Stuart Holden. The site was assigned the unique code NNB 07 by the Museum of London.

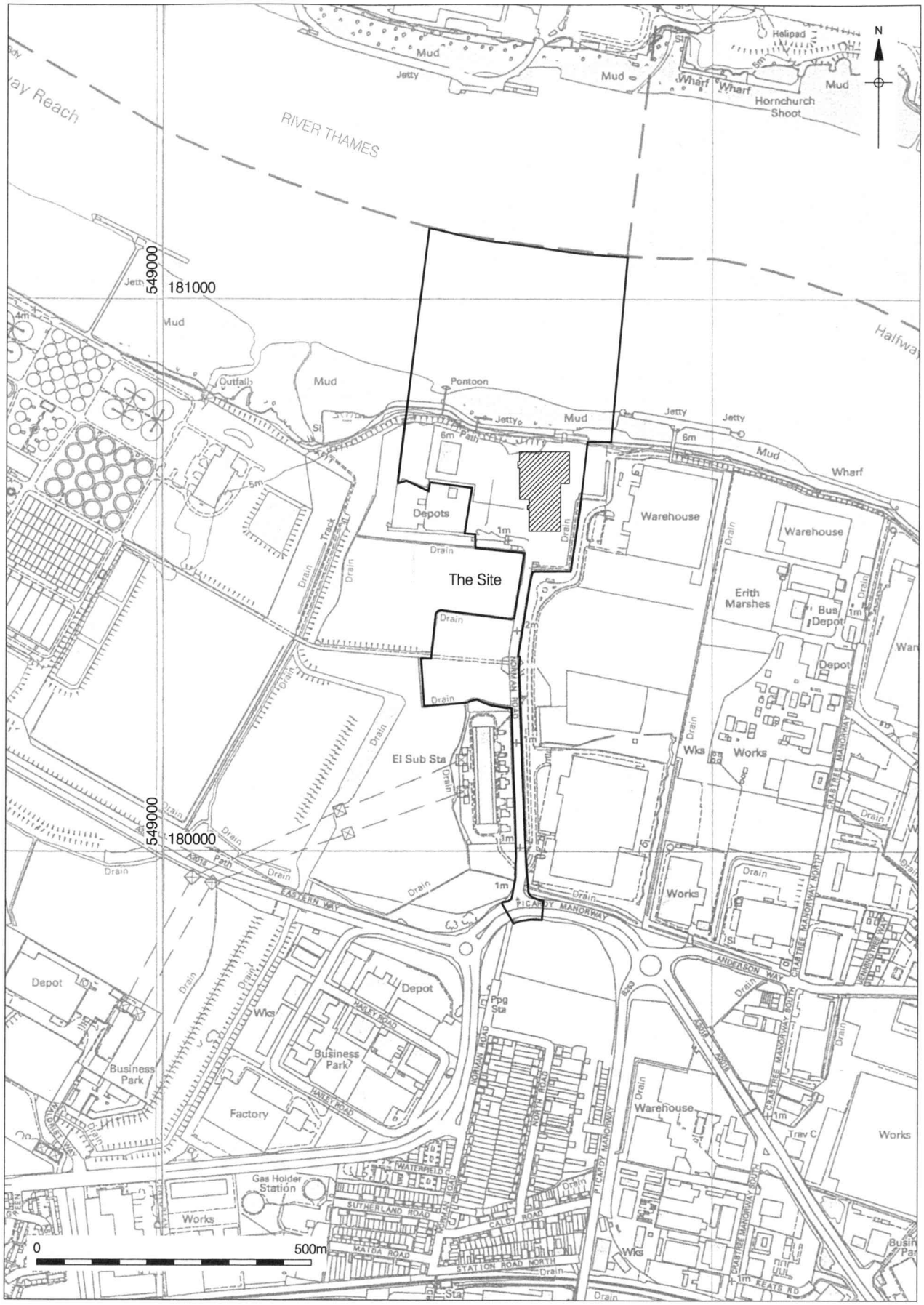
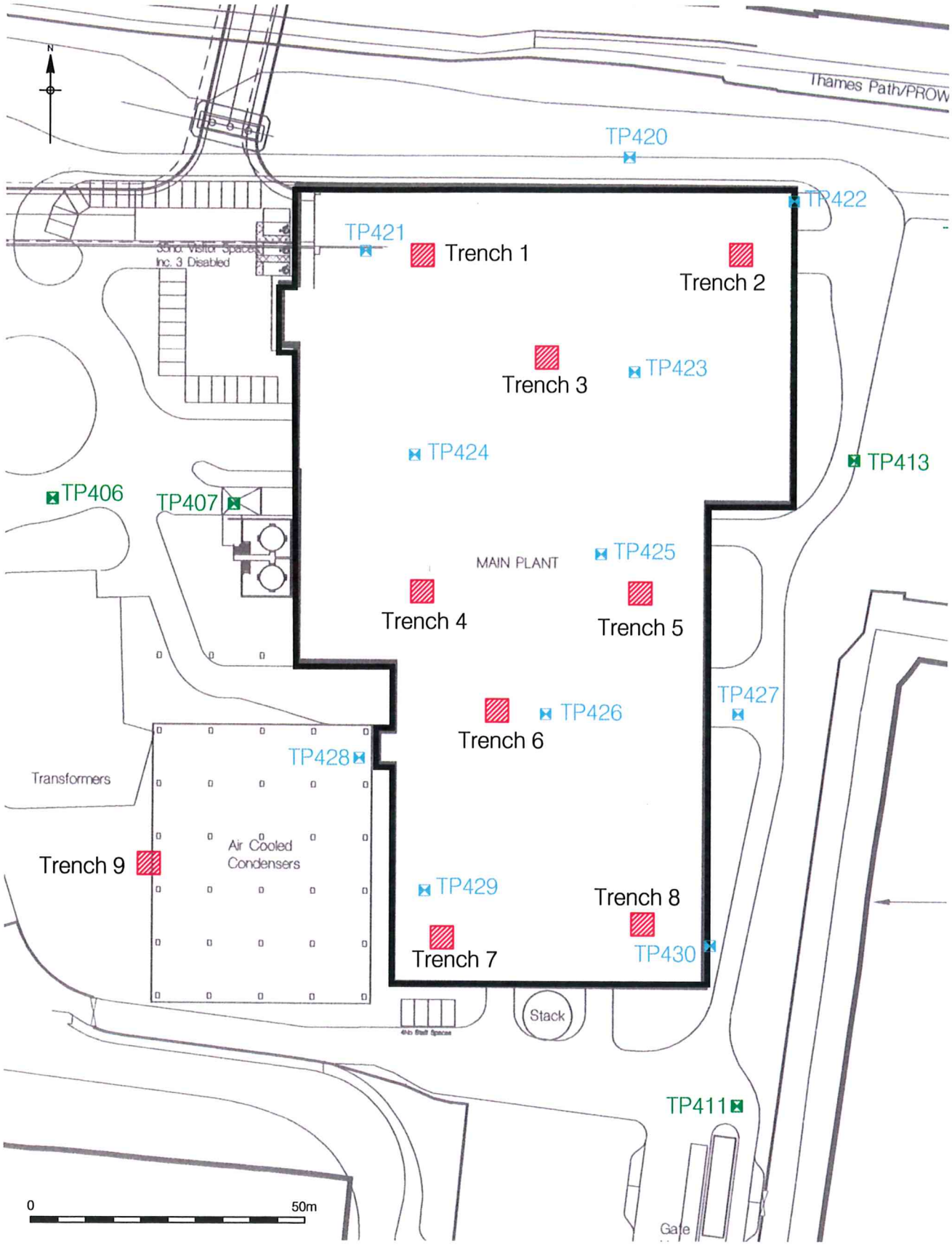


Figure 1
Site Location
1:10,000 at A4



Evaluation trench locations

Previous trial pits

Additional trial pits

Figure 2
Trench Location
1:1,000

3 PLANNING BACKGROUND AND RESEARCH OBJECTIVES

3.1 National Framework

3.1.1 This study aims to satisfy the objectives of the London Borough of Bexley, which fully recognises the importance of the buried heritage for which they are the custodians. In November 1990 the Department of the Environment issued Planning Policy Guidance Note 16 (PPG16) 'Archaeology and Planning'. It provided guidance for planning authorities, property owners, developers and others on the preservation and investigation of archaeological remains.

3.1.2 The advice states 'the desirability of preserving an ancient monument and its setting is a material consideration in determining planning applications whether that monument is scheduled or unscheduled. Developers and local authorities should take into account archaeological considerations and deal with them from the beginning of the development control process' (paragraph 18).

3.1.3 It also states 'where nationally important archaeological remains, whether scheduled or not, are affected by proposed development there should be a presumption in favour of their physical preservation' (paragraph 8).

3.2 Archaeology in the London Borough of Bexley

3.2.1 PPG16 provides guidance on archaeology within Development Plans. In this instance the relevant Plan is the London Borough of Bexley Unitary Development Plan (UDP). This was adopted on April 28th 2004 and contains policies relating to archaeological remains and sites with archaeological potential:

> 5.76. 'The archaeological remains below the ground represent a storehouse of historic information including evidence of the evolution of development and settlements in this area. This applies to remains of domestic, industrial and agricultural origins. All remains are unique and represent a finite and non-renewable resource. As such there will always be a presumption to protect such remains. Recent thinking suggests that it is best to preserve as many remains in situ since future analytical techniques may enable far more information to be gleaned from the sites. Excavation can result in the destruction of material, levels etc, leaving only rescued artefacts and any records made during excavation. This is considered to be second best. However, the potential archaeological interest must be weighed against the needs of development. Where development of necessity disturbs the sub-soil levels on sites of archaeological interest, adequate investigations and excavation will be expected and policies have been formulated on this basis. Government advice in PPG16, "Archaeology and Planning", reinforces the need for developers to give early consideration to archaeological issues, normally before planning applications are made.'
>
> **Policy ENV56**
> **In Areas of Archaeological Search and other areas where finds are likely to occur and in certain historic standing buildings where development proposals may affect archaeological remains or historical evidence, the Council will expect applicants to have**

properly assessed and planned for the archaeological implications. The council may require a preliminary archaeological site evaluation before proposals are considered.

5.77. 'The proposals map identifies the most important known archaeological areas, indicated as Areas of Archaeological Search, prepared by representatives of the Museum of London. This indicates approximate areas where there could be interesting remains, but the boundaries should not be taken as being definitive, and finds may occur outside these areas. Historical evidence may also be revealed during alterations to standing buildings and it is important that such evidence is properly recorded. In areas where finds are most likely to occur, the Council may require preliminary site investigation, so that the possible extent of interest can be established in advance. Such an assessment will involve a field evaluation carried out by a recognised archaeological organisation or suitably qualified individuals to a specification set by the Local Planning Authority. In certain cases, applications may not be considered before such an evaluation is completed. This will benefit developers in that they will be fully aware of any implications before works begin on site, since later changes of design to accommodate archaeological remains can prove expensive. Developers are invited to discuss implications and the need for evaluations at the earliest possible stage.'

Policy ENV57
Where sites of archaeological significance or potential are discovered the Council will seek that:

the most important archaeological remains and their settings are preserved in situ (if appropriate for public access and display) and that where appropriate they are given statutory protection; and
sites not requiring preservation in situ shall be made for an appropriate level of archaeological investigation and excavation by a recognised archaeological organisation before development begins.

5.78. 'Archaeological sites can be damaged or destroyed by even modest developments. The most important remains should be preserved wherever possible because of their historic interest. Where sites are to be developed, and archaeological remains are not to be preserved in situ, arrangements should be made, including planning agreements as necessary, for the proper investigation, excavation and recording of remains. A specification of work for any investigation will need to be agreed beforehand. There should also be provision for the subsequent analysis, interpretation and presentation to the public of the archaeological results and findings. Developers will be expected to co-operate in archaeological investigations and, if not prepared to do so voluntarily, the Council will consider whether it would be appropriate to direct an applicant to supply further information under the provisions of the Town and Country Planning (Applications) Regulations 1988. This is in accordance with the Government's advice in PPG16. A code of practice has been agreed by developers and archaeologists (the British Archaeologists' and Developers' Code of Practice) and the use of this will be encouraged. The Council appreciates the need to minimise the impact of development proposals and in conjunction with the Museum of London and English Heritage will offer advice to help minimise any possible delays or alterations to developments and to guide design around sensitive locations.'

Policy ENV58
There will be a presumption against any development, which would adversely affect any Scheduled Ancient Monument or other nationally important archaeological sites and monuments and their settings.

5.79. 'The designation of certain monuments as scheduled Ancient Monuments is a recognition their special national importance. Their rarity means that special attention will be taken to protect them from unsuitable development or uses which may damage the remains or adversely affect their setting. The sites currently scheduled as Ancient Monuments are listed at Appendix D3.'

5.80. 'The Council has a range of means at its disposal to secure the protection of archaeological remains. In general, the preference is to use voluntary agreements freely entered into by all parties concerned. However, where necessary, the Council will consider using its statutory powers or seeking action by others such as English Heritage and the Department for Culture, Media and Sport.

3.2.2 The site lies within an Area of Archaeological Search, as defined in the above UDP. No Scheduled Ancient Monuments are located in the immediate vicinity of the proposed development area.

3.3 Research Objectives

3.3.1 General

The objectives of the evaluation were to define the character and extent of any archaeological remains that may be present, and thus indicate the weight which may to be attached to their preservation or mitigation.

3.3.2 Thames foreshore

Archaeological investigation of the proposed jetty location was not practicable due to the thickness of modern estuarine sediments and the tidal waters. An examination of the borehole logs in the locale, provided by investigations associated with the proposed development and from the British Geological Survey, aimed to:

1. Determine the nature and extent of the sedimentary deposits proximal to the proposed jetty.
2. Produce a depositional model for the sediments.

The results of this investigation are provided in full in Appendix 1.

3.3.3 Geoarchaeological

The evaluation aimed to recover an extensive series of environmental samples from which it may be possible to reconstruct the environmental history of the site and its environs. Discussions between Mark Stevenson (English Heritage Greater London Archaeological Advisory Service), Dominique De Moulins (English Heritage Archaeological Science Advisor) and Pre-Construct Archaeology led to the formulation of the following research questions, specific to the geoarchaeological assessment:

1. Can different ecosystems (wood, open areas etc) be recorded in the litho- and bio-stratigraphic sequences, especially as one goes away from the river?
2. Can the period or periods the forest growth in the wetland be delimited?
3. Can the woodland flora and fauna be characterised?
4. Were there significant changes to the composition and structure of the woodland over time?
5. Are there identifiable changes in the environment that can be attributed to either human impact or climate change?
6. Can human exploitation and/or utilisation of the woodland be identified, such as the free roaming of pigs, harvesting of trees, nut collection etc?

7. Is there any signal of land-use and exploitation of the more distant, drier valley slopes?

The results of this investigation are provided in full in Appendix 2.

4 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

4.1 Pre-Construct Archaeology Ltd have previously produced an archaeological Desk Top Assessment (Haslam 2006). The results of this document are summarised below.

4.2 Palaeolithic

4.2.1 The previous borehole investigations conducted on the site identified river terrace gravels overlying the London Clay at a lowest level of -14.51m AOD. The gravels themselves were deposited during the Pleistocene and their nature would suggest that there is little chance of archaeological features or artefacts being contained within this horizon. However, material of Palaeolithic date has been recovered from similar gravel deposits elsewhere, and the potential for the recovery of faunal and floral remains dating to this period should be recognised. Palaeolithic tools, comprising 11 handaxes, 48 flakes and 1 Levallois core have been found in the vicinity of the town of Erith, and there is further evidence of Palaeolithic hominid activity further to the east of the subject site in Dartford and Swanscombe.

4.3 Mesolithic

4.3.1 There are a number of findspots of Mesolithic date within the immediate vicinity of the study site. The most significant of these from a watching brief conducted between April 1995 and May 1996 on Bronze Age Way, situated to the southeast of the study site where Norman Road meets Eastern Way. Evidence of flintworking was recorded along the length of the road scheme beneath peat deposits. A total of 147 environmental samples were taken producing 3,190 pieces of worked flint and 51.4kg of burnt flint. The worked flint recovered included 356 blades, 80 cores, 29 core fragments, 15 core rejuvenation flakes, biface trimming and thinning flakes and 13 tranchet axe sharpening flakes. A further 31 tools were recovered including microliths, scraphs, a large awl and a broken tranchet axe. Radiocarbon dating of the peat that sealed the sand horizon containing this flintwork, offers a deposition range of 4,670-4,230 BC.

4.3.2 A further watching brief to the south of the study site in 1997 took place in Norman Park on Picardy Manorway to the immediate south of the study site. One Mesolithic to early-Neolithic broken crested flint blade was recovered from the lower sand, and has been dated at between 7,000-3,001 BC. The lower sand was sealed by alluvial silts, clays and marginal peats. A Mesolithic bone awl was recovered from the marshes c.

1.7km west of the study site, where it was described as being located between two layers of peat.

4.4 Neolithic

4.4.1 There is a fair amount of evidence for Neolithic activity within the immediate vicinity of the study site. During a watching brief undertaken on Bronze Age Way, sherds of Neolithic pottery were recovered in the form of a Grimston Lyle-Hill carinated bowl. Two other sherds from a separate vessel were also recovered. Radiocarbon dates from a charcoal deposit directly associated with the carinated bowl gave a deposition date of 4,040-3,700 BC. Residue analysis also identified cereal remains on one vessel and meat residue on both of them.

4.4.2 Recovered to the southeast of the study site and recorded in the work of Flaxman C. J. Spurrell (an amateur archaeologist) in 1885 were a polished flint axe and a flint scraper. Both of these finds were recovered from the inside of a dugout boat, and were initially interpreted as having been Neolithic (4,000-2,201 BC) in date. However, the boat is now believed to have been Bronze Age in date, with the flint axe and scraper having been interpreted as possible forgeries.

4.4.3 To the south of the study site a sequence of alluvial deposits was encountered during groundworks for a Thames water pipeline at Eastern Way, Picardy Manorway and Anderson Way. The alluvial sequence consisted of silt clay and peat and several channels were recorded as cutting into the relatively high peatland. No direct evidence was noted in terms of human occupation, although subsequent environmental assessment has indicated local woodland clearance between the mid-Neolithic and early-Bronze Age periods. Evidence was also discovered of nearby cereal cultivation during the early-Bronze Age period. One of the channels cutting into the peat is believed to have been of a mid-Neolithic to early-Bronze Age date.

4.5 Bronze Age

4.5.1 The previously discussed logboat, was revealed during the digging of a ditch through peat in the Erith Marshes. This was recorded by Mr. Spurrell as follows:

> *'low down in the peat, which rises to zero OD, a 'dug out' boat was cut through, the ends being left in either bank of the ditch which was being made.'*

He also recorded a second Neolithic flint axe or chisel from within the immediate vicinity of the boat.

4.5.2 Bronze Age material has been recovered extensively from Devoy's Tilbury IV deposits in Greater London, and the area around the study site certainly displays evidence of land use during this time period. To the south east of the site, the watching brief on Bronze Age Way unearthed numerous worked wood objects and staves associated with horizontally lying brushwood. As the brushwood and the staves were associated with one another, the feature has been interpretation as a trackway. Other worked wood from the proximity of this trackway has been C14 dated to 1,620-1,370 BC. An additional 4m of a woven hurdle type trackway was exposed on the site and constructed from coppiced roundwood. Several C14 dates suggest a date of around 1,500 BC for this hurdle. In comparison, further trackways of this type have been discovered in Lewisham, Beckton and Rainham in Essex. This evidence of a network of trackways constructed during the Bronze Age suggests that the marshlands along both banks of the River Thames were being utilised during this period and that there was sufficient social organisation for trackways leading to the waterfront and across the marshland to be built and maintained. Also on the Bronze Age Way site, evidence for an area of natural gravel spread across a peat deposit was discovered and interpreted as a possible 'hard' to provide access to the marsh.

4.5.3 To the west of the site, excavations at Summerton Way in 1997 also revealed a peat deposit, subsequently C14 dated at between 1,215-830 BC. An archaeological evaluation at Picardy Park in 1998, immediately to the south of the study site, revealed an upper peat deposit believed to correlate with that of Devoy's Tilbury III phase of marine regression, dated to between the late-Neolithic and early-Bronze Age periods.

4.6 **Iron Age**

4.6.1 Finds of Iron Age date from the vicinity of the study site are rare, the only authentic find of this date being an un-inscribed gold coin, found close to Erith in the mid-19th century.

4.6.2 The nearest known settlements of this period within the wide locality of the site itself are at Charlton and Woolwich, both of which lie some distance to the west. However, a peat deposit revealed during excavations at Summerton Way has been C14 dated at between 600-375 BC.

4.7 **Roman**

4.7.1 There are numerous findspots of Roman date within the immediate vicinity of the study site. Writing in 1889, the antiquarian Spurrell states:

> *'Beneath the whole district of the Marshland, Roman pottery, burials and sites of dwellings are found, especially at Crossness. I have repeatedly found pottery on the shore of the Thames along the whole line of marshes between Woolwich and Gravesend'.*

At Crossness (to the west of the study site) he recorded:

> *'Much Roman pottery, tile, rubbish and portions of wood lying about 9ft below the surface on the upper part of a layer of peat, which shows unmistakably that hazel and birches were growing on it, while moss etc., covered the surface and large quantities of native oyster and snail shells lay in the peat'.*

4.7.2 Two sites have been recorded with Roman finds within proximity of the study site. On Church Manorway investigations revealed a thick sequence of deposits, recorded as overlying the peat. The earliest deposit encountered here was in the form of a Roman dump layer that yielded large quantities of pottery. This layer was then overlain by successive layers of alluvial clay, most likely to represent flooding episodes.

4.7.3 The Summerton Way excavations encountered two forms of peat as the earliest deposits. These are suggestive of damp marshland with natural ditches and channels and were sealed by alluvial clay silt, implying a rise in the Thames levels. A system of north-south orientated ditches was recorded cutting into this alluvium, presumably for drainage purposes. Shallow pits containing pottery, animal bone and charcoal dated at around AD 250 together with a hearth were excavated and associated with the ditches. Sealing all these features was a layer containing pottery and Ceramic Building Material (CBM) dated to the last quarter of the third century. It appears that this layer was put down in order to fill in hollows in farmyard trackways, a theory extrapolated by the fact that the CBM within this layer mostly consisted of flat tegula pieces as opposed to the curved imbrex type. Cereal grains recovered from this layer suggest that a change in land use had occurred in this area during the Roman period, with the ground being reclaimed from damp marshland and converted into agricultural usage. Clay silts were then recorded as sealing these Roman features and deposits, again suggestive of a flooding episode. The site appears to have returned to use in the late-4th century, as evidenced by the presence of two heaths, and a new drainage system was established in the form of northwest-southeast aligned drainage ditches. At least one field appeared to be represented by these drainage ditches, along with a 7m to 8m wide droveway. These features were then sealed by another flooding episode in the form of alluvial clays, marking the end of the Roman period.

4.8 **Saxon and Early-Medieval**

4.8.1 Erith is almost certainly a Saxon foundation, the name 'Earhyth' most likely to mean old haven, although some scholars have reinterpreted the name to mean muddy haven (Prichard 1976). The earliest documentary evidence dating to Erith dates to AD 695, and there are other documents dating to before the Norman conquest. However, there is no direct evidence that the marshes in the area of the study site were being utilised or occupied at this date.

4.8.2 No findspots or settlement sites dating to the Saxon and early-Medieval period are recorded within the immediate vicinity of the study site, or in fact from this area of the Thames floodplain. However, this may simply reflect the limited amount of archaeological fieldwork conducted in this area to date.

4.9 **Medieval**

4.9.1 During the Medieval period, the study site was part of the extensive embanked marsh along the Thames frontage that may have been drained to serve as pasture from about 1230 onwards. These measures were implemented in order to both prevent flooding and to reclaim flooded land.

4.9.2 Lesnes Abbey, to southwest of the subject site, held various properties in the locality and a statement of possession dated 1472 indicates that these included the marshlands. The maintenance of the river walls and the drains in this area of the marsh were the responsibility of the Abbey. However, despite the effort and expenses to maintain them, the walls were in need of continual repair and were frequently breached, resulting in the flooding of the marshland.

4.9.3 Spurrell was of the opinion that many of the embankments or sea defences along the marshlands, as well as those close to the Abbey, were in fact the work of the monks. He dated the work to after 1279 and believed that the embankments were not a single phase of activity, but were added to over the centuries. In contrast, Pritchard suggests that the defences were actually Roman, and that it was the monks who merely added on to them. He notes that the defences were not entirely successful, with documents relating to a serious breach in 1230. To date, there has been no serious examination of these defences, but Spurrell made the following observations:

> *'What the earliest banks were made of, other than surface clay, I have no evidence, except that occasionally there is a record that a certain wood was cut down to use in embanking. But I have found no sign of such wood, nor have I seen any in dock excavations. In an old bank at Erith, which was blown out of*

> *the earth in 1864 from the layer of peat, at a depth of 10 or 12 feet below the surface of the marsh, the severed ends of the banks showed no signs of wood, and consisted solely of marsh clay. There is no need for piles except when the bank crosses a flat or creek.'*

4.9.4 Several 'mud walls' or embankments of medieval date have been excavated along the Thames foreshore. They tend to consist of a mud bank with some form of low revetment or reinforcement of the erosion prone frontage. An example, discovered on the outer Thames estuary at Foulness, consisted of a substantial clay embankment, 15.83m wide at the base, with well battered sides surviving up to 1.82m above the then ground surface leaving a top width of 11.26m. A further example at Faversham in Kent revealed an embankment less than 7m in width and less than 2m in height. Here, horizontally laid elm and oak logs and occasional stakes reinforced the tidally exposed front of the mud wall. In terms of the inner Thames estuary, the remains of another mud wall were found at the Atlas Wharf site on the west side of the Isle of Dogs. Here the structure showed a sequence of dumping events projecting upward and riverward with time. An associated pile and plank revetment-like structure was also recorded. Excavations at the former Deptford Power stations revealed a wall constructed of alluvial clays, at least 8.5m in width at the base and fronted with timber piles that held horizontally laid planks in place.

4.9.5 It seems to be the case that the marshes were constantly flooded after 1291, but were recovered some time before 1531, after another serious breach of the defences had been recorded in 1527. An act of 1531 (22 Henry VIII) was passed to reimburse the bailiff for his expenses in recovering them. By 1562, it is stated that 2,000 acres lying in Erith, Lesnes and Plumstead marshes had lain waste for 30 years past, and in 1607, in spite of reclamation work carried out over many years, the 'drowned marshes' of Lesnes and Faints had long been 'overflowed'.

4.9.6 There are few findspots of medieval material within the immediate vicinity of the study site. During ground works for the construction of an electricity station immediately to the east of the study site in 1954, various animal bones believed to be medieval in date were collected. Excavations at Summerton Way, to the west of the site, in 1997 revealed medieval material within an alluvial deposit, however some modern material was also present. An in-fill chestnut stave from a medieval timber framed building was recovered during a watching brief undertaken on Bronze Age Way in 1995 to 1996.

4.10 **Post-Medieval**

4.10.1 From at least the mid-18th century the site has been used for agricultural purposes. Before the turn of the 19th century, Norman Road is depicted on the cartographic sources although at this time it is likely to have existed under the name of 'Pyccarde Streete' as a document dated to 1569 mentions this thoroughfare in the local area. Picardy was the traditional name for this district until c.1858 when it changed to be named after the principal residence, Belvedere House, home of the Eardleys. The road name 'Picardy Manorway' is depicted on the publication of the 1843 Tithe Map the accompanying records, for which, shown that the majority of the land is still in use for agriculture. Shortly afterwards, in 1860, a building is erected on the site in the form of a Manure Works. Gunpowder was being manufactured in the area from at least the mid-18th century and in 1864 a major explosion occurred at a magazine in the area with disastrous consequences, believed to be one positioned to the east of the subject site. To the west of the site, a major sewage works was established in 1875 at Crossness.

4.10.2 By 1897 the study site becomes heavily developed, with the fields in the northern portion of the site having completely disappeared. Buildings on the site include the 'Thames Fish, Guano & Oil Works' (later the 'Belvedere Fish and Guano Works') and the 'New Marsh Tavern', with the Belvedere Mills located immediately to the east. Several houses and cottages are present on the main site, whilst 'Orient House' now occupies the square parcel of land to the south. By 1909 the Belvedere Mills are listed as producing Borax and following the First World War, these buildings have expanded into the study site. Most of the cottages and houses are demolished by 1959, as are the buildings formerly located on the southern parcel of land. The Borax Works continued to operate on the site until 1989 and were finally demolished in 1993, leaving the site abandoned, with nothing but hard standing and one large, open sided metal structure with a corrugated roof standing in the northwestern corner of the site.

4.10.3 There are only two records for post-medieval activity within the vicinity of the study site, both revealed during excavations on Bronze Age Way. The first relates to a line of roughly cut timber posts recorded as running parallel to the edge of the marsh. The contractor observed a similar line following completion of the watching brief. This line was noticed along the east side of Lower Road, which marks the interface of dry land and peat marsh. The second entry relates to some tarred oak timbers that were recovered and may possibly be associated with ship breaking as one of these timbers appeared to have been part of a carvel built ship.

5 METHODOLOGY

5.1 The fieldwork was designed to assess the presence or absence of significant archaeological remains, which may require further investigation. The work was undertaken following English Heritage guidelines (GLAAS 1998).

5.2 The excavation of nine trenches each measuring 4.0m x 4.0m in plan was agreed with the Archaeology Advisor to the London Borough of Bexley. Eight of the trenches were positioned within the footprint of the proposed main building while the other was positioned within the footprint of the air-cooled condensers. Each trench was located so as to avoid areas where elevated levels of contamination had been identified.

5.3 The hard standing, constituting areas of concrete slab and of asphalt, was broken out from the trench locations using a pneumatic breaker and 13 ton 360° excavator. Interlocking sheet piles were driven into the ground to provide trench support. Excavation within the sheet piles was made using a wide, flat bladed grading bucket to the maximum reach of the boom, a depth of c.5.0-6.0m below ground level. Beyond this depth, a grab bucket was employed that reduced the trench further to a depth of up to c.9.0m. Where the trench depth exceeded the reach of the machine, or in situations where the risk of ground boil became high, a hand auger was used to assess lower deposits until gravel was reached.

5.4 The surfaces of the trench were cleaned and investigated by hand. Investigation was limited to identifying the extent and nature of the deposits and to recover dating evidence. A comprehensive sampling strategy was employed in order to maximise the potential for recovering geoarchaeological information for off-site study. This comprised column samples being taken from every trench and, on the advice of our specialist geoarchaeological sub-contractor Archaeoscape, bulk samples being taken from Trench 6 only. Details of the specific methodologies undertaken during that study can be found in Appendix 2.

5.5 All archaeological significant features (stratigraphical layers, cuts, fills, structures) were recorded in plan and in section using standard recording methods, That is those derived from the Museum of London standard. The levels of the principal strata were calculated using the Ordnance Survey Bench Mark, located on the sluice gate to the east of the bridge accessing Norman Road North from Picardy Manor Way, with a value of 1.35m OD. A photographic record using colour 35mm colour transparencies, black and white film and digital mediums was made.

5.6 Following the completion of the archaeological investigation, the trenches were backfilled as directed by the client.

5.7 The development site has risks from ground contamination, perched and ground water tables, all of which required specific mitigation during the evaluation. Each evaluation trench was deemed to be a confined space.

6 GEOLOGY AND TOPOGRAPHY

6.1 Geology

6.1.1 British Geological Survey Sheet 257 (Romford 1:50,000 series for England and Wales, 1996, solid and drift edition) shows the site to be underlain by alluvium, consisting of mainly sand, silt and clay with some gravel. This is in turn overlain by made ground, mostly in the form of landfill.

6.1.2 Numerous geotechnical investigations have taken place at the site. One of the more recent, undertaken in 2003 by AERC, revealed that the general sequence of strata comprised of made ground, alluvium, river terrace gravels and London Clay, with a surface covering of concrete over most of the site.

6.1.3 The made ground varied in depth across the site from between 0.60m and 4.0m. Underlying the made ground was a deposit of soft to firm green-grey silty clay, with occasional peaty lenses. This alluvium was between 4.0m and 9.30m in depth. This deposit decreased in thickness towards the northwest of the site where it was recorded as being only 2.0m in depth. Substantial deposits of peat were encountered within this alluvium, with a greatest thickness of 3.15m. The alluvium recorded here is of considerable archaeological and palaeoenvironmental potential and interest, and represents episodes of both marine transgression (a rise in mean sea level) and regression (a drop in mean sea level) which have taken place since the last glaciation. Transgression phases survive in the geological record as olive green to blue grey silts and clays, while the phases of regression are evidenced by fibrous peats. Work by Devoy in 1979 at Tilbury identified five regression phases (Tilbury I-V) and four transgression phases (Thames I-V), with the fifth one still currently taking place. The transgression phases are believed to have started in 8,200 uncal Before Present (BP) (c.7,200 cal BC), with the fourth phase ending around 1,750 uncal BP (C.245 – 340 AD). The work of Devoy has recently been reassessed, however, by Haggart in 1995 and more recently by Sidell *et al* in 2000. Sidell *et al* identified an early Holocene transgression taking place on the downstream part of the River Thames prior to 3,800 cal BC. This was then followed by a wetland expansion between c. 3,800-1,500 cal BC. A second transgression then began in c.1,500 cal BC and is still currently taking place.

