Severnside West Pipeline Diversion, South Gloucestershire

Archaeological Evaluation Report

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Archaeological Evaluation Report

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Archaeological Evaluation Report

Summary

In June 2015 Oxford Archaeology undertook an archaeological evaluation along the route of the proposed Severnside Pipeline Diversion, South Gloucestershire. The work was commissioned by Jacobs on behalf of the National Grid. The primary purpose of the evaluation was to assess the archaeological potential of the route of the proposed pipeline diversion.

The site lies upon extensive estuarine alluvial deposits known as the Wentlooge Formation, which underlie large areas of both the English and Welsh sides of the Severn Estuary. In the Enron site to the south, a thin peat layer containing a comminuted charcoal in-wash was radiocarbon dated to the early Bronze Age. Although no evidence of human activity accompanied this deposit, previous work to the north-east of the site had provided evidence of Romano-British settlement.

A geophysical survey was undertaken prior to the intrusive works that suggested low archaeological potential, with mainly services and geological changes revealed. The archaeological evaluation comprised the mechanical excavation of 20 trenches measuring 30m by 2m, comprising a 4% sample of the proposed route. The trenches were positioned to investigate the results of the geophysical survey and to investigate areas that had been unavailable at the time of the survey. In addition, four geoarchaeological test pits were excavated within the trenches, and four boreholes, in order to map the underlying sediments and to investigate the presence/extent of any charcoal and peat layers.

Several undated ditches were identified in the north-west area of the route and have been interpreted as drainage ditches associated with post-medieval cultivation. The remaining trenches were devoid of archaeological remains and only ceramic land drains and clearly modern features were recorded.

The geoarchaeological test pits and boreholes showed an alluvial sequence across the route consistent with the Middle to Upper Wentlooge Formation. A layer corresponding precisely with a charcoal layer previously found to the south was mapped across the area. The layer is interpreted as a humified incipient vegetation layer, which in the west and south of the site was very dark and contained microscopic charcoal (but no in situ burning), whilst further east the layer became more humic and peaty. No archaeological finds or features were found in association with this layer.

Based on the result of the evaluation, the archaeological and palaeoenvironmental impact of the proposed pipeline diversion is considered to be low.

1 INTRODUCTION

1.1 Location and scope of work

1.1.1 In June 2015 Oxford Archaeology (OA) undertook an archaeological evaluation along the route of the proposed Severnside Pipeline Diversion (centred on ST 555 825, Fig.1). the route of the proposed Severnside Pipeline Diversion, South Gloucestershire. The work was commissioned by Jacobs on behalf of the National Grid. The primary purpose of the evaluation was to assess the archaeological potential of the route of the proposed pipeline diversion.

1.1.2 The proposed main works associated with the 2km pipeline diversion comprised excavation of ground for the removal of the existing pipeline, excavation of ground for pipeline diversion and haul roads. Associated archaeological work comprised a geoarchaeological assessment, geophysical survey and archaeological trial trenching.

1.1.3 This report details the results of the archaeological evaluation trenching undertaken across the proposed route. The evaluation was carried out in accordance with a Written Scheme of Investigation (WSI) prepared by Jacobs (February 2015) and approved by South Gloucestershire County Council.

1.1.4 All work was undertaken in accordance with the Institute for Archaeologists' '*Standard and Guidance for archaeological field evaluation*' (revised 2008) and the National Planning Policy Framework (NPPF).

1.2 Location, topography and geology

1.2.1 The proposed Severnside pipeline diversion was located *c* 9.5km north-west of the centre of the city of Bristol, *c* 2km east of the Severn Estuary and is *c* 2km in length, running parallel to the M49 motorway.

1.2.2 The route crossed an area of scrubland and agricultural fields, surrounded by recently built warehouse developments. The area was generally flat between 4-6m aOD and prone to seasonal flooding.

1.2.3 The bedrock geology of the area comprised Triassic Age Mercia Mudstone overlain by Tidal Flat deposits of Holocene date (BGS map, Sheet 264), in places reaching *c* 15m in thickness.

1.3 Geoarchaeological and archaeological background

1.3.1 The Severn Estuary is located at the head of the Bristol Channel and is the largest estuarine system on the British west coast (Severn Estuary Levels Research Committee website). The estuary developed when the peri-glaciated area between South Wales and the Cornish Peninsular was transgressed by the rising post-glacial seas causing wetlands and their deposits to be formed close to sea level along the margins of the estuary and creating the extensive Severn Estuary Levels (ibid.).

1.3.2 The Severn Estuary Levels are a group of low-lying areas, barely rising above 10m aOD, located in the Local Authority Areas of South Gloucestershire, Bristol and North Somerset. They are mainly flat, coastal areas, which have been reclaimed or protected from tidal incursions, usually controlled by networks of surface waterways or ‘rhines’, with banks, straightened rivers and a few large settlements; ‘rhines’ are channels which used to drain the land and reclaim it from the Severn estuary and its associated wetlands.

1.3.3 The underlying geology consists of the Triassic Age Mercia Mudstone Group (formerly the Keuper Marls) (BGS map, Sheet 264). Overlying this geology are the relatively

recent formations of the Severn Levels, comprising post-glacial estuarine and riverine alluvium (South Gloucestershire Council SPG undated).

1.3.4 The alluvium preserved beneath the Severn Estuary Levels is dominated by alternating silts, formed by intertidal salt marshes and mudflats, and peats, representing organic marshes at the intertidal zone or above tide levels (Severn Estuary Levels Research Committee website). The alluvium can extend to a depth of 20m in places and can be laterally very variable with the boundaries between the silt and peat beds varying considerably in age, dependent on factors such as the distance from the coast or the main river (Severn Estuary Levels Research Committee website).

1.3.5 The Seven Levels can be sub-divided into a number of smaller, geographically distinct areas. The study area is located on the Avonmouth-Severnside Levels, which covers the parishes of Almondsbury, Pilning, Bristol, Severn Beach, Olveston, Henbury and Aust. The Avonmouth-Severnside Levels are a low-lying area which is used as agricultural land and for industrial/business uses and is bounded by the M49 to the east and the Severn Estuary to the west.

1.3.6 As wetlands fringing the Severn Estuary, the Avonmouth-Severnside Levels, in their natural state, formed areas of mudflats and saltmarsh that were regularly flooded by the tide. The floodplain generally produces fertile farmland because of the regular deposition of silt and where soft clays dominate they give rise to heavy but productive soils (Severn Estuary Levels Research Committee website).

1.3.7 Considerable research has been undertaken into sediment formations around the Severn Estuary, which extend into the Avonmouth-Severnside Levels. The origin of the post-glacial Holocene (12,000BP-recent) sediment deposits, known as the Wentlooge Formation, lies in fluctuating climates and sea levels, with marine clays settling out at times of high sea level and peat forming during times of low sea level (Allen and Scaife 2010). The Wentlooge Formation comprises a complex series of estuarine silt/sands and peat horizons, with a total depth of up to 15m (Allen 1992). The peats identified tend to be discontinuous in distribution, representing islands of marsh in the estuary. The Wentlooge Formation can be divided into three sub-formations:

Table 1: The features of the Wentlooge sub-formations in the Severn Levels (after Allen and Scaife 2010)

Formation	**Deposit**	**Period**	**Environmental conditions**	**Archaeology**
Upper Wentlooge	Reddish or pale green estuarine silts/clays with no peat	Romano-British and later (500 BC +)	Return to saltmarsh, some gradual flooding and inundation, especially associated with channels	Ditched field systems and drained landscape
Middle Wentlooge	Blue and grey estuarine silts/clay alternating with thick peats	Bronze Age to Iron Age (4500-800 BC)	Salt-marsh and intertidal mudflats	Human exploitation of the saltmarsh: Cabot Park and Avonmouth (LBA), Hallen Marsh, (IA), Northwick (RB)
Lower Wentlooge	Thick blue/grey estuarine silts over sands with few, thin, or no peats.	Mesolithic to Neolithic (5500-4500 BC)	Saltmarsh, w*et al*der carr with local *Phragmites* reed swamps, raised bogs, minor rivers and numerous small streams	Potential for fishing and fowling. Limited artefacts and occupation

1.3.8 The previous geoarchaeological survey identified the presence of a buried bedrock ridge to the north of the proposed pipeline route (Figs. 2-3). In the south, the bedrock dropped to 14m in depth and was in-filled with inter-bedded sandy deposits with multiple channel sequences recorded within the upper alluvial sequence. The presence of a deeply incised valley has been previously noted within the Avonmouth Levels (Hawkins 1990) and mapped running to the east of the proposed route (Carter *et al.* 2004).

1.4 Archaeological and historical background

1.4.1 The archaeological background to the project had been previously described in detail in the desk-based assessment (Jacobs 2014) and geoarchaeological assessment (OA 2015). A brief summary of the relevant background is reproduced below:

Upper Palaeolithic (45,000-10,000 BP) to Mesolithic period (10,000-4,000 BC)

1.4.2 Environmental samples from within the Avonmouth-Severnside Levels have allowed an understanding of the Holocene-Flandrian sedimentation of the landscape and show that the way the Avon Levels were exploited in late prehistory was greatly affected by changes in sea level (Mullin, Brunning and Chadwick 2009).

1.4.3 The accumulation of peats and silt within the Avonmouth-Severnside Levels from the Mesolithic period onwards has created thick Quaternary deposits, which have tended to bury any earlier archaeological features. It is unlikely therefore that any early prehistoric features within the coastal area will be located at or near the surface, should they survive (Webster 2007). However, those prehistoric features within inland areas may be located closer to the surface, although they are still likely to be buried by some alluvium.