6.1.4 Underlying the alluvium are the river terrace gravels, which were encountered in all of the boreholes and recorded as being between 5.30m and 12.05m thick. The gravels existed at a highest level to the southern end of the former Borax Works where they were recorded at a highest level of -7.87mOD. The gravels themselves were

deposited during the Pleistocene. All of the boreholes excavated during the AERC site investigation were terminated at depths of between 14m and 17m below ground level and within the London Clay.

6.2 Topography

6.2.1 The study site varies in height, from a highest level of 2.84mOD to the north of the site to a lowest level of 0.93mOD on the square parcel of land to the south of the former Borax Works. This indicates how the land had been banked up along the rivers edge to form the flood defences.

7 ARCHAEOLOGICAL SEQUENCE

7.1 Summary

7.1.1 The evaluation revealed a general sequence of gravel, alluvial deposits, peat, alluvial clay and made ground across the site with slight variations (Figure 4). A continuous column sample was taken from each of the trenches, together with a bulk sample sequence from Trench 6. No archaeologically sensitive features were encountered although a single unstratified rim sherd of a fresh sandy greyware necked jar (Form 2D), dated AD 60-160[1] was recovered from above the peat in Trench 1.

7.1.2 The geoarchaeological study of the borehole data from the area of the proposed jetty recognised a comparable stratigraphic sequence comprising sand and gravel up to 10.0m in thickness, overlain by fine-grained alluvium, generally between 6.0m and 11.0m in thickness. A discontinuous peat, up to 2.0m thick, was present at or close to the base of this alluvial sequence, with a separate, but also discontinuous peat horizon at a higher level and more extensively preserved inland from the estuarine margin. In the intertidal zone and off-shore the alluvial sequence has been heavily truncated.

7.1.3 The stratigraphic sequences from each trench, with heights above Ordnance Datum, are summarised in Table 1.

7.2 Phase 1: Bedrock

7.2.1 Of the twenty-seven boreholes analysed during the archaeological investigation for the proposed jetty, sixteen penetrated into Lower Tertiary (Eocene) sediments (London Clay) at depths ranging from c. -10.5mOD showing an uneven surface with a maximum relief amplitude of 6.9m.

7.3 Phase 2: Sand and Gravel

7.3.1 Sand and gravel, attributable to the Shepperton Gravel of Late Devensian age, is present above the London Clay within most of the boreholes undertaken on the site. During the course of the evaluation, gravel was attained in two of the trenches by use of a hand auger. This was present in Trench 1 [58] at a depth of -8.90mOD and in Trench 6 [59] at a depth of -9.40mOD.

[1] Dr James Gerrard, pers comm

7.3.2 The borehole data suggests that the upper surface of the sand and gravel is uneven with a relief amplitude measuring c.2.5m. In the boreholes close to the modern estuary, this deposit is located between -9.2m and -6.7mOD whilst further inland the top of the gravel is at a higher level, as demonstrated by its presence in Trench 6. In borehole BH494 the upper surface of the sand and gravel was considerably higher at -2.8mOD (the approximate location of BH494 is shown in Appendix 1, Figure 11).

7.4 Phase 3: Alluvial Deposits

7.4.1 The sand and gravel is overlain by up to 11.4m of fine-grained alluvial sediments deposited from suspension on the floodplain of a river with a low to moderate energy system. Within the alluvial deposits the remains of fallen trees were found in five trenches. Four samples were taken from timbers in Trench 1 at a level of -6.10mOD, all of which were alder. Further specimens of alder were recovered from comparable levels in Trenches 7 and 8 with pollen of this species also recovered from the alluvial deposits in Trench 6 (context [33], see Appendix 3). This suggests that the landscape included a wetland community comprising woodland dominated by alder whilst the pollen species indicates that nearby dryland was dominated by oak and lime with less dense areas where hazel and heather shrublands and bracken were able to colonise.

7.4.2 The alluvial deposits are discontinuously interspersed with peat horizons, likely to represent a change in environment from river to semi-terrestrial land, brought about by either a reduction in the rate of sea-level rise or local factors such as a change in the proximity of the river channel. It was not always possible to ascertain the extent of any peat layers (as opposed to peaty organic silts) within the borehole analysis, due to vagaries in the recording. However, a peat of up to 2.3m in thickness appears to be present in the locale of the foreshore at levels between -9.0m OD and -5.7m OD. The peat lies either directly on top of the sands and gravels or is separated from it by up to 2m of mineral silts and clays. A thin band of depleted peat was identified during augering in Trench 1, present 0.5m above the sand and gravel at a level of -8.30mOD and measuring only 0.05m in thickness.

7.4.3 With two exceptions peat appears to be absent in boreholes along the estuarine margin at levels above -5.7m OD, but further inland peat occurs at higher levels. The lowest level from which this peat was present is -3.8mOD in a borehole and in Trenches 1-6 from -2.50m and -1.80mOD, measuring between 1.00m and 1.80m in thickness. It was entirely absent further inland in Trenches 7, 8 and 9.

7.4.4 In Trench 6 a bulk sampling exercise was undertaken to provide for detailed analysis of the peat sequence. Over a 0.50m by 0.50m area, continuous 0.05m spits were

taken for 2m through the peat and the upper and lower interfaces with the alluvial deposits. Plant macrofossil assessment indicates that alder dominated the wetland woodland and samples of timbers recovered from the peat in this and other trenches included alder, yew, elm and oak, the latter being suitable for dendrochronological analysis. Alder pollen was dominant amongst samples recovered from the peat in Trench 6 (context [31]), but there was also evidence that lime prevailed on the nearby drier ground. An assessment was made of the presence and preservation of insect remains within the bulk samples. This indicated that in some of the samples there was a good to excellent abundance of insect fossils, including specimens indicative of aquatic environments of both standing and running water, with excellent preservation. Of particular importance is the presence of the taxon *Scolytus multistriatus* as it carries the fungus *Ophiostoma (Ceratocystis) ulmi*, which is responsible for Dutch Elm disease - a possible cause of the Neolithic elm decline.

7.4.5 At c.-1.40mOD in Trenches 1 to 5 and c.-1.80m OD in Trench 6 there was a transition towards a wetter, less stable peat surface, and mineral sedimentation increased. This was probably caused by an increase in the duration or frequency of flood events affecting locations proximal to the main river channel. From c. -0.70mOD in Trenches 1 to 6, alluvial sediments inundated the peat surface, most likely a response to rising relative sea levels.

7.4.6 From the top of the alluvial sequence in Trench 1 a single sherd of pottery was found which has been dated to the AD 1st or 2nd century. The artefact was not located within a discrete feature and is likely to have been deposited by water action. As such its provenance is unknown.

7.5 **Phase 4: Made Ground**

7.5.1 Made ground capped the sequence in all the trench locations. No evidence was observed for any revetment of the river's edge, such as has been observed elsewhere along the southern bank of the Thames and is believed to have been constructed along this stretch of the foreshore during the medieval period. The made ground was deposited for consolidation in the 19th and 20th centuries, as the site was taken from agricultural to industrial usage.

7.5.2 Elements likely to have related to the former 20th century Borax Works were observed in several trenches. However, due to the elevated levels of contaminants within the made ground, no further investigations into these were made.

Table 1: Stratigraphic sequence by trench

Trench 1			
Context	Highest Level	Comments	Phase
--	-9.35m OD	NFE	--
58	-8.90m OD	Gravel	2
57	-8.35m OD	Alluvium	3
56	-8.30m OD	Peat	3
27	-2.20m OD	Alluvium	3
19	-0.51m OD	Peat	3
18	-0.48m OD	Alluvium	3
17	2.00m OD	Made ground/GL	4

Trench 2			
Context	Highest Level	Comments	Phase
--	-6.35m OD	NFE	--
45	-2.1m OD	Alluvium	3
44	-0.80m OD	Peat	3
43	-0.40m OD	Alluvium	3
42	2.10m OD	Made ground/GL	4

Trench 3			
Context	Highest Level	Comments	Phase
--	-7.47m OD	NFE	--
28	-2.50m OD	Alluvium	3
11	-0.60m OD	Peat	3
10	0.00m OD	Alluvium	3
9	1.93m OD	Made ground/GL	4

Trench 4			
Context	Highest Level	Comments	Phase
--	-6.20m OD	NFE	--
41	-1.80m OD	Alluvium	3
40	-0.80m OD	Peat	3
39	0.50m OD	Alluvium	3
38	1.96m OD	Made ground/GL	4

Trench 5			
Context	Highest Level	Comments	Phase
--	-8.40m OD	NFE	--
13	-2.15m OD	Alluvium	3
3	-1.90m OD	Peat	3
2	0.50m OD	Alluvium	3
1	1.20m OD	Made ground/GL	4

Trench 6			
Context	Highest Level	Comments	Phase
--	-9.55m OD	NFE	--
59	-9.40m OD	Gravel	2
33	-2.40m OD	Alluvium	3
31	-0.65m OD	Peat	3
30	0.50m OD	Alluvium	3
29	1.64m OD	Made ground/GL	4

Trench 7			
Context	Highest Level	Comments	Phase
--	-6.97m OD	NFE	--
47	-0.10m OD	Alluvium	3
46	1.65m OD	Made ground/GL	4

Trench 8			
Context	Highest Level	Comments	Phase
--	-7.60m OD	NFE	--
49	-0.20m OD	Alluvium	3
48	1.80m OD	Made ground/GL	4

Trench 9			
Context	Highest Level	Comments	Phase
--	-7.50m OD	NFE	--
55	-4.70m OD	Alluvium	3
54	-3.20m OD	Peat	3
53	0.82m OD	Alluvium	3
52	1.63m OD	Made ground/GL	4

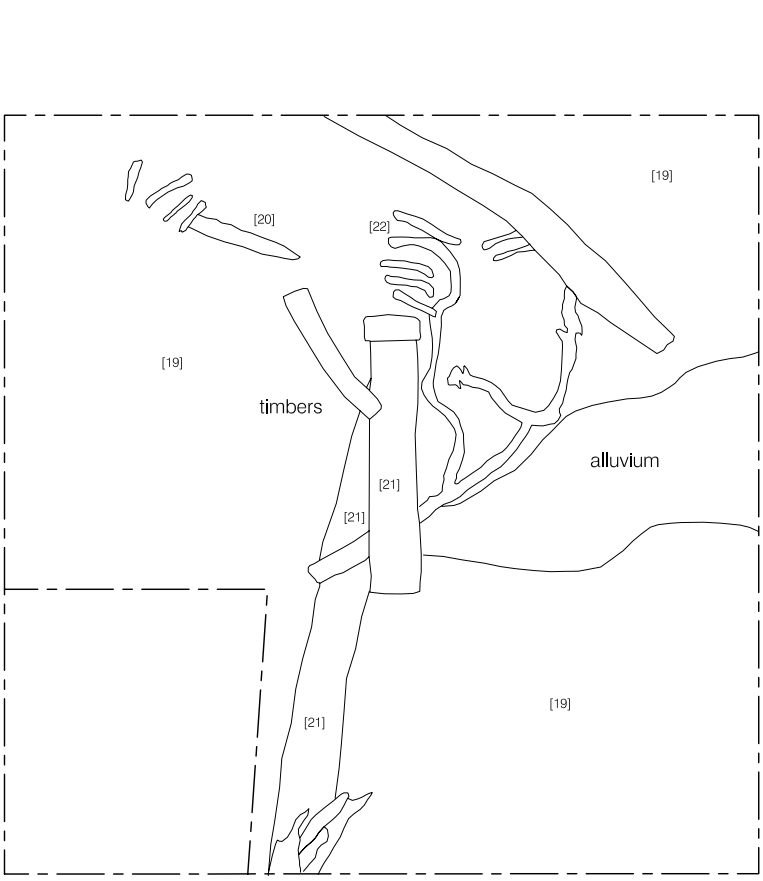
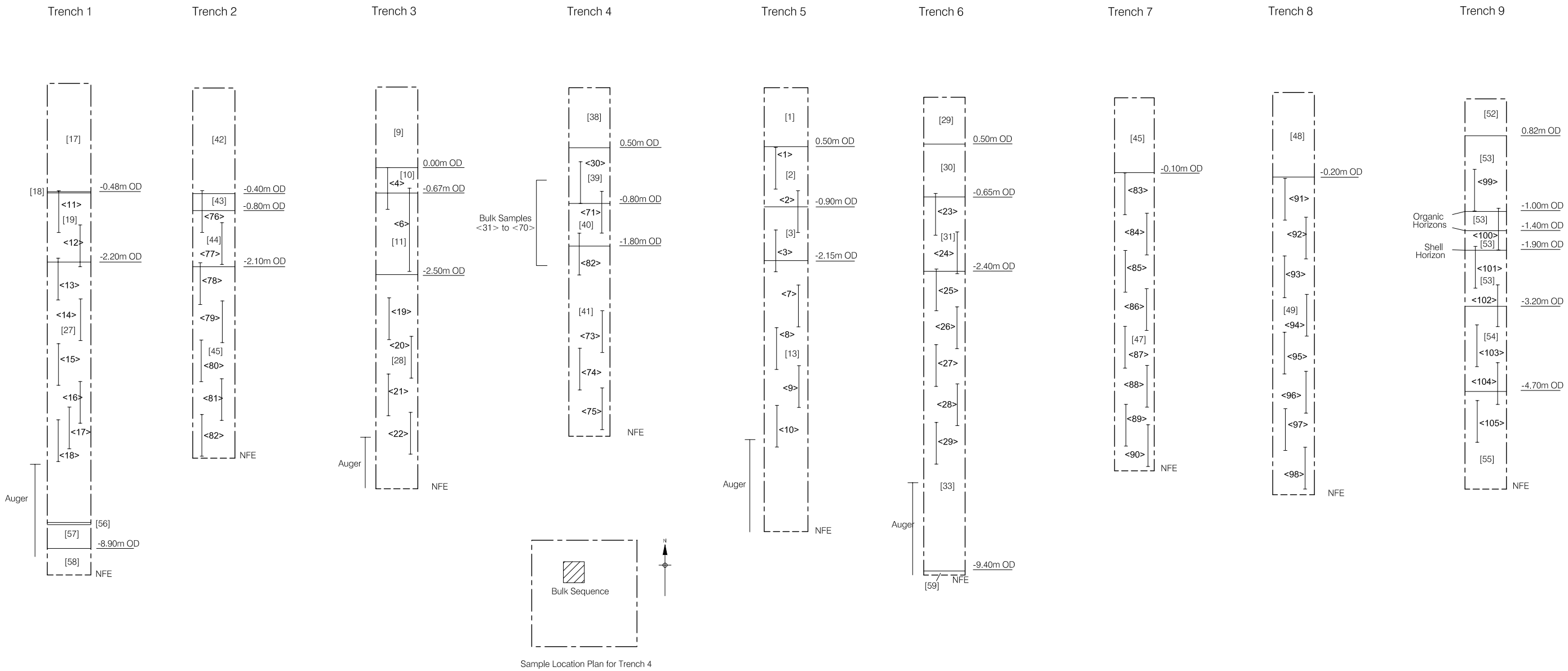


Figure 3
Plan of Trench 1
1:40 at A4



Sample Location Plan for Trench 4

Figure 4
Trenches 1-9 Representative Sections
1:100 at A3
NB Not shown in actual spatial relationships

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 The evaluation and borehole investigation identified that the general stratigraphic sequence for the site is London Clay, Shepperton Gravel, alluvium with localised deposits of peat and capped with made ground. The peat is of particular archaeological interest as it provides information on the waterlogged land on the margins of the River Thames. Recent palaeoenvironmental investigations undertaken c.1km west of Norman Road at the Thames Water Utilities Ltd site at Crossness provided an early-Neolithic radiocarbon date of 6010-5870 cal yr BP for peat initiation, and an Iron Age radiocarbon date of 2720-2350 cal yr BP date for peat inundation (Batchelor *et al*, 2007). However the latter undoubtedly represents a minimum age due to evidence for extensive erosion (truncation) of the peat surface, probably due to the effects of marine incursion. Indeed, similar evidence for erosion may be recorded in Trenches 7 to 9 at Norman Road, where there is no evidence for peat formation.

8.2 A comprehensive program of environmental sampling recovered sixty-four column samples, forty bulk samples and twenty-two timber samples that have undergone a rapid assessment, identifying the potential for investigating a number of key environmental archaeological issues, such as the phenomenon of the Neolithic elm decline.

8.3 The archaeological evaluation and rapid assessment of the environmental samples has not, other than the recovery of a single unstratified sherd of Roman pottery, revealed any evidence for human activity on the site earlier than post-medieval period. This points to the historical unsuitability of the site for human occupation due to its marsh composition. It is not expected that evidence for human activity will arise from further analysis of the archaeological records and environmental archaeological assessment data, although inferences will be made on the likely effects of environmental change on resource availability.

8.4 Further work on the site will be formed by detailed laboratory analysis of the environmental samples, including; a full radiocarbon-dated plant macrofossil, waterlogged wood and insect analysis on the sedimentary sequence from Trench 4 and pollen analysis conducted on the sequences from Trenches 4 and 6. These analyses will address the research questions detailed in para 3.3 and Appendix 2. It is intended that the analysis stage will be completed by 28th March 2008, with publication text submitted by 25th April 2008 to the Journal of Environmental Archaeology.

9 ACKNOWLEDGEMENTS

9.1 Pre-Construct Archaeology Limited would like to thank Cory Environmental Limited, for commissioning the work on behalf of Riverside Resource Recovery Limited.

9.2 We also thank Mark Stephenson of English Heritage for monitoring the evaluation on behalf of London Borough of Bexley and to Jane Sidell and Dominique De Moulin, English Heritage Archaeological Science Advisors, for their input and advice.

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9.4 The environmental assessment and analysis was undertaken by Nick Branch and his team at ArchaeoScape.

9.5 The author would like to thank Paw Jorgenson for his sterling work and entertaining attitude on site, and Chris Mayo, Lisa Lonsdale and Frank Meddens for their support. Josephine Brown and Hayley Baxter produced the illustrations in this report whilst Chris Mayo undertook the project management and editing.

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APPENDIX 1: RECONSTRUCTION OF THE SUB-SURFACE STRATIGRAPHY IN THE AREA OF THE JETTY

RECONSTRUCTION OF THE SUB-SURFACE STRATIGRAPHY AT THE FORMER BORAX WORKS, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY

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INTRODUCTION

This report summarises the findings arising out of the desk-based investigation undertaken by *ArchaeoScape* in association with Pre-Construct Archaeology Limited of geotechnical boreholes taken at the former Borax Works, Norman Road, Belvedere, London Borough of Bexley (NGR: TQ 4975 8065). The investigation formed part of a ground investigation for a proposed jetty at the Riverside Resource Facility, Belvedere, co-ordinated by Riverside Resource Recovery Limited (RRRL). The aims of the investigation were: (1) to determine the nature and extent of the sedimentary deposits proximal to the proposed jetty, and (2) to produce a depositional model that will enable archaeologists to target specific areas of the site for test pitting and larger scale excavation, and representative environmental archaeological sampling (if necessary).

GEOLOGICAL CONTEXT

The British Geological Survey (BGS) 1:50,000 Sheet 257 Romford (Solid and drift geology) shows the area to be situated on 'alluvium', a generic term used by the BGS for Late Quaternary deposits forming in fluvial and intertidal environments. These overlie sandy gravel deposits which can be confidently referred to as the Shepperton Gravel of Late Devensian age (Gibbard, 1994), which are in turn underlain by London Clay (an Eocene deposit).

METHODS

The development site (Figure 1) covers an area of 9.95 hectares of present land surface, while a further 12 hectares of the proposed development lies within present channel of the River Thames (Haslam, 2006). Borehole logs from 9 geotechnical

boreholes taken by Soil Mechanics (Figure 2) together with 23 borehole logs purchased from the British Geological Survey (BGS) permitted a reasonably comprehensive survey of the Quaternary sedimentary history of the area. These data were inputted into a database with the RockWorks 2006 geological utilities software. A single cross section (Figure 3) was plotted from the raw lithostratigraphic data. Then, in order to model the sub-surface stratigraphy of the development area, lithological data from each borehole were reclassified into the following stratigraphic groupings:

1. London Clay
2. Shepperton Gravel
3. Peat
4. Alluvium (including in some cases peaty alluvium)
5. Made Ground

Models of surface outcrop height (using a nearest neighbour routine) were generated for each of these stratigraphic groups, and also in the case of the peat and Shepperton Gravel outcrop thickness (also using a nearest neighbour routine) (Figures 4 to 10). It should be noted that because the boreholes are not uniformly distributed over the development area, the reliability of the models generated using RockWorks is highly variable. Thus the foreshore strip is considered to have been robustly modelled, but modelling of the stratigraphy in those areas of the site to the south of the strip must be taken as an approximation.

Figure 1: Location of former BORAX Works, Norman Road, Belvedere, London Borough of Bexley (Reproduced from Ordnance Survey digital map data © Crown copyright 2007. All rights reserved. License Number 0100031673)

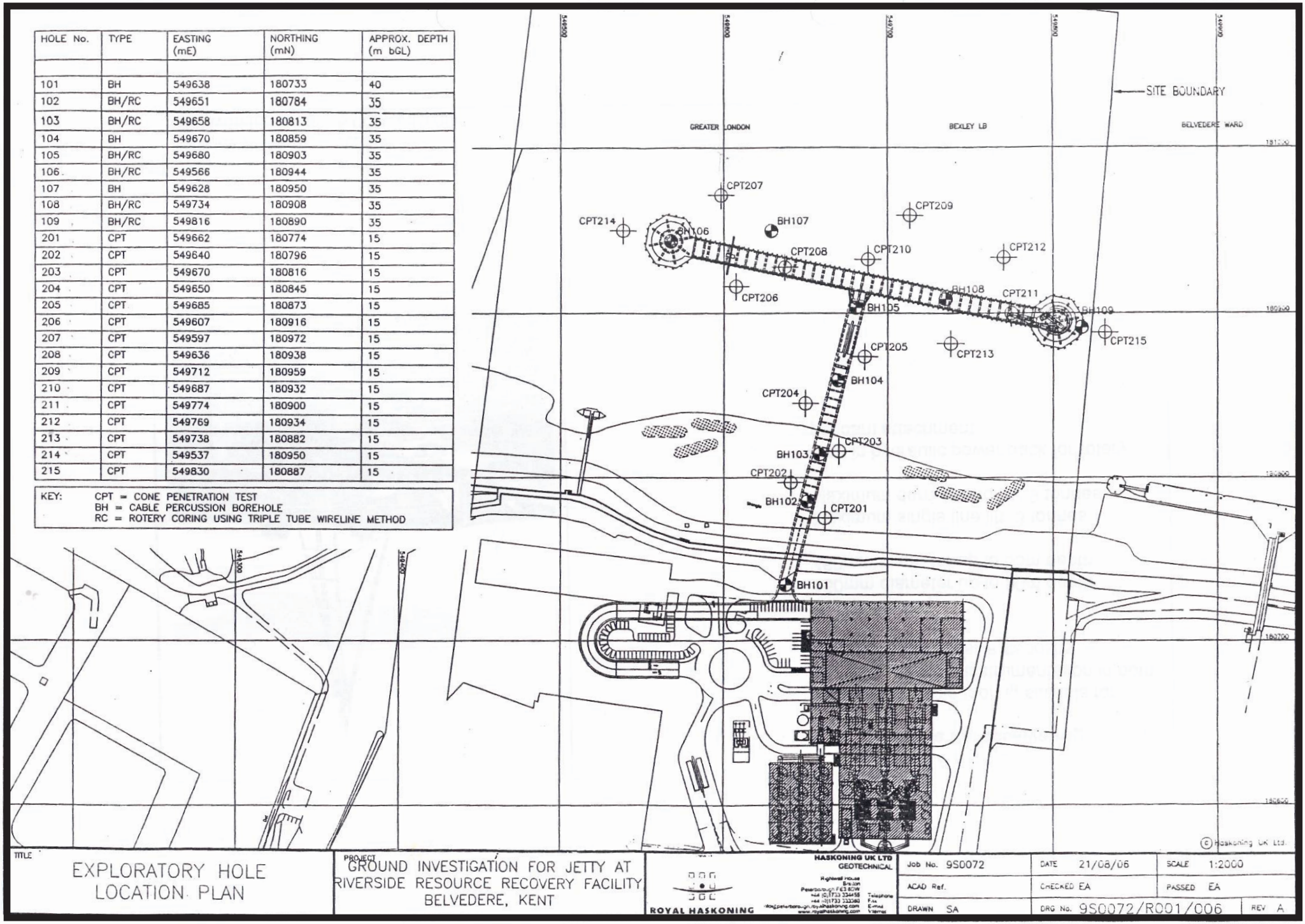

Figure 2: Site plan, Former BORAX Works, Norman Road, Belvedere, London Borough of Bexley

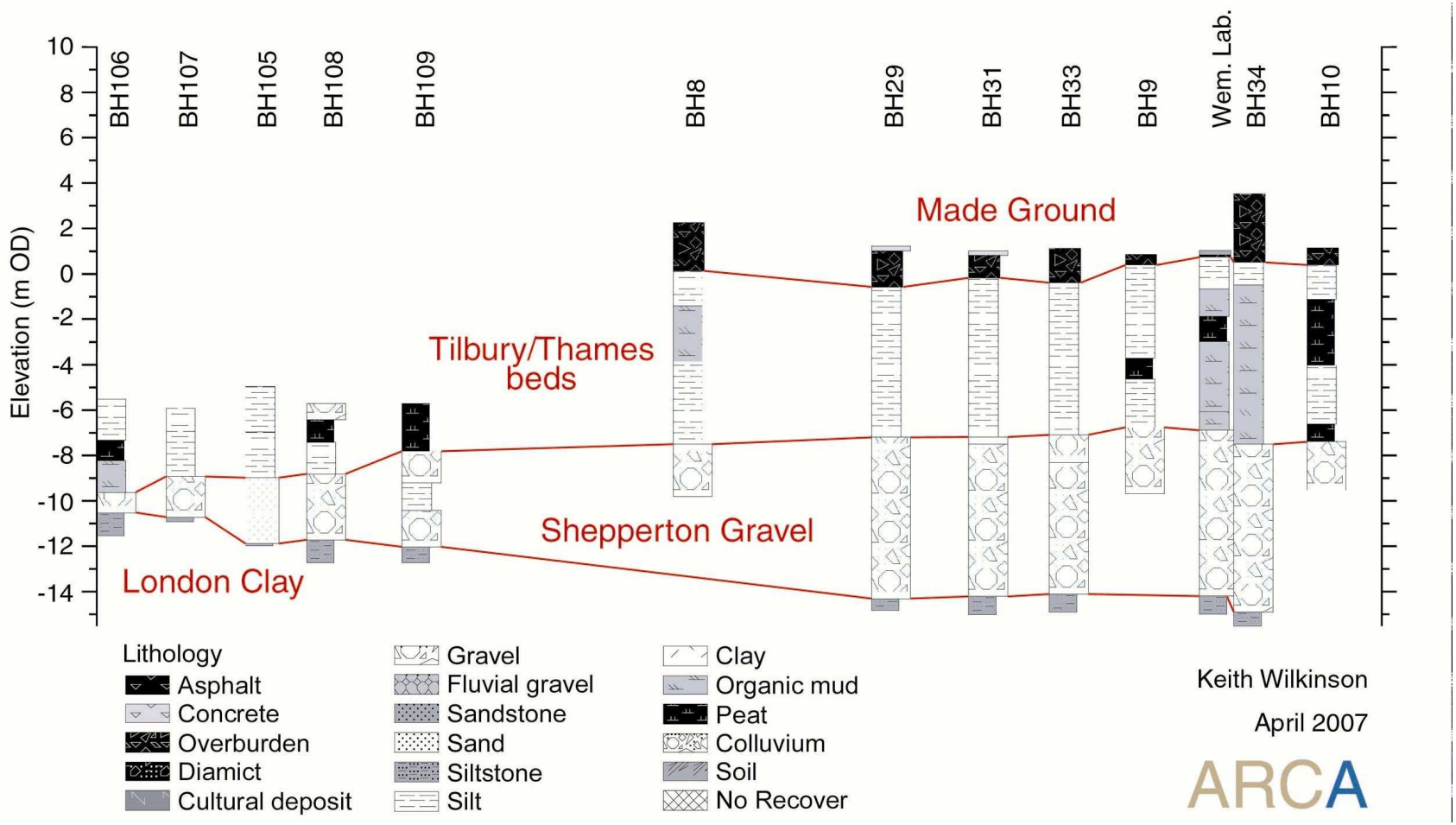

Figure 3: Cross section, former BORAX Works, Norman Road, Belvedere, London Borough of Bexley

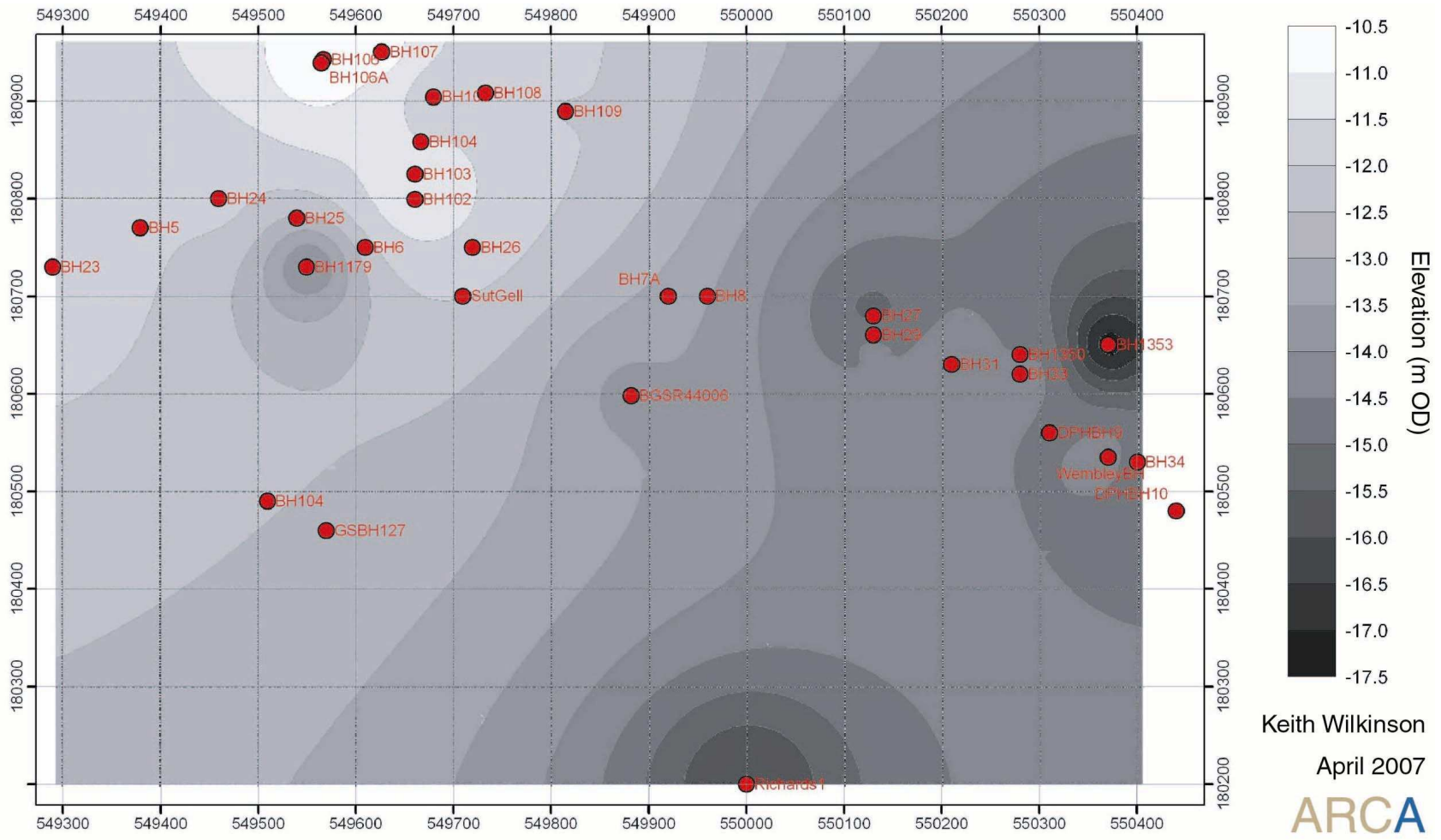

Figure 4: Top of London Clay, former BORAX Works, Norman Road, Belvedere, London Borough of Bexley

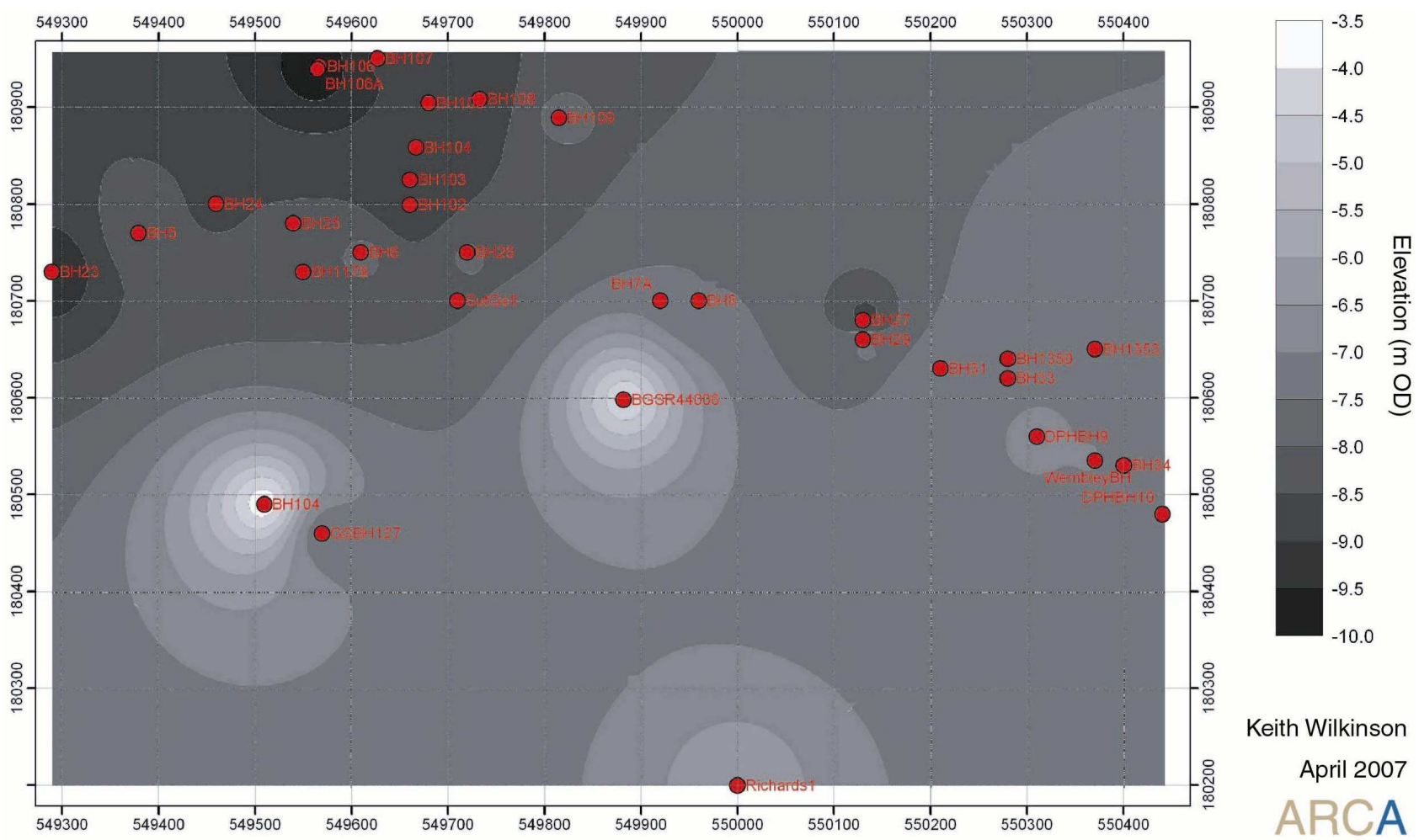

Figure 5: Top of Shepperton Gravel, former BORAX Works, Norman Road, Belvedere, London Borough of Bexley

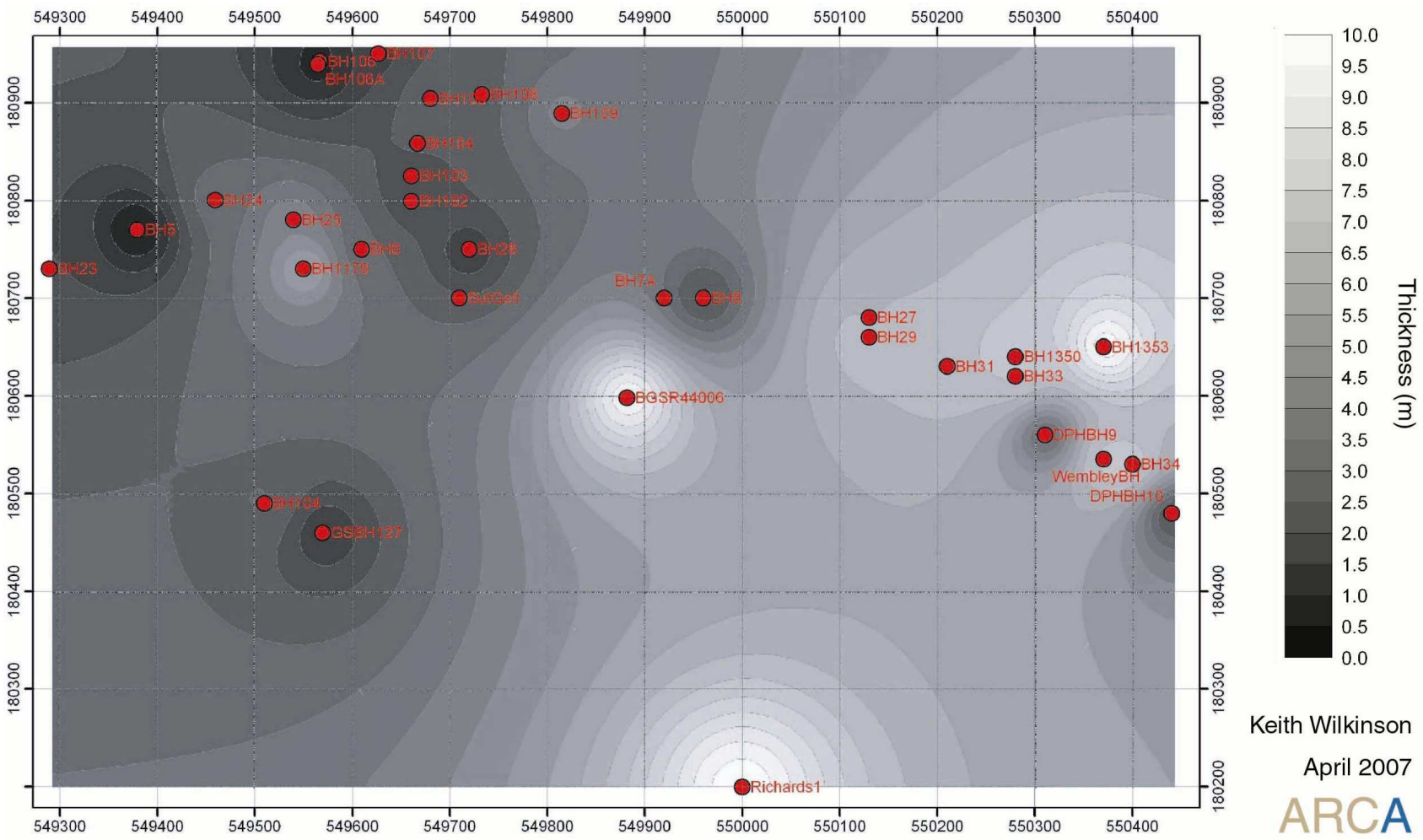

Figure 6: Gravel thickness, former BORAX Works, Norman Road, Belvedere, London Borough of Bexley

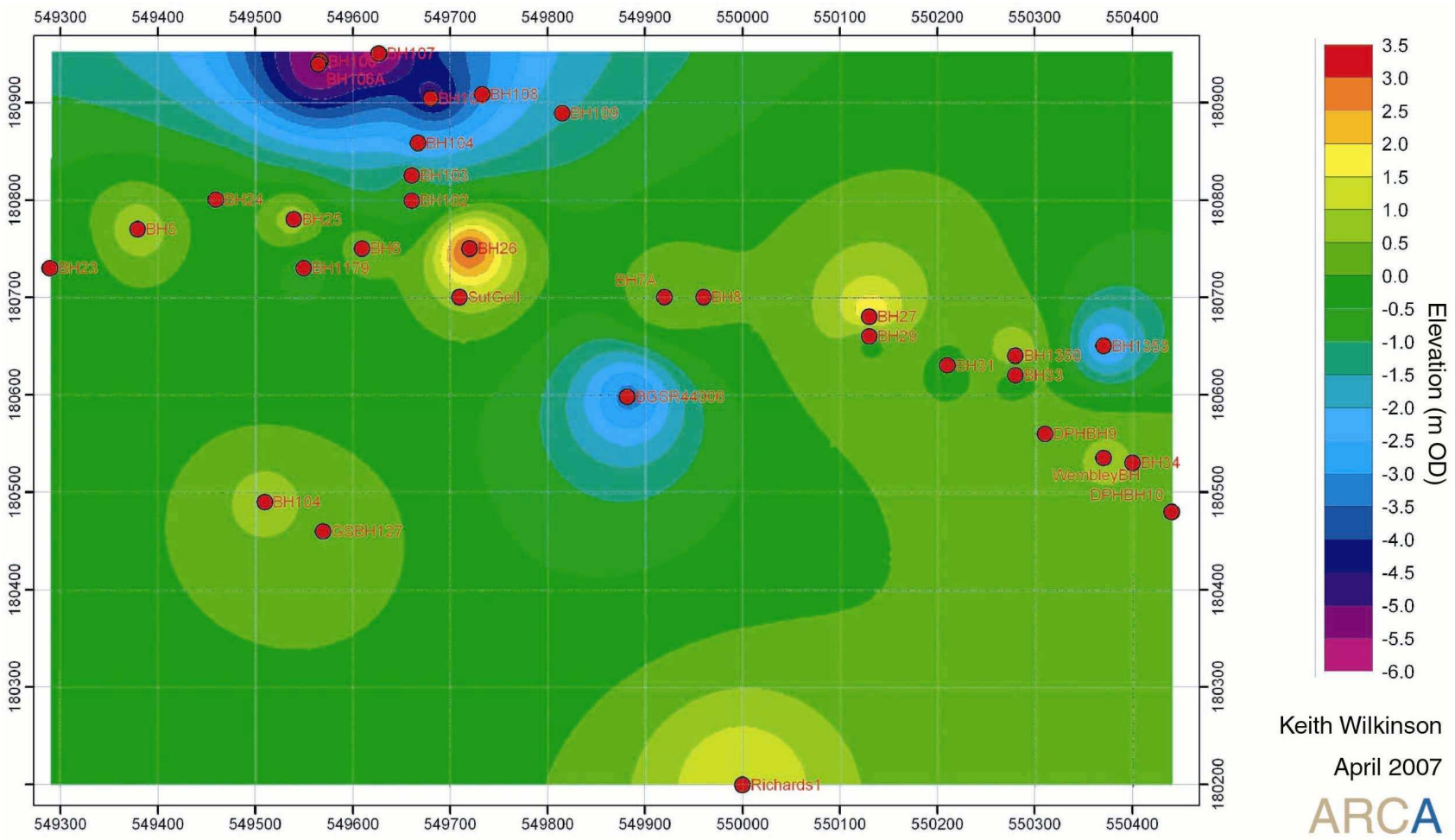

Figure 7: Top of alluvium, former BORAX Works, Norman Road, Belvedere, London Borough of Bexley

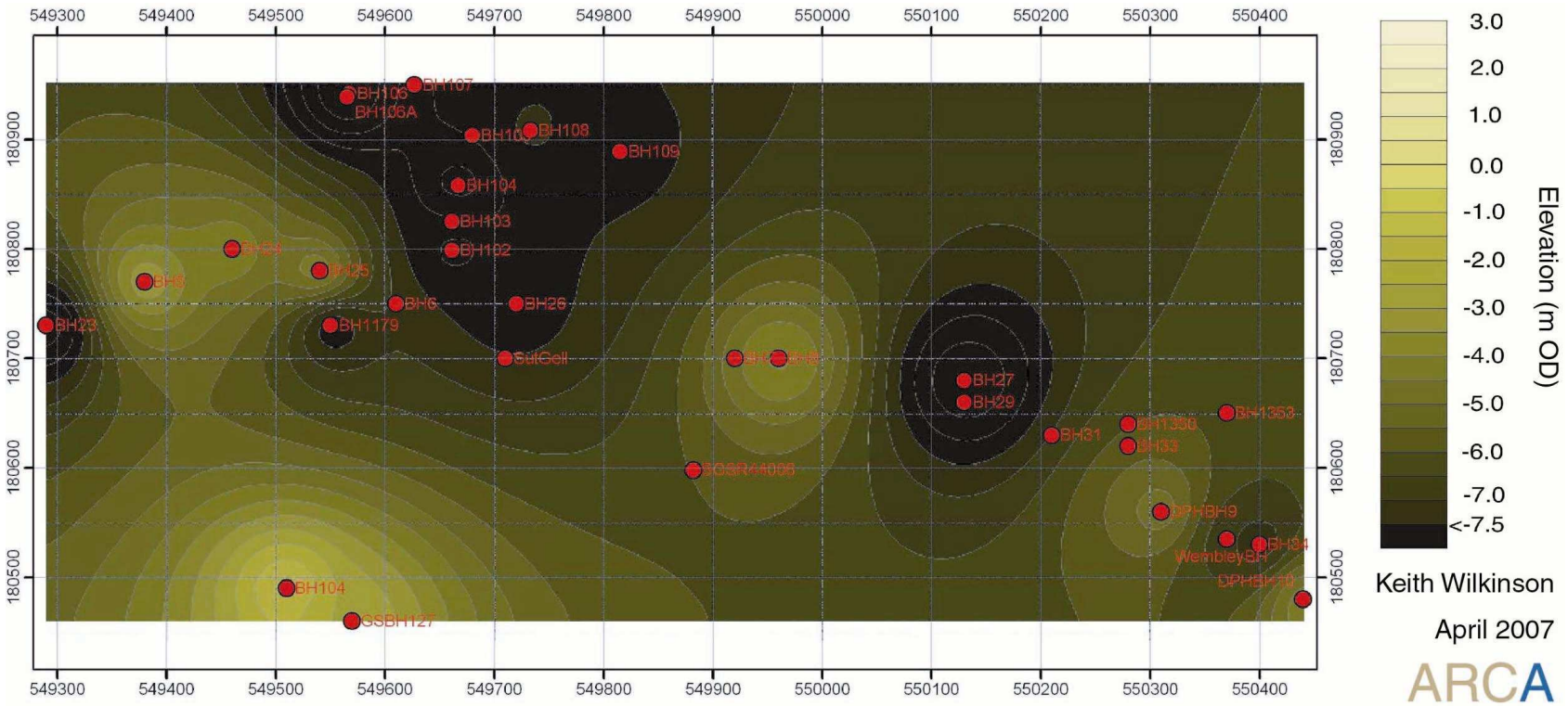

Figure 8: Base of peat, former BORAX Works, Norman Road, Belvedere, London Borough of Bexley

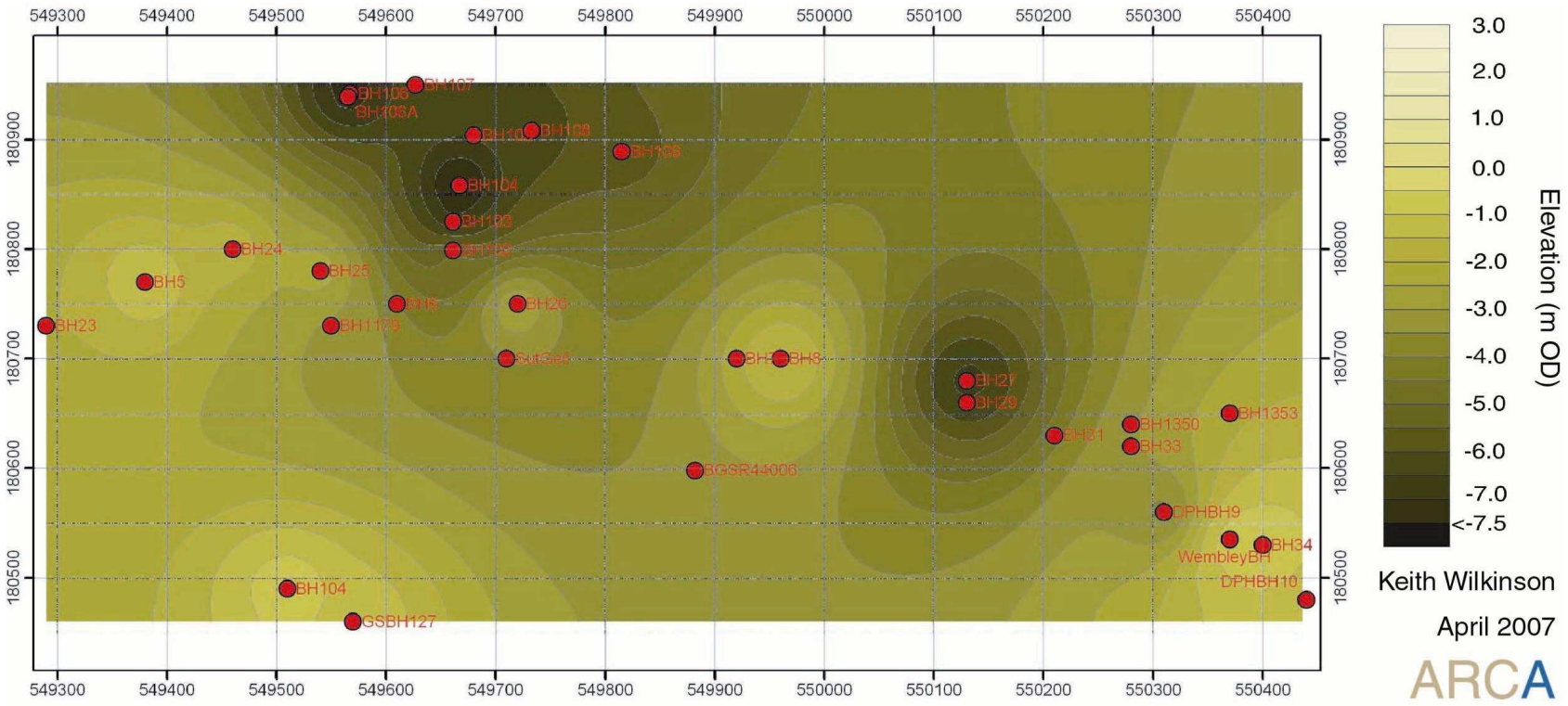

Figure 9: Top of peat, former BORAX Works, Norman Road, Belvedere, London Borough of Bexley

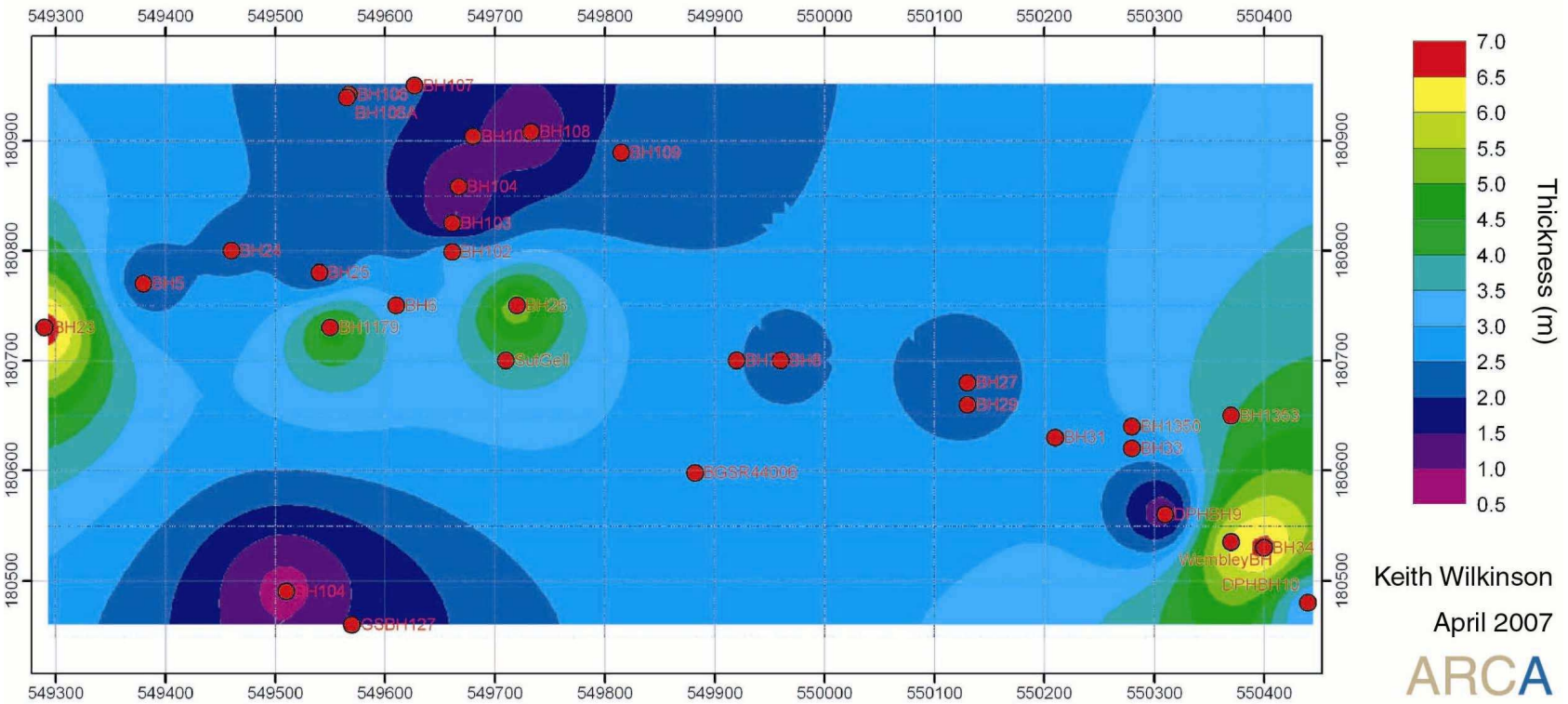

Figure 10: Peat thickness, former BORAX Works, Norman Road, Belvedere, London Borough of Bexley

RESULTS

The borehole logs examined are of varying quality in terms of the sediment description, the recognition of significant stratigraphic boundaries, spatial resolution and the accuracy of the ground levels (OD) recorded. In general those borehole logs completed prior to 1970 have only generalised lithological descriptions, are located to within 10m and have surface elevation heights approximated to the nearest foot. Those logs recorded after 1970 are of much higher quality. It is notable that Made Ground is recorded in many of the boreholes and it can therefore be concluded that considerable disturbance of superficial and underlying sediments is likely to have occurred across the whole area of investigation.

Figure 11 shows in its upper part the distribution of the boreholes (horizontal and vertical axes are the Ordnance Survey National Grid). The lower part of Figure 11 shows 27 borehole logs. The key indicates a simplified stratigraphy. 22 of the boreholes are located close to the modern waterfront of the Thames estuary or in the intertidal zone or off-shore. Only 5 boreholes are situated further inland (BH34, BH37, BH492, BH1163 and BH494).

16 of the boreholes penetrated into bedrock Lower Tertiary (Eocene) sediments (London Clay) and in all cases showed the Lower Tertiaries to be overlain by sand and gravel attributable to the Shepperton Gravel of Late Devensian age (Gibbard, 1994).

The base of the sand and gravel is uneven with a maximum relief amplitude of 6.9m. The upper surface of the sand and gravel is also uneven but the relief amplitude is smaller, measuring *ca.* 2.5m in the boreholes close to the modern estuary, between -9.2m and -6.7m OD. In four of the boreholes lying slightly further inland (BH34, BH37, BH1163 and BH494) the top of the gravel is at a higher level, up to -2.8m OD in borehole BH494.

The sand and gravel is overlain by up to 11.4m of fine-grained and often peaty alluvium, with the natural ground surface along the estuarine margin probably at a level of 0.5-1.5m OD, possibly rising slightly inland.

The varying quality of the sediment logging in the boreholes makes it difficult to be sure of the extent of any peat layers (as opposed to peaty organic silts). However, a

peat of up to 2.3m in thickness (BH72) appears to be locally present at levels between -9.0m OD and -5.7m OD. Where borehole lithology is recorded in detail, the peat would appear to contain well preserved wood, while shells are also occasionally noted in the logs. The peat lies either directly on top of the sands and gravels (presumably with an unconformable contact), or is separated from it by up to 2m of mineral silts and clays (a conformable contact).

With two exceptions (BH306 and BH119), peat appears to be absent in boreholes along the estuarine margin at levels above -5.7m OD, but further inland peat occurs at higher levels, from -3.8m OD (BH 492) to +1.5m OD (BH494).

Overall, across the whole area examined, it is possible to recognise a consistent stratigraphic sequence comprising a unit of sand and gravel (Shepperton Gravel) up to 10m in thickness, overlain by fine-grained alluvium, generally between 6.0m and 11.0m in thickness. A discontinuous peat, up to 2.0m thick, appears to be present at or close to the base of this alluvial sequence, with a separate, but also discontinuous peat horizon at a higher level in the alluvial sequence and more extensively preserved inland from the estuarine margin. In the intertidal zone and off-shore the alluvial sequence has been heavily truncated.

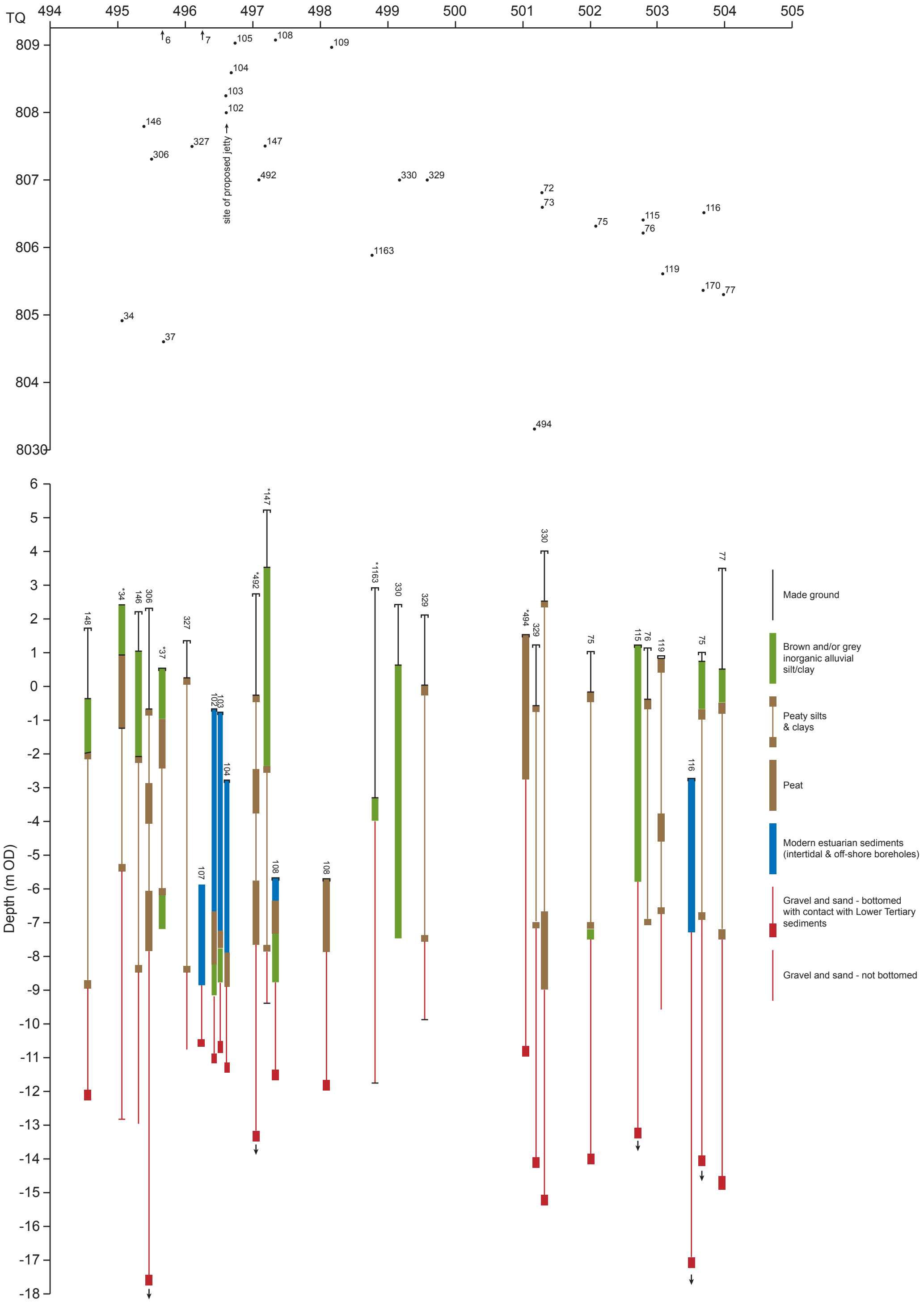

Figure 11: Borehole stratigraphy, Former BORAX Works, Norman Road, Belvedere, London Borough of Bexley

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APPENDIX 2: RAPID ENVIRONMENTAL ARCHAEOLOGICAL ASSESSMENT

FORMER BORAX WORKS, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY: RAPID ENVIRONMENTAL ARCHAEOLOGICAL ASSESSMENT (SITE CODE: NNB07)

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INTRODUCTION

This report summarises the findings arising out of the rapid environmental archaeological assessment undertaken by *ArchaeoScape* in connection with the proposed development at the former Borax Works, Norman Road, Belvedere, London Borough of Bexley (Site Code: NNB07; National Grid Reference: TQ 4975 8065; Figure 1). During recent archaeological investigations at the site, Pre-Construct Archaeology Limited obtained samples for environmental archaeological assessment, and possible future analysis, from nine trenches (Trench 1 to Trench 9; Table 1; Figure 2). The overarching aim of the environmental archaeological assessment was to evaluate the potential of the sedimentary sequences for reconstructing the environmental history of the site and its environs. In particular, the assessment focussed on the potential of sediments to address the following research questions (slightly modified from those agreed with English Heritage and Pre-Construct Archaeology Ltd):

1. Can different ecosystems (wood, open areas etc) be recorded in the litho- and bio-stratigraphic sequences, especially as one goes away from the river?
2. Can the period or periods the forest growth in the wetland be delimited?
3. Can the woodland flora and fauna be characterised?
4. Were there significant changes to the composition and structure of the woodland over time?
5. Are there identifiable changes in the environment that can be attributed to either human impact or climate change?
6. Can human exploitation and/or utilisation of the woodland be identified, such as the free roaming of pigs, harvesting of trees, nut collection etc?
7. Is there any signal of land-use and exploitation of the more distant, drier valley slopes?

In order to achieve this aim, the environmental archaeological assessment consisted of:

1. Recording the lithostratigraphy (sixty four column samples from Trenches 1 to 9), quantifying the organic matter content (Trench 4 and Trench 6) and humification values (Trench 4 and Trench 6) to provide a preliminary reconstruction of the sedimentary history
2. Assessment of the preservation and concentration of pollen grains and spores (Trench 6) to provide a preliminary reconstruction of the vegetation history, and to detect evidence for human activities e.g. woodland clearance and cultivation
3. Assessment of the preservation and concentration of macroscopic plant (seeds, wood) and insect remains from selected bulk samples (Trench 4) to provide a preliminary reconstruction of the vegetation history and general environmental context of the site.

Figure 1: Location of the Former Borax works, Norman Road, Belvedere, London Borough of Bexley (NNB07) (reproduced from Ordnance Survey digital map data ©Crown copyright 2007. All rights reserved. License number 0100031673)

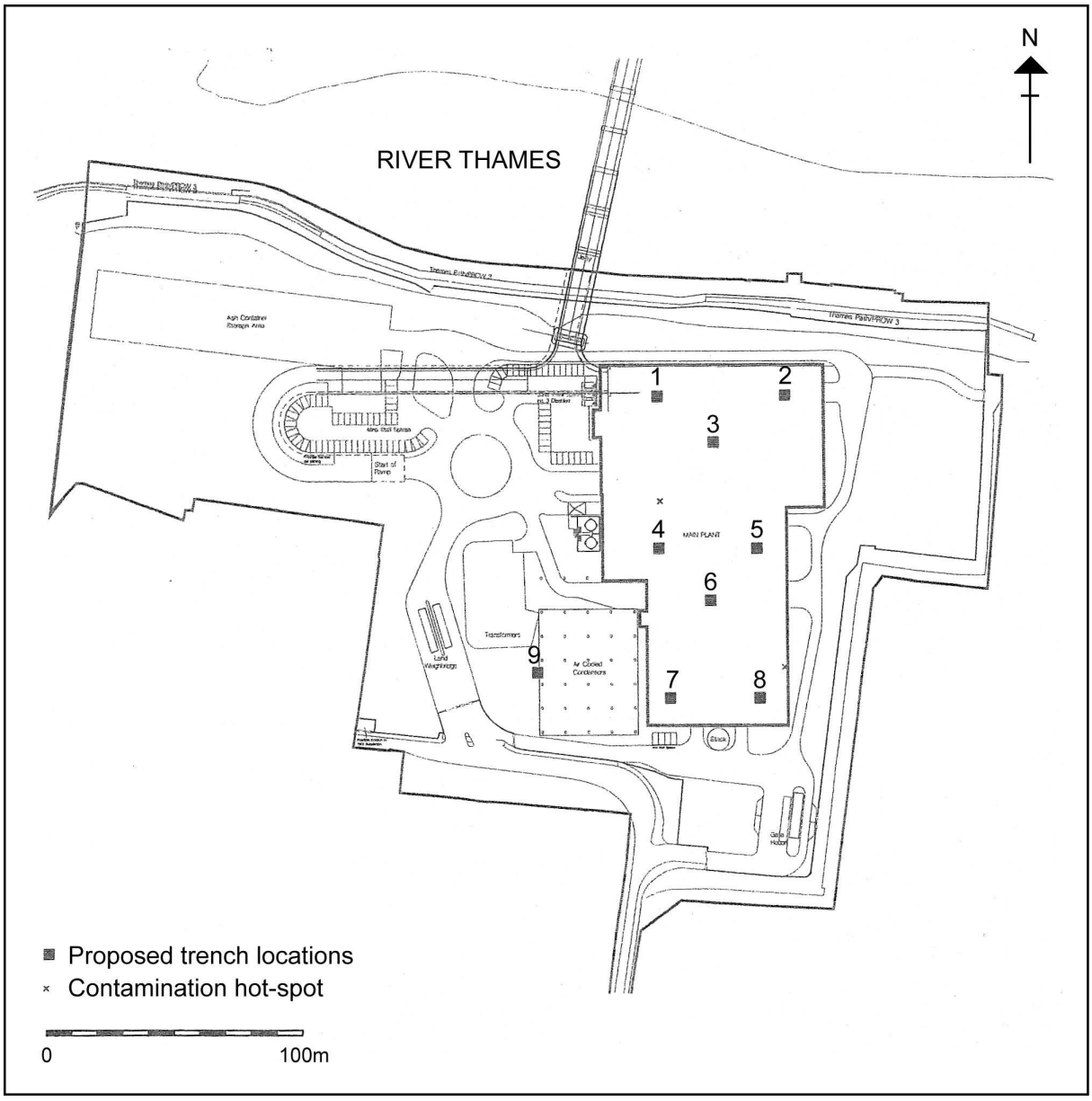

Figure 2: Location of the nine evaluation trenches at the Former Borax works, Norman Road, Belvedere, London Borough of Bexley (NNB07)

GEOLOGICAL CONTEXT

The British Geological Survey (BGS) 1:50,000 Sheet 257 Romford (solid and drift geology) shows the area to be situated on 'alluvium', a generic term used by the BGS for Late Quaternary deposits forming in fluvial and intertidal environments. These overlie sandy gravel deposits which can be confidently referred to as the Shepperton Gravel of Late Devensian age (Gibbard, 1994), which are in turn underlain by London Clay (an Eocene deposit). Recent reconstruction of the sub-surface stratigraphy at Norman Road (Green and Wilkinson, 2007) indicated a consistent stratigraphic sequence comprising a unit of sand and gravel (Shepperton Gravel) up to 10m in thickness, overlain by fine-grained alluvium, generally between 6.0m and 11.0m in thickness. A discontinuous peat, up to 2.0m thick, appears to be present at or close to the base of this alluvial sequence, with a separate, but also discontinuous peat horizon at a higher level in the alluvial sequence and more extensively preserved inland from the estuarine margin. In the intertidal zone and off-shore the alluvial sequence has been heavily truncated.