1.4.4 Some Palaeolithic and Mesolithic activity has been recorded on both sides of the Severn estuary (Webster 2007). Several sites suggest that there is the potential for Palaeolithic and Mesolithic sites further inland on the Avonmouth-Severnside Levels (Allen and Scaife 2010); for instance, excavations at a sewage works at Avonmouth, approximately 12km to the south of the area revealed evidence for a Mesolithic saltmarsh environment which was subject to later alluviation. Within such landscapes, the ecotone between dry land and marsh is particularly attractive for settlement, giving access to both dryland and wetland resources with an abundance of easily exploitable resources (Masser, Jones and McGill 2005).

Neolithic (4000-2200 BC)

1.4.5 During the Neolithic period, the Avonmouth-Severnside Levels comprised a complex landscape of mudflat, saltmarsh, reed swamp and raised bog that may have been periodically inundated (Mullin, Brunning and Chadwick 2009). Increasing sea-levels during this period resulted in the formation of the Lower Wentlooge Series (ibid.).

1.4.6 At Easter Compton, a village to the east of the M49, a charcoal sample from a feature below the alluvium, which was associated with two flints, was dated to 3550-2900 cal BC (ibid.).

1.4.7 At the nearby site of Awkley Lane, to the north-east of the proposed pipeline diversion, excavations were supported by pollen analysis. During the Neolithic, at the base of a layer dated to 3630-3360 BC (1.86 m OD), there were indicators of declines in pollen indicators of woodland, particularly of lime and elm, and increases in grass pollens and of plants associated with open, disturbed ground such as ribwort plantain and nettle. These indicate the first impact of human disturbance in the environment through woodland clearance in the wider area of the site. Insect remains preserved through

water-logging in the same sequence indicated that the Awkley Lane site itself would still have been an area of small pools and open swamp at this date (Allen and Scaife 2010).

Bronze Age (2500-800 BC)

1.4.8 During the Bronze Age/early Iron Age there was a negative sea-level change which resulted in the formation of Middle Wentlooge deposits associated with accumulation of peat within a fen-carr environment (Mullin, Brunning and Chadwick 2009).

1.4.9 Excavation at a sewage works at Avonmouth produced late Bronze Age pottery as well as charred wheat and barley, charcoal, imported stone and animal bone, situated above a saltmarsh environment and later alluvium. The deposits were dated to 1070-810 cal BC and 1380-1010 cal BC and were also sealed by over a metre of alluvial clay (Mullin, Brunning and Chadwick 2009).

Iron Age (800 BC-AD 43)

1.4.10 From *c* 390-110 cal BC, there appears to have been further rises in sea level which marked the change from the Middle Wentlooge deposits to the deposition of estuarine sediments forming the Upper Wentlooge deposits.

1.4.11 The earliest Iron Age evidence identified close to the route was a settlement located at Hallen Marsh, to the south-west of the area (SLR 2009). The site was the first large-scale archaeological investigation of an Iron Age settlement located in the Avonmouth-Severnside wetlands. The excavation recorded deposits extending over 60m comprising at least two complex roundhouse structures located on two low islands of relatively dry land within the marsh. The site was located on either side of a small stream that was probably freshwater, although brackish on higher tides (Mullin, Brunning, and Chadwick 2009). Occupation occurred during the 2nd-1st centuries BC as revealed by pottery, both local and imported, animal bone (largely sheep but with some cattle and pig) smaller quantities of fired clay, worked stone and worked bone.

1.4.12 Although the Iron Age activity at Hallen Marsh was relatively substantial, it may not indicate permanent settlement on the site (Allen and Scaife 2010). There was little evidence for the presence of crops or crop processing in the environmental samples; all of the artefacts were readily portable and it seems that all the necessities of basic life, including staple foods, were brought to the site. The animal bone assemblage indicates a 'normal' herd structure, with animals being killed as required for immediate consumption (Allen and Scaife 2010). The environmental sequences suggested that the site was initially a stable saltmarsh edge, followed by either negative sea-level tendency or marsh outgrowth. The site was interpreted as a short-lived, seasonally-occupied site used for grazing sheep and cattle based on transhumance between the limestone uplands and the rich summer pasture of accessible parts of the Levels (Mullin, Brunning and Chadwick 2009).

Roman (AD 43-410)

1.4.13 It was not until the Roman period that the Avonmouth-Severnside wetlands were reclaimed through the construction of protective earthen embankments and the excavation of ditches and sluices to drain the land (Severn Estuary Levels Research Committee website). Roman settlement within the wetlands area tended to prefer the relatively dry land further from the coast (Mullin, Brunning and Chadwick 2009).

1.4.14 At Crooks Marsh (HER No. 4896), to the south-west of the route, a Roman settlement was identified during clay extraction and consisted of ditches and enclosures, *c* 0.5m below ground surface, with coins dated to AD 367-383 and other finds suggesting occupation from 4th to 5th centuries (Mullin, Brunning and Chadwick 2009). There was

evidence of silting and re-cutting of ditches associated with small rectangular features and industrial activity on the site was suggested from increased levels of charcoal and heat-damaged clay and pottery (Masser *et al.* 2005).

1.4.15 Further work around the site revealed three ditches containing substantial quantities of 3rd to 4th century pottery, coins and some very late 4th or early 5th century shell-gritted wares. The environmental evidence suggested an open environment where ditches were periodically flooded by salt water but wheat and barley were grown and processed in the vicinity (Mullin, Brunning and Chadwick 2009).

1.4.16 At Minor's Lane, situated to the south of the area, a watching brief on cable-laying works located part of a ditch network extending over a considerable area. The ditches contained Roman pottery, consisting of Severn-Valley wares and grey wares of 2nd century date with similar sherds in the subsoil (Allen and Scaife 2010). The cumulative evidence suggested continuous or intermittent occupation of the area from the 2nd to at least the late 4th century (Masser *et al.* 2005).

1.4.17 Excavations at Farm Lane, to the north-east of the study area, recovered evidence for a pair of parallel ditches which contained mid 2nd century AD pottery and features dating from the 3rd to 4th centuries AD (ibid.). However, there was no evidence to suggest that the site was occupied beyond AD 350. The environment during the 2nd century around the site appears to have been open grassland with probable cereal cultivation and animal grazing nearby. By the end of the 2nd century the site appears to have been occasionally inundated by the tide (ibid.). The remains of wheat, barley and oats were recovered from the 3rd to 4th century deposits at the site, when the environment appears to have comprised open, disturbed grassland with few trees (ibid.). An excavation at Plot 4000, immediately to the north-east of the site, exposed Roman enclosures, at least three roundhouses and possible evidence for metalworking at *c* 5.45m OD, immediately below the topsoil. The post-excavation assessment indicates that activity on the site spanned the 2nd to 4th centuries. No evidence was found for Iron Age activity on this site (Ritchie *et al.* 2008).

1.4.18 More recent evaluations works at East Crompton, to the east of the site, have also revealed a number of ditches, suggesting a degree of occupation, settlement and utilisation of the landscape during the 2nd-4th centuries AD at the edge of the Levels (Wessex Archaeology 2014).

1.4.19 Prior to the excavations on Plots 4000 and 5000, the only other recorded evidence for Roman activity within the Distribution Park was the discovery of a V-shaped Roman ditch from SSC:EA trial pit GO12 to the north of Plot 5000 (Lawler *et al.* 1992). Roman activity had been thought to be concentrated on the higher ground to the east of the Levels, although sites were known at Rookery Farm, *c* 2 km to the north of Plot 8000, and Elmington Manor Farm, *c* 1 km to the south-east of Plot 5000 (GGAT 1997; Rippon 1993). Later activity is recorded at Ellinghurst Farm, *c* 0.8 km north-east of Plot 8000, and, dating to the 4th century AD, Crook's Marsh Farm, *c* 1.5 km south-west of Plot 5000 (Everton and Everton 1981; Juggins 1982).

1.4.20 Before the completion of the fieldwork, it was unclear whether the archaeology exposed at Plots 4000 and 5000 was part of an island of Roman activity or was, in fact, part of a wider settled landscape. It is, however, now clear that Romano-British activity was not distributed uniformly across the Distribution Park. Although the reasons why certain plots within the Distribution Park were selected for settlement are not yet understood, it seems likely that hydrology was a significant factor. Settlement and enclosures are concentrated at particular locations, perhaps on slightly higher, drier ground.

1.4.21 Prior to the work on Plot 4000, archaeological fieldwork had focused on the Wentlooge sequence in an attempt to find archaeological deposits at depths in excess of 1.5 m below the current ground surface. It was, then, perhaps surprising that the archaeology at Plot 4000 was exposed close to the present ground surface, suggesting that there has been little or no alluviation since. It is possible that in the middle of the Roman period the area was drained and managed in such a way that it was no longer as prone to alluviation. On Plots 4000, 5000 and 8000, where the maximum depth of topsoil is *c* 0.3 m (with the exception of slight undulations and mounds), the Roman and medieval ground surfaces were almost the same. Trenches recently excavated within Plot 8000 did not identify any anthropogenic evidence pre-dating the medieval period.

Early medieval (AD 410-1066) to medieval (AD 1066-1540)

1.4.22 In the immediate post-Roman period, the flood defence systems were destroyed probably due to a failure to maintain them combined with rising sea levels, and a thick layer of alluvial deposits accumulated over much of the landscape (Severn Estuary Levels Research Committee website).

1.4.23 However, from around the 10th century there was a second phase of land reclamation along the Severn which led to the creation of the patterns of sea walls, drainage ditches, settlements, fields, and roads that form the basic framework of the landscape today (Mullin, Brunning and Chadwick 2009). At Seabank, for instance, an excavation undertaken in advance of the development of a power station in 1995 revealed peat and a series of ditches, probably representing field boundaries, dating from between the 11th and 14th centuries (ibid.).