METHODS

Field investigations

Sixty four column samples and forty continuous bulk samples, each 5cm in thickness, were recovered from the nine trenches located across the site (Table 1; Figure 2).

TABLE 1: DETAILS OF SAMPLES TAKEN AT NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Sample type	Sample number	Trench number	Context number	OD height at top (m)	OD height at base (m)	Sample volume (litres)
Column	11	1	(18)/(19)	-0.48	-1.48	-
Column	12	1	(19)/(27)	-1.30	-2.30	-
Column	13	1	(19)/(27)	-2.10	-3.10	-
Column	14	1	(27)	-3.05	-4.05	-
Column	15	1	(27)	-4.10	-5.10	-
Column	16	1	(27)	-5.00	-6.00	-
Column	17	1	(27)	-5.60	-6.60	-
Column	18	1	(27)	-5.90	-6.90	-
Column	76	2	(42)/(43)/(44)	-0.30	-1.30	-
Column	77	2	(44)	-1.05	-2.10	-
Column	78	2	(44)/(45)	-2.00	-3.00	-
Column	79	2	(45)	-2.90	-3.90	-
Column	80	2	(45)	-3.80	-4.80	-
Column	81	2	(45)	-4.70	-5.70	-
Column	82	2	(45)	-5.60	-6.60	-
Column	4	3	(10)/(11)	0.00	1.00	-
Column	6	3	(10)/(11)/(28)	-0.40	-2.40	-
Column	19	3	(28)	-3.00	-4.00	-
Column	20	3	(28)	-3.90	-4.90	-
Column	21	3	(28)	-4.70	-5.70	-
Column	22	3	(28)	-4.80	-5.80	-

Column	30	4	(38)/(39)	0.20	-0.80	-
Column	71	4	(39)/(40)	-0.60	-1.60	-
Column	72	4	(40)/(41)	-1.50	-2.50	-
Column	73	4	(41)	-3.30	-4.30	-
Column	74	4	(41)	-4.20	-5.20	-
Column	75	4	(41)	-5.10	-6.10	-
Column	1	5	(2)	0.50	-0.50	-
Column	2	5	(2)/(3)	-0.50	-1.50	-
Column	3	5	(3)/(13)	-1.40	-2.40	-
Column	7	5	(13)	-1.70	-2.70	-
Column	8	5	(13)	-3.68	-4.68	-
Column	9	5	(13)	-4.60	-5.60	-
Column	10	5	(13)	-5.50	-6.50	-
Column	23	6	(30)	-0.55	-1.55	-
Column	24	6	(31)	-1.45	-2.45	-
Column	25	6	(31)/(33)	-2.30	-3.30	-
Column	26	6	(33)	-3.20	-4.20	-
Column	27	6	(33)	-4.10	-5.10	-
Column	28	6	(33)	-5.00	-6.00	-
Column	29	6	(33)	-5.90	-6.90	-
Column	83	7	(47)	-0.10	-1.10	-
Column	84	7	(47)	-1.00	-2.00	-
Column	85	7	(47)	-1.90	-2.90	-
Column	86	7	(47)	-2.80	-3.80	-
Column	87	7	(47)	-3.70	-4.70	-
Column	88	7	(47)	-4.60	-5.60	-
Column	89	7	(47)	-5.50	-6.50	-
Column	90	7	(47)	-6.00	-7.00	-
Column	91	8	(49)	-0.20	-1.20	-
Column	92	8	(49)	-1.10	-2.10	-
Column	93	8	(49)	-2.00	-3.00	-
Column	94	8	(49)	-2.90	-3.90	-
Column	95	8	(49)	-3.80	-4.80	-
Column	96	8	(49)	-4.70	-5.70	-
Column	97	8	(49)	-5.60	-6.60	-
Column	98	8	(49)	-6.50	-7.50	-
Column	99	9	(53)	0.00	-1.00	-
Column	100	9	(53)	-0.90	-1.90	-
Column	101	9	(53)	-1.80	-2.80	-
Column	102	9	(53)/(54)	-2.70	-3.70	-
Column	103	9	(54)	-3.60	-4.60	-
Column	104	9	(54)/(55)	-4.50	-5.50	-
Column	105	9	(56)	-5.40	-6.40	-
Bulk	31	4	(39)	-0.24	-0.29	*ca*. 20
Bulk	32	4	(39)	-0.29	-0.34	*ca*. 20
Bulk	33	4	(39)	-0.34	-0.39	*ca*. 20
Bulk	34	4	(39)	-0.39	-0.44	*ca*. 20
Bulk	35	4	(39)	-0.44	-0.49	*ca*. 20
Bulk	36	4	(39)	-0.49	-0.54	*ca*. 20
Bulk	37	4	(39)	-0.54	-0.59	*ca*. 20
Bulk	38	4	(39)	-0.59	-0.64	*ca*. 20
Bulk	39	4	(39)/(40)	-0.64	-0.69	*ca*. 20
Bulk	40	4	(40)	-0.69	-0.74	*ca*. 20
Bulk	41	4	(40)	-0.74	-0.79	*ca*. 20
Bulk	42	4	(40)	-0.79	-0.84	*ca*. 20
Bulk	43	4	(40)	-0.84	-0.89	*ca*. 20

Bulk	44	4	(40)	-0.89	-0.94	*ca*. 20
Bulk	45	4	(40)	-0.94	-0.99	*ca*. 20
Bulk	46	4	(40)	-0.99	-1.04	*ca*. 20
Bulk	47	4	(40)	-1.04	-1.09	*ca*. 20
Bulk	48	4	(40)	-1.09	-1.14	*ca*. 20
Bulk	49	4	(40)	-1.14	-1.19	*ca*. 20
Bulk	50	4	(40)	-1.19	-1.24	*ca*. 20
Bulk	51	4	(40)	-1.24	-1.29	*ca*. 20
Bulk	52	4	(40)	-1.29	-1.34	*ca*. 20
Bulk	53	4	(40)	-1.34	-1.39	*ca*. 20
Bulk	54	4	(40)	-1.39	-1.44	*ca*. 20
Bulk	55	4	(40)	-1.44	-1.49	*ca*. 20
Bulk	56	4	(40)	-1.49	-1.54	*ca*. 20
Bulk	57	4	(40)	-1.54	-1.59	*ca*. 20
Bulk	58	4	(40)	-1.59	-1.64	*ca*. 20
Bulk	59	4	(40)	-1.64	-1.69	*ca*. 20
Bulk	60	4	(40)	-1.69	-1.74	*ca*. 20
Bulk	61	4	(40)	-1.74	-1.79	*ca*. 20
Bulk	62	4	(40)	-1.79	-1.84	*ca*. 20
Bulk	63	4	(40)/(41)	-1.84	-1.89	*ca*. 20
Bulk	64	4	(41)	-1.94	-1.99	*ca*. 20
Bulk	65	4	(41)	-1.99	-2.04	*ca*. 20
Bulk	66	4	(41)	-2.04	-2.09	*ca*. 20
Bulk	67	4	(41)	-2.09	-2.14	*ca*. 20
Bulk	68	4	(41)	-2.14	-2.19	*ca*. 20
Bulk	69	4	(41)	-2.19	-2.24	*ca*. 20
Bulk	70	4	(41)	-2.24	-2.29	*ca*. 20

Lithostratigraphic descriptions

The lithostratigraphy of all column samples was described in the laboratory using standard procedures for recording unconsolidated sediment and peat, noting the physical properties (colour), composition (gravel, sand, clay, silt and organic matter) and inclusions (e.g. artefacts) (Troels-Smith, 1955). The procedure involved: (1) cleaning the samples with a spatula or scalpel blade and distilled water to remove surface contaminants; (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 Tables 2 to 28, 31 to 44, and 47 to 69, and Figures 3 to 6, 9 to 10 and 13 to 15.

Organic matter determinations

Sixty-nine sub-samples were taken from Trench 4 (between 0.15m and -6.10m OD) and eighty sub-samples were taken from Trench 6 (between -0.57m and -6.90m OD) for determination of the organic matter content (Tables 29 and 45; Figures 7 and 11). These records were important for two reasons: (1) they identified lithostratigraphic units with a higher organic matter content that may be suitable for radiocarbon dating, and (2) they identified 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 110^0C for 12 hours to remove excess moisture; (2) placing the sub-sample in a muffle furnace at 550℃ for 2 hours to remove organic matter (thermal oxidation), and (2) re-weighing the sub-sample obtain the 'loss-on-ignition' value (see Bengtsson and Enell, 1986).

Humification analysis

Twenty-five sub-samples were taken from Trench 4 (between -0.73m and -2.26m OD, and between -3.45 and -3.78m OD) and forty-seven sub-samples were taken from Trench 6 (between -0.58m and -2.41m OD) for humification analysis (Tables 30 and 46, and Figures 8 and 12). Humification analysis is important because: (1) it provides an indication of changes in bog surface wetness that can be compared with changes in vegetation history, and (2) in certain circumstances it may be linked to changes in the palaeoclimatic record. The procedure followed that of Blackford (1990) and Blackford and Chambers (1993) and involved: (1) dispersing a known amount of dried peat in 8% Sodium hydroxide; (2) filtering through grade 1 paper; (3) analysing the solution using an Amlab portable datalogging spectrophotometer at a wavelength of 540nm, and (4) correcting the results for organic matter content.

Pollen assessment

Sixteen sub-samples were extracted from Trench 6 (between -6.90m and -0.57m OD) for assessment of the pollen content. The pollen was extracted as follows: (1) sampling a standard volume of sediment (1ml); (2) deflocculation of the sample in 1% Sodium pyrophosphate; (3) sieving of the sample to remove coarse mineral and organic fractions (>125µ); (4) acetolysis; (5) removal of finer minerogenic fraction using Sodium polytungstate (specific gravity of 2.0g/cm^3); (6) 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 Royal Holloway (University of London) pollen type collection and the following sources of keys and photographs: Moore *et al* (1991); Reille (1992). Plant nomenclature follows the Flora Europaea as summarised in Stace (1997). The assessment procedure consisted of scanning the prepared slides at 2mm intervals along the whole length of the coverslip and recording the concentration and state of preservation of pollen grains and spores, and the principal pollen taxa (Table 70).

Plant macrofossil assessment

Six bulk samples recovered from Trench 4 (<43>, <45>, <48>, <50>, <51>, and <54>) were processed for the plant macrofossil assessment. The samples were wet-sieved using 300 micron and 1mm mesh sizes. The residues were scanned using a low power zoom-stereo microscope. Identifications are currently being made with reference to the modern seed

collection at Royal Holloway University London, and Berggren (1981) and Anderberg (1994). Plant nomenclature follows Stace (1997). The results are displayed in Table 71.

Waterlogged wood assessment

Twenty-two samples recovered from various trenches by Pre-Construct Archaeology Limited were processed for the waterlogged wood assessment. Examination followed standard procedures for the examination of waterlogged wood as described in Hather (2000). Taxa were identified with reference to descriptions in Hather (*ibid*.). Nomenclature follows Stace (1997). The results are displayed in Table 72.

Insect assessment

Six bulk samples recovered from Trench 4 (<43>, <45>, <48>, <50>, <51>, and <54>) were processed for the insect assessment. Samples were processed by paraffin flotation following the methodology of Atkinson *et al.* (1987).

1. Wash bulk peat samples through a 5mm mesh using hot water to remove larger wood fragments
2. Wash remaining fraction onto a 300 micron mesh
3. Wash twice with hot water to remove the fine fraction, and two cold water washes to remove the possibility of a thermal gradient forming during the subsequent flotation
4. Drain well and mix with paraffin in a large bowl for 5 minutes
5. Decant excess paraffin back into the stock bottle through an 80 micron mesh
6. Add cold water to the organic fraction, mixing thoroughly
7. Leave to stand for 15 minutes
8. Decant the oil overlying the bulk material onto a 300 micron mesh and wash gently with detergent and hot water
9. Rinse with distilled water, dehydrate in 95% ethanol, and transfer to a sealed container for storage in 95% ethanol
10. Save remaining bulk material for further extraction of other fossil material.

Flots were scanned briefly using a low power binocular microscope (x10) to record the concentration and state of preservation of insect material, and to note principal beetle (Coleoptera) and bug (Hemiptera) taxa (Table 73).

RESULTS AND INTERPRETATION OF THE LITHOLOGICAL ASSESSMENT

Trench 1

The results of the Trench 1 lithological assessment are displayed in Tables 2 to 9 and Figure 3. Below the base of Trench 1, auger samples were taken by Pre-Construct Archaeology Limited to a depth of -9.4m OD. The auger recorded gravel deposits below -8.9m OD (context (58)) and most likely represents the Shepperton Gravel of Late Devensian Age. This was overlain by mid 'grey brown sandy silts' between -8.9m and -8.3m OD (context (57)). From -8.3m to -8.25m OD, a 'mid brown silty sand and organic material' (context (56)) was recorded and interpreted by Pre-Construct Archaeology Limited as a depleted peat horizon. This was overlain by silts and sandy silts (context (27)). Dominantly silts and sandy silts with trace quantities of detrital wood continued accumulating to a depth of -2.11m OD as recorded in samples <18> to <12> (context (27)). Contexts (57) and (27) represent fine grained sediments deposited from suspension on the margins of river channel (floodplain) of low to moderate energy during intermittent flood events (alluvium), while context (56) may indicate a transition towards conditions marginal to the main channel and within a semi-aquatic / semi-terrestrial environment.

From -2.11m to -1.30m OD (samples <12> and <11>), the lithostratigraphy indicates a sharp transition into well humified peat (context (19)), most likely representing a change in environment from a low energy river system to semi-terrestrial peat forming conditions. This transition may have been brought about by: (1) a reduction in the rate of sea-level rise (see Devoy, 1979, 1982; Haggart, 1995; Sidell *et al*., 2000), or (2) local factors, such as a change in the proximity of the river channel permitting the formation of an extensive back swamp. Between -1.30m and -0.58m OD (sample <11>), a gradual change in lithostratigraphy indicates a decrease in bog surface stability (context (19)) and eventual fluvial inundation above -0.58m OD (context (18)). This environmental transition may have been caused by one or more of the following: (1) an increase in the rate of relative sea level rise (see above), or (2) migration of the river channel towards the site. These mineral rich alluvial sediments were overlain by made ground deposits between -0.48m OD and +2.00m OD (context (17)) according to field records made by Pre-Construct Archaeology Ltd.

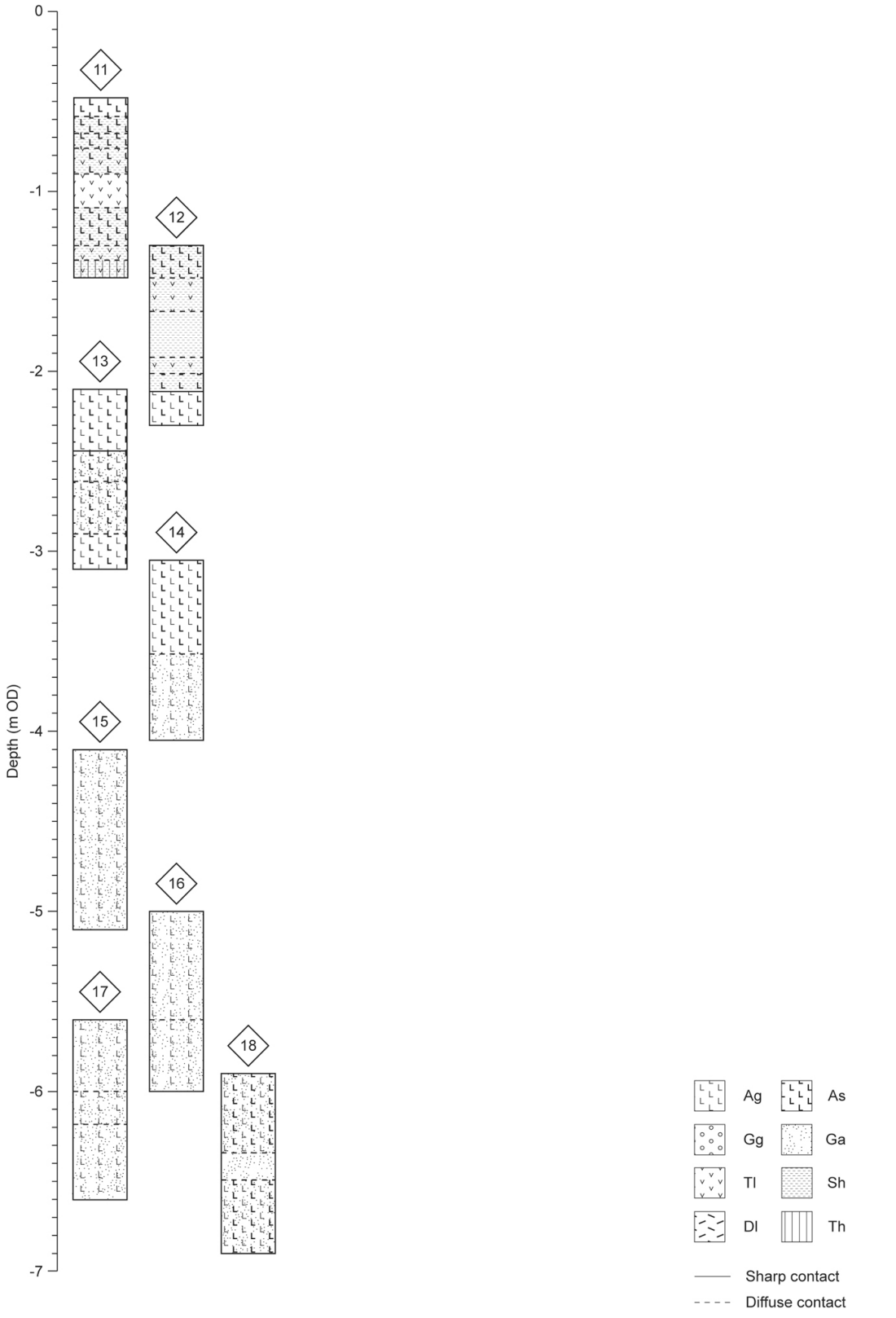

Figure 3: Lithostratigraphy of column samples <11> to <18> obtained from Trench 1, Norman Road, Belvedere, London Borough of Bexley (NNB07)

TABLE 2: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <11>, TRENCH 1, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-0.48 to -0.58	8	(19)/(18)	10YR 4/2; As4, Ag+; Dark greyish brown clay with silt inclusions; diffuse contact into:
-0.58 to -0.68	7	(19)	10YR 3/1; As3, Sh1, Ag+, Dl+; Very dark grey organic rich clay with silt and detrital wood inclusions; diffuse contact into:
-0.68 to -0.76	6	(19)	10YR 3/1; As2, Sh2; $Th^{3/4}$+, Tl^{3}+; Very dark grey very organic rich clay with well humified wood and herbaceous peat inclusions; diffuse contact into:
-0.76 to -0.90	5	(19)	10YR 3/1; Sh2, $Tl^{3/4}$1, As1, Th^{3}+; Very dark grey very organic rich clay and well humified wood peat with well humified herbaceous peat inclusions; diffuse contact into;
-0.90 to -1.09	4	(19)	10YR 2/1; Tl4; Black wood macrofossil; diffuse contact into:
-1.09 to -1.30	3	(19)	10YR 3/1; Sh2, As2, Tl^{3}+; Very dark grey very organic rich clay with well humified wood peat inclusions; diffuse contact into:
-1.30 to -1.38	2	(19)	10YR 2/1; Sh2, Tl^{4}2, Th^{4}+; Black very organic rich well humified wood peat with well humified herbaceous peat inclusions; diffuse contact into:
-1.38 to -1.48	1	(19)	10YR 2/1; Tl^{3}2, Th^{3}1, Sh1; Black organic rich well humified wood and herbaceous peat

TABLE 3: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <12>, TRENCH 1, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-1.30 to -1.48	6	(19)	10YR 3/1; Sh2, As2, Tl^{3}+, Th^{3}+; Very dark grey very organic rich clay with well humified wood and herbaceous peat inclusions; diffuse contact into:
-1.48 to -1.66	5	(19)	10YR 2/1; Sh3, Tl^{4}1, As+, Th^{3}+; Black highly organic well humified wood peat with well humified herbaceous peat and clay inclusions; diffuse contact into:
-1.66 to -1.92	4	(19)	10YR 2/1; Sh4, Tl^{4}+, Th^{2}+, As+; Black highly organic peat with clay, well humified wood and moderately humified herbaceous peat inclusions; diffuse contact into:
-1.92 to -2.01	3	(19)	10YR 2/1; Sh2, Tl^{3}2, Th^{2}+; Black very organic rich well humified wood peat with moderately humified herbaceous peat inclusions; diffuse contact into:

-2.01 to -2.11	2	(19)	10YR 3/1; Sh3, As1, Tl^4+, Th^4+; Very dark grey highly organic rich clay with well humified wood and herbaceous peat inclusions; sharp contact into:
-2.11 to -2.30	1	(27)	10YR 2/1 and Gley 1 5/10Y; As3, Ag1, Sh+, Dl+; Mottled black and greenish grey silty clay with organic and detrital wood inclusions.

TABLE 4: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <13>, TRENCH 1, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-2.10 to -2.44	4	(27)	10YR 2/1 and Gley 1 5/10Y; As3, Ag1, Sh+, Dl+; Mottled black and greenish grey silty clay with organic and detrital wood inclusions.
-2.44 to -2.61	3	(27)	Gley 1 5/10Y; Ag2, As1, Ga1, Dl+; Greenish grey silty sandy clay with detrital wood inclusions; diffuse contact into:
-2.61 to -2.90	2	(27)	Gley 1 5/10Y; Ag2, As1, Ga1, Dl+; Greenish grey silty sandy clay with detrital wood inclusions; diffuse contact into:
-2.90 to -3.10	1	(27)	Gley 1 4/10Y; As2, Ag2, Ga+, Dl+, shells+; Dark greenish grey silty clay with sand, detrital wood and shell inclusions

TABLE 5: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <14>, TRENCH 1, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-3.05 to -3.57	2	(27)	Gley 1 4/10Y; As2, Ag2, Ga+, Dl+, shells+; Dark greenish grey silty clay with sand, detrital wood and shell inclusions; diffuse contact into:
-3.57 to -4.05	1	(27)	5Y 4/2; Ga3, Ag1, Dl+, As+; Olive grey silty sand with detrital wood and clay inclusions

TABLE 6: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <15>, TRENCH 1, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-4.10 to -5.10	1	(27)	5Y 4/2; Ga3, Ag1, Dl+, As+; Olive grey silty sand with detrital wood and clay inclusions

TABLE 7: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <16>, TRENCH 1, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-5.00 to -5.60	2	(27)	5Y 4/2; Ga3, Ag1, Dl+, As+; Olive grey silty sand with detrital wood and clay inclusions; diffuse contact into:
-5.60 to -6.00	1	(27)	5Y 4/2; Ga3, Ag1, Dl+, As+, Sh+; Olive grey silty sand with detrital wood and clay inclusions, with fine horizontal bands of organic black material

TABLE 8: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <17>, TRENCH 1, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-5.60 to -6.00	3	(27)	5Y 4/2; Ga2, Ag2, As+; Olive grey silty sand with clay inclusions; diffuse contact into:
-6.00 to -6.18	2	(27)	5Y 4/2; Ga2, Ag2, As+; Olive grey silty sand with clay inclusions, with fine horizontal bands of organic black material; diffuse contact into:
-6.18 to -6.60	1	(27)	5Y 4/2; Ga3, Ag1, Dl+, As+, Sh+; Olive grey silty sand with detrital wood and clay inclusions, with fine horizontal bands of organic black material

TABLE 9: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <18>, TRENCH 1, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-5.90 to -6.44	3	(27)	5Y 5/2; Ga2, Ag1, As1, Dl+; Olive grey silty clayey sand with detrital wood inclusions; diffuse contact into:
-6.44 to -6.59	2	(27)	5Y 5/2; Ga4, Ag+, Dl+; Olive grey sand with silt and detrital wood inclusions; diffuse contact into:
-6.59 to -6.90	1	(27)	5Y 5/2; Ga2, Ag1, As1, Dl+; Dark olive grey silty clayey sand

Trench 2

The results of the Trench 2 lithological assessment are displayed in Tables 10 to 16 and Figure 4. Dominantly clays, silts and sands with varying quantities of detrital wood and organic material were recorded from the base of the Trench 2 (-6.60m OD) to -1.81m OD as recorded in samples <82> to <77> (context (45)). These fine grained deposits most likely represent deposition from suspension (alluvium) and on the margins of a river channel (floodplain) within a low to moderate energy river system. From -1.81m to -1.29m OD (sample <77>), the lithostratigraphy indicates a sharp transition into well humified wood peat (context (44)), most likely representing a change in environment from low to moderate energy fluvial conditions to semi-terrestrial peat formation. This transition may have been brought about by: (1) a reduction in the rate of sea-level rise (see Devoy, 1979 1982; Haggart, 1995; Sidell *et al*., 2000), or (2) local factors, such as a change in the proximity of the river channel permitting the formation of an extensive back swamp. Between -1.29 and -0.82m OD (samples <77> and <76>), a gradual change in lithostratigraphy indicates a decrease in bog surface stability (context (44)) and eventual fluvial inundation above -0.82m OD (context (43)). This environmental transition may have been caused by one or more of the following: (1) an increase in the rate of relative sea level rise, or (2) a change in the proximity of the river channel. These mineral rich alluvial sediments were overlain by made ground deposits from -0.40m OD to +2.10m OD (context (17)) according to the field records made by Pre-Construct Archaeology Ltd.

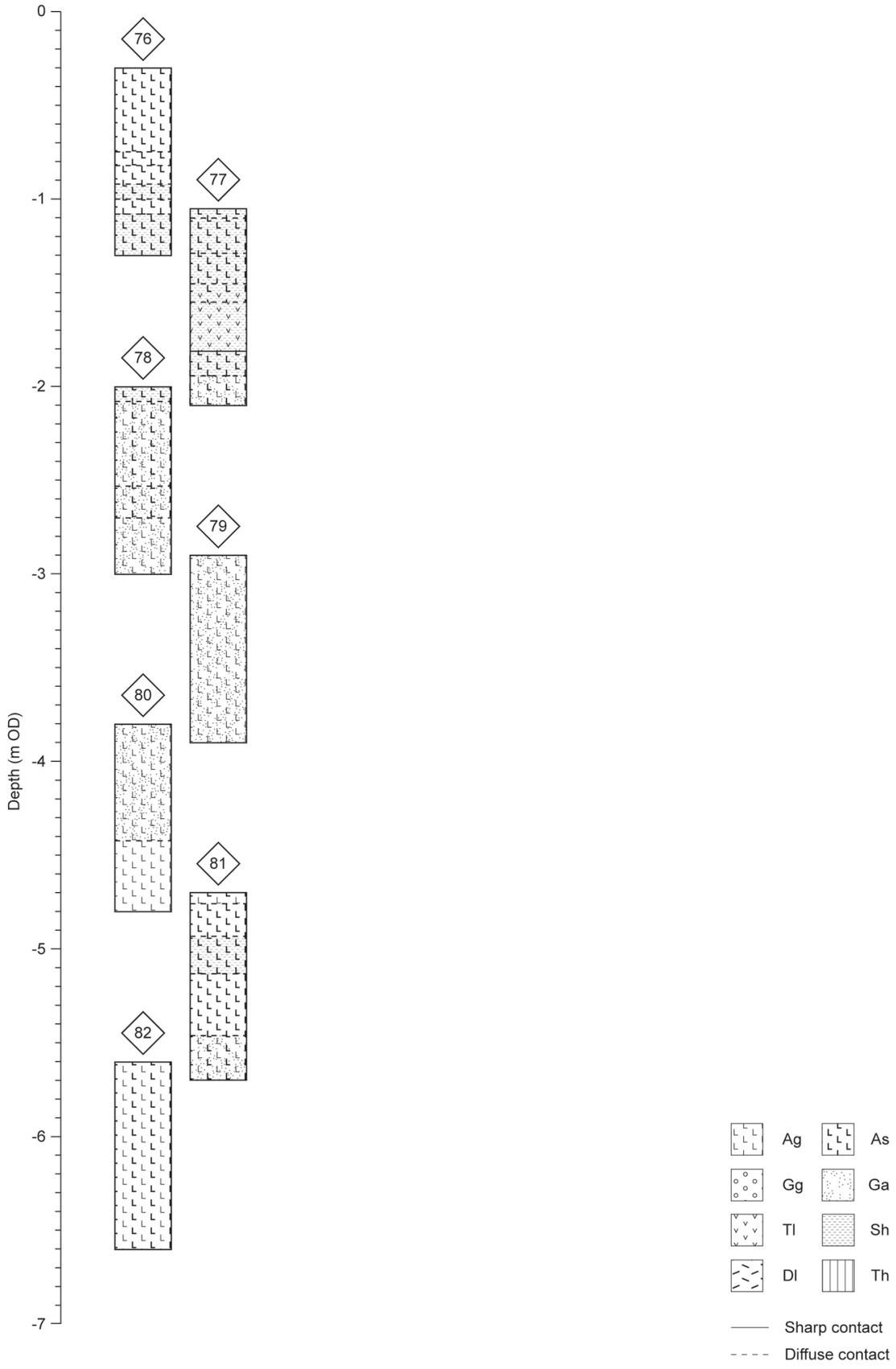

Figure 4: Lithostratigraphy of column samples <76> to <82> obtained from Trench 2, Norman Road, Belvedere, London Borough of Bexley (NNB07)

TABLE 10: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <76>, TRENCH 2, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-0.30 to -0.75	6	(43)/(42)	5Y 5/1; As4, Dl+; Grey clay with detrital wood inclusions; diffuse contact into:
-0.75 to -0.82	5	(43)	5Y 5/1; As4, Sh+, Dl+; Grey clay with detrital wood and organic inclusions; diffuse contact into:
-0.82 to -0.92	4	(44)	5Y 4/1; As4, Sh+, Dl+; Dark grey clay with organic and detrital wood inclusions; diffuse contact into:
-0.92 to -1.00	3	(44)	5YR 4/1; As3, Sh1; Dark grey organic rich clay; diffuse contact into:
-1.00 to -1.08	2	(44)	10YR 4/1; As4, Sh+, Dl+; Dark grey organic rich clay with organic and detrital wood inclusions; diffuse contact into:
-1.08 to -1.30	1	(44)	10YR 3/1; As2, Sh2, Tl^{3}+, Th^{3}+; Very dark grey very organic rich clay with well humified wood and herbaceous peat inclusions

TABLE 11: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <77>, TRENCH 2, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-1.05 to -1.10	7	(44)	10YR 3/1; As2, Sh2, Tl^{3}+, Th^{3}+; Very dark grey very organic rich clay with well humified wood and herbaceous peat inclusions; diffuse contact into:
-1.10 to -1.29	6	(44)	10YR 4/1; As3, Sh1, Tl^{3}+, Th3+; Dark grey organic rich clay with well humified wood and herbaceous peat inclusions; diffuse contact into:
-1.29 to -1.45	5	(44)	10YR 3/1; As2, Sh2, Tl^{4}+, Th^{3}+; Very dark grey very organic rich clay with well humified wood and herbaceous peat inclusions; diffuse contact into:
-1.45 to -1.55	4	(44)	10YR 3/1; Tl^{4}2, Sh1, As1, Th^{3}+; Very dark grey organic rich well humified wood peat and clay with herbaceous peat inclusions; diffuse contact into:
-1.55 to -1.81	3	(44)	10YR 2/1; Tl$^{3/4}$2, Sh2, As+; Black very organic rich well humified wood peat with clay inclusions; sharp contact into:
-1.81 to -1.94	2	(44)	Gley 1 5/10Y; As3, Sh1, Ag+, Dl+; Greenish grey organic rich clay with silt and detrital wood inclusions; diffuse contact into:
-1.94 to -2.10	1	(44)	Gley 1 5/10Y; Ag2, As1, Ga1, Dl+; Greenish grey silty sandy clay with detrital wood inclusions

TABLE 12: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <78>, TRENCH 2, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-2.00 to -2.08	4	(44)	10YR 4/1; As3, Sh1, Dl+; Dark grey organic rich clay with detrital inclusions; diffuse contact into:
-2.08 to -2.53	3	(45)	Gley 1 5/10Y; Ag2, As1, Ga1, Dl+; Greenish grey silty sandy clay with detrital wood inclusions; diffuse contact into:
-2.53 to -2.70	2	(45)	5Y 4/1; Ag2, As1, Ga1, Dl+; Dark grey clayey sandy silt with detrital wood inclusions; diffuse contact into:
-2.70 to -3.00	1	(45)	10YR 4/1; Ag2, Ga2; Dark grey silty sand

TABLE 13: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <79>, TRENCH 2, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-2.90 to -3.90	1	(45)	5Y 4/1; Ag3, Ga1, As+, Dl+; Olive grey sandy silt with clay and detrital wood inclusions

TABLE 14: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <80>, TRENCH 2, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-3.80 to -4.42	2	(45)	5Y 4/2; Ag3, Ga1, Dl+; Olive grey sandy silt with detrital wood inclusions; diffuse contact into:
-4.42 to -4.80	1	(45)	5Y 4/2; Ag4, Ga+, As+, Dl+; Olive grey silt with sand, clay and detrital wood inclusions

TABLE 15: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <81>, TRENCH 2, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-4.70 to -4.76	5	(45)	10YR 4/1; As2, Ag1, Sh1, Dl+; Dark grey organic rich silty clay with detrital wood inclusions; diffuse contact into:
-4.76 to -4.93	4	(45)	2.5Y 5/3; As3, Dl1; Light olive grey clay and detrital wood; diffuse contact into:
-4.93 to -5.13	3	(45)	10YR 4/1; As3, Sh1, Dl+, shell+; Dark grey organic rich clay with detrital wood and shell inclusions; diffuse contact into:
-5.13 to -5.46	2	(45)	10YR 4/1; As4, Sh+, Dl+, shell+; Dark grey clay with organic, detrital wood and shell inclusions; diffuse contact into:
-5.46 to -5.70	1	(45)	5Y 5/2; Ag2, As1, Ga1, Dl+; Olive grey clayey sandy silt with detrital wood inclusions

TABLE 16: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <82>, TRENCH 2, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-5.60 to -6.60	1	(45)	10YR 4/1; As3, Ag1, Sh+, Dl+; Dark grey silty clay with organic and detrital wood inclusions

Trench 3

The results of the Trench 3 lithological assessment are displayed in Tables 17 to 22 and Figure 5. Dominantly sands with occasional detrital wood and organic material were recorded from the base of the Trench 3 (-5.80m OD) to -2.01m OD as recorded in samples <22> to <19> and <6> (context (28)). Auger samples taken by Pre-Construct Archaeology Ltd indicate these sediments continued to at least -7.5m OD. These fine grained deposits most likely represent deposition from suspension (alluvium) on the margins of (floodplain) a river channel within a low to moderate energy river system. From -2.01m to -1.40m OD (sample <6>), the lithostratigraphy indicates a sharp transition into well humified wood peat (context (11)), most likely representing a change in environment from a low to moderate energy river system to semi-terrestrial peat formation. This transition may have been brought about by: (1) a reduction in the rate of sea-level rise (see Devoy, 1979, 1982; Haggart, 1995; Sidell *et al*., 2000), or (2) local factors, such as a change in the proximity of the river channel permitting the formation of an extensive back swamp. Between -1.40m and -0.63m OD, the lithostratigraphy indicates a change from well humified wood peat to very organic rich clay with wood peat or detrital material (context (11)), to fine grained mineral-rich sediment deposition above -0.63m OD (context (10)). This most likely represents a change in environment to semi-aquatic or less stable semi-terrestrial conditions between -1.40m and -0.63m OD, prior to fluvial inundation above -0.63m OD. This environmental transition may have been caused by one or more of the following: (1) an increase in the rate of relative sea level rise, or (2) a change in the proximity of the river channel. These mineral rich alluvial sediments were overlain by made ground deposits from -0m OD to +1.9m OD (context (9)) according to the field records made by Pre-Construct Archaeology Ltd.

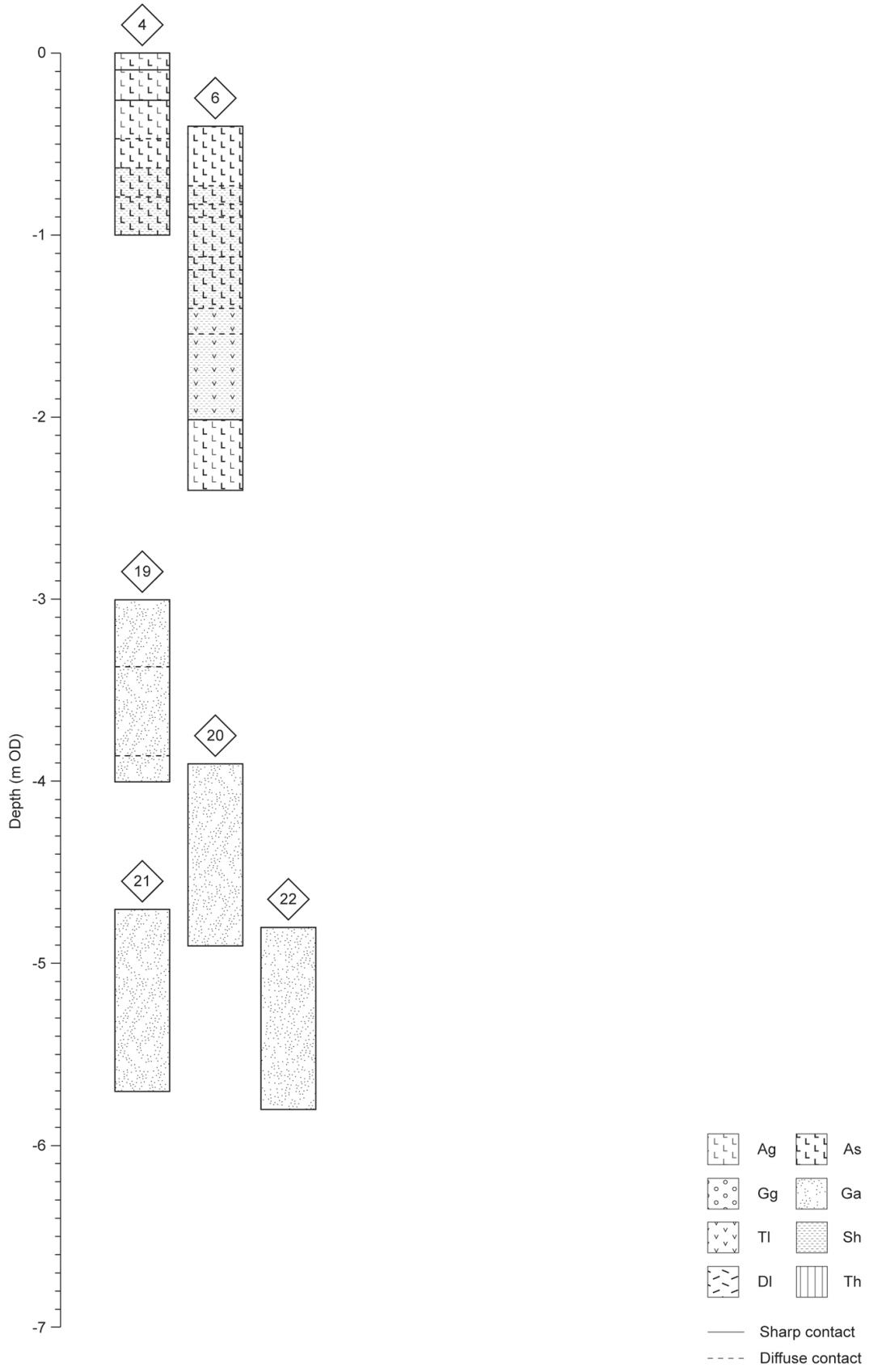

Figure 5: Lithostratigraphy of column samples <4>, <6> and <19> to <22> obtained from Trench 3, Norman Road, Belvedere, London Borough of Bexley (NNB07)

TABLE 17: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <4>, TRENCH 3, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
0.00 to -0.09	6	(10)	10YR 5/1; As3, Ag1; Grey silty clay; sharp contact into:
-0.09 to -0.26	5	(10)	10YR 4/1; As3, Ag1, charcoal+, Dl+; Dark grey silty clay with charcoal and detrital wood inclusions; sharp contact into:
-0.26 to -0.47	4	(10)	10YR 5/2; As3, Ag1; Greyish brown silty clay; diffuse contact into:
-0.47 to -0.63	3	(10)	10YR 4/1; As4, Dl+, Dh+; Dark grey clay with detrital wood and herbaceous inclusions; diffuse contact into:
-0.63 to -0.79	2	(10)	10YR 3/1; As3, Sh1, Dl+; Very dark grey organic rich clay with detrital wood inclusions; diffuse contact into:
-0.79 to -1.00	1	(10)	10YR 3/1 and 10YR 2/1; As2, Sh2, Tl^{3}+; Mottled very dark grey and black very organic clay with well humified wood peat inclusions

TABLE 18: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <6>, TRENCH 3, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-0.40 to -0.63	9	(10)	10YR 4/2; As4, Dl+, Dh+; Dark greyish brown clay with detrital wood and herbaceous inclusions; diffuse contact into:
-0.63 to -0.83	8	(11)	10YR 3/1; As3, Sh1, Dl+; Very dark grey organic rich clay with detrital wood inclusions; diffuse contact into:
-0.83 to -0.90	7	(11)	10YR 3/1; As2, Sh2, Tl^{3}+; Very dark grey very organic rich clay with well humified wood peat inclusions; diffuse contact into:
-0.90 to -1.12	6	(11)	10YR 3/1; Sh3, As1, Tl^{3}+; Th^{3}+; Very dark grey very organic rich clay with well humified wood and herbaceous peat inclusions; diffuse contact into:
-1.12 to -1.19	5	(11)	10YR 3/1; As2, Sh2, Tl^{3}+; Th^{3}+; Very dark grey very organic rich clay with well humified wood and herbaceous peat inclusions; diffuse contact into:
-1.19 to -1.40	4	(11)	10YR 3/1; As3, Sh1, Th^{3}+, Tl^{3}+; Very dark grey organic rich clay with well humified wood and herbaceous peat inclusions; diffuse contact into:

-1.40 to -1.54	3	(11)	10YR 2/1; Tl$^{2/3}$2, Sh2, Th^{3}+; Black very organic rich moderate to well humified wood peat with well humified herbaceous peat inclusions; diffuse contact into:
-1.54 to -2.01	2	(11)	10YR 2/1; Tl$^{3/4}$3, Sh1; Black very organic rich well humified wood peat; sharp contact into:
-2.01 to -2.40	1	(11)	Gley 1 5/10Y; As3, Ag1, Dl+; Greenish grey silty clay with detrital wood inclusions.

TABLE 19: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <19>, TRENCH 3, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-3.00 to -3.37	3	(28)	5Y 5/2; Ga4; Olive grey sand; diffuse contact into:
-3.37 to -3.86	2	(28)	5Y 5/2; Ga4, Sh+; Olive grey sand with thin horizontal bands of organic material; diffuse contact into:
-3.86 to -4.00	1	(28)	5Y 5/2; Ga4; Olive grey sand.

TABLE 20: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <20>, TRENCH 3, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-3.90 to -4.90	1	(28)	5Y 5/2; Ga4, Sh+; Olive grey sand with thin horizontal bands of organic material.

TABLE 21: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <21>, TRENCH 3, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-4.70 to -5.70	1	(28)	5Y 5/2; Ga4, Sh+; Olive grey sand with organic inclusions

TABLE 22: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <22>, TRENCH 3, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-4.80 to -5.80	1	(28)	5Y 5/2; Ga4, Dl+; Olive grey sand with detrital wood inclusions

Trench 4

The results of the Trench 4 lithological assessment are displayed in Tables 23 to 30 and Figures 6 to 8. Dominantly fine grained inorganic sediment with occasional detrital wood was recorded from the base of the Trench 4 (-6.10m OD) to -3.85m OD (samples <75> to <73>; context (41)). These fine grained deposits most likely represented deposition from suspension (alluvium) on the margins of a river channel (floodplain) within a low to moderate energy river system. A change in lithostratigraphy and increase in organic matter content from <5% to *ca*. 55% between -3.85m and -3.45m OD (context (41)) indicates a temporary transition towards semi-terrestrial conditions, most likely caused by either: (1) a reduction in the rate of sea-level rise (see Devoy, 1979, 1982; Haggart, 1995; Sidell *et al*., 2000), or (2) local factors, such as a change in the proximity of the river channel permitting the formation of an extensive back swamp. A return to mineral-rich sedimentation occurred above -3.30m OD, as indicated by a change in lithostratigraphy and decrease in organic matter content.

From -2.10m to -1.53m OD (samples <72> and <71>), the lithostratigraphic record indicates a sharp transition to wood peat (context (40); *ca*. 80% organic matter). This trend indicates a transition towards semi-terrestrial peat forming conditions. Humification values indicate that the bog surface was well humified and thus relatively dry and stable during this period (Table 30; Figure 8). Between -1.53m and -1.21m OD (context (40)), the peat surface became wetter and more unstable as indicated by: (1) a change in lithostratigraphy; (2) a decline in organic matter content (from *ca*. 80% to 25%), and (3) a decline in humification values (from *ca*. 45% to 20%). These trends once again reversed indicating a return to moderately stable bog surface conditions between -1.21m and -0.97m OD (context (40)). At -0.93m OD, the lithostratigraphy indicates a transition from moderately humified wood peat and clay to organic rich clay with detrital wood (context <40>), to fine grained mineral-rich sediment deposition above -0.68m OD (context (39)). This final transition may have been caused by one or more of the following: (1) an increase in the rate of relative sea level rise, or (2) a change in the proximity of the river channel. The mineral-rich alluvial sediments were overlain by made ground deposits from 0.5m OD to +1.96m OD (context (38)) according to the field records made by Pre-Construct Archaeology Ltd.

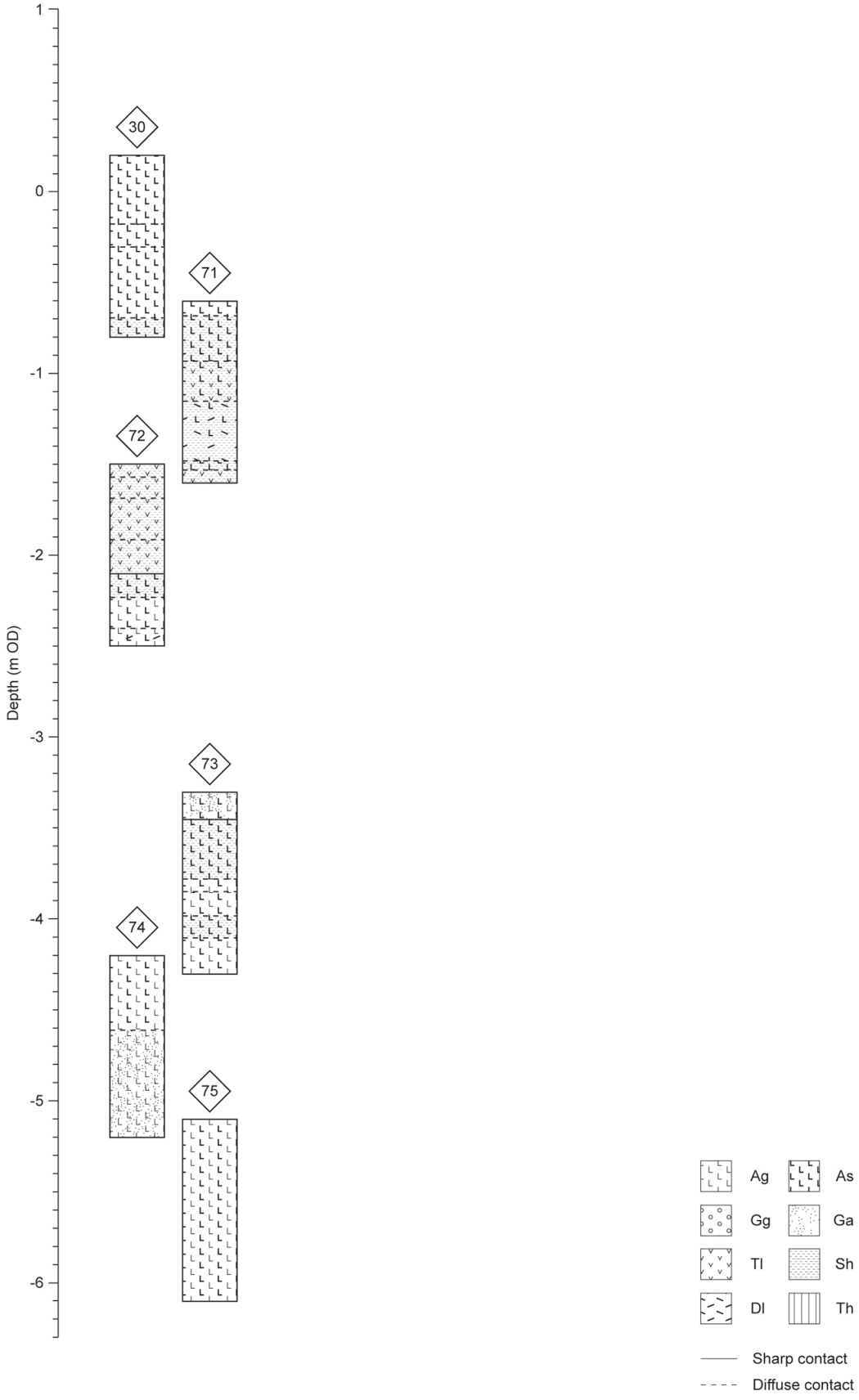

Figure 6: Lithostratigraphy of column samples <30> and <71> to <75> obtained from Trench 4, Norman Road, Belvedere, London Borough of Bexley (NNB07)

TABLE 23: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <30>, TRENCH 4, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
0.20 to -0.18	4	(38)	10YR 5/3; As4, Gg+; Brown clay with gravel inclusions; diffuse contact into:
-0.18 to -0.30	3	(38)	10YR 4/1; As4; Dark grey clay; diffuse contact into:
-0.30 to -0.69	2	(39)/(38)	10YR 4/2; As4, Dl+; Dark greyish brown clay with detrital wood inclusions; diffuse contact into:
-0.69 to -0.80	1	(39)	10YR 4/1; As3, Sh1; Dark grey organic rich clay.

TABLE 24: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <71>, TRENCH 4, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-0.60 to -0.68	6	(39)	10YR 4/2; As4, Dl+; Dark greyish brown clay with detrital wood inclusions; diffuse contact into:
-0.68 to -0.93	5	(40)/(39)	10YR 4/1; As3, Sh1; Dl+; Dark grey organic rich clay with detrital wood inclusions; diffuse contact into:
-0.93 to -1.15	4	(40)	10YR 3/1; As2, Sh1, Tl^{4}1, Th^{3}+; Very dark grey organic rich clay and well humified wood peat with well humified herbaceous peat; diffuse contact into:
-1.15 to -1.48	3	(40)	10YR 4/1; As2, Sh1, Dl1; Dark grey organic rich clay with detrital wood inclusions; diffuse contact into:
-1.48 to -1.53	2	(40)	10YR 3/1; As2, Sh2, Tl^{3}+; Very dark grey very organic rich clay with well humified wood peat inclusions; diffuse contact into:
-1.53 to -1.60	1	(40)	10YR 2/1; Sh3, $Tl^{3/4}$1, As+; Black very organic rich well humified wood peat with clay inclusions.

TABLE 25: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <72>, TRENCH 4, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-1.50 to -1.57	7	(40)	10YR 2/1; Sh3, $Tl^{3/4}$1, As+; Black very organic rich well humified wood peat with clay inclusions; diffuse contact into:
-1.57 to -1.68	6	(40)	10YR 2/1; Th^{3}3, Sh1; Black organic rich well humified herbaceous peat; diffuse contact into:

-1.68 to -1.91	5	(41)/(40)	10YR 2/1; Sh2, Tl^{3}2, Th^{3}+; Black very organic rich well humified wood peat with well humified herbaceous peat inclusions; diffuse contact into:
-1.91 to -2.10	4	(41)	10YR 2/1; Sh3, Tl^{4}1; Black very organic rich well humified wood peat; sharp contact into:
-2.10 to -2.23	3	(41)	10YR 4/1; Sh2, As2, Tl^{3}+; Dark grey very organic rich clay with well humified wood peat inclusions; diffuse contact into:
-2.23 to -2.40	2	(41)	Gley 1 5/10Y; As2, Ag2, Ga+; Greenish grey silty clay with sand inclusions; diffuse contact into:
-2.40 to -2.50	1	(41)	Gley 1 5/10Y; Dl2, As1, Ag1; Greenish grey silty clay with detrital wood inclusions

TABLE 26: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <73>, TRENCH 4, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-3.30 to -3.45	6	(41)	5Y 4/2; Ag2, As1, Ga1; Olive grey clayey sandy silt; sharp contact into:
-3.45 to -3.78	5	(41)	10YR 3/1; As2, Sh2, Th3+; Mottled very dark grey very organic rich clay with herbaceous peat inclusions; diffuse contact into:
-3.78 to -3.85	4	(41)	5Y 4/2; Ag3, As1, Dl+; Greenish grey clayey silt with detrital wood inclusions; diffuse contact into:
-3.85 to -3.98	3	(41)	5Y 4/2; Ag2, As2, Dl+; Greenish grey silty clay with detrital wood inclusions; diffuse contact into:
-3.98 to -4.10	2	(41)	10YR 4/1; As3, Sh1, Ag+, Dl+; Dark grey organic rich clay with silt and detrital wood inclusions; diffuse contact into:
-4.10 to -4.30	1	(41)	5Y 5/2; As3, Ag1, Dl+; Olive grey silty clay with detrital wood inclusions

TABLE 27: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <74>, TRENCH 4, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-4.20 to -4.61	2	(41)	5Y 5/2; As3, Ag1, Dl+; Olive grey silty clay with detrital wood inclusions; diffuse contact into:
-4.61 to -5.20	1	(41)	5Y 4/1; Ag3, Ga1, As+; Dark grey sandy silt with clay inclusions

TABLE 28: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <75>, TRENCH 4, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-5.10 to -6.10	1	(41)	5Y 5/2; As3, Ag1, Dl+; Olive grey silty clay with detrital wood inclusions

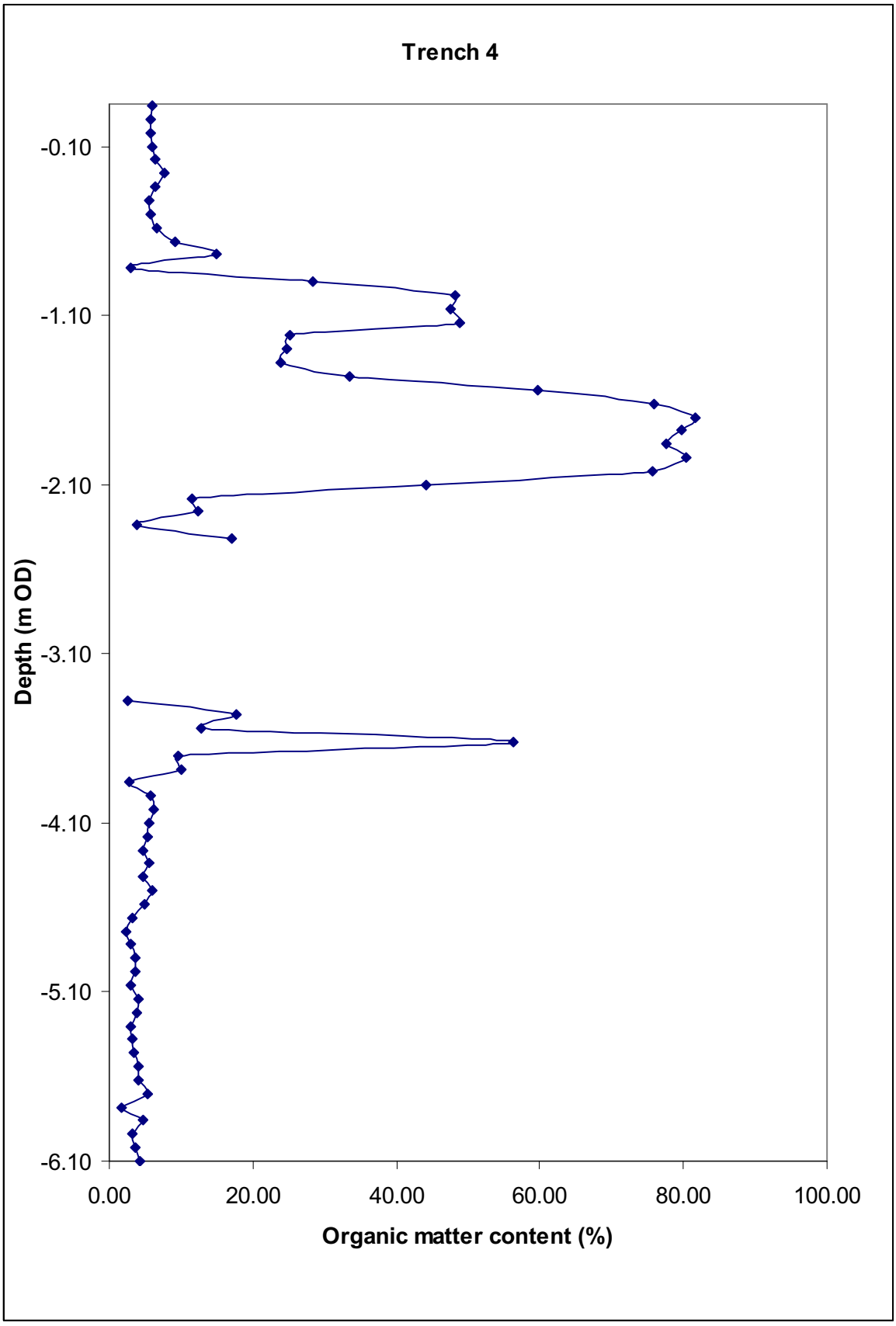

Figure 7: Organic matter content (<30> and <71> to <75>) obtained from Trench 4, Norman Road, Belvedere, London Borough of Bexley (NNB07)

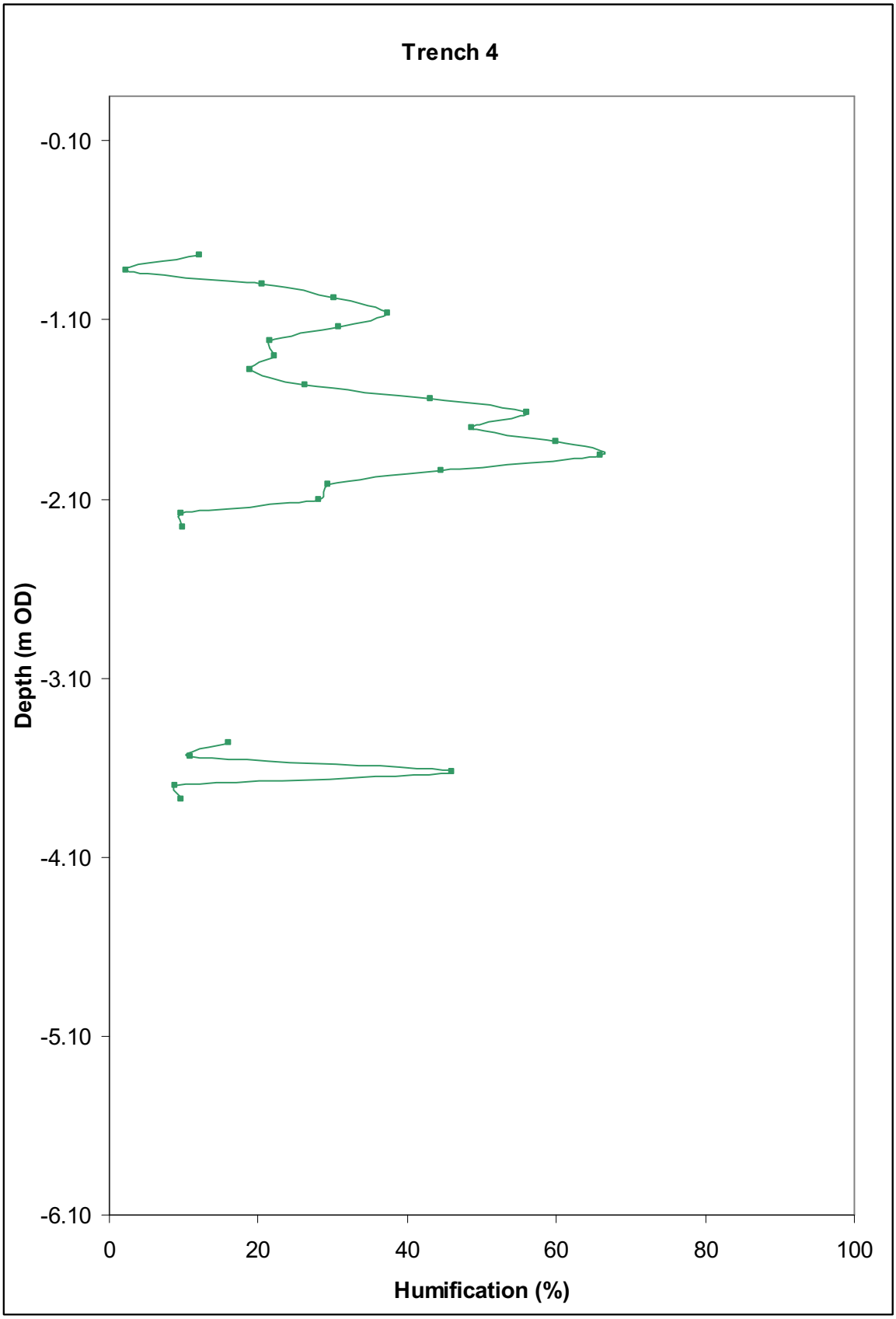

Figure 8: Humification results (<30> and <71> to <75>) obtained from Trench 4, Norman Road, Belvedere, London Borough of Bexley (NNB07)

TABLE 29: ORGANIC MATTER CONTENT OF TRENCH 4, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)		Sample number	Unit number	Context number	Organic matter (%)
To	From				
0.15	0.14	<30>	4	(38)	6.02
0.07	0.06	<30>	4	(38)	5.76
-0.01	-0.02	<30>	4	(38)	5.73
-0.09	-0.10	<30>	4	(38)	5.95
-0.17	-0.18	<30>	4	(38)	6.31
-0.25	-0.26	<30>	3	(38)	7.60
-0.33	-0.34	<30>	2	(38)	6.31
-0.41	-0.42	<30>	2	(39)	5.62
-0.49	-0.50	<30>	2	(39)	5.80
-0.57	-0.58	<30>	2	(39)	6.70
-0.65	-0.66	<30>	6	(39)	9.22
-0.73	-0.74	<71>	5	(39)	14.87
-0.81	-0.82	<71>	5	(40)	3.09
-0.89	-0.90	<71>	5	(40)	28.44
-0.97	-0.98	<71>	4	(40)	48.23
-1.05	-1.06	<71>	4	(40)	47.64
-1.13	-1.14	<71>	4	(40)	48.93
-1.21	-1.22	<71>	3	(40)	25.16
-1.29	-1.30	<71>	3	(40)	24.78
-1.37	-1.38	<71>	3	(40)	23.97
-1.45	-1.46	<71>	3	(40)	33.40
-1.53	-1.54	<72>	7	(40)	59.67
-1.61	-1.62	<72>	6	(40)	76.01
-1.69	-1.70	<72>	5	(40)	81.64
-1.77	-1.78	<72>	5	(40)	79.79
-1.85	-1.86	<72>	5	(41)	77.67
-1.93	-1.94	<72>	4	(41)	80.38
-2.01	-2.02	<72>	4	(41)	75.60
-2.09	-2.10	<72>	4	(41)	44.16
-2.17	-2.18	<72>	3	(41)	11.56
-2.25	-2.26	<72>	2	(41)	12.46
-2.33	-2.34	<72>	2	(41)	3.81
-2.41	-2.42	<72>	1	(41)	16.97
-3.37	-3.38	<73>	6	(41)	2.63
-3.45	-3.46	<73>	5	(41)	17.64
-3.53	-3.54	<73>	5	(41)	12.81
-3.61	-3.62	<73>	5	(41)	56.22
-3.69	-3.70	<73>	5	(41)	9.54
-3.77	-3.78	<73>	5	(41)	38.38
-3.85	-3.86	<73>	3	(41)	2.80
-3.93	-3.94	<73>	3	(41)	5.86
-4.01	-4.02	<73>	2	(41)	6.29
-4.09	-4.10	<73>	2	(41)	5.60
-4.17	-4.18	<73>	1	(41)	5.29
-4.25	-4.26	<74>	2	(41)	4.72
-4.33	-4.34	<74>	2	(41)	5.60
-4.41	-4.42	<74>	2	(41)	4.59
-4.49	-4.50	<74>	2	(41)	5.95
-4.57	-4.58	<74>	2	(41)	4.86
-4.65	-4.66	<74>	1	(41)	3.28
-4.73	-4.74	<74>	1	(41)	2.33

-4.81	-4.82	<74>	1	(41)	2.99
-4.89	-4.90	<74>	1	(41)	3.56
-4.97	-4.98	<74>	1	(41)	3.61
-5.05	-5.06	<74>	1	(41)	2.90
-5.13	-5.14	<75>	1	(41)	4.00
-5.21	-5.22	<75>	1	(41)	3.79
-5.29	-5.30	<75>	1	(41)	2.91
-5.37	-5.38	<75>	1	(41)	3.27
-5.45	-5.46	<75>	1	(41)	4.12
-5.53	-5.54	<75>	1	(41)	4.04
-5.61	-5.62	<75>	1	(41)	5.29
-5.69	-5.70	<75>	1	(41)	1.70
-5.77	-5.78	<75>	1	(41)	4.71
-5.85	-5.86	<75>	1	(41)	3.15
-5.93	-5.94	<75>	1	(41)	3.67
-6.01	-6.02	<75>	1	(41)	4.21
-6.09	-6.10	<75>	1	(41)	4.12

TABLE 30: HUMIFICATION ANALYSIS OF TRENCH 4, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)		Sample number	Unit number	Context number	Humification (%)
To	From				
-0.73	-0.74	<71>	5	(39)	12.13
-0.81	-0.82	<71>	5	(40)	2.28
-0.89	-0.90	<71>	5	(40)	20.59
-0.97	-0.98	<71>	4	(40)	30.29
-1.05	-1.06	<71>	4	(40)	37.47
-1.13	-1.14	<71>	4	(40)	30.78
-1.21	-1.22	<71>	3	(40)	21.65
-1.29	-1.30	<71>	3	(40)	22.15
-1.37	-1.38	<71>	3	(40)	18.89
-1.45	-1.46	<71>	3	(40)	26.23
-1.53	-1.54	<72>	7	(40)	43.05
-1.61	-1.62	<72>	6	(40)	56.06
-1.69	-1.70	<72>	5	(40)	48.57
-1.77	-1.78	<72>	5	(40)	59.96
-1.85	-1.86	<72>	5	(41)	65.83
-1.93	-1.94	<72>	4	(41)	44.49
-2.01	-2.02	<72>	4	(41)	29.37
-2.09	-2.10	<72>	4	(41)	28.22
-2.17	-2.18	<72>	3	(41)	9.70
-2.25	-2.26	<72>	2	(41)	9.81
-3.45	-3.46	<73>	5	(41)	16.09
-3.53	-3.54	<73>	5	(41)	10.91
-3.61	-3.62	<73>	5	(41)	45.96
-3.69	-3.70	<73>	5	(41)	8.82
-3.77	-3.78	<73>	5	(41)	9.60

Trench 5

The results of the Trench 5 lithological assessment are displayed in Tables 31 to 37 and Figure 9. Dominantly sands with occasional detrital wood were recorded from the base of the Trench 3 (-6.50m OD) to -2.11m OD (samples <10> to <7> and <3>; context (13)). Auger samples taken by Pre-Construct Archaeology Ltd indicate these sediments continued to at least -8.60m OD. These fine grained deposits most likely represent deposition from suspension (alluvium) on the margins of (floodplain) a river channel within a low to moderate energy river system. From -2.11m to -1.46m OD (sample <3>), the lithostratigraphy indicates a sharp transition into well humified wood peat (context (3)), most likely representing a change in environment from low to moderate energy river system to semi-terrestrial peat forming conditions. This transition may have been brought about by: (1) a reduction in the rate of sea-level rise (see Devoy, 1979, 1982; Haggart, 1995; Sidell *et al*., 2000), or (2) local factors, such as a change in the proximity of the river channel permitting the formation of an extensive back swamp. Between -1.46m and -0.80m OD, the lithostratigraphy indicates a change from well humified wood peat to organic rich clay with detrital wood (sample <2>; context (3)), to fine grained mineral-rich sediment deposition above -0.80m OD (context (2)). This most likely represents a change in environment to semi-aquatic or less stable semi-terrestrial conditions between -1.46m and -0.80m OD, prior to fluvial inundation above -0.80m OD. This environmental transition may have been caused by one or more of the following: (1) an increase in the rate of relative sea level rise, or (2) a change in the proximity of the river channel. These mineral rich alluvial sediments were overlain by made ground deposits from 0.5m to +1.20m OD (context (1)) according to field records made by Pre-Construct Archaeology Ltd.