Post-medieval to modern (AD 1540-present)

1.4.24 The reclamation that started in the medieval period was only completed in the 19th century when the last of the lower-lying areas were drained. Many of these areas show irregular field patterns created by the gradual process of reclamation and drainage in the medieval and post-medieval periods (Severn Estuary Levels Research Committee website). Until the 16th century and in some cases the 19th century, extensive medieval and post-medieval open fields of ridge and furrow dominated the landscape. The rectilinear pattern of ridge and furrow blocks has shaped the modern landscape and remnants of ridge and furrow are still visible on aerial photographs at places such as Asset 12 (Jacobs 2014), where an area of ridge and furrow is associated with a possible early Neolithic enclosure at Hallen Marsh. During the post-medieval period, the model of medieval rural settlement continued, with dispersed farmsteads and manorial holdings (ibid.).

1.4.25 In the 19th and 20th centuries, military and industrial activity developed in the region with the construction of the large port of Avonmouth and batteries and munitions factories and associated structures being built nearby (SLR 2009).

2 Aims and Methodology

2.1 Aims

2.1.1 The general aim of the evaluation was to identify and characterise any archaeological remains within the route of the pipeline:

2.1.2 The specific aims of the archaeological evaluation are:

- *To identify the presence of any buried archaeological remains along sections of the pipeline diversion;*

- *To identify, investigate and record any such archaeological remains to the extent possible by the methods put forward in this WSI;*
- *To establish the preservation of any buried remains and provide a chronology of the archaeological phasing; and*
- *To disseminate the results through reporting that will inform the requirement for further work;*
- *To establish the location, extent, nature, and date of any archaeological features or deposits that may be present;*
- *To establish the integrity and state of preservation of any archaeological features or deposits that may be present;*
- *To determine the potential of the site to provide palaeoenvironmental and/or economic evidence;*
- *To provide sufficient information on the archaeological potential of the site to enable the archaeological implications of any proposed developments to be assessed;*
- *To inform a strategy to avoid or mitigate impacts of any proposed development on surviving archaeological remains;*
- *To disseminate the results through the production of a site archive for deposition with and to provide information for accession to Gloucetsershire HER.*

2.2 Methodology

2.2.1 An array of twenty evaluation trenches, each measuring 30m x 2m, was excavated across the route, representing a 4% sample of the area (Fig. 4). The trenches were positioned to investigate the potential impacts along the route of the pipeline. The aims of the trial trenching was to investigate fully and expose the entire vertical extent of all trenches to this depth.

2.2.2 The trenches were excavated using a mechanical excavator under archaeological supervision and were positioned on anomalies identified from the geophysical survey, in order to establish the date, nature, vertical and horizontal extent and significance of any archaeology. A proportion of the trial trenches were also located to investigate areas without geophysical anomalies in order to test the efficacy of the geophysics and ensure that the issue of the presence/absence of archaeological remains was resolved. Some trenches were split into sections in order to maintain stability, reduce flooding and minimise risks to personnel.

2.2.3 In particularly deep deposits such as the crossing of the Red Rhine (DX6) and roads (RDX1 and RDX2) depths were anticipated be at least 4m and consequently a series of four test pits and four boreholes was undertaken to evaluate the deeper impact areas. The boreholes were drilled using a terrier rig with continuous sleeved core recovery. The test pit were dug with the mechanical excavator.

3 Results

3.1 Ground conditions

3.1.1 The evaluation was undertaken in good weather conditions, although ground water flooding was experienced in the majority of the trenches. The vegetation and topsoil had been stripped by the main contractor prior to arriving on site.

3.1.2 A series of thin 0.10-0.25m topsoil/ploughsoils were recorded across the route sealing alluvial deposits of the Upper Wentlooge Formation. All trenches came down onto alluvial silty clay deposits.

3.1.3 Most of the evaluation trenches were dug in their proposed positions; only the locations of Trenches 12 and 20 needed to be offset due to ground obstructions. A few trenches were excavated in two segments to avoid services and help reduce the flooding risk.

3.2 Trench Results

3.2.1 This section presents the results of the evaluation, comprising a summary of the stratigraphic sequence revealed by each trench as well as a summary of the artefactual assemblage. Full details of all trenches, including the dimensions and depths of all deposits, can be found in Appendix A.

3.2.2 Trenches 1-9 (Figure 4 and Plates 1 and 2)

3.2.3 The trenches in the northern part of the route exposed alluvial silty clay and were taken down to a depth of just over 1-1.2m, to the proposed impact levels. No peat or organic horizons were identified within the trenches.

3.2.4 The general sequence comprised mid brownish/bluish grey sterile silty clay overlain by increasingly brown or reddish mottled alluvial grey clays. The level at which Roman features were previously identified was reached, but no significant archaeological features or finds were identified at this horizon.

3.2.5 Several of the trenches contained modern ceramic land drains, indicated that flooding was an issue within the area. A modern drainage ditch (404) was identified within the west end of Trench 4. Modern rubbish was recorded within the upper fills of the backfilled ditch and was not retained. A similar modern drainage ditch was also identified within Trench 9.

3.2.6 Trenches 10, 11, 12, 13 and 14 (Figure 4 and Plate 3)

3.2.7 The trenches were taken down to just beyond the impact depth, between 1-1.2m. A similar sequence of bluish grey alluvium and mottled silty clay deposits were identified within the trenches. No significant archaeological features or peat deposits were identified.

3.2.8 Two NE-SW ditches were identified within Trench 10. One contained a ceramic land drain at the base and the second lay on a parallel alignment and was therefore probably also modern. Ceramic field drains were also identified within Trenches 11 and 12.

3.2.9 Trenches 15, 16 and 17 (Figure 4 and Plates 4 and 5)

3.2.10 A humic alluvial layer extended through Trenches 15, 16 and 17. In Trench 15 the layer (1503) was observed *c* 5.80m from the southern end of Trench 15 at 1.10m in depth (4.04m aOD). It was described as a dark blackish clay deposit with small charcoal inclusions and was 0.10m thick. Further to the north this gave way to bluish grey silty clay alluvium suggestive of channel activity. The humic layer was overlain by 0.28m of light grey to mid brown silty clay (1502) and 0.24m of mid bluish grey silty clay (1501). This was sealed by slightly oxidised light grey/brownish orange silty clay alluvium (1500), which also formed part of the thin modern topsoil.

3.2.11 A 0.06m humic clay layer (1604) was identified in Trench 16 at 0.91m depth (4.43m aOD), sealed beneath layers of brownish grey silty clay alluvium (1601-1603). Small

charcoal and plant remains were noted and sampled <4> for further sediment analysis and dating.

3.2.12 The humic clay deposit (1704) was recorded within Trench 17 at a depth of 1.5m (4.22m aOD). It was overlain by a series of mid grey silty clay alluvial deposits (1701-1703) with frequent brown mottling.

3.2.13 The humic layer was investigated for archaeological remains but no finds or features were identified. Both stratified and bulk samples were taken for further palaeoenvironmental analysis and dating.

3.2.14 Trenches 18-20 (Figure 4 and Plate 6)

3.2.15 Alluvial mid grey deposits were identified at the base of each of the trenches. No archaeological features or peat deposits were identified.

3.2.16 A large modern drainage ditch (1904) was identified within Trench 19. It appeared to have been recut several times, the most recent phase containing modern rubbish. The only finds from the lower fills was a piece of animal bone and an abraded CBM fragment. Modern drainage ditches were also identified in Trenches 18 and 20.

3.3 Test pit summary (Figure 5 and Plates 7-10)

3.3.1 The general results of the test pits are described below. Detailed lithological descriptions for each pit are tabulated in Appendices A. The pit locations are shown on Figure 4.

3.3.2 The four test pits were dug in Trenches 6, 13, 17 and 20. They extended to depths of up to 4m in order to investigate and understand the potential for deeper archaeological remains.

3.3.3 Test pit 6 reached a depth of 4m, but was still within greyish blue alluvium. A series of three inter-bedded thin peat bands were identified at depths of 2.24m (+3.21m OD), 2m (+3.45m OD) and 1.68m (+3.77m OD). These were bands of fibrous peat between 0.06m and 0.16m in thickness, separated by grey silty clay alluvium (Plate 7). This was overlain by bluish grey silty clays and the Upper Wentlooge Formation.

3.3.4 A similar but thicker sequence of peat deposits were also identified within test pit 13 (Plate 8). The peats were identified at depths of 3.62m (+0.64m OD), 2.46m (+1.80m OD), 1.42m (+2.84m OD). Generally the peats were much thicker to the south, between 0.18m and 0.40m, separated by thick greyish silty clay alluvium. The peat sequence became shallower and thicker still within test pit 17, possibly relating to a rise in the bedrock, with thin peat being recorded at 1.50m (+4.22m OD) within the evaluation trench and at 4m (+1.72mOD) and 3.4m (+2.32m OD) within the test pit (Plate 9). The upper peat was only 0.08m in thickness, but the lower two were 0.26m and 0.30m in thickness respectively.

3.3.5 Only two peat layers were identified within test pit 20, located at the southern end of the proposed route (Plate 10). The peats were identified at depths of 3.34m (+2.53m OD) and 2.12m (+3.75m OD). Again they were inter-bedded with grey silty clay alluvium and sealed by silty clay alluvium.

3.3.6 These deposits are interpreted as an incipient wetland vegetation layer, sealed beneath estuarine alluvium of the Upper Wentlooge Formation. This incipient vegetation layer, which would largely have been composed of Phragmites reeds, would have formed during a brief period of increased freshwater dominance, either as a result of a minor marine regression or increased freshwater run off from landwards. This growth was then choked off by renewed estuarine alluviation.

3.3.7 The upper humic layer within Trenches 15-17 corresponded very well in level and description to those described at the Enron site and there is very high confidence that the layers correspond stratigraphically and chronologically (i.e. early Bronze Age; Wessex 2005). In the west of the site, where the deposit was almost black, it is likely that microscopic comminuted charcoal was present (although no charcoal fragments could be observed using x10 hand lens).

3.4 Borehole summary (Plates 11-16)

3.4.1 All boreholes were completed successfully to their required depth of 4-5m and at the proposed locations (Fig. 4). Continuous sleeved samples were recovered from each sampling location (Plate 11). The general results of the boreholes are described below. Detailed lithological descriptions for each boreholes are tabulated in Appendix C.