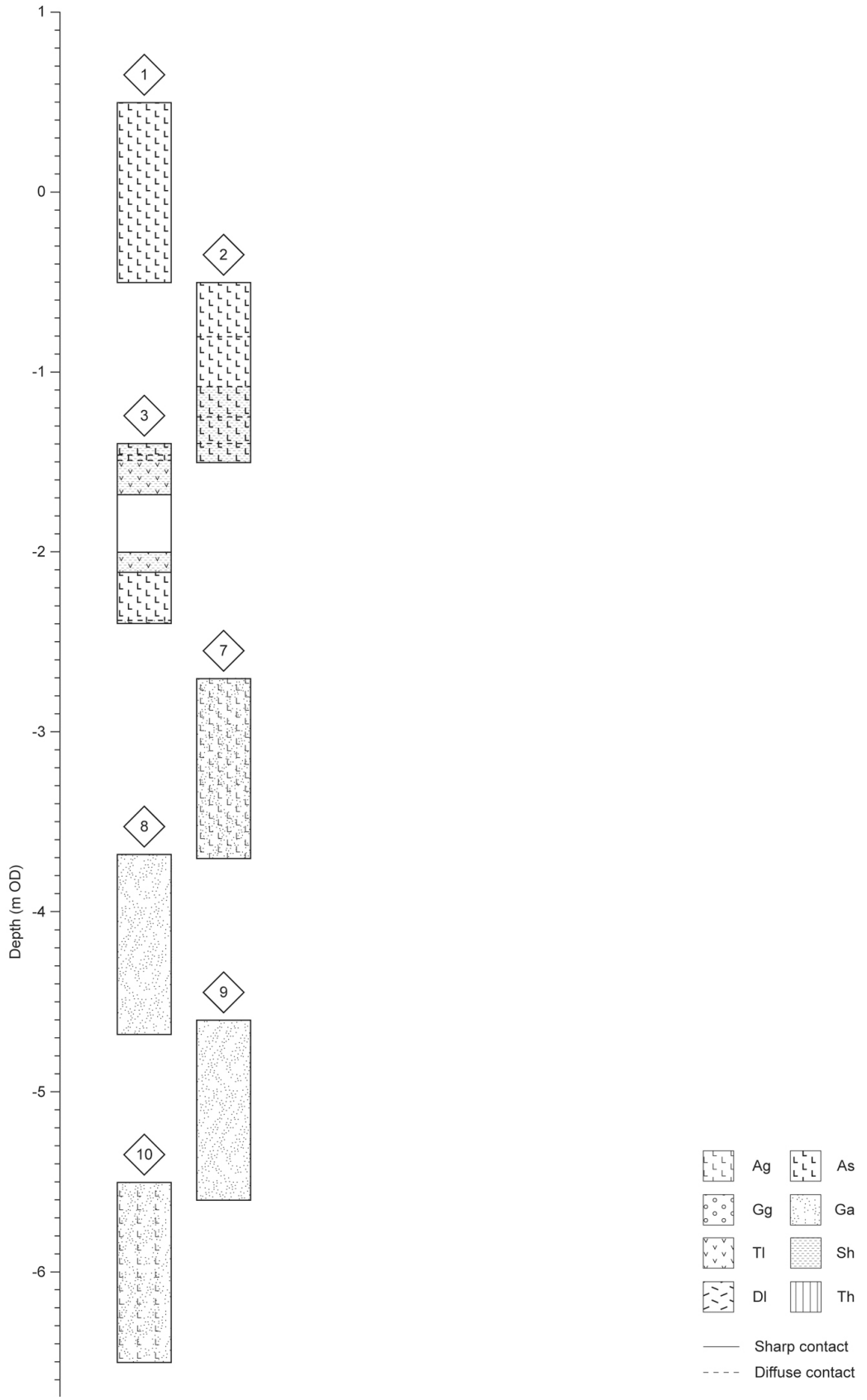

Figure 9: Lithostratigraphy of column samples <1> to <10> obtained from Trench 5, Norman Road, Belvedere, London Borough of Bexley (NNB07)

TABLE 31: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <1>, TRENCH 5, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
0.50 to -0.50	1	(2)	10YR 4/2; As4, Gg+; Dark greyish brown clay with gravel inclusions

TABLE 32: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <2>, TRENCH 5, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-0.50 to -0.80	5	(2)	10YR 5/1; As4; Grey clay; diffuse contact into:
-0.80 to -1.08	4	(3)	10YR 4/1; As4, Sh+, Dl+; Dark grey clay with organic and detrital wood inclusions; diffuse contact into:
-1.08 to -1.25	3	(3)	10YR 4/1; As3, Sh1, Dl+; Dark grey organic rich clay with detrital wood inclusions; diffuse contact into:
-1.25 to -1.40	2	(3)	10YR 3/1; As3, Sh1, Dl+; Very dark grey organic rich clay with detrital wood inclusions; diffuse contact into:
-1.40 to -1.50	1	(3)	10YR 3/1; As3, Sh1, Dl+; Very dark grey organic rich clay with detrital wood inclusions

TABLE 33: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <3>, TRENCH 5, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-1.40 to -1.46	6	(3)	10YR 3/1; As3, Sh1, Dl+; Very dark grey organic rich clay with detrital wood inclusions; diffuse contact into:
-1.46 to -1.49	5	(3)	10YR 3/1; Sh2, Tl^{4}1, As1, Th^{3}+; Very dark grey very organic rich clay and well humified wood peat with well humified herbaceous peat inclusions; diffuse contact into:
-1.49 to -1.68	4	(3)	10YR 2/1; Sh3, $Tl^{3/4}$1, Th^{3}+; Black very organic well humified wood peat with herbaceous peat inclusions
-1.68 to -2.00			VOID
-2.00 to -2.11	3	(3)	10YR 2/1; Sh3, Tl^{4}1, Th^{3}+; Black very organic well humified wood peat with herbaceous peat inclusions; sharp contact into:
-2.11 to -2.38	2	(13)	Gley 1 5/10Y; As4, Dl+, Sh+; Greenish grey clay with detrital wood and organic inclusions; diffuse contact into:

-2.38 to -2.40	1	(13)	Gley 1 5/10Y; Ga3, Ag1, Dl+, Sh+; Greenish grey silty sand with detrital wood and organic inclusions.

TABLE 34: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <7>, TRENCH 5, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-2.70 to -3.70	1	(13)	5Y 4/2; Ga3, Ag1, Dl+; Olive grey silty sand with detrital wood inclusions

TABLE 35: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <8>, TRENCH 5, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-3.68 to -4.68	1	(13)	5Y 4/2; Ga4, Sh+, Dl+; Olive grey sand with organic and detrital wood inclusions

TABLE 36: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <9>, TRENCH 5, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-4.60 to -5.60	1	(13)	5Y 4/2; Ga4; Olive grey sand.

TABLE 37: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <10>, TRENCH 5, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-5.50 to -6.50	1	(13)	5Y 4/2; Ga3, Ag1, As+, Dl+; Olive grey silty sand with clay and detrital wood inclusions

Trench 6

The results of the Trench 6 lithological assessment are displayed in Tables 38 to 44, and 45 and 46, and Figures 10, 11 and 12. Below the base of Trench 6, auger samples were taken by Pre-Construct Archaeology Ltd to a depth of -9.4m OD. The auger recorded gravel deposits below -9.4 m OD (context (59)) and most likely represents the Shepperton Gravel of Late Devensian Age. This was overlain by 'mid blueish grey silts and sandy silts' from -9.4m OD (context (33)). These fine-grained mineral-rich deposits (organic matter values <10%), with various quantities of detrital wood, continued to accumulate until -2.45/2.38m OD (samples <29> to <25>; context (33)). Higher organic matter values of up to 35% were recorded between -6.18m to -5.90m OD (sample <29>, unit 5), and of up to 20% between -3.86m and -2.90m OD (samples <26>, units 1-6; <25>, units 1-3). These fine grained deposits were most likely deposited from suspension (alluvium) on the margins (floodplain) of a river channel and within a low to moderate energy river system, with periods of higher organic matter content representing small shifts towards semi-terrestrial conditions.

From -2.45/2.38m to -1.78m OD (samples <25> and <24>), the lithostratigraphic record indicates a sharp transition into wood peat (context (31); *ca*. 75% organic matter). These trends indicate a transition towards semi-terrestrial peat forming conditions. This transition may have been brought about by: (1) a reduction in the rate of sea-level rise (see Devoy, 1979, 1982; Haggart, 1995; Sidell *et al*., 2000), or (2) local factors, such as a change in the proximity of the river channel permitting the formation of an extensive back swamp. Humification values indicate that the bog surface was well humified and thus relatively dry and stable during this period (Table 46; Figure 12). From -1.78m to -0.82m OD, organic matter values decreased from *ca*. 75% to *ca*. 35%, and humification values declined from *ca*. 50% to *ca*. <30% (context (31)). This indicates a transition towards a wetter and more unstable peat surface that was intermittently inundated by mineral rich sediments (flood deposits). From -0.82m OD, a change to mineral rich sediment and a decline in organic matter content indicates the formation of a fully fluvial environment (context (<30>)). These two phases may have been caused by one or more of the following: (1) a gradual but sustained increase in the rate of relative sea level rise, or (2) a change in the proximity of the river channel. The mineral-rich alluvial sediments were overlain by made ground deposits from *ca*. +0.5m to +1.64m OD (context (29)) according to field records made by Pre-Construct Archaeology Ltd.

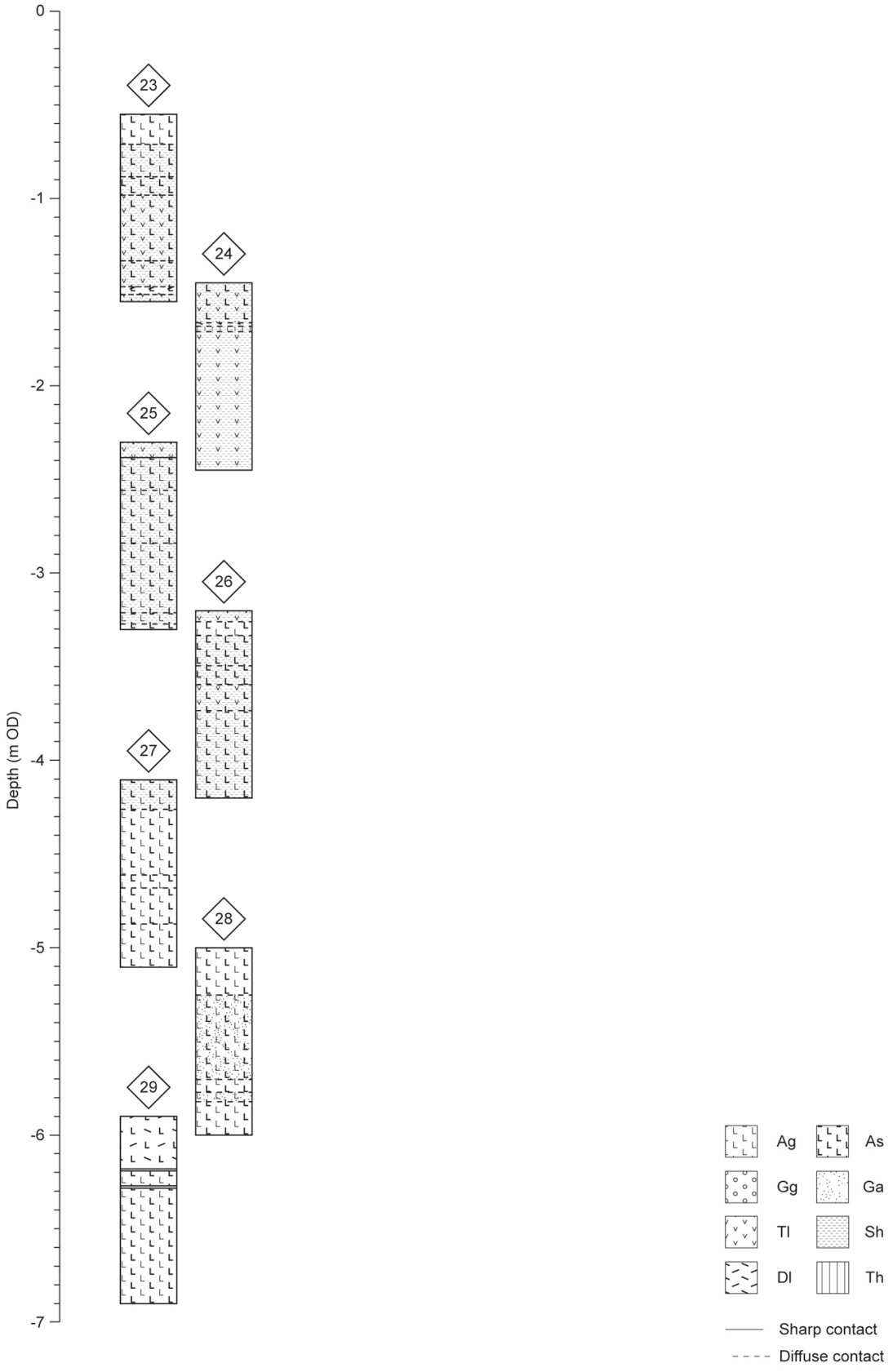

Figure 10: Lithostratigraphy of column samples <23> to <29> obtained from Trench 6, Norman Road, Belvedere, London Borough of Bexley (NNB07)

TABLE 38: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <23>, TRENCH 6, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-0.55 to -0.71	7	(31)/(30)	10YR 4/1; As3, Ag1, Sh+, Dl+; Dark grey silty clay with organic and detrital wood inclusions; diffuse contact into:
-0.71 to -0.88	6	(31)	10YR 3/1; As2, Ag1, Sh1, Dl+; Very dark grey organic rich silty clay with detrital wood inclusions; diffuse contact into:
-0.88 to -0.98	5	(31)	10YR 3/1; Sh2, As2, Tl^{3}+, Th^{3}+; Very dark grey organic rich clay with well humified wood and herbaceous peat inclusions; diffuse contact into:
-0.98 to -1.33	4	(31)	10YR 3/1; As2, Sh1, Tl^{3}1, Th^{3}+; Very dark grey organic rich clay and well humified wood peat with well humified herbaceous peat inclusions; diffuse contact into:
-1.33 to -1.47	3	(31)	10YR 3/1; Sh2, As1, Tl^{4}1; Th^{3}+; Very dark grey, very organic rich clay well humified wood peat with well humified herbaceous peat inclusions; diffuse contact into:
-1.47 to -1.51	2	(31)	10YR 4/1; As3, Dl1, Sh+; Dark grey clay and detrital wood with organic inclusions; diffuse contact into:
-1.51 to -1.55	1	(31)	10YR 3/1; Sh2, As1, Tl^{3}1; Th^{3}+; Very dark grey, very organic rich clay and well humified wood peat with well humified herbaceous peat inclusions

TABLE 39: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <24>, TRENCH 6, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-1.45 to -1.56	4	(31)	10YR 3/1; As2, Sh1, Tl^{3}1, Th^{3}+; Very dark grey organic rich clay and well humified wood peat with well humified herbaceous peat; diffuse contact into:
-1.56 to -1.58	3	(31)	10YR 4/1; As3, Dl1, Sh+, Dh+; Dark grey clay and detrital wood with organic and detrital herbaceous material; diffuse contact into:
-1.58 to -1.71	2	(31)	10YR 3/1; Sh3, Th^{3}1, Tl^{3}+, As+; Very dark grey very organic rich well humified herbaceous peat with well humified wood peat and clay inclusions; diffuse contact into:
-1.71 to -2.45	1	(31)	10YR 2/1; Sh3, Tl^{4}1, Th^{3}+; Black very organic well humified wood peat with well humified herbaceous peat.

TABLE 40: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <25>, TRENCH 6, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-2.30 to -2.38	6	(31)	10YR 2/1; Sh3, Tl^{4}1, Th^{3}+; Black very organic well humified wood peat with well humified herbaceous peat; sharp contact into:
-2.38 to -2.56	5	(33)	Gley 1 5/10Y; As3, Ag1, Sh1, Dh+ Dl+; Greenish grey organic rich silty clay with detrital wood and herbaceous inclusions; diffuse contact into:
-2.56 to -2.84	4	(33)	Gley 1 5/10Y; As3, Ag1, Sh1, Dh+ Dl+; Greenish grey organic rich silty clay with detrital wood and herbaceous inclusions; diffuse contact into:
-2.84 to -3.21	3	(33)	10YR 4/1; As2, Ag1, Sh1, Dl+; Dark grey organic rich silty clay with detrital wood inclusions; diffuse contact into:
-3.21 to -3.27	2	(33)	10YR 3/1; Sh2, As1, Ag1, Tl^{3}+; Very dark grey very organic rich silty clay with well humified wood peat inclusions; diffuse contact into:
-3.27 to -3.30	1	(33)	10YR 4/1; As2, Ag2, Sh+, Dl+; Dark grey silty clay with organic and detrital wood inclusions

TABLE 41: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <26>, TRENCH 6, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-3.20 to -3.26	6	(33)	10YR 3/1; Sh2, As1, Tl^{3}+; Very dark grey very organic rich clay and well humified wood peat; diffuse contact into:
-3.26 to -3.33	5	(33)	10YR 4/1; As2, Ag2, Sh+, Dl+; Dark grey silty clay with organic and detrital wood inclusions; diffuse contact into:
-3.33 to -3.49	4	(33)	10YR 3/1; As2, Sh1, Tl^{3}1; Very dark grey organic rich clay and well humified wood peat; diffuse contact into:
-3.49 to -3.59	3	(33)	10YR 3/1; Sh2, As1, Tl^{3}+; Very dark grey very organic rich clay and well humified wood peat; diffuse contact into:
-3.59 to -3.73	2	(33)	10YR 4/1; As2, Sh1, Tl^{3}1; Dark grey organic rich clay and well humified wood peat; diffuse contact into:
-3.79 to -4.20	1	(33)	Gley 1 4/10Y; As2, Sh1, Ag1, Dl+, shells+; Dark greenish grey organic rich silty clay with detrital wood and shell inclusions

TABLE 42: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <27>, TRENCH 6, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-4.10 to -4.26	5	(33)	Gley 1 4/10Y; As2, Sh1, Ag1, Dl+, shells+; Dark greenish grey organic rich silty clay with detrital wood and shell inclusions; diffuse contact into:
-4.26 to -4.61	4	(33)	Gley 1 5/10Y; As2, Ag2, Dl+, shells+; Greenish grey silty clay with detrital wood and shell inclusions; diffuse contact into:
-4.61 to -4.68	3	(33)	10YR 4/1; As2, Ag2, Dl+, shells+, Sh+; Dark grey silty clay with detrital wood, shell, and organic inclusions; diffuse contact into:
-4.68 to -4.87	2	(33)	Gley 1 6/10Y; As2, Ag2, Dl+, shells+; Greenish grey silty clay with detrital wood and shell inclusions; diffuse contact into:
-4.87 to -5.10	1	(33)	Gley 1 4/10Y; As2, Ag2, Sh+, Dl+, shells+; Dark greenish grey organic rich silty clay with organic, detrital wood and shell inclusions; diffuse contact into:

TABLE 43: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <28>, TRENCH 6, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-5.00 to -5.25	5	(33)	Gley 1 4/10Y; As2, Ag2, Sh+, Dl+, shells+; Dark greenish grey organic rich silty clay with organic, detrital wood and shell inclusions; diffuse contact into:
-5.25 to -5.70	4	(33)	Gley 1 5/10Y; Ag2, As1, Ga1, Dl+, shells+; Greenish grey sandy, clayey silt with detrital wood and shell inclusions; diffuse contact into:
-5.70 to -5.77	3	(33)	10YR 4/1; As2, Ag2, Sh+, Dl+, shells+; Dark grey organic rich silty clay with organic, detrital wood and shell inclusions; diffuse contact into:
-5.77 to -5.82	2	(33)	Gley 1 5/10Y; Ag2, As1, Ga1, Dl+, shells+; Greenish grey sandy, clayey silt with detrital wood and shell inclusions; diffuse contact into:
-5.82 to -6.00	1	(33)	10YR 4/1; As3, Ag1, Sh+, Dl+, shells+; Dark grey organic rich silty clay with organic, detrital wood and shell inclusions.

TABLE 44: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <29>, TRENCH 6, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-5.90 to -6.18	5	(33)	10YR 3/1; As2, Sh1, Dl1; Very dark grey organic rich clay and detrital wood; sharp contact into:
-6.18 to -6.19	4	(33)	10YR 2/1; Dl4; Black detrital wood; sharp contact into:
-6.19 to -6.27	3	(33)	10YR 4/1; 10YR 4/1; As2, Ag2, Sh+, Dl+; Dark grey silty clay with organic and detrital wood inclusions; sharp contact into:
-6.27 to -6.28	2	(33)	10YR 2/1; Dl4; Black detrital wood; sharp contact into:
-6.28 to -6.90	1	(33)	10YR 5/1; As2, Ag2, Sh+, Dl+; Grey silty clay with organic and detrital wood inclusions.

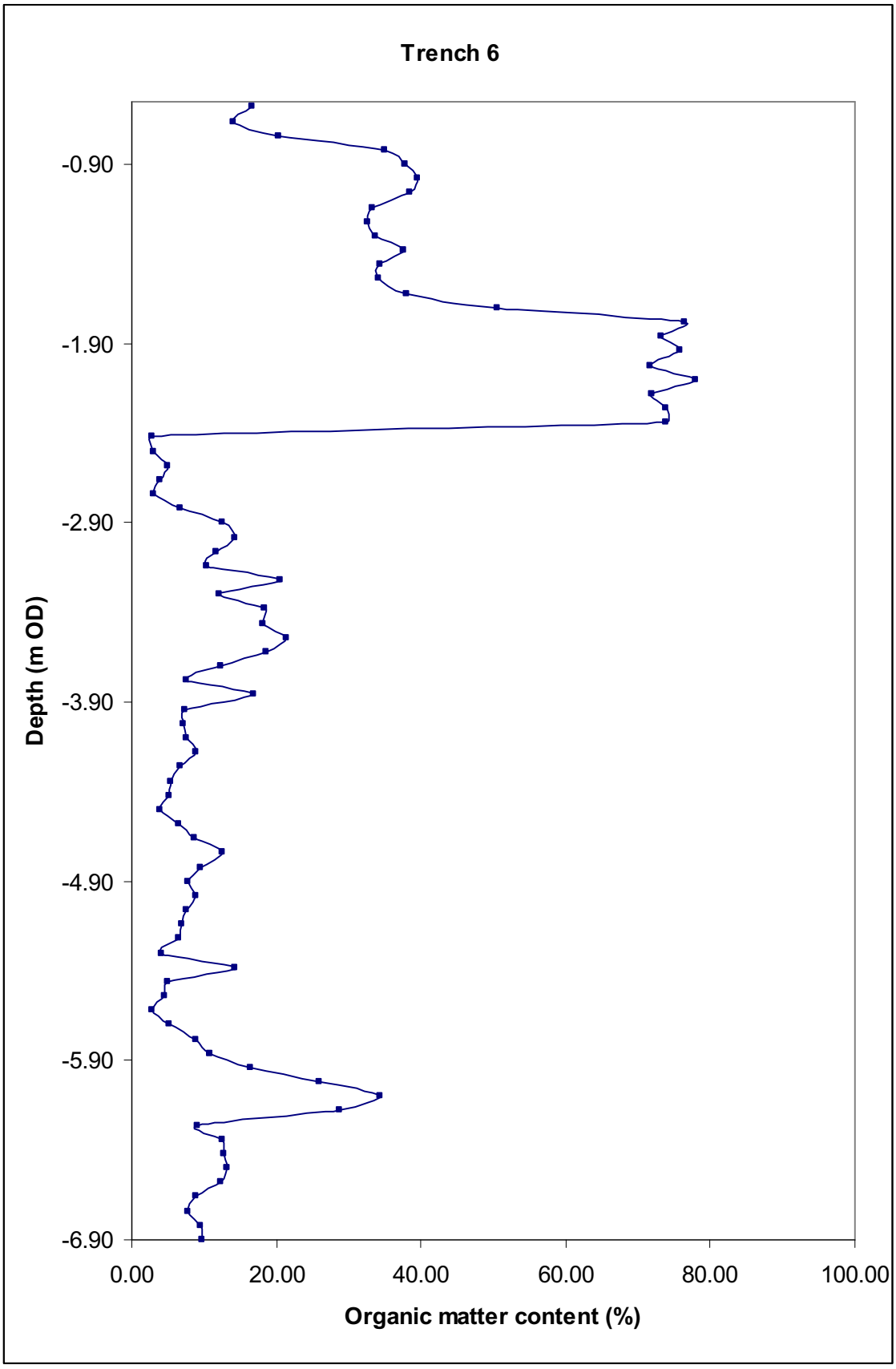

Figure 11: Organic matter content (<23> to <29>) obtained from Trench 6, Norman Road, Belvedere, London Borough of Bexley (NNB07)

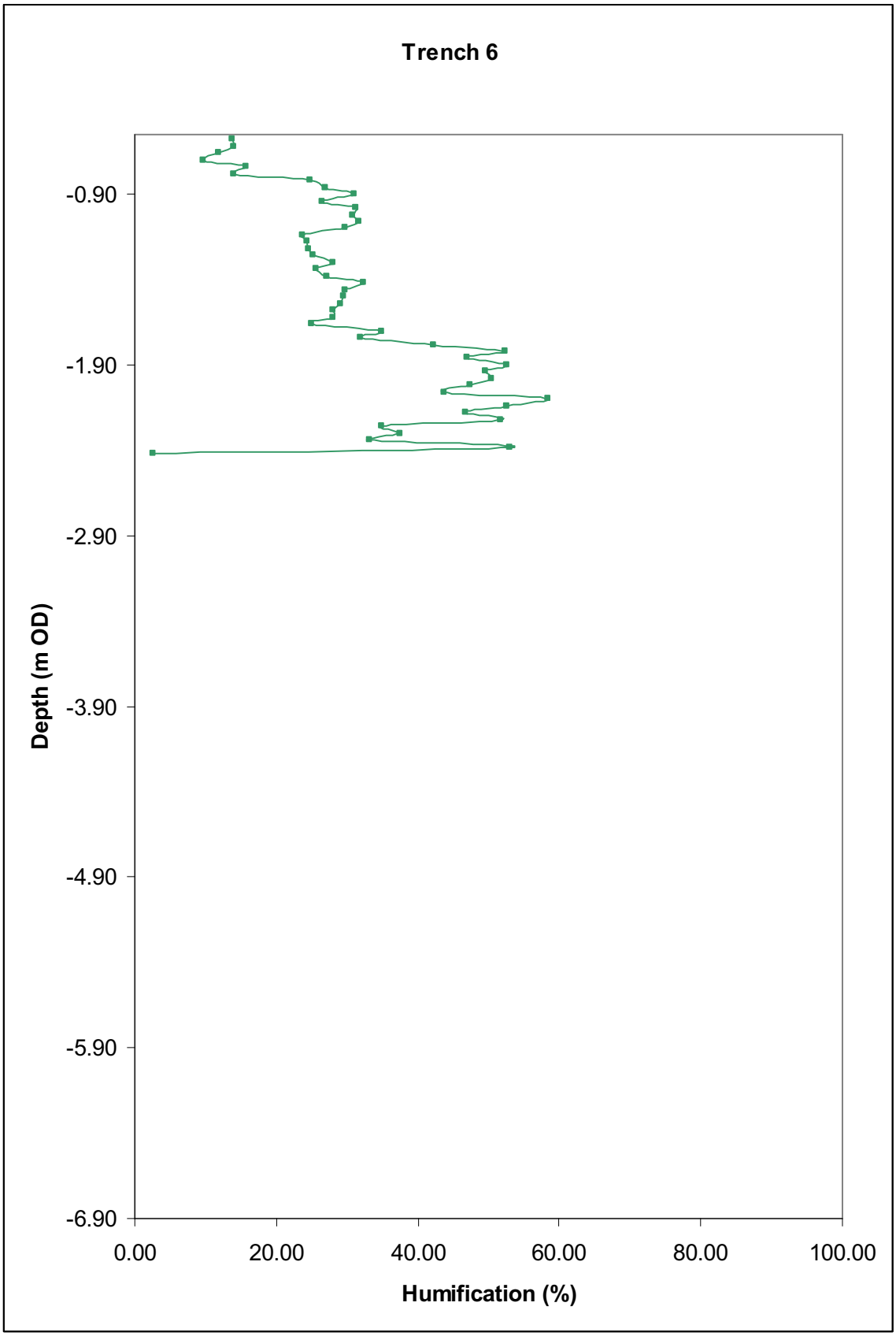

Figure 12: Humification results (<23> to <29>) obtained from Trench 6, Norman Road, Belvedere, London Borough of Bexley (NNB07)

TABLE 45: ORGANIC MATTER CONTENT OF TRENCH 6, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)		Sample number	Unit number	Context number	Organic matter (%)
To	From				
-0.57	-0.58	<23>	7	(30)	16.72
-0.65	-0.66	<23>	7	(31)	14.07
-0.73	-0.74	<23>	6	(31)	20.33
-0.81	-0.82	<23>	6	(31)	34.94
-0.89	-0.90	<23>	5	(31)	37.88
-0.97	-0.98	<23>	5	(31)	39.48
-1.05	-1.06	<23>	4	(31)	38.37
-1.13	-1.14	<23>	4	(31)	33.18
-1.21	-1.22	<23>	4	(31)	32.64
-1.29	-1.30	<23>	4	(31)	33.68
-1.37	-1.38	<23>	3	(31)	37.56
-1.45	-1.46	<24>	4	(31)	34.26
-1.53	-1.54	<24>	3	(31)	34.05
-1.61	-1.62	<24>	2	(31)	38.03
-1.69	-1.70	<24>	2	(31)	50.64
-1.77	-1.78	<24>	1	(31)	76.42
-1.85	-1.86	<24>	1	(31)	73.13
-1.93	-1.94	<24>	1	(31)	75.83
-2.01	-2.02	<24>	1	(31)	71.71
-2.09	-2.10	<24>	1	(31)	77.98
-2.17	-2.18	<24>	1	(31)	71.95
-2.25	-2.26	<24>	1	(31)	73.92
-2.33	-2.34	<25>	6	(31)	73.81
-2.41	-2.42	<25>	5	(33)	2.73
-2.49	-2.50	<25>	5	(33)	3.07
-2.57	-2.58	<25>	4	(33)	4.87
-2.65	-2.66	<25>	4	(33)	3.99
-2.73	-2.74	<25>	4	(33)	3.11
-2.81	-2.82	<25>	4	(33)	6.75
-2.89	-2.90	<25>	3	(33)	12.51
-2.97	-2.98	<25>	3	(33)	14.25
-3.05	-3.06	<25>	3	(33)	11.75
-3.13	-3.14	<25>	3	(33)	10.38
-3.21	-3.22	<26>	6	(33)	20.47
-3.29	-3.30	<26>	5	(33)	12.06
-3.37	-3.38	<26>	4	(33)	18.42
-3.45	-3.46	<26>	4	(33)	18.05
-3.53	-3.54	<26>	3	(33)	21.34
-3.61	-3.62	<26>	2	(33)	18.61
-3.69	-3.70	<26>	2	(33)	12.30
-3.77	-3.78	<26>	2	(33)	7.45
-3.85	-3.86	<26>	1	(33)	16.88
-3.93	-3.94	<26>	1	(33)	7.41
-4.01	-4.02	<26>	1	(33)	7.16
-4.09	-4.10	<26>	1	(33)	7.63
-4.17	-4.18	<27>	5	(33)	8.90
-4.25	-4.26	<27>	5	(33)	6.72
-4.33	-4.34	<27>	4	(33)	5.30
-4.41	-4.42	<27>	4	(33)	5.24
-4.49	-4.50	<27>	4	(33)	3.88
-4.57	-4.58	<27>	4	(33)	6.57

-4.65	-4.66	<27>	3	(33)	8.63
-4.73	-4.74	<27>	2	(33)	12.62
-4.81	-4.82	<27>	2	(33)	9.61
-4.89	-4.90	<27>	1	(33)	7.86
-4.97	-4.98	<27>	1	(33)	8.88
-5.05	-5.06	<28>	5	(33)	7.66
-5.13	-5.14	<28>	5	(33)	6.91
-5.21	-5.22	<28>	5	(33)	6.54
-5.29	-5.30	<28>	5	(33)	4.16
-5.37	-5.38	<28>	4	(33)	14.32
-5.45	-5.46	<28>	4	(33)	4.95
-5.53	-5.54	<28>	4	(33)	4.59
-5.61	-5.62	<28>	4	(33)	2.87
-5.69	-5.70	<28>	4	(33)	5.14
-5.77	-5.78	<28>	2	(33)	8.85
-5.85	-5.86	<28>	1	(33)	10.70
-5.93	-5.94	<29>	5	(33)	16.41
-6.01	-6.02	<29>	5	(33)	26.02
-6.09	-6.10	<29>	5	(33)	34.40
-6.17	-6.18	<29>	5	(33)	28.65
-6.25	-6.26	<29>	3	(33)	9.08
-6.33	-6.34	<29>	1	(33)	12.60
-6.41	-6.42	<29>	1	(33)	12.74
-6.49	-6.50	<29>	1	(33)	13.08
-6.57	-6.58	<29>	1	(33)	12.37
-6.65	-6.66	<29>	1	(33)	8.76
-6.73	-6.74	<29>	1	(33)	7.74
-6.81	-6.82	<29>	1	(33)	9.58
-6.89	-6.90	<29>	1	(33)	9.61

TABLE 46: HUMIFICATION ANALYSIS OF TRENCH 6, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)		Sample number	Unit number	Context number	Humification (%)
To	From				
-0.57	-0.58	<23>	7	(30)	13.87
-0.61	-0.62	<23>	7	(30)	14.10
-0.65	-0.66	<23>	7	(31)	11.94
-0.69	-0.70	<23>	7	(31)	9.64
-0.73	-0.74	<23>	6	(31)	15.64
-0.77	-0.78	<23>	6	(31)	14.08
-0.81	-0.82	<23>	6	(31)	24.81
-0.85	-0.86	<23>	6	(31)	26.99
-0.89	-0.90	<23>	5	(31)	31.12
-0.93	-0.94	<23>	5	(31)	26.40
-0.97	-0.98	<23>	5	(31)	31.33
-1.01	-1.02	<23>	4	(31)	30.85
-1.05	-1.06	<23>	4	(31)	31.73
-1.09	-1.10	<23>	4	(31)	29.76
-1.13	-1.14	<23>	4	(31)	23.71
-1.17	-1.18	<23>	4	(31)	24.27
-1.21	-1.22	<23>	4	(31)	24.54
-1.25	-1.26	<23>	4	(31)	25.28
-1.29	-1.30	<23>	4	(31)	27.93
-1.33	-1.34	<23>	3	(31)	25.64

-1.37	-1.38	<23>	3	(31)	27.25
-1.41	-1.42	<23>	3	(31)	32.30
-1.45	-1.46	<24>	4	(31)	29.72
-1.49	-1.50	<24>	4	(31)	29.47
-1.53	-1.54	<24>	4	(31)	29.18
-1.57	-1.58	<24>	3	(31)	27.94
-1.61	-1.62	<24>	2	(31)	28.08
-1.65	-1.66	<24>	2	(31)	24.97
-1.69	-1.70	<24>	2	(31)	34.89
-1.73	-1.74	<24>	1	(31)	31.95
-1.77	-1.78	<24>	1	(31)	42.15
-1.81	-1.82	<24>	1	(31)	52.35
-1.85	-1.86	<24>	1	(31)	46.98
-1.89	-1.90	<24>	1	(31)	52.50
-1.93	-1.94	<24>	1	(31)	49.48
-1.97	-1.98	<24>	1	(31)	50.39
-2.01	-2.02	<24>	1	(31)	47.37
-2.05	-2.06	<24>	1	(31)	43.78
-2.09	-2.10	<24>	1	(31)	58.41
-2.13	-2.14	<24>	1	(31)	52.49
-2.17	-2.18	<24>	1	(31)	46.87
-2.21	-2.22	<24>	1	(31)	51.66
-2.25	-2.26	<24>	1	(31)	34.89
-2.29	-2.30	<24>	1	(31)	37.40
-2.33	-2.34	<25>	6	(31)	33.29
-2.37	-2.38	<25>	6	(31)	52.92
-2.41	-2.42	<25>	5	(33)	2.59

Trench 7

The results of the Trench 7 lithological assessment are displayed in Tables 47 to 54 and Figure 13. Trench 7 was dominated by clays with detrital wood and occasional shells from a depth of -7.00m to -0.10m OD as recorded in samples <90> to <83> (context (47)). These deposits most likely represent deposition from suspension (alluvium) on the margins of a river channel (floodplain) within a low energy fluvial environment. These mineral-rich alluvial sediments were overlain by made ground deposits from -0.10m to +1.65m OD (context (46)) according to field records made by Pre-Construct Archaeology Ltd.

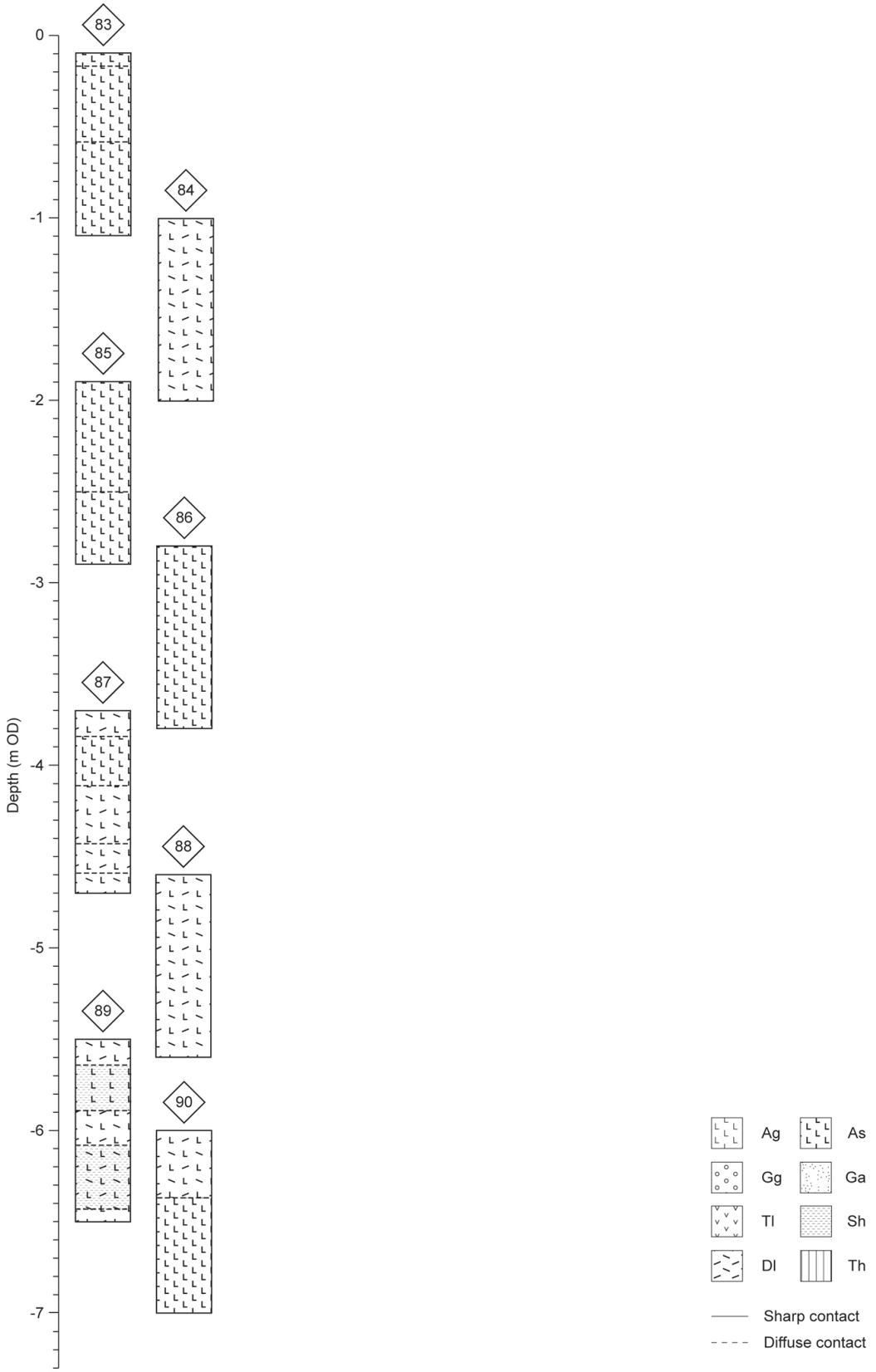

Figure 13: Lithostratigraphy of column samples <83> to <90> obtained from Trench 7, Norman Road, Belvedere, London Borough of Bexley (NNB07)

TABLE 47: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <83>, TRENCH 7, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-0.10 to -0.17	3	(47)	10YR 5/3; As4; Brown clay; diffuse contact into:
-0.17 to -0.58	2	(47)	10YR 5/2; As4, Gg+, Dl+; Greyish brown clay with gravel and detrital wood inclusions; diffuse contact into:
-0.58 to -1.10	1	(47)	10YR 4/1; As4, Dl+, Sh+; Mottled dark grey clay with detrital wood and organic inclusions.

TABLE 48: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <84>, TRENCH 7, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-1.00 to -2.00	1	(47)	10YR 4/1; As3, Dl1; Mottled dark grey clay with detrital wood

TABLE 49: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <85>, TRENCH 7, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-1.90 to -2.50	2	(47)	5Y 4/2; As4; Mottled olive grey clay; diffuse contact into:
-2.50 to -2.90	1	(47)	5Y 4/2; As4; Mottled olive grey clay.

TABLE 50: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <86>, TRENCH 7, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-2.80 to -3.80	1	(47)	5Y 4/2 and 10YR 5/1; As4; Mottled olive grey and grey clay.

TABLE 51: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <87>, TRENCH 7, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-3.70 to -3.84	5	(47)	10YR 4/1; As3, Dl1, shells+; Dark grey clay and detrital wood with shell inclusions; diffuse contact into:
-3.84 to -4.11	4	(47)	10YR 4/2; As4, Dl+, shells+; Dark greyish brown clay with shell and detrital wood inclusions; diffuse contact into:
-4.11 to -4.43	3	(47)	10YR 4/1; As3, Dl1, shells+; Dark grey clay and detrital wood with shell inclusions; diffuse contact into:
-4.43 to -4.59	2	(47)	10YR 4/1; As2, Dl2; Dark grey clay and detrital wood; diffuse contact into:
-4.59 to -4.70	1	(47)	10YR 4/1; As3, Dl1; Dark grey clay and detrital wood.

TABLE 52: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <88>, TRENCH 7, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-4.60 to -5.60	1	(47)	10YR 4/1; As3, Dl1; Dark grey clay and detrital wood.

TABLE 53: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <89>, TRENCH 7, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY

Depth (m OD)	Unit number	Context number	Description
-5.50 to -5.64	5	(47)	10YR 4/1; As3, Dl1, Sh+; Dark grey clay and detrital wood with organic inclusions; diffuse contact into:
-5.64 to -5.89	4	(47)	10YR 3/1; As2, Sh1, Dl1; Very dark grey very organic rich clay with detrital wood; diffuse contact into:
-5.89 to -6.08	3	(47)	10YR 4/1; As3, Dl1, Sh+; Dark grey clay and detrital wood with organic inclusions; diffuse contact into:
-6.08 to -6.43	2	(47)	10YR 3/1; As2, Sh1, Dl1; Very dark grey very organic rich clay with detrital wood; diffuse contact into:
-6.43 to -6.50	1	(47)	10YR 4/1; As3, Dl1; Dark grey clay and detrital wood.

TABLE 54: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <90>, TRENCH 7, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY

Depth (m OD)	Unit number	Context number	Description
-6.00 to -6.37	2	(47)	10YR 4/1; As3, Dl1; Dark grey clay with detrital wood inclusions; diffuse contact into:
-6.37to -7.00	1	(47)	10YR 5/1; As4, Dl+, Sh+; Grey clay with detrital wood and organic inclusions

Trench 8

The results of the Trench 8 lithological assessment are displayed in Tables 55 to 62 and Figure 14. Trench 8 was dominated by clays with silts, detrital wood and occasional shells from a depth of -7.50m to -0.20m OD as recorded from samples <98> to <91> (context (49)). These deposits most likely represent deposition from suspension (alluvium) on the margins of a river channel (floodplain) within a low energy fluvial environment. These mineral-rich alluvial sediments were overlain by made ground deposits from -0.20m to +1.80m OD (context (48)) according to field records made by Pre-Construct Archaeology Ltd.

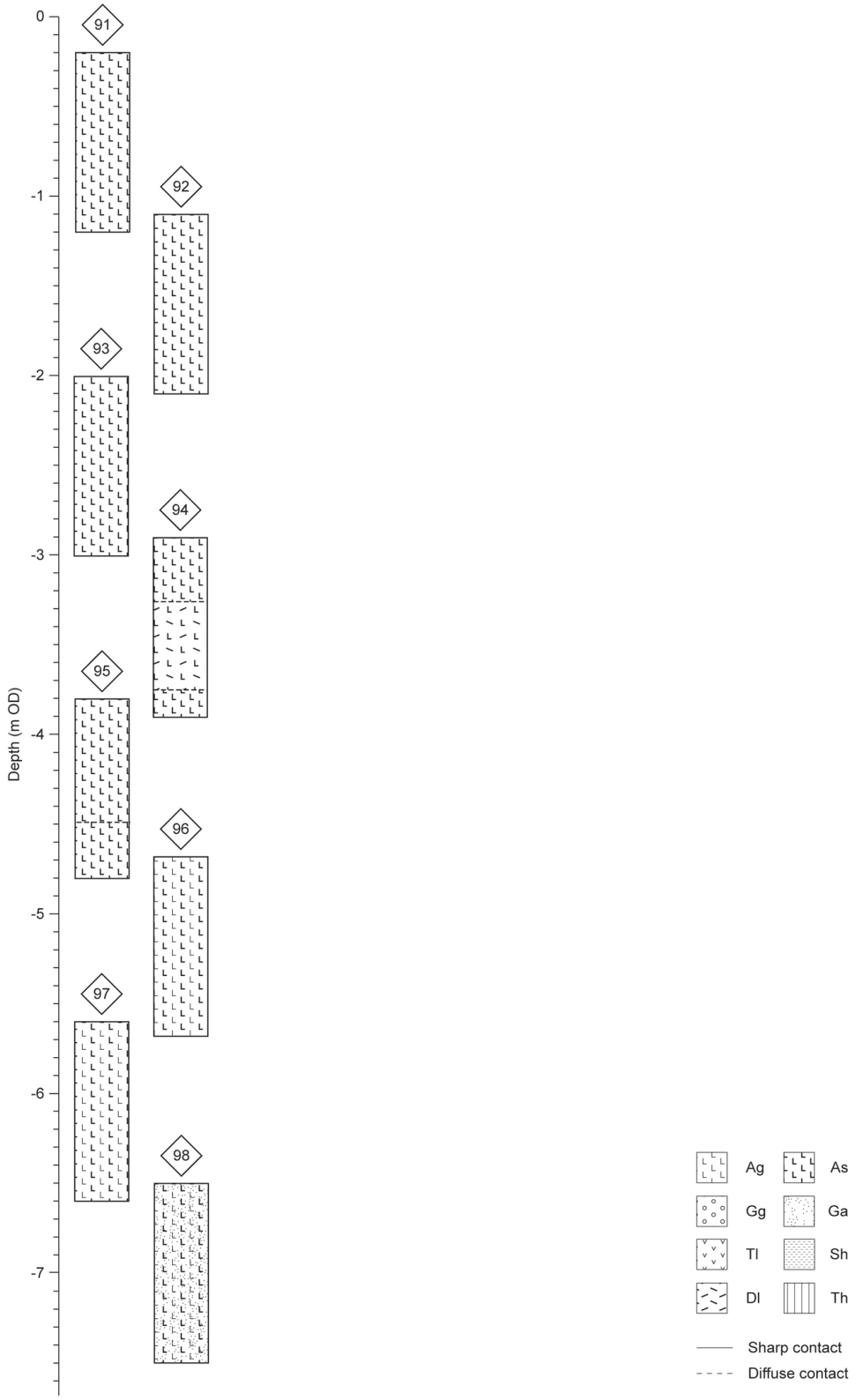

Figure 14: Lithostratigraphy of column samples <91> to <98> obtained from Trench 8, Norman Road, Belvedere, London Borough of Bexley (NNB07)

TABLE 55: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <91>, TRENCH 8, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-0.20 to -1.20	1	(49)	10YR 5/2; As4; Greyish brown clay

TABLE 56: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <92>, TRENCH 8, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-1.10 to -2.10	1	(49)	10YR 5/1; As4, Dl+, shell+; Grey clay with detrital wood and shell inclusions

TABLE 57: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <93>, TRENCH 8, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-2.00 to -3.00	1	(49)	10YR 4/1; As4, Dl+, shell+; Dark grey clay with detrital wood and shell inclusions

TABLE 58: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <94>, TRENCH 8, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-2.90 to -3.26	3	(49)	10YR 4/1; As4, Dl+, shell+; Dark grey clay with detrital wood and shell inclusions; diffuse contact into:
-3.26 to -3.75	2	(49)	10YR 4/1 and 10YR 3/1; As3, Dl1, Sh+; Mottled dark grey and very dark grey clay and detrital wood with organic inclusions; diffuse contact into:
-3.75 to -3.90	1	(49)	10YR 4/1; As4, Sh+, Dl+; Dark grey clay with organic and detrital wood inclusions

TABLE 59: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <95>, TRENCH 8, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-3.80 to -4.49	2	(49)	10YR 4/1; As4, Dl+, shell+; Dark grey clay with detrital wood and shell inclusions; diffuse contact into:
-4.49 to -4.80	1	(49)	5Y 5/2; As4, Dl+, shell; Olive grey silty clay with detrital wood, shell and sand inclusions

TABLE 60: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <96>, TRENCH 8, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-4.70 to -5.70	1	(49)	5Y 5/2; As3, Ag1, Dl+, shell, Ga+; Olive grey silty clay with detrital wood, shell and sand inclusions

TABLE 61: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <97>, TRENCH 8, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-5.60 to -6.60	1	(49)	5Y 5/2; As3, Ag1, Dl+, Ga+; Olive grey silty clay with detrital wood and sand inclusions

TABLE 62: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <98>, TRENCH 8, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-6.50 to -7.50	1	(49)	5Y 5/2; As2, Ag1, Ga1; Olive grey silty sandy clay

Trench 9

The results of the Trench 9 lithological assessment are displayed in Tables 63 to 69 and Figure 15. From the base of the trench at -6.40m, to -4.60m OD, the sediments were dominated by clays with detrital wood, organic material and shell inclusions (samples <105> and <104>; context (55)). These fine grained deposits most likely represent deposition from suspension (alluvium) on the margins of a river channel (floodplain) within a low energy river system. Between -4.60m and -3.17m OD (samples <103> and <102>; context (54)), there was a transition to organic-rich clays with detrital wood. This change in sedimentation represents a transition towards shallower water marginal aquatic conditions. From -3.17m OD to -0.84m OD (samples <102> to <99>; context (53)), there was a transition to sediments dominated by clay with detrital wood and shell inclusions, indicating a return to low energy fluvial conditions. These mineral-rich alluvial sediments were overlain by made ground deposits from -0.84m to +1.63m OD (context (52)) according to field records made by Pre-Construct Archaeology Ltd.

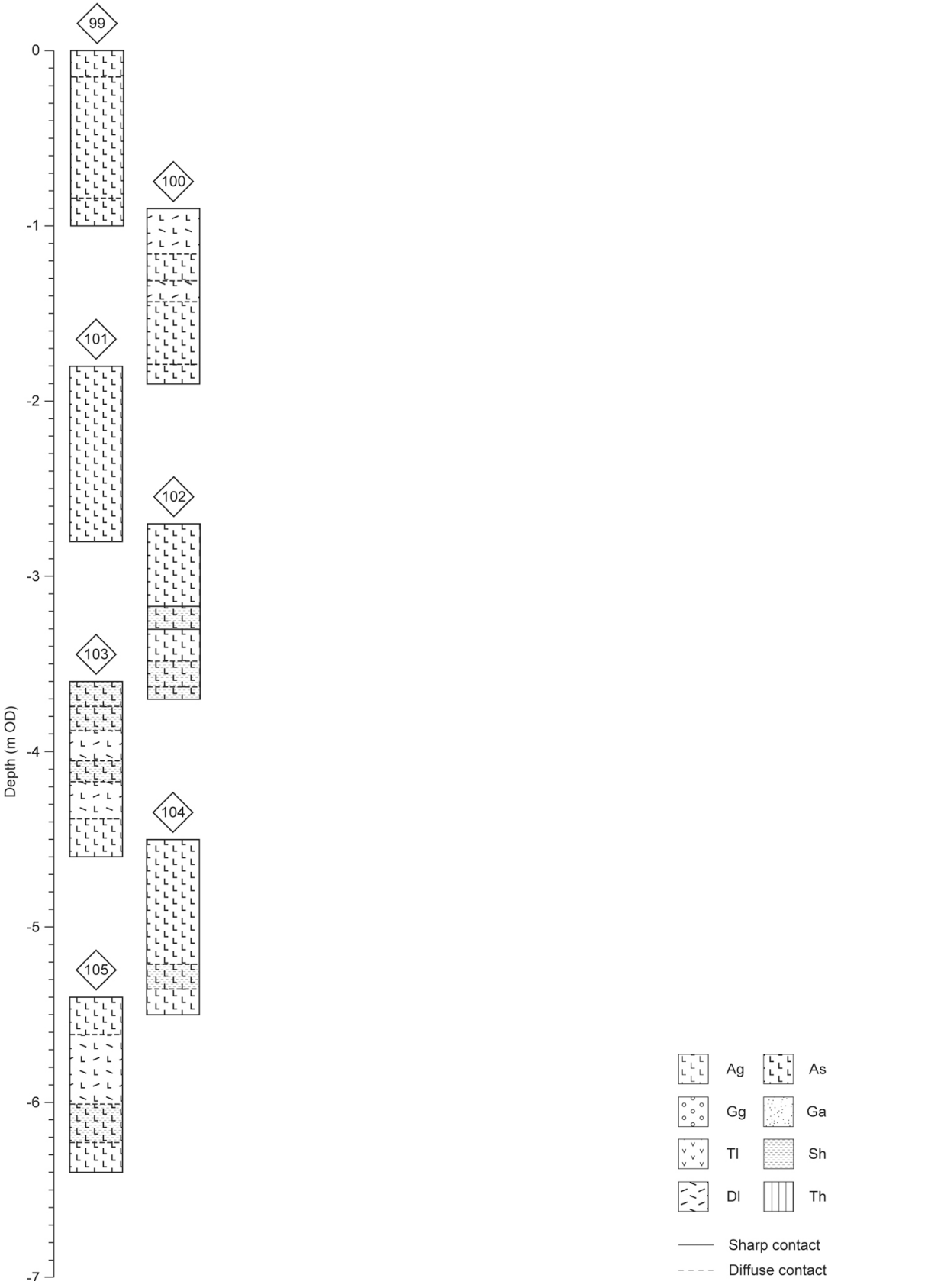

Figure 15: Lithostratigraphy of column samples <99> to <105> obtained from Trench 9, Norman Road, Belvedere, London Borough of Bexley (NNB07)

TABLE 63: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <99>, TRENCH 9, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
0 to -0.15	3	(53)	10YR 5/1; As4; Grey clay; diffuse contact into:
-0.15 to -0.84	2	(53)	10YR 5/2; As4, Gg+; Greyish brown clay with gravel inclusions; diffuse contact into:
-0.84 to -1.00	1	(53)	10YR 4/1; As4, Dl+, shell+; Dark grey clay with detrital wood and shell inclusions

TABLE 64: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <100>, TRENCH 9, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-0.90 to -1.16	5	(53)	10YR 4/1; As3, Dl1, shell+; Dark grey clay and detrital wood with shell inclusions; diffuse contact into:
-1.16 to -1.31	4	(53)	10YR 4/1; As4, Dl+; Dark grey clay with detrital wood inclusions; diffuse contact into:
-1.31 to -1.43	3	(53)	10YR 4/1; As3, Dl1, shell+, chalk+; Dark grey clay and detrital wood with shell and chalk inclusions; diffuse contact into:
-1.43 to -1.79	2	(53)	10YR 4/1; As4, Dl+; Dark grey clay with detrital wood inclusions; diffuse contact into:
-1.79 to -1.90	1	(53)	10YR 4/1; As4, Dl+, shell+, Sh; Dark grey clay with shell, organic and detrital wood inclusions

TABLE 65: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <101>, TRENCH 9, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-1.8 to -2.8	2	(53)	10YR 5/1; As4, Dl+, shell+, Sh; Grey clay with shell, organic and detrital wood inclusions

TABLE 66: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <102>, TRENCH 9, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-2.70 to -3.17	5	(53)	10YR 5/1; As4, Dl+, shell+, Sh; Grey clay with shell, organic and detrital wood inclusions; sharp contact into:
-3.17 to -3.30	4	(54)	10YR 4/1; As3, Sh1, Dl+, shell+; Dark grey organic rich clay with shell and detrital wood inclusions; sharp contact into:
-3.30 to -3.48	3	(54)	10YR 5/1; As4, Dl+; Grey clay with detrital wood inclusions; diffuse contact into:
-3.48 to -3.63	2	(54)	10YR 4/1; As3, Sh1, Dl+; Dark grey organic rich clay with detrital wood inclusions; diffuse contact into:
-3.63 to -3.70	1	(54)	10YR 3/1; As3, Sh1, Dl+; Very dark grey organic rich clay with detrital wood inclusions

TABLE 67: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <103>, TRENCH 9, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-3.60 to -3.74	6	(54)	10YR 4/1; As3, Sh1, Dl+; Dark grey organic rich clay with detrital wood inclusions; diffuse contact into:
-3.74 to -3.89	5	(54)	10YR 3/1; As2, Sh2, Dl+; Very dark grey very organic rich clay with detrital wood inclusions; diffuse contact into:
-3.89 to -4.05	4	(54)	10YR 4/1; As3, Dl1, Sh+; Dark grey clay and detrital wood with organic inclusions; diffuse contact into:
-4.05 to -4.17	3	(54)	10YR 3/1; As2, Sh2, Dl+; Very dark grey very organic rich clay with detrital wood inclusions; diffuse contact into:
-4.17 to -4.38	2	(54)	10YR 3/1 and 10YR 5/1; As3, Dl1, Sh+; Mottled very dark grey to grey clay and detrital wood with organic inclusions; diffuse contact into:
-4.38 to -4.60	1	(54)	10YR 5/1; As4, Dl+, Sh+; Grey clay with detrital wood and organic inclusions

TABLE 68: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <104>, TRENCH 9, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-4.50 to -5.21	3	(54)/(55)	5Y 4/2; As4, Dl+, Sh+, shell+; Olive grey clay with detrital wood, organic and shell inclusions; diffuse contact into:
-5.21 to -5.35	2	(55)	5Y 4/2; As3, Sh1, Dl+, shell+; Olive grey organic rich clay with detrital wood and shell inclusions; diffuse contact into:
-5.35 to -5.50	1	(55)	5Y 4/2; As4, Sh+, Dl+, shell+; Olive grey clay with detrital wood, organic and shell inclusions

TABLE 69: LITHOSTRATIGRAPHIC DESCRIPTION OF SAMPLE <105>, TRENCH 9, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Unit number	Context number	Description
-5.40 to -5.61	4	(55)	10YR 4/1; As4, Sh+, Dl+, shell+; Dark grey clay with detrital wood, organic and shell inclusions; diffuse contact into:
-5.61 to -6.01	3	(55)	10YR 4/1; As3, Dl1, Sh+, shell+; Dark grey clay and detrital wood with organic and shell inclusions; diffuse contact into:
-6.01 to -6.23	2	(55)	10YR 3/1; As2, Sh1, Dl+, shell+; Very dark grey organic rich clay and detrital wood with shell inclusions; diffuse contact into:
-6.23 to -6.40	1	(55)	10YR 4/1; As4, Sh+, Dl+, shell+; Dark grey clay with detrital wood, organic and shell inclusions

RESULTS AND INTERPRETATION OF THE POLLEN ASSESSMENT

The results of the pollen-stratigraphical assessment of column samples <23> to <29> from Trench 6 indicate moderate pollen concentrations and moderate to high preservation (Table 70). The main taxa identified in context (33) between -6.66m and -2.58m OD were *Alnus* (alder), *Quercus* (oak), *Corylus* type (e.g. hazel) with occasional *Tilia* (lime) and *Pinus* (pine). These taxa indicate the presence of a wetland community comprising alder woodland, most likely forming fen Carr, with an understorey of grasses (Poaceae) and buttercups (*Ranunculus* type). On the nearby dryland, oak and lime dominated the vegetation cover, although the presence of hazel and heather (Ericaceae) shrubland suggests that areas of less dense woodland existed, permitting light loving taxa to colonise. Supporting this interpretation is the presence of bracken (*Pteridium aquilinum*), and occasional grasses, perhaps suggesting the presence of woodland glades. Saltmarsh and freshwater environments are also indicated due to the presence *Chenopodium* type (e.g. sea purslane) and *Sparganium* type (e.g. branched bur-reed).

The main taxa identified in context (31) between -2.26 and -0.66m OD were *Alnus* (alder) and *Tilia* (lime). These taxa indicate the presence of a wetland community with alder woodland most likely forming a dense fen Carr woodland with an understorey of grasses (Poaceae), ferns (*Dryopteris*) and polypody (*Polypodium*). During this period, lime dominated the vegetation cover on the dryland, though the pollen signal from other dryland taxa was most likely masked by the dense woodland cover on the wetland. The presence of *Chenopodium* type (e.g. sea purslane) at –1.30m OD may represent the local presence of saltmarsh conditions (see Devoy, 1979).