3.4.2 The general sequence of the boreholes is consisted with what is expected for the Upper and Middle Wentlooge as described by Allen (1987; 1990a) and Allen and Rae (1987).

Table 2: Peat units within the Middle Wentlooge Formation

Upper Wentlooge Formation					
Depth	**OABH1**	**OABH2**	**OABH3**	**OABH4**	**Description**
Clayey silt	1.89	1.7	1.23	2.0	Firm light bluish grey silty clay, mottled light brown.
Middle Wentlooge Formation					
Depth	**OABH1**	**OABH2**	**OABH3**	**OABH4**	**Description**
Peat I	1.89-1.9	1.7-1.94	1.23-1.38	-	Thin dark brown peaty organic silt with fe mottling
Peat II	2.2-2.28	2.66-2.68	-	2.08-2.34	Firm dark brown peat with small wood fragements.
Peat III	3.77-3.81	3.77-3.88	3.89-4.04	3.46-3.75	Dark – mid blackish brown pseudo-fibrous peaty silty with small wood inclusions.
Peat IV	4.37-4.4	-	4.3-4.65	4.41-4.67	Dark blackish to brown pseudo-fibrous peat with wood fragments.

3.4.3 The peat layers cannot be directly correlated without radiocarbon dating to those in other sequences since the peat horizons are neither planar nor continuous. Such horizons have been previously dated to between 5790-5590 cal BC and 930-520 cal BC (Allen *et al.* 2002).

3.5 Finds summary

3.5.1 Only two finds were recovered from the evaluation. A single amorphous fragment of undateable ceramic building material and rib bone of a large mammal was recovered from a drainage ditch fill (1905) from Trench 19. The find assemblage is of low potential and requires no further work.

3.6 Environmental summary

3.6.1 Four samples were taken during the course of the evaluation from key peat deposits. Three samples were taken from the peat deposits (1304, 1306, and 1308) from the test pit in Trench 13. A fourth sample was collected from the humic layer (1604) at 0.90m in depth within Trench 16.

3.6.2 Intact plant stems and pieces of waterlogged wood were observed in the samples, as well as occasional insect remains. Waterlogged seeds were present, although again occurring infrequently, and included *Ranunculus* cf subgenus *Batrachium* (Water Crow-foot) and Cyperacaeae Schoenoplectus type (Club-rush). A small fragment of charred or partially charred plant stem was provisionally identified as possible *Phragmites australis* (common reed) or *Equisetum* sp.(horsetail). The assemblage is consistent a wetland edge, fen or bog environments.

3.6.3 Assessment of the four samples reveals that very little charred material is present, therefore providing no evidence for the burning of waterside vegetation which, it had been suggested, may have been carried out at the site in prehistory. Occasional charcoal flecks and one or two charred, or partially-charred, plant stems perhaps represent the burning of material at some distance, but did not approach the frequency that would be expected had *in situ* burning occurred.

4 DISCUSSION

4.1 Reliability of field investigation

4.1.1 The evaluation was conducted in fair weather conditions, although ground conditions were poor over much of the route. However, the evaluation achieved sufficient spatial and sample coverage of the area to be deemed to be representative of the archaeological potential of the route.

4.1.2 No archaeological features or finds of significance were identified during the work. A significant number of mapped and unmapped drainage ditches were encountered during the course of the evaluation.

4.2 Interpretation

4.2.1 The archaeological evaluation was able to achieve the main project objectives in determining that no identified archaeology will be impacted by the proposed pipeline route.

4.3 Archaeological potential

4.3.1 No conclusive evidence of *in situ* burning was identified within the peat deposits identified at the base of the trenches or within the boreholes. Evidence of charred woody and herbaceous stems was previously identified in the upper peat sequence from Plot 4000/5000 dating from the late Bronze Age (Ritchie *et al*. 2007; OA 2010) and at the Enron site and has been interpreted as evidence of land clearance by early prehistoric communities to encourage seasonal grazing (*ibid*).

4.3.2 The northern end of the route, which is located between two nearby Roman sites, produced no evidence of any Roman remains. Settlement activity has been previously located within the Business Park at Plots 4000/5000 to the west and along Farm Lane to the east. The Roman features at these sites was found between 0.40m-0.60m in depth and would have been identified within the trenches, had it been present. The potential land surface associated with the Roman archaeology known as the BaRAS layer (BaRAS 1998) or Wentlooge Surface (Allen 1987) was encountered within the trenches but there were no associated features or finds.

4.3.3 The Roman settlement activity within the area of the bedrock ridge would appear to have been located within an alluvial island that was sufficiently elevated or away from channel activity to have been above all but the highest of spring tides, whereas the pipeline route skirted round the edge of the bedrock ridge and was most likely closer to

channel activity and therefore more prone to flooding and less favourable for settlement.

4.4 Landscape evolution

4.4.1 The rise in the Mercia Mudstone underlying the route may reflect the presence of a bedrock ridge, recorded at the Western Approaches Distribution Park (OA 2010), that is believed to separate a former inlet of the river Severn from the present-day river. This ridge is thought to underlie Pilning, Severn Beach and Seabank. Carter *et al.* (2004) estimate that the bedrock ridge would have passed below the high tide level by 5000 BP (*c* 3800 cal BC). However, it still appears to have continued to affect sediment deposition and creek formation within the marsh and appears to have been a significant influence on the location of late Roman settlement within the Avonmouth-Severnside Levels.

4.4.2 To the south of the bedrock ridge the presence of a complex sequence of estuarine and alluvial sands and silts potentially represents a former route or branch of the River Severn. The geophysical survey and geotechnical boreholes indicated a complex sequence of estuarine deposits within this area dating from the early Holocene. Previous investigations at the edge of the channel sequence have recorded a series of intercalated peats and clayey sands. Radiocarbon results from the organics from the lower sequences suggest that the material accumulated from the Mesolithic period (5210-4840 cal BC, 95.4% probability, and probably 5080-4840, 90.3% probability).

4.4.3 Evidence of burnt reed deposits from the lower peats from Plot 5000/4000, dated to the late Mesolithic period, suggesting that early prehistoric communities were accustomed to manipulating such marsh environment in order to increase the availability of resources (OA 2010). Whether the evidence of reed burning indicates man-made burning (either by accident or design) or a wholly natural event (possibly through lightning strike during a period of drought), however, is unclear. Other examples of burning events dating to this period in the Severn Estuary have been detected at Goldcliffe (eg Bell *et al.* 1995: dated 5250–5550 cal BP) and at the Caldicot Levels in Wales (eg Walker *et al.* 1998, 75). Elsewhere in England some authors have argued that Mesolithic peoples were intentionally modifying reed beds by burning them back in order to improve access to open water, possibly improving hunting opportunities as well (eg Star Carr: Hather 1998)

4.4.4 The overlying Middle Wentlooge Formation consisted of a series of minerogenic bluish/greenish grey clay-silts inter-stratified with peat and organic deposits between -1.00m and +4.00m OD. This sequence represents a phase of rising and fluctuating sea level during the Neolithic period and Bronze Age. The organic and peat deposits indicate periods of partial stabilisation of the wetlands through emergent vegetation which were interspersed with periods of renewed estuarine flooding and a return to a saltmarsh environment. The peat deposits identified within the boreholes and trenches occur at similar elevations to those recorded previously within the area.

4.4.5 The peat has been previously radiocarbon dated to the later Neolithic period-middle Bronze Age and the palaeoenvironmental data suggests a potential sea level index point of Bronze Age date (1520-1310 cal BC, 95.4%; 3151 ± 45 BP, at +3.69 m aOD, OA 2010). The height data for the peat units, commonly occurring at elevations comparable to other radiocarbon-dated sequences in the Severn Estuary of Bronze Age date. Several of these buried wetland surfaces have been investigated (Druce 1998; 2000; Carter *et al.* 2004) but associated human activity has only been identified in the Somerset Levels (Coles and Coles 1986).

4.4.6 The Upper Wentlooge Formation relates to estuarine inundation from the late Iron Age onwards. Stabilisation or standstill horizons were identified within the upper sequence within the trenches representing a slow down in the rate of sea level rise during the Roman period. The overlying weathered silty clay deposits represent rising sea levels and estuarine inundation during the post-Roman period and a potential breakdown in coastal defences. The remains of a network of drainage ditches within the area relate to the reclamation and drainage of the area from the medieval period, which continued in use through to modern times.

4.5 Conclusion

4.5.1 Based on the results of the archaeological and geoarchaeological evaluation no significant archaeological or palaeoenvironmental deposits will be impacted by the proposed pipeline route. The main impacts will be limited to the Upper Wentlooge Formation, which has limited potential for dating or palaeoenvironmental remains.

4.6 References

Allen, J R L,1987 Late Flandrian shoreline oscillations in the Severn Estuary: the Rumney Formation and its type site (Cardiff area), *Philosophical Transactions of the Royal Society of London* B315, 157-184

Allen, J R L,1990 The Severn Estuary in south-west Britain: its retreat under marine transgression and fine sediment regime. *Sedimentary Geology* **66**, 13-28

Allen, J R L, 1992 The post-glacial geology and geoarchaeology of the Avon Wetlands, in P R Crowther (ed.), *The coast of Avon*, Bristol Naturalists Society, Special Issue 3, 28-46

Allen, J R L, and Fulford, M G, 1990 Romano-British wetland reclamations at Longney, Gloucestershire, and evidence for the earlier settlement of the inner Severn Estuary, *Antiq J* **70**, 288–326

Allen, M J and Scaife, R G, 2010 *The physical evolution of the North Avon Levels: a review and summary of the archaeological implications,* Publication Paper **1**, Wessex Archaeology

BaRAS, 1998 Archaeological watching brief on the laying of an effluent pipeline between Avonmouth Sewage Works and Seabank Power Station, Bristol, for Wessex Water Parlc, unpubl. report, Bristol and Region Archaeological Service 1998 Report 265/1998

Bates, M R, and Barnham, A J, 1995 Holocene alluvial stratigraphic architecture and archaeology in the Lower Thames area, in D R Bridgland, P Allen and B A Haggart, *The Quaternary of the lower reaches of the Thames: field guide*, Cambridge, 85-98

Bell, M, and Neumann, H, 1997 Prehistoric intertidal archaeology and environments in the Severn Estuary, Wales, *World Archaeology* **29(1)**, 95-113

Carter, S, Jones, J, and McGill, B, 2004 The Pucklechurch to Seabank pipeline: sediment stratigraphic and palaeoenvironmental data from the Avonmouth Levels, *Archaeology in the Severn Estuary* **14**, 69-86

Coles, J, and Coles, B, 1986 *Sweet track to Glastonbury*, Thames and Hudson

Crowther, S, and Dickson, A, 2008 *Severn Estuary Rapid Coastal Zone Assessment*

Survey National Mapping Programme English Heritage; HEEP Project No. 3885

Druce, D, 2000 Mesolithic to Romano-British archaeology and environmental changes of the Severn Estuary, England. Unpubl. PhD. Thesis, University of Bristol.

Druce, D, 1998 Late Mesolithic to early Neolithic environmental change in the central Somerset Levels: recent work on Burham-on-sea, *Archaeology in the Severn Estuary* **9**, 17-30

English Heritage, 2007 *Geoarchaeology: Using an earth sciences approach to understand the archaeological record*

English Heritage, 2011 *Environmental archaeology: A guide to the theory and practice of methods from sampling and recovery to post-excavation*

Everton, A, and Everton, B, 1981 Romano-British occupation at Crook's Marsh Farm, Avonmouth, *Bristol and Avon Archaeological Research Group Review* **2**, 57-8

Gardiner, J, Allen, M J, Hamilton-Dyer, S, Laidlaw, M, and Scaife, R G, 2002 Making the most of it: late prehistoric pastoralism in the Avon Levels, Severn Estuary, *Proceedings of the Prehistoric Society* **68**, 1-39

Glamorgan-Gwent Archaeological Trust 1997, M49 Motorway Junction Archaeological Desk-Based Assessment- A report prepared for Landmark Environmental Consultants Ltd (GGAT Project No A 430, Report No 97/066) (SGHER-12766).

Hather, J G, 1998 Identification of macroscopic charcoal assemblages, in P Mellars and P Dark (eds), *Star Carr in context: new archaeological and palaeoecological investigations at the early Mesolithic site of Star Carr in North Yorkshire*, McDonald Institute Monographs, Cambridge, 183-196

Hawkins, A B, 1990 Geology of the Avon coast, *Proceedings of the Bristol Naturalists' Society* **50**, 1-27

Jacobs, 2014 Heritage Statement: Severnside Pipeline Diversion

Jacobs, 2015 Written Scheme of Investigation: Severnside Pipeline Diversion

Jones, A P, Tucker, M E, and Hart, J, 1999 *The description and analysis of Quaternary stratigraphic field sections,* Quaternary Research Association Technical Guide **7**

Juggins, S J, 1982 The geoarchaeology of Hallen Marsh, Unpubl. dissertation, University of Bristol

Locock, M, 2001 Later Bronze Age landscape on the Avon Levels: settlement, shelters and saltmarsh at Cabot Park in J Bruck (ed.) *Bronze Age landscapes: tradition and transformation,* 121-128

Masser, P, Jones, J, and McGill, B, 2005 Romano-British settlement and laud use on the Avonmouth Levels: the evidence of the Pucklechurch to Seabank pipeline project, *Transactions of the Bristol and Gloucestershire Archaeological Society* **123**, 55-86

MOLAS, 2007 *Plot 9, Cabot P*ark, Avonmouth, City of Bristol: a report on the geoarchaeological borehole survey (Unpublished report)

MOLAS, 2007 Plot 9, Cabot Park, Avonmouth, City of Bristol: an archaeological evaluation report (Unpublished report)

Mullin, D, Brunning, R, and Chadwick, A, 2009 Gloucestershire and Somerset County Council's Severn Estuary Rapid Coastal Zone Assessment Survey Phase I report for English Heritage (HEEP Project No. 3885)

OA, 2010 Investigation of the Lower and Middle Wentlooge Formation, and further excavation of a later Romano-British farmstead at Henbury Level (Plot 5000, Western Approaches Distribution Park, Avonmouth, South Gloucestershire), Oxford Archaeology unpublished client report

Rippon, S, 2000 The Romano-British exploitation of coastal wetlands: survey and excavation on the North Somerset Levels, 1993-1997, *Britannia* **31**, 69-200

Ritchie, K, and Barnett, C, 2007 The Upper Wentlooge formation and a Romano-British settlement: Plot 4000, the Western Approach Business Park, Avonmouth, South Gloucestershire, Archaeology of the Severn Estuary 18, 19-58

SLR, 2009 Severn Road Resource Recovery Centre: Chapter 13 Cultural Heritage for Viridor, SLR Ref 402.0036.00374

Stace, C, 2010 New flora of the British Isles, 3rd edn, Cambridge University Press, Cambridge

Walker, M J C, Bell, M, Caseldine, A E, Cameron, N G, Hunter, K L, James, J H, Johnson, S, and Smith, D N, 1998 Palaeoecological investigation of middle and late Flandrian buried peats on the Caldicot Levels, Severn Estuary, Wales, *Proceedings of the Geologists Association* **109**, 51-78

Webster, C J (ed.), 2007 *Archaeology of South West England: South West Archaeological Research Framework Resource Assessment and Research Agenda*

Wessex Archaeology, 2014 The Wave Washing Farm and Over Court Farm, Over, South Gloucestershire. Archaeological Borehole and Survey Report

APPENDIX A. TRENCH AND TEST PIT DESCRIPTIONS

Trench 1						
General description					**Orientation**	N-S
Trench devoid of archaeology.					**Avg. depth (m)**	1
					Width (m)	2
					Length (m)	30
Contexts						
Context no	**Type**	**Width (m)**	**Thickness (m)**	**Comment**	**Finds**	**Date**
100	Layer	-	0.49	Thin topsoil on top of a mid grey silty clay alluvium with mid brownish orange mottling.	-	-
101	Layer	-	0.5	Mid blue grey silty clay alluvium with brown mottling.	-	-
102	Layer	-	0.18	Firm mid grey silty clay alluvium with brown mottling.	-	-

Trench 2						
General description					**Orientation**	SSE-NNW
Trench devoid of archaeology.					**Avg. depth (m)**	1
					Width (m)	2
					Length (m)	30
Contexts						
Contex`t no	**Type**	**Width (m)**	**Thickness (m)**	**Comment**	**Finds**	**Date**
200	Layer	-	0.6	Mid grey silty clay alluvium with brownish orange mottles.	-	-
201	Layer	-	0.16	Mid bluish grey silty clay alluvium with brown mottling	-	-
202	Layer	-	0.33	Mid grey silty clay alluvium with brown mottling.	-	-

Trench 3		
General description	**Orientation**	NNW-SSE
Trench devoid of archaeology.	**Avg. depth (m)**	1

	Width (m)	2
	Length (m)	30

Contexts

Context no	Type	Width (m)	Thickness(m)	Comment	Finds	Date
300	Layer	-	0.68	Mid grey silty clay with reddish brown mottles.	-	-
301	Layer	-	0.17	Mid blue grey silty clay alluvium with mid brown mottles.	-	-
302	Layer	-	0.28	Soft mid bluish grey silty clay alluvium with brown mottles.	-	-

Trench 4

General description		
	Orientation	E-W
Trench devoid of archaeology. Modern drainage ditch present.	**Avg. depth (m)**	1
	Width (m)	2
	Length (m)	30

Contexts

Context no	Type	Width (m)	Thickness (m)	Comment	Finds	Date
400	Layer	-	0.13	Topsoil: Dark greyish brown silty clay, soft to tacky	-	-
401	Layer	-	0.59	Soft mid grey silty clay alluvium with mid reddish brown mottles	-	-
402	Layer	-	0.14	Mid blue grey silty clay alluvium with brown mottles.	-	-
403	Layer	-	0.30	Mid grey silty clay alluvium with mid brown mottles.	-	-
404	Cut	3.60	1.15	Drainage ditch cut. Filled by (405).	-	-
405	Fill	3.60	1.15	Fill of [404]; Dark grey brown and black silty clay.	Plastic	Modern

Trench 5

General description		
	Orientation	N-S

Trench devoid of archaeology.	**Avg. depth (m)**	1
	Width (m)	2
	Length (m)	30

Contexts

Context no	Type	Width (m)	Depth (m)	Comment	Finds	Date
500	Layer	-	0.13	Topsoil: dark greyish brown silty clay, soft to tacky	-	-
501	Layer	-	0.30	Mid grey silty clay alluvium with brownish orange mottling.	-	-
502	Layer	-	0.45	Mid grey silty clay alluvium with mid brown mottles.	-	-
503	Layer	-	0.15	Mid grey silty clay alluvium with brown and mid blue mottles.	-	-

Trench 6

General description	**Orientation**	WNW-ESE
Trench devoid of archaeology.	**Avg. depth (m)**	1
	Width (m)	2
	Length (m)	25.6

Contexts

Context no	Type	Width (m)	Thickness (m)	Comment	Finds	Date
600	Layer	-	0.59	Mid grey silty clay alluvium with mid brownish orange mottles.	-	-
601	Layer	-	0.22	Soft mid grey silty clay alluvium with mid brownish mottles	-	-
602	Layer	-	0.25	Light brownish grey silty clay with mid blue grey and orange mottles.	-	-
603	Layer	-	0.44	Mid grey silty clay alluvium with with brown mottles.	-	-
604	Layer	-	0.30	Mid greyish blue silty clay alluvium with dark blue mottles.	-	-

605	Layer	-	0.06	Dark greyish brown peat.	-	-
606	Layer	-	0.26	Mid greyish blue silty clay alluvium with dark blue mottles.	-	-
607	Layer	-	0.08	Light greyish brown peat.	-	-
608	Layer	-	0.16	Mid greyish blue silty clay alluvium with dark blue mottles.	-	-
609	Layer	-	0.16	Dark brown/black peat.	-	-
610	Layer	-	1.60	Mid greyish blue silty clay alluvium with dark blue mottles.	-	-

Trench 7						
General description					**Orientation**	E-W
Trench devoid of archaeology.					**Avg. depth (m)**	1
					Width (m)	2
					Length (m)	30
Contexts						
Context no	**Type**	**Width (m)**	**Thickness (m)**	**Comment**	**Finds**	**Date**
700	Layer	-	0.10	Topsoil: Dark greyish brown silty clay, soft to tacky	-	-
701	Layer	-	0.44	Soft mid grey silty clay alluvium with mid orange brown mottles	-	-
702	Layer	-	0.26	Mid grey silty clay alluvium with brown mottles	-	-
703	Layer	-	0.23	Mid grey silty clay alluvium with blue grey mottles.	-	-

Trench 8		
General description	**Orientation**	N-S
Trench devoid of archaeology.	**Avg. depth (m)**	1
	Width (m)	2
	Length (m)	30
Contexts		

Context no	Type	Width (m)	Thickness (m)	Comment	Finds	Date
800	Layer	-	0.66	Mid grey silty clay alluvium with brownish orange mottles.	-	-
801	Layer	-	0.30	Soft mid grey silty clay alluvium with brown mottles	-	-
802	Layer	-	>0.10	Mid grey silty clay alluvium with brown mottles	-	-

Trench 9		
General description	**Orientation**	NW-SE
Trench devoid of archaeology. Modern drainage ditch present.	**Avg. depth (m)**	1
	Width (m)	2
	Length (m)	30

Contexts

Context no	Type	Width (m)	Thickness (m)	Comment	Finds	Date
900	Layer	-	0.65	Light orangey brown silty clay alluvium.	-	-
901	Layer	-	0.15	Light brownish grey clay alluvium with brown-orange mottles.	-	-
902	Layer	-	0.20	Soft, light grey to blue clay alluvium.	-	-
903	Cut	4.70	1.40	NE-SW drain cut. Filled by (904).	-	-
904	Fill	4.70	1.40	Fill of [903]; Mixed deposit comprising black topsoil, yellow clay and rubble.	-	-

Trench 10						
General description					**Orientation**	E-W
Trench devoid of archaeology. Modern drainage ditches present.					**Avg. depth (m)**	1
					Width (m)	1.8
					Length (m)	50
Contexts						
Context no	**Type**	**Width (m)**	**Thickness (m)**	**Comment**	**Finds**	**Date**
1000	Layer	-	0.28	Light brownish grey silty clay alluvium with orange grey mottles.	-	-
1001	Layer	-	0.74	Light brownish grey silty clay alluvim.	-	-
1002	Cut	0.80	0.15	NE-SW drain cut. Filled by (1003)	-	-
1003	Fill	0.80	0.15	Fill of [1002]; dark brown grey silty clay	-	-
1004	Cut	0.78	0.48	NE-SW drainage ditch; filled by (1005).	-	-
1005	Fill	0.78	0.48	Fill of [1004]; light brownish orange silty clay.	-	-
1006	Cut	0.90	0.05	NE-SW drainage ditch; filled by (1007).	-	-
1007	Fill	0.90	0.05	Fill of [1006]; dark brownish grey silty clay.	-	-

Trench 11						
General description					**Orientation**	E-W
Trench devoid of archaeology. Modern drainage ditches present.					**Avg. depth (m)**	1
					Width (m)	2
					Length (m)	30
Contexts						
Context no	**Type**	**Width (m)**	**Thickness (m)**	**Comment**	**Finds**	**Date**
1100	Layer	-	0.51	Light brownish grey silty clay alluvium with orange mottles.	-	-
1101	Layer	-	0.09	Mid blue grey silty clay alluvium with brown mottles.	-	-
1102	Layer	-	0.30	Mid grey silty clay	-	-

				alluvium with brown mottles.		
1103	Cut	1.0	0.07	Drainage ditch cut; filled by (1104).	-	-
1104	Fill	1.0	0.07	Fill of [1103]; dark brown grey silty clay.	-	-
1105	Cut	1.0	0.66	Drain cut; filled by (1106).	-	-
1106	Fill	1.0	0.66	Fill of [1105]; light brown grey silty clay.	-	-

Trench 12						
General description					**Orientation**	N-S
Trench devoid of archaeology. Land drain present.					**Avg. depth (m)**	1
					Width (m)	2
					Length (m)	30
Contexts						
Context no	**Type**	**Width (m)**	**Thickness (m)**	**Comment**	**Finds**	**Date**
1200	Layer	-	0.62	Light brownish grey silty clay alluvium with orange mottles.	-	-
1201	Layer	-	0.07	Mid blue grey silty clay alluvium with brown mottles.	-	-
1202	Layer	-	0.31	Mid grey silty clay alluvium with brown mottles.	-	-
1203	Cut	0.20	0.35	WNW-ESE land drain; filled by (1204).	-	-
1204	Fill	0.20	0.35	Fill of [1203]; light orangey brown silty clay.	-	-

Trench 13						
General description					**Orientation**	SE-NW
Trench devoid of archaeology. Land drains present.					**Avg. depth (m)**	1
					Width (m)	2
					Length (m)	25.6
Contexts						
Context no	**Type**	**Width (m)**	**Thickness (m)**	**Comment**	**Finds**	**Date**

1300	Layer	-	0.62	Mid grey silt clay alluvium with brownish orange mottles.	-	-
1301	Layer	-	0.08	Mid blue grey silty clay alluvium with brown mottles.	-	-
1302	Layer	-	0.42	Mid grey silty clay alluvium with brown mottles.	-	-
1303	Layer	-	0.30	Mid greyish blue silty clay alluvium with brown mottles.	-	-
1304	Layer	-	0.40	Mid to dark brown peat.	-	-
1305	Layer	-	0.64	Mid greyish blue silty clay alluvium with dark blue mottles.	-	-
1306	Layer	-	0.18	Dark brown to black peat.	-	-
1307	Layer	-	0.98	Mid greyish blue silty clay alluvium with dark blue mottles.	-	-
1308	Layer	-	0.18	Dark brown to black peat.	-	-
1309	Layer	-	>0.22	Mid greyish blue silty clay alluvium with dark blue mottles.	-	-
1310	Cut	-	-	NE-SW Land drain; filled by (1311)	-	-
1311	Fill	-	-	Fill of [1310]; mid grey with brownish orange mottles, silty clay.	-	-

Trench 14						
General description					**Orientation**	NE-SW
Trench devoid of archaeology.					**Avg. depth (m)**	1
					Width (m)	2
					Length (m)	30
Contexts						
Context no	**Type**	**Width (m)**	**Thickness (m)**	**Comment**	**Finds**	**Date**
1400	Layer	-	0.58	Mid grey silty clay alluvium with brownish orange	-	-

				mottles.		
1401	Layer	-	0.27	Mid blue grey silty clay alluvium with brown mottles.	-	-
1402	Layer	-	0.36	Mid grey silty clay alluvium with brown mottles.	-	-

Trench 15						
General description					**Orientation**	N-S
Trench devoid of archaeology.					**Avg. depth (m)**	1
					Width (m)	2
					Length (m)	19.2
Contexts						
Context no	**Type**	**Width (m)**	**Thickness (m)**	**Comment**	**Finds**	**Date**
1500	Layer	-	0.58	Light grey brown silty clay alluvium with brownish orange mottles.	-	-
1501	Layer	-	0.24	Mid blue grey clay alluvium.	-	-
1502	Layer	-	0.28	Light to mid grey brown clay alluvium with dark orange specks.	-	-
1503	Layer	-	-	Dark grey to black humic clay, alluvium?	-	-

Trench 16						
General description					**Orientation**	NE-SW
Trench devoid of archaeology.					**Avg. depth (m)**	1
					Width (m)	2
					Length (m)	30
Contexts						
Context no	**Type**	**Width (m)**	**Thickness (m)**	**Comment**	**Finds**	**Date**
1600	Layer	-	0.44	Plastic light grey brown silty clay alluvium with orange specks.	-	-
1601	Layer	-	0.06	Plastic mid blue grey clay alluvium.	-	-

1602	Layer	-	0.32	Plastic light grey brown clay alluvium with orange specks.	-	-
1603	Layer	-	0.09	Plastic blue grey clay alluvium with yellowy brown mottles.	-	-
1604	Layer	-	0.06	Dark grey to black humic clay alluvium.	-	-
1605	Layer	-	0.03	Light grey blue clay alluvium with yellowy brown mottles.	-	-

Trench 17						
General description					**Orientation**	NE-SW
Trench devoid of archaeology.					**Avg. depth (m)**	1
					Width (m)	2
					Length (m)	30
Contexts						
Context no	**Type**	**Width (m)**	**Thickness (m)**	**Comment**	**Finds**	**Date**
1700	Layer	-	0.28	Topsoil: dark grey brown silty clay.	-	-
1701	Layer	-	0.54	Mid grey silty clay alluvium with orange mottles.	-	-
1702	Layer	-	0.06	Mid blue grey silty clay alluvium with brown mottles.	-	-
1703	Layer	-	0.62	Mid grey silty clay alluvium with brown mottles.	-	-
1704	Layer	-	0.08	Dark grey to black silty clay alluvium.	-	-
1705	Layer	-	0.28	Mid grey silty clay alluvium with brown mottles.	-	-
1706	Layer	-	1.54	Mid greyish blue silty clay alluvium with dark blue mottles.	-	-
1707	Layer	-	0.30	Dark brown to black peat.	-	-
1708	Layer	-	0.04	Mid greyish blue silty clay alluvium with dark blue mottles.	-	-
1709	Layer	-	0.26	Dark brown to black peat.	-	-

1710	Layer	-	-	Mid greyish blue silty clay alluvium with dark blue mottles.	-	-

Trench 18						
General description					**Orientation**	NE-SW
Trench devoid of archaeology.					**Avg. depth (m)**	1
					Width (m)	2
					Length (m)	30
Contexts						
Context no	**Type**	**Width (m)**	**Thickness (m)**	**Comment**	**Finds**	**Date**
1800	Layer	-	0.89	Mid grey silty clay alluvium with brownish orange mottles.	-	-
1801	Layer	-	0.10	Mid blue grey silty clay alluvium with brown mottles.	-	-
1802	Layer	-	0.11	Mid grey silty clay alluvium with brown mottles.	-	-

Trench 19						
General description					**Orientation**	WNW-ESE
Trench devoid of archaeology. Modern drainage ditches present.					**Avg. depth (m)**	1
					Width (m)	2
					Length (m)	30
Contexts						
Context no	**Type**	**Width (m)**	**Thickness (m)**	**Comment**	**Finds**	**Date**
1900	Layer	-	0.80	Mid grey silty clay alluvium with brownish orange mottles.	-	-
1901	Layer	-	>0.20	Mid grey silty clay alluvium with brown mottles.	-	-
1902	Cut	4.60	1.0	ENE-WSW ditch; filled by (1903).	-	-
1903	Fill	4.60	1.0	Fill of [1902]; light browny orange clayey	-	-

				silt.		
1904	Cut	3.5	1.20	ENE-WSW drainage ditch; filled by (1905) and (1906)	-	-
1905	Fill	3.50	0.40	Fill of [1904]; firm dark grey silty clay.	-	-
1906	Fill	3.0	0.18	Fill of [1904]; firm dark grey brown silty clay.	-	-

Trench 20						
General description					**Orientation**	N-S
Trench devoid of archaeology. Modern drainage ditches present.					**Avg. depth (m)**	1
					Width (m)	2
					Length (m)	30
Contexts						
Context no	**Type**	**Width (m)**	**Thickness (m)**	**Comment**	**Finds**	**Date**
2000	Layer	-	0.80	Mid grey silty clay alluvium with brownish orange mottles.	-	-
2001	Layer	-	0.48	Mid grey silty clay alluvium with brown mottles.	-	-
2002	Cut	4.60	1.10	ENE-WSW ditch; filled by (2003).	-	-
2003	Fill	4.60	1.10	Fill of [2002]; mixed deposit comprising brownish grey clay and yellowy brown sandy gravel.	-	-
2004	Cut	4.90	1.20	ENE-WSW ditch; filled by (2005) and (2006).	-	-
2005	Fill	4.90	0.40	Fill of [2004]; firm dark grey silty clay.	-	-
2006	Fill	2.10	0.18	Fill of [2004]; Compact mid greyish brown silty clay with orange specks.	-	-
2007	Layer	-	0.46	Mid greyish blue silty clay alluvium with brownish orange mottles.	-	-

2008	Layer	-	0.38	Mid greyish blue silty clay with dark blue mottles.	-	-
2009	Layer	-	0.16	Dark brown to black peat.	-	-
2010	Layer	-	0.48	Mid greyish blue silty clay alluvium with dark blue mottles.	-	-
2011	Layer	-	0.58	Light greyish blue silty clay alluvium with dark blue mottles.	-	-
2012	Layer	-	0.21	Dark brown to black peat.	-	-
2013	Layer	-	>0.39	Mid greyish blue silty clay alluvium with dark blue mottles.	-	-

APPENDIX B. BOREHOLE DESCRIPTIONS

TOP	BASE	LITHOLOGY	CONTACT	DESCRIPTION OA01
0	0.4	clayey silt	diffuse	Firm light brown mottled light grey slightly clayey silt, rare lenses (2mm) of fine sandy silt. ALLUVIUM.
0.4	1	clayey silt	diffuse	Firm bluish grey mottled light brown (20%) clayey silt. ALLUVIUM
1	1.51	clayey silt	diffuse	Firm light brown light greenish grey (20%) clayey silt, common olive brown concretions, rare black flecks. ALLUVIUM
1.51	1.8	clayey silt	clear	Firm greenish grey clayey silt, rare lenses of slightly sandy silt with rare fine white inclusions (shell fragments?), few small brown “peaty” lenses present, <40mm lenses of dark brown organic silt common at base. ALLUVIUM
1.8	1.9	peat	abrupt	Firm dark greyish brown “peaty” organic silt, small reddish brown wood fragments included, rare <1mm lenses of greenish grey clayey silt. PEAT
1.9	2.2	clayey silt	diffuse	Soft dark greenish grey clayey silt with few small <2mm lenses of brown “peaty” silt in top 50mm, rare fine white grains (shell Fragments?) present. ALLUVIUM
2.2	2.28	organic rich silt	clear	Moderately firm dark brownish grey humic rich silt, small greenish grey mottles common, <5mm lenses of black “peaty” silt included. ORGANIC RICH ALLUVIUM
2.28	2.6	clayey silt	abrupt	Soft greenish grey clayey silt with fine brown and black flecks (plant detritus?) and common inclusions of small wood fragments, remains of roots present present above base. ALLUVIUM
2.6	2.74	peat	abrupt	Firm dark brown pseudo-fibrous “peaty” organic silt, small yellowish brown wood fragments common. PEAT
2.74	3.5	clayey silt	diffuse	Soft greenish grey clayey silt with common fine blackish flecks, wood fragments are common in the top 130mm, small plant detritus occurs in top 0.6m. ALLUVIUM
3.5	3.77	clayey silt	clear	Moderately firm greenish grey clayey silt, weak lamination, long vertical yellowish brown <3mm roots common, few plant remains <1mm close to base. ALLUVIUM
3.77	3.81	organic rich silt	abrupt	Firm mid-brownish grey with fine light greenish grey mottles (25%) humic rich, slightly clayey silt, few inclusions of ,4mm wood remains (10%) ORGANIC RICH ALLUVIUM
3.81	4.02	peat	abrupt	Firm dark brown / blackish pseudo-fibrous organic rich “peaty” silt, common inclusions of small wood fragments and rare <3mm lenses of greyish brown clayey silt. PEAT
4.02	4.37	clayey silt	abrupt	Soft light greyish brown slightly clayey silt, inclusions of small yellowish brown and brown plant detritus (wood, reeds) common (15%). ALLUVIUM
4.37	4.4	organic silt	clear	Moderately firm dark brown / blackish organic rich “peaty“ silt, trace of clay, organic odour, few plant remains included. PEAT
4.4	4.58	clayey silt	diffuse	Firm greenish grey slightly clayey silt, trace of fine sand, grey mottles common in top 0.13m, plant and (vertical) root remains common, rare subangular <20mm pebbles in top 0.05m. ALLUVIUM
4.58	4.84	clayey silt	clear	Light greenish grey mottled dark grey (5%) slightly clayey silt with rare fine plant remains <1%). ALLUVIUM
4.84	5	sandy clayey silt		Firm dark greenish grey slightly sandy slightly clayey “gritty” silt with few angular to sub-rounded flint pebbles <10mm. FLUVIAL DEPOSIT

TOP	BASE	LITHOLOGY	CONTACT	DESCRIPTION OA02
0	0.7	clayey silt	diffuse	Firm light brown slightly clayey silt, small light grey mottles (25%), rare small brown and black concretions. ALLUVIUM
0.7	1	clayey silt	diffuse	Firm grey clayey silt, common small brown mottles (35%), few <4mm Fe-concretions. ALLUVIUM
1	1.61	clayey silt	clear	Moderately firm light brownish grey mottled olive brown (25%), olive brown (Fe) concretions at 0.1 and 0.3m above base. ALLUVIUM
1.61	1.7	clayey silt	clear	Soft mid-bluish grey clayey silt, homogenous. ALLUVIUM
1.7	1.75	organic rich silt	clear	Soft dark brownish grey humic rich homogenous clayey silt. ORGANIC RICH ALLUVIUM
1.75	1.84	organic rich silt	clear	Soft dark greyish brown humic rich homogenous silt, trace of clay, few lenses <2mm of “peaty” silt. ORGANIC RICH ALLUVIUM
1.84	1.94	organic silt	abrupt	Friable, dark brownish grey/blackish “peaty” organic silt. Fine plant detritus present. PEAT
1.94	2.1	clayey silt	diffuse	Soft dark greenish grey clayey silt, becoming mid-greenish grey moyyeld olive-brown (15%) ALLUVIUM.
2.1	2.66	clayey silt	abrupt	Soft light bluish grey clayey silt, common small plant remains, small black organic flecks at base. ALLUVIUM
2.66	2.68	organic rich silt	clear	Soft light brown organic rich slightly clayey silt, small lenses <2mm of “peaty”silt common. ORGANNIC RICH ALLUVIUM
2.68	3.77	clayey silt		Soft light greenish grey silt, rare fine black organic flecks and small brown plant remains present. Small lenses of brown “peaty” silt at 0.02m above base. ALLUVIUM
3.77	3.88	organic silt	diffuse	Friable blackish organic silt, slightly sandy, rare small plant remains (reeds?). PEAT
3.88	400	silty sand	diffuse	Moderately firm to loose dark greenish grey becoming greenish grey very find silty sand, mica present, rare brown organic inclusions (2mm). FLUVIAL SAND
4	4.55	sand	clear	Loose light greenish grey fine to medium (mainly fine) homogenous sand, rare small diffuse black mottles and brown flecks. (Possibly secundary effects after retrieval). FLUVIAL SAND

TOP	BASE	LITHOLOGY	CONTACT	DESCRIPTION OA03
0	0.7	clayey silt	diffuse	Firm light brown slightly clayey silt, grey mottles common (30%) rare <2mm lenses of fine sandy silt. ALLUVIUM
0.7	1	clayey silt	diffuse	Firm grey clayey silt, frequent small brown mottles and few friable Fe-concretions. ALLUVIUM
1	1.23	clayey silt	abrupt	Moderately firm light brownish grey mottled yellowish brown (20%) clayey silt, few Fe-concretions. ALLUVIUM
1.23	1.26	organic silt	abrupt	Friable dark brown organic “peaty” silt, trace of clay. PEAT
1.26	1.3	organic rich silt	abrupt	Moderately firm dark greyish brown humic rich clayey silt, yellowish brown (10mm) at base, rare small lenses <1mm of brown “peaty” silt. ORGANIC RICH ALLUVIUM
1.3	1.34	organic rich silt	abrupt	Moderately firm very dark grey homogenous slightly clayey organic rich silt. ORGANIC RICH ALLUVIUM
1.34	1.38	organic silt	clear	Moderately firm black organic rich “peaty“ silt, plastic, trace of clay, organic odour, few plant remains included. PEAT
1.38	1.65	clayey silt	diffuse	Soft light brown mottled yellowish brown (15%) clayey silt, small lenses of fine sandy silt in lower 0.15m. ALLUVIUM
1.65	2	sandy clayey sil	diffuse	Soft mid-brownish grey slightly clayey silt, laminated with groups fine sandy lenses <2mm of (very fine) sandy silt, rare black flecks (organic detritus). STRATIFIED ALLUVIUM.
2	2.14	clayey silt	clear	Soft mid-grey clayey silt, few lenses of (very fine) sandy silt (2mm). ALLUVIUM
2.14	2.24	sandy clayey sil	clear	Moderately firm mid-brownish grey slightly clayey silt, frequent lenses <3mm of (very fine) sandy silt. ALLUVIUM
2.24	2.55	clayey silt	clear	Moderately firm light brownish grey slightly clayey silt, fine black mottling at basal 0.1m. ALLUVIUM
2.55	3	sandy clayey sil	clear	Soft dark greenish grey clayey silt, laminated with groups of lenses <1mm of very fine sand. STRATIFIED ALLUVIUM
3	3.26	clayey silt	clear	Soft dark greenish grey clayey silt, week intermittent lamination with 1mm thin silt lenses. ALLUVIUM
3.26	3.89	sandy clayey sil	abrupt	Soft dark greenish grey slightly clayey silt, laminated with groups of dark brownish grey <1mm lenses of very fine sandy silt.
3.89	4.04	organic silt	clear	Friable very dark brown organic “peaty” silt, small brown plant remains common. PEAT
4.4	4.3	clayey silt	abrupt	Soft mid-bluish grey clayey silt,common small black mottles, few large lenses <60mm of dark brownish grey “peaty organic silt. ALLUVIUM
4.3	4.65	peat	clear	Firm dark brown fibrous peat, small plant remains included (15%). PEAT
4.65	4.7	clayey silt	clear	Soft mid-brownish grey clayey silt, frequent lenses (1mm) of brown “peaty” silt in top 30mm, few wood remains. ALLUVIUM.
4.7	5	sandy clayey sil	clear	soft mid greenish grey clayey silt, common lenses of very fine silty sand (1 – 40mm), small black mottles in top 0.1m.

TOP	BASE	LITHOLOGY	CONTACT	DESCRIPTION OA04
0	0.5	clayey silt	diffuse	Firm light greenish grey mottled brown (30%) slightly clayey silt, fine roots present. ALLUVIUM
0.5	1	clayey silt	diffuse	Firm greyish brown mottled slight grey slightly clayey silt, trace of fine sand. ALLUVIUM
1	1.25	clayey silt	diffuse	Moderately firm light brown clayey silt, common small olive brown mottles and Fe-concretions. ALLUVIUM
1.25	1.6	clayey silt	clear	Soft mid-grey slightly clayey silt, very fine black organic flecks present (5%). ALLUVIUM
1.6	1.95	silt	clear	Soft greyish brown silt, trace of clay and of fine sand, mica present, olive brown mottles and concretions in top 0.1m. ALLUVIUM
1.95	2	clayey silt	clear	Moderately firm mid-bluish grey slightly clayey silt, rare black organic flecks. ALLUVIUM
2	2.08	clayey silt	abrupt	Soft dark brownish grey slightly clayey humic rich silt, band (20mm) of bluish grey clayey silt present. ORGANIC RICH ALLUVIUM.
2.08	2.34	peat	clear	Moderately firm dark brown pseudo-fibrous organic “peaty” silt, trace of clay, few black mottles, yellowish brown wood inclusions
2.34	2.78	clayey silt	diffuse	Soft dark greenish grey with brownish grey mottles clayey silt, brown and black plant detritus common, large lenses of blackish organic silt in top 0.05m. ALLUVIUM
2.78	3	clayey silt	diffuse	Soft mid-greenish grey clayey silt, few organic black flecks and small brown plant remains. ALLUVIUM
3	3.46	clayey silt	abrupt	Soft light greenish grey clayey silt, dark grey mottles 0.1m below top, rare small wood remains. ALLUVIUM
3.46	3.75	peat	abrupt	Firm dark brown pseudo-fibrous “peaty” organic silt, small yellowish brown wood fragment. A 10mm lense of light grey clay is post sedimentary. PEAT
3.75	4.18	clayey silt	clear	Soft mid-greenish grey clayey silt, few organic black mottles and small to medium <4mm plant remains (reeds, wood). ALLUVIUM
4.18	4.41	clayey silt	abrupt	Soft mid-greenish grey clayey silt with abundant lenses (60%) of dark brownish grey / blackish spongy “peaty” organic silt with inclusions of rare brown wood fragments (eroded peat). ALLUVIUM
4.41	4.5	peat	abrupt	Friable dark greyish brown pseudo-fibrous “peaty” organic silt, few wood fragments. PEAT
4.5	4.67	peat	clear	Firm fibrous dark brown / blackish peat, few wood fragments. PEAT
4.67	4.86	clayey silt	diffuse	Soft dark greyish brown becoming greenish grey clayey silt, common small wood fragments. ALLUVIUM
486	5	sandy clayey silt	diffuse	Soft becoming firm greenish grey slightly clayey silt, with lenses (2-10mm) 0f fine sand with mica. SANDY STRATIFIED ALLUVIUM

APPENDIX C. FINDS REPORTS

C.1 Animal bone

Identified by Lena Strid

Context	Description
1905	Single fragment large mammal rib.

Discussion and recommendations.

The single fragment of animal bone recovered during this evaluation is of low potential and requires no further work.

C.2 Ceramic building material

Identified by Paul Booth

Context	Description	Date
1905	Single amorphous tile fragment ceramic building material	Undateable

Discussion and recommendations.

The single fragment of undateable ceramic building material recovered during this evaluation is of low potential and requires no further work.

APPENDIX D. ENVIRONMENTAL REPORTS

By Julia Meen

Introduction

A number of sediment samples were recovered from test pit sections during archaeological evaluation works at the Severnside Pipeline Diversion, in June 2015. Three of these samples were taken from a sequence of peat layers identified in the section of a test pit in Trench 13. The sampled layers were recorded as contexts 1304, 1306, and 1308, and samples were taken at 1.6m (sample <1>), 2.5m (sample <2>) and 3.7m (sample <3>) depth, respectively. A fourth sample (sample <4>) was collected from a layer 0.7-0.8m below the top of section in Trench 16, described as 'humic alluvium' and recorded as context 1604.

It was considered that the sampled deposits had the potential to span the Mesolithic to the Romano-British period, and obtaining a reliable date for the deposits was identified as a priority. Assessment of the samples therefore aimed to establish whether material suitable for radiocarbon dating was present. It was also suggested that the site may have seen burning of waterside vegetation during prehistory, and the assessment therefore aimed to identify the presence of charred plant remains which might support this theory.

Methodology

A one litre subsample was processed from each of the four sampled contexts. In each case, the sediment was hand floated using the wash-over technique, with waterlogged organic material collected on 250µm mesh. These 'flots' were then retained damp in sealed plastic bags to prevent drying out. In the case of the three peat samples from Trench 13, no mineral residue was produced as the sediment contained only organic material; sample <4>, from the 'humic alluvium' layer, also produced a coarse mineral residue which was collected on a separate mesh and retained.

A subsample (4-5 spoonfuls) of each of the four flots was scanned for plant remains using a binocular microscope at approximately x15 magnification. Identifications were made with reference to published guides and the comparative seed collection held at OAS, with guidance from K. Hunter. Plant nomenclature follows Stace (2010).

Results

Samples 1-3, from the sequence of peat layers observed in trench 13, each produced large flots of waterlogged organic material. Sample <1>, from context (1304), was mostly composed of amorphous, degraded organic matter and small fragments of indeterminate plant tissue. A small number of waterlogged seeds were observed in the subsample scanned, provisionally identified as belonging to the Ranunculaceae (buttercup) family. One or two strands of charred, or partially charred, fibrous plant material was noted.

Sample <2> was, again, mostly composed of degraded, amorphous organic material and indeterminate plant tissue fragments. No material suitable for radiocarbon dating was obvious in the scanned portion of the flot. Charcoal flecks were noted very rarely.

Sample <3> showed the best waterlogged preservation of the three peat samples, with plant material less fragmentary that that seen higher in the sequence. Intact plant stems and pieces of waterlogged wood were observed, as well as occasional insect remains. Waterlogged seeds were present, although again occurring infrequently, and included *Ranunculus* cf subgenus *Batrachium* (Water Crow-foot) and Cyperacaeae Schoenoplectus type (Club-rush). A small fragment of charred or partially charred plant stem