TABLE 70: POLLEN-STRATIGRAPHIC ASSESSMENT FROM TRENCH 6, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Depth (m OD)	Sample number	Unit number	Context number	Main pollen taxa	Common name	Concentration	Preservation	Microscopic charred particles
						0 (none) to 4 (high)	0 (none) to 4 (high)	
-0.65 to -0.66	<23>	7	(31)	*Alnus*	Alder	2	3	None
				Poaceae	Grass family			
-0.97 to -0.98	<23>	5	(31)	None	-	0	0	None
-1.29 to -1.30	<23>	4	(31)	*Alnus*	Alder	2	3	None
				Polypodium	Polypody			
				Chenopodium type	e.g. Sea purslane			
				Cyperaceae	Sedge family			
-1.61 to -1.62	<24>	2	(31)	*Alnus*	Alder	1	1	None
				Poaceae	Grass family			
-1.93 to -1.94	<24>	1	(31)	Poaceae	Grass family	1	2	None
-2.25 to -2.26	<24>	1	(31)	Poaceae	Grass family	1	3	None
				Tilia	Lime			
				Polypodium	Polypody			
				Dryopteris	Fern			
				Alnus	Alder			
-2.57 to -2.58	<25>	4	(33)	*Tilia*	Lime	3/2	2	None
				Alnus	Alder			
				Poaceae	Grass family			
-2.89 to -2.90	<25>	3	(33)	*Tilia*	Lime	3/2	3	None
				Pteridium aquilinum	Bracken			
				Pinus	Pine			
				Corylus type	e.g. Hazel			
				Alnus	Alder			
				Quercus	Oak			

-3.21 to -3.22	<26>	6	(33)	*Quercus*	Oak	2	3	None
				Ranunculus type	e.g. Creeping buttercup			
-3.53 to -3.54	<26>	3	(33)	*Quercus*	Oak	1	2	None
				Tilia	Lime			
-3.85 to -3.86	<26>	1	(33)	*Ericaceae*	Heather family	1	3	None
-4.17 to -4.18	<27>	5	(33)	*Corylus* type	e.g. Hazel	1/2	3	None
				Pinus	Pine			
-4.81 to -4.82	<27>	1		*Alnus*	Alder	1	1	None
-5.45 to -5.46	<28>	4	(33)	*Alnus*	Alder	3	3	None
				Quercus	Oak			
				Corylus type	e.g. Hazel			
				Sparganium type	e.g. Branched bur-reed			
				Chenopodium type	e.g. Sea purslane			
-6.09 to -6.10	<29>	5	(33)	*Alnus*	Alder	1	2	None
				Chenopodium type	e.g. Sea purslane			
				Corylus type	e.g. Hazel			
				Quercus	Oak			
-6.65 to -6.66	<29>	1	(33)	*Alnus*	Alder	2/3	3	None
				Quercus	Oak			
				Ranunculus type	e.g. Creeping buttercup			

RESULTS AND INTERPRETATION OF THE PLANT MACROFOSSIL ASSESSMENT

Six bulk samples (<43>, <45>, <48>, <50>, <51>, and <54>) from Trench 4 were subject to plant macrofossil assessment (Table 71). All samples had a very high concentration of waterlogged wood and monocotyledonous plants. Identifiable plant macrofossil remains were recorded in samples <43> and <45>, and consisted of *Alnus glutinosa* (alder), *Rubus* sp (e.g. raspberry), *Ranunculus* sp (e.g. creeping buttercup) and *Carex* sp (sedge). These taxa support other biostratigraphic data and indicate the growth of alder dominated woodland on the wetland with an understorey consisting of shrubs and herbs.

TABLE 71: PLANT MACROFOSSIL ASSESSMENT FROM TRENCH 4, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Sample number	Depth (m OD)	Context number	Volume processed (litres)	Charred		Waterlogged		Molluscs	Monocots	Bone	Main taxa
				Wood	Seeds	Seeds	Wood				
<43>	-0.83 to -0.89	(40)	1	-	-	3	5	-	5	-	*Alnus glutinosa* *Carex* sp. *Ranunculus* sp. *Rubus* sp.
<45>	-0.94 to -0.99	(40)	1	-	-	2	5	-	5	-	*Carex* sp. *Rubus* sp. *Ranunculus* sp.
<48>	-1.09 to -1.14	(40)	1	-	-	-	5	-	5	-	-
<50>	-1.19 to -1.24	(40)	1	-	-	-	5	-	5	-	-
<51>	-1.24 to -1.29	(40)	1	1	-	-	5	-	5	-	-
<54>	-1.34 to -1.44	(40)	1	-	-	-	5	-	5	-	-

Key	Individuals
- =	Absent
1 =	1 to 25
2 =	26 to 50
3 =	51 to 75
4 =	76 to 100
5 =	101+

RESULTS AND INTERPRETATION OF THE WATERLOGGED WOOD ASSESSMENT

The results of the twenty-two waterlogged wood samples subject to species identification and assessment of their suitability for dendrochronology are displayed in Table 72. The results reveal a selection of woodland taxa including: *Alnus glutinosa* (alder), *Taxus baccata* (yew), *Ulmus* sp (elm), *Quercus* sp (oak) and *Fraxinus excelsior* (ash). Of these samples only sample <21> from Trench 1 (*Quercus* sp) is recommended for dendrochronology.

TABLE 72: WATERLOGGED WOOD ASSESSMENT, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Trench number	Context number	Depth (m OD)	Taxon	Common name	Recommended for dendrochronology
1	(14)	-1.00	*Taxus baccata*	Yew	No
1	(15)	-1.00	*Taxus baccata*	Yew	No
1	(16)	-1.00	*Taxus baccata*	Yew	No
1	(20)	-1.41	*Taxus baccata*	Yew	No
1	(21)	-1.41	*Quercus* sp.	Oak	Yes
1	(22)	-1.41	*Alnus glutinosa*	Alder	No
1	(23)	-6.10	*Alnus glutinosa*	Alder	No
1	(24)	-6.10	*Alnus glutinosa*	Alder	No
1	(25)	-6.10	*Alnus glutinosa*	Alder	No
1	(26)	-6.10	*Alnus glutinosa*	Alder	No
3	(12)	-2.40	*Taxus baccata*	Yew	No
4	(51)	*ca*. -2.00	*Alnus glutinosa*	Alder	No
5	(8)	-0.90	*Ulmus* sp.	Elm	No
6	(32)	*ca*. -1.00	*Taxus baccata*	Yew	No
6	(34)	*ca*. -3.50	*Ulmus sp.*	Elm	No
6	(36)	*ca*. -4.00	[Unidentified]	-	No
6	(37)	*ca*. -5.00	*Alnus glutinosa*	Alder	No
8	(50)	-6.00	*Alnus glutinosa*	Alder	No
5	(4)	-0.90	*Fraxinus excelsior*	Ash	No
5	(5)	-0.90	*Taxus baccata*	Yew	No
5	(6)	-0.90	*Ulmus* sp.	Elm	No
5	(7)	-0.90	*Ulmus* sp.	Elm	No

RESULTS AND INTERPRETATION OF THE INSECT ASSESSMENT

Six bulk samples (<43>, <45>, <48>, <50>, <51>, and <54>) from Trench 4 were subject to insect assessment (Table 73). Samples <43> and <45> had a good to excellent abundance of insect fossils and excellent preservation. Samples <48>, <50> and <51> had a limited number of specimens in a moderate state of preservation, while sample <54> had no identifiable fragments.

The five samples containing insects have taxa that are indicative of aquatic environments, including both standing and running water. The standing water environments included richly vegetated margins with reeds. Samples <43> and <45> also had evidence of animal dung, based on the presence of dung beetles. There is evidence for the presence of oak trees in samples <43> and <45>, and for elm in sample <51>. Indeed the taxon *Scolytus multistriatus* is of particular importance as it carries the fungus *Ophiostoma* (*Ceratocystis*) *ulmi,* which is responsible for Dutch elm disease – a possible cause of the Neolithic elm decline.

TABLE 73: INSECT ASSESSMENT OF BULK SAMPLES TAKEN FROM TRENCH 4, NORMAN ROAD, BELVEDERE, LONDON BOROUGH OF BEXLEY (NNB07)

Sample number	<43>	<45>	<48>	<50>	<51>
Depth (m OD)	-0.83 to -0.89	-0.94 to -0.99	-1.09 to -1.14	-1.19 to -1.24	-1.24 to -1.29
Context number	(40)	(40)	(40)	(40)	(40)
Sample volume (litres)	5	5	5	3	6
Taxon					
Coleoptera					
Carabidae					
Patrobus atrorufus (Ström.)	-	-	-	2	-
Bembidion sp.	1	1	-	-	1
Trechus secalis (Paykull)	1	-	-	-	-
Pterostichus strenuus (Panz.)	-	1	-	-	-
Agonum sp.	1	1	-	-	-
Hydraenidae					
Hydraena gracilis Germar	2	1	3	-	-
Hydrophilidae					
Ochthebius sp.	1	1	8	3	3
Cercyon sp.	-	1	-	-	-
Staphylinidae					
Anthobium atrocephalum (Gyll.)	5	2	1	-	1
Lesteva longelytrata (Goeze)	-	1	-	-	-
Stenus sp.	2	1	1	-	-
Lathrobium sp.	-	-	-	1	
Silphidae					
Silpha atrata L.	1	1	-	-	-
Scarabaeidae					
Aphodius distinctus (Müll.)	-	1	-	-	-
Aphodius sp.	1	1	-	-	-
Cetonia aurata (L.)	1	1	-	-	-

Trypocopris vernalis (L.)	1		-		-		-		-			
Sinodendron cylindricum (L.)		1		-		-		-		-		
Dryopidae												
Esolus parallelapipedus (Müller)	2		-		3		2		2			
Scirtidae												
Cyphon sp.		1		-		-		-		-		
Chrysomelidae												
Plateumaris sp.	2		-		-		-		-			
Curculionidae												
Apion sp.		-		1		1		-		-		
Sciaphilus asperatus (Bonsd.)	1		-		-		-		-			
Scolytidae												
Scolytus multistriatus (Marsham)		-		-		-		-		1		
Kissophagus hederae (Schmitt)	1		1		-		-		-			
Dryocoetinus villosus (Fab.)		1		1		-		-		-		

CONCLUSIONS AND RECOMMENDATIONS

The overarching aim of the rapid environmental archaeological assessment was to evaluate the potential of the sedimentary sequence for reconstructing the environmental history of the site and its environs. In particular, the assessment focussed on the potential of the sedimentary sequences to address the following research questions:

1. Can different ecosystems (wood, open areas etc) be recorded in the litho- and bio-stratigraphic sequences, especially as one goes away from the river?

The results indicate that gravels are present at Norman Road below *ca*. -9m OD, and most likely represent the Shepperton Gravel of Late Devensian Age. Above this, dominantly fine grained mineral-rich sediment was deposited representative of low-moderate energy fluvial conditions and deposition on the margins of a river channel (River Thames; until *ca*. -2.00 ± 0.20m OD in Trenches 1 to 5; *ca*. -2.40m OD in Trench 6; *ca*. -0.20m OD in Trenches 7 to 9). The mineral-rich sediments of Trenches 1 to 6 were overlain by well humified wood peat representative of semi-terrestrial conditions, which were prone to intermittent flooding. It is highly likely that this significant change in the environment was a response to a reduction in, or stabilisation of, the height of relative sea level, although local conditions may also have been a factor. At *ca*. -1.40 ± 0.10m OD in Trenches 1 to 5, and *ca*. -1.80m OD in Trench 6, there was a transition towards a wetter, less stable peat surface, and mineral sedimentation increased, which was probably caused by an increase in the duration or frequency of flood events affecting locations proximal to the main river channel.

The peat surface was inundated by alluvial sediments from *ca*. -0.70 ± 0.10m OD in Trenches 1 to 6, which was most likely a response to rising relative sea levels. This significant event has been recorded elsewhere in the Lower Thames Valley (see Devoy, 1979; 1982; Haggart, 1995; Sidell *et al.*, 2000; Batchelor, 2007). Recent palaeoenvironmental investigations undertaken *ca*. 1km west of Norman Road at the Thames Water Utilities Ltd site at Crossness provided an Early Neolithic radiocarbon date of 6010-5870 cal yr BP for peat initiation, and an Iron Age radiocarbon date of 2720-2350 cal yr BP date for peat inundation (Batchelor *et al.*, 2007). Although the latter undoubtedly represents a minimum age due to evidence for extensive erosion (truncation) of the peat surface, probably due to the effects of marine incursion. Indeed, similar evidence for erosion may be recorded in Trenches 7 to 9 at Norman Road, where there is no evidence for peat formation.

The results indicate that different ecosystems can be recorded, with spatial and temporal variations in peat composition and humification, and mineral sedimentation, between those trenches examined proximal and distal to the present river channel. The precise nature of these ecosystems, and the timing and duration of changes, will be recorded at the analysis stage by detailed modelling of the sedimentary sequences, radiocarbon dating, and analysis of sub-fossil pollen, insects and plant macrofossils.

2. Can the period or periods the forest growth in the wetland be delimited?

The presence of waterlogged seeds and wood in the sedimentary successions will permit the compilation of a high-resolution palaeoenvironmental record at the analysis stage where the events recorded i.e. forest succession (composition and structure), will be chronologically constrained by: (1) a series of rangefinder radiocarbon dates; (2) the compilation of an age-depth model using OxCal v4, and (3) further radiocarbon dating to refine the model and date specific events.

3. Can the woodland flora and fauna be characterised?

The pollen, plant macrofossil, waterlogged wood and insect assessment data provide evidence for a rich woodland plant community comprising alder, yew, elm, ash and oak, most likely forming fen carr with an understorey comprising shrubs, sedges and grasses, with evidence for both stagnant and freshwater. On the nearby dryland, oak and lime woodland with occasional elm dominated the vegetation cover, although the presence of shrubland suggests that areas of less dense woodland also existed. Unfortunately, the rapid assessment has yielded no direct evidence for human activity, such as cereal cultivation. However, based upon the results from the Thames Water Utilities Ltd site at Crossness (Batchelor *et al.,* 2007), it is highly likely that the analysis stage will provide palaeoecological records for woodland clearance and land-use.

4. Were there significant changes to the composition and structure of the woodland over time?

At both the RRRF site and in the wider vicinity, we are interested in recording the timing, duration and nature of four main events: the elm decline, the lime decline, and the expansion and decline of yew woodland. In particular, we aim to test the hypotheses that: (a) the elm decline was primarily caused by disease (Dutch elm disease), although we acknowledge that human activity probably occurred during the same time; (b) the lime decline occurred as consequence of human activity, especially forest farming is more compelling; (c) the colonisation of yew woodland occurred as a response to Middle Holocene climate change to drier peat surface conditions (lower bog surface wetness), and (d) the decline of yew woodland occurred as a response to increasing bog surface wetness and eventual marine inundation. The results of the assessment are very promising, with well-preserved pollen, waterlogged wood and insect remains. In particular, the high quantity of *Ulmus* sp. waterlogged wood, and the presence of the bark beetle *Scolytus multistriatus*, suggests that that there is considerable potential for investigating the phenomenon of the Neolithic elm decline, and testing the above hypothesis. In addition, the high number of *Taxus baccata* waterlogged wood samples offers the opportunity to increase our knowledge and understanding of the timing of yew woodland colonisation and decline in the Lower Thames Valley.

5. Are there identifiable changes in the environment that can be attributed to either human impact or climate change?

This research question will partly be addressed at the analysis stage with reference to the four events listed above, namely the elm decline, lime decline, and yew colonisation and decline. In addition, the assessment has provided data on the main changes in vegetation cover that characterised the wetland, namely the colonisation of alder carr during peat formation, and salt marsh plants during marine incursion, both of which were probably triggered by sea level change linked to northern hemispheric climate change. The sequence from Norman Road will contribute to our understanding of these major changes following analysis of the sequences, as well as highlighting periods of mineral sediment in-wash during peat formation and progressive changes in wetland ecosystems prior to the Late Bronze Age/Early Iron Age marine incursion, which may have had an anthropogenic cause.

6. Can human exploitation and/or utilisation of the woodland be identified, such as the free roaming of pigs, harvesting of trees, nut collection etc?

Based on the archaeological records and environmental archaeological assessment data it is very unlikely that we will be able to obtain information to address this question directly, although inferences will be made on the likely effects of environmental change on resource availability.

7. Is there any signal of land-use and exploitation of the more distant, drier valley slopes?

This research question will be addressed by the combined analysis of the litho- and bio-stratigraphy. In particular, further careful examination and interpretation will be made of changes in lithostratigraphy that may be due to in-washing of mineral sediment from adjacent dryland slopes, for which there is already some evidence. This may be due to woodland clearance causing accelerated erosion of the soil surface. In addition, the multi-proxy sub-fossil analyses, especially pollen and microscopic charred particles, will be used to detect woodland clearance, biomass burning, cultivation and grassland formation.

The overarching aim of the rapid environmental archaeological assessment was to evaluate the potential of the sedimentary sequence for reconstructing the environmental history of the site and its environs. In particular, the assessment focussed on the potential of the sedimentary sequences to: (1) record spatial and temporal changes in the environment, and in particular to identify those ecosystems that form due to human activity e.g. cultivated ground and grassland formation, and (2) reconstruct the precise timing and duration of peat formation, and assess the implications for our understanding of landscape history and sea level change in the Lower Thames Valley.

The results indicate that gravels are present at Norman Road below ca. -9m OD, and most likely represent the Shepperton Gravel of Late Devensian Age. Above this, dominantly fine grained mineral-rich sediment was deposited representative of low-moderate energy fluvial conditions and deposition on the margins of a river channel (River Thames; until ca. -2.00 ± 0.20m OD in Trenches 1 to 5; ca. -2.40m OD in Trench 6; ca. -0.20m OD in Trenches 7 to 9). The mineral-rich sediments of Trenches 1 to 6 were overlain by well humified wood peat representative of semi-terrestrial conditions, which were prone to intermittent flooding. It is highly likely that this significant change in the environment was a response to a reduction in, or stabilisation of, the height of relative sea level, although local conditions may also have been a factor. At ca. -1.40 ± 0.10m OD in Trenches 1 to 5, and ca. -1.80m OD in Trench 6, there was a transition towards a wetter, less stable peat surface, and mineral sedimentation increased, which was probably caused by an increase in the duration or frequency of flood events affecting locations proximal to the main river channel. The peat surface was inundated by alluvial sediments from ca. -0.70 ± 0.10m OD in Trenches 1 to 6, which was most likely in response to rising relative sea levels. This significant event has been recorded elsewhere in the Lower Thames Valley (see Devoy, 1979; 1982; Haggart, 1995; Sidell et al., 2000; Batchelor, 2007). Recent palaeoenvironmental investigations undertaken ca. 1km west of Norman Road at the Thames Water Utilities Ltd site at Crossness provided an Early Neolithic radiocarbon date of 6010-5870 cal yr BP for peat initiation, and an Iron Age radiocarbon date of 2720-2350 cal yr BP date for peat inundation (Batchelor et al., 2007). Although the latter undoubtedly represents a minimum age due to evidence for extensive erosion (truncation) of the peat surface, probably due to the effects of marine incursion. During the analysis stage for Norman Road, it will be established whether the timing and duration of peat formation is broadly synchronous throughout this part of the Lower Thames Valley.

The pollen, plant macrofossil, waterlogged wood and insect data support this interpretation with evidence for a rich woodland plant community comprising alder, yew, elm, ash and oak, most likely forming fen Carr with an understorey comprising shrubs, sedges and grasses and evidence for both stagnant and freshwater. On the nearby dryland, oak and lime woodland with occasional elm dominated the vegetation cover, although the presence of shrubland suggests that areas of less dense woodland also existed. Unfortunately, the rapid assessment has yielded no direct evidence for human activity, such as cereal cultivation. However, based upon the results from the Thames Water Utilities Ltd site at Crossness (Batchelor et al., 2007), it is highly likely that the analysis stage will provide palaeoecological records for woodland clearance and land-use.

It is intended, therefore, that a full radiocarbon-dated plant macrofossil, waterlogged wood and insect analysis be conducted on the sedimentary sequences from Trench 4, and pollen analysis conducted on Trenches 4 and 6, with the aim of providing a detailed reconstruction of spatial and temporal changes in the environment. Furthermore, the high quantity of Ulmus sp. waterlogged wood, and the presence of the bark beetle Scolytus multistriatus, suggests that that there is considerable potential for investigating further the phenomenon of the Neolithic elm decline, and testing the hypothesis that the

elm decline was caused by disease. In addition, the high number of Taxus baccata waterlogged wood samples offers the opportunity to increase our knowledge and understanding of the timing and duration of yew woodland colonisation in the Lower Thames Valley.

In conclusion, a full radiocarbon-dated plant macrofossil, waterlogged wood and insect analysis will be conducted on the sedimentary sequence from Trench 4, and pollen analysis conducted on the sequences from Trenches 4 and 6. We believe that these analyses will address the research questions set out above. The analysis stage will be completed by 28th March 2008, with publication text submitted by 25th April 2008 to the *Journal of Environmental Archaeology*.

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APPENDIX 3: CONTEXT INDEX

Site code	Context	Type	Trench	Description	Date	Phase	Section
NNB 07	1	Deposit	5	Made ground	Post-med	4	5
NNB 07	2	Deposit	5	Upper Alluvium	Late Quaternary	3	5
NNB 07	3	Deposit	5	Peat	Early-Neolithic to Iron Age	3	5
NNB 07	4	Timber	5	Tree	Early-Neolithic to Iron Age	3	5
NNB 07	5	Timber	5	Lower Alluvium	Late Quaternary	3	5
NNB 07	6	Timber	5	Tree	Early-Neolithic to Iron Age	3	5
NNB 07	7	Timber	5	Tree	Early-Neolithic to Iron Age	3	5
NNB 07	8	Timber	5	Tree	Early-Neolithic to Iron Age	3	5
NNB 07	9	Deposit	3	Made ground	Post-med	4	3
NNB 07	10	Deposit	3	Upper Alluvium	Late Quaternary	3	3
NNB 07	11	Deposit	3	Peat	Early-Neolithic to Iron Age	3	3
NNB 07	12	Timber	3	Tree	Early-Neolithic to Iron Age	3	3
NNB 07	13	Deposit	5	Lower Alluvium	Late Quaternary	3	5
NNB 07	14	Timber	1	Tree	Early-Neolithic to Iron Age	3	1
NNB 07	15	Timber	1	Tree	Early-Neolithic to Iron Age	3	1
NNB 07	16	Timber	1	Tree	Early-Neolithic to Iron Age	3	1
NNB 07	17	Deposit	1	Made ground	Post-med	4	1
NNB 07	18	Deposit	1	Upper Alluvium	Late Quaternary	3	1
NNB 07	19	Deposit	1	Peat	Early-Neolithic to Iron Age	3	1
NNB 07	20	Timber	1	Tree	Early-Neolithic to Iron Age	3	1
NNB 07	21	Timber	1	Tree	Early-Neolithic to Iron Age	3	1
NNB 07	22	Timber	1	Tree	Early-Neolithic to Iron Age	3	1
NNB 07	23	Timber	1	Tree	Early-Neolithic to Iron Age	3	1
NNB 07	24	Timber	1	Tree	Early-Neolithic to Iron Age	3	1
NNB 07	25	Timber	1	Tree	Early-Neolithic to Iron Age	3	1
NNB 07	26	Timber	1	Tree	Early-Neolithic to Iron Age	3	1
NNB 07	27	Deposit	1	Lower Alluvium	Late Quaternary	3	1
NNB 07	28	Deposit	3	Lower Alluvium	Late Quaternary	3	3
NNB 07	29	Deposit	6	Made ground	Post-med	4	6
NNB 07	30	Deposit	6	Upper Alluvium	Late Quaternary	3	6
NNB 07	31	Deposit	6	Peat	Early-Neolithic to Iron Age	3	6
NNB 07	32	Timber	6	Tree	Early-Neolithic to Iron Age	3	6
NNB 07	33	Deposit	6	Lower Alluvium	Late Quaternary	3	6
NNB 07	34	Timber	6	Tree	Early-Neolithic to Iron Age	3	6
NNB 07	35	Timber	6	Tree	Early-Neolithic to Iron Age	3	6
NNB 07	36	Timber	6	Tree	Early-Neolithic to Iron Age	3	6
NNB 07	37	Timber	6	Tree	Early-Neolithic to Iron Age	3	6
NNB 07	38	Deposit	4	Made ground	Post-med	4	4
NNB 07	39	Deposit	4	Upper Alluvium	Late Quaternary	3	4
NNB 07	40	Deposit	4	Peat	Early-Neolithic to Iron Age	3	4
NNB 07	41	Deposit	4	Lower Alluvium	Late Quaternary	3	4
NNB 07	42	Deposit	2	Made ground	Post-med	4	2
NNB 07	43	Deposit	2	Upper Alluvium	Late Quaternary	3	2
NNB 07	44	Deposit	2	Peat	Early-Neolithic to Iron Age	3	2
NNB 07	45	Deposit	2	Lower Alluvium	Late Quaternary	3	2
NNB 07	46	Deposit	7	Made ground	Post-med	4	7
NNB 07	47	Deposit	7	Alluvium	Late Quaternary	3	7
NNB 07	48	Deposit	8	Made ground	Post-med	4	8
NNB 07	49	Deposit	8	Alluvium	Late Quaternary	3	8
NNB 07	50	Timber	8	Tree	Early-Neolithic to Iron Age	3	8
NNB 07	51	Timber	6	Tree	Early-Neolithic to Iron Age	3	6
NNB 07	52	Deposit	9	Made ground	Post-med	4	9
NNB 07	53	Deposit	9	Alluvium	Late Quaternary	3	9
NNB 07	54	Deposit	9	Peat	Early-Neolithic to Iron Age	3	9
NNB 07	55	Deposit	9	Alluvium	Early-Neolithic to Iron Age	3	9
NNB 07	56	Deposit	1	Peat	Early-Neolithic to Iron Age	3	1
NNB 07	57	Deposit	1	Alluvium	Late Quaternary	3	1
NNB 07	58	Deposit	1	Gravel	Late Devensian	2	1
NNB 07	59	Deposit	6	Gravel	Late Devensian	2	6

APPENDIX 4: ENVIRONMENTAL SAMPLE REGISTER

Sample number	Context Number	Type	Trench	Top mOD	Comments
1	2	Column	5	0.5	1m long
2	2,3	Column	5	-0.5	1m long
3	3,4	Column	5	-1.4	1m long
4	10,11	Column	3	0	1m long
5	NOT USED				
6	10,11,28	Column	3	-0.4	2m long
7	13	Column	5	-2.7	1m long
8	13	Column	5	-3.68	1m long
9	13	Column	5	-4.6	1m long
10	13	Column	5	-5.5	1m long
11	18,19	Column	1	-0.48	1m long
12	19,27	Column	1	-1.3	1m long
13	19,27	Column	1	-2.1	1m long
14	27	Column	1	-3.05	1m long
15	27	Column	1	-4.1	1m long
16	27	Column	1	-5	1m long
17	27	Column	1	-5.6	1m long
18	27	Column	1	-5.9	1m long
19	28	Column	3	-3	1m long
20	28	Column	3	-3.9	1m long
21	28	Column	3	-4.8	1m long
22	28	Column	3	-5.7	1m long
23	30,31	Column	6	-0.55	1m long
24	31,33	Column	6	-1.45	1m long
25	31,33	Column	6	-2.3	1m long
26	33	Column	6	-3.2	1m long
27	33	Column	6	-4.1	1m long
28	33	Column	6	-5	1m long
29	33	Column	6	-5.9	1m long
30	38,39	Column	4	-0.2	1m long
31	39	Bulk	4	-0.24	Over 0.5 x 0.5m area
32	39	Bulk	4	-0.29	Over 0.5 x 0.5m area
33	39	Bulk	4	-0.34	Over 0.5 x 0.5m area
34	39	Bulk	4	-0.39	Over 0.5 x 0.5m area
35	39	Bulk	4	-0.44	Over 0.5 x 0.5m area
36	39	Bulk	4	-0.49	Over 0.5 x 0.5m area
37	39	Bulk	4	-0.54	Over 0.5 x 0.5m area
38	39	Bulk	4	-0.59	Over 0.5 x 0.5m area
39	39	Bulk	4	-0.64	Over 0.5 x 0.5m area
40	39	Bulk	4	-0.69	Over 0.5 x 0.5m area
41	39	Bulk	4	-0.74	Over 0.5 x 0.5m area
42	39	Bulk	4	-0.79	Over 0.5 x 0.5m area
43	39	Bulk	4	-0.84	Over 0.5 x 0.5m area
44	39	Bulk	4	-0.89	Over 0.5 x 0.5m area

45	39	Bulk	4	-0.94	Over 0.5 x 0.5m area
46	39	Bulk	4	-0.99	Over 0.5 x 0.5m area
47	39	Bulk	4	-1.04	Over 0.5 x 0.5m area
48	39	Bulk	4	-1.09	Over 0.5 x 0.5m area
49	39	Bulk	4	-1.14	Over 0.5 x 0.5m area
50	39	Bulk	4	-1.19	Over 0.5 x 0.5m area
51	39	Bulk	4	-1.24	Over 0.5 x 0.5m area
52	39	Bulk	4	-1.29	Over 0.5 x 0.5m area
53	39	Bulk	4	-1.34	Over 0.5 x 0.5m area
54	39	Bulk	4	-1.39	Over 0.5 x 0.5m area
55	39	Bulk	4	-1.44	Over 0.5 x 0.5m area
56	39	Bulk	4	-1.49	Over 0.5 x 0.5m area
57	39	Bulk	4	-1.54	Over 0.5 x 0.5m area
58	39	Bulk	4	-1.59	Over 0.5 x 0.5m area
59	39	Bulk	4	-1.64	Over 0.5 x 0.5m area
60	39	Bulk	4	-1.69	Over 0.5 x 0.5m area
61	39	Bulk	4	-1.74	Over 0.5 x 0.5m area
62	39	Bulk	4	-1.79	Over 0.5 x 0.5m area
63	40,41	Bulk	4	-1.84	Over 0.5 x 0.5m area
64	41	Bulk	4	-1.89	Over 0.5 x 0.5m area
65	41	Bulk	4	-1.94	Over 0.5 x 0.5m area
66	41	Bulk	4	-1.99	Over 0.5 x 0.5m area
67	41	Bulk	4	-2.04	Over 0.5 x 0.5m area
68	41	Bulk	4	-2.09	Over 0.5 x 0.5m area
69	41	Bulk	4	-2.14	Over 0.5 x 0.5m area
70	41	Bulk	4	-2.19	Over 0.5 x 0.5m area
71	39,40	Column	4	-0.6	1m long
72	40,41	Column	4	-1.5	1m long
73	41	Column	4	-3.3	1m long
74	41	Column	4	-4.2	1m long
75	41	Column	4	-5.1	1m long
76	42,43,44	Column	2	-0.3	1m long
77	44	Column	2	1.05	1m long
78	44,45	Column	2	-2	1m long
79	45	Column	2	-2.9	1m long
80	45	Column	2	-3.8	1m long
81	45	Column	2	-4.7	1m long
82	45	Column	2	-5.6	1m long

APPENDIX 5: OASIS FORM

OASIS ID: preconst1-35907	
Project details	
Project name	RRRF, Norman Road, Belvedere
Short description of the project	An archaeological evaluation was undertaken the former Borax Works, Norman Road, Belvedere in advance of proposed redevelopment. The evaluation comprised the excavation of nine trenches and assessment of the subsequent environmental samples and a desk-based assessment of borehole data. The general sequence on the site comprised London Clay, Shepperton Sand and Gravel and alluvial deposits including a peat formation likely to be of early-Neolithic to Iron Age date.
Project dates	Start: 03-09-2007 End: 14-11-2007
Previous/future work	No / Yes
Any associated project reference codes	NNB 07 - Sitecode
Type of project	Field evaluation
Site status	Local Authority Designated Archaeological Area
Current Land use	Other 13 - Waste ground
Significant Finds	POTTERY Late Prehistoric
Methods & techniques	'Augering', 'Dendrochronological Survey', 'Environmental Sampling', 'Sample Trenches'
Development type	Service infrastructure (e.g. sewage works, reservoir, pumping station, etc.)
Prompt	Direction from Local Planning Authority - PPG16
Position in the planning process	After full determination (eg. As a condition)
Project location	
Country	England
Site location	GREATER LONDON BEXLEY ERITH RRRF, Norman Road, Belvedere
Postcode	DA17
Study area	21.95 Hectares
Site coordinates	TQ 4975 8065 51.5044068370 0.157916618268 51 30 15 N 000 09 28 E Point
Height OD	Min: -0.48m Max: 0.82m
Project creators	
Name of Organisation	Pre-Construct Archaeology Ltd
Project brief originator	Greater London Archaeological Advisory Service
Project design originator	Chris Mayo
Project director/manager	Chris Mayo
Project supervisor	Stuart Holden
Type of sponsor/funding body	Electricity Authority/Company
Name of sponsor/funding body	Riverside Resource Recovery Limited
Project archives	
Physical Archive recipient	LAARC
Physical Contents	'Ceramics'
Digital Archive recipient	LAARC

Digital Contents	'Environmental', 'Stratigraphic', 'Survey'
Digital Media available	'Database' ,'Images raster / digital photography', 'Spreadsheets', 'Survey', 'Text'
Paper Archive recipient	LAARC
Paper Contents	'Environmental', 'Stratigraphic' ,'Survey'
Paper Media available	'Context sheet', 'Correspondence', 'Notebook - Excavation', ' Research', ' General Notes', 'Photograph', 'Plan', 'Report', 'Section', 'Survey ','Unpublished Text'
Project bibliography 1	
Publication type	Grey literature (unpublished document/manuscript)
Title	Land at Norman Road (North), Belvedere, London Borough of Bexley: An Archaeological Evaluation
Author(s)/Editor(s)	Holden, S
Date	2007
Issuer or publisher	Pre-Construct Archaeology Limited
Place of issue or publication	London
Description	Unpublished client report
Entered by	Stuart Holden (sholden@pre-construct.com)
Entered on	20 December 2007

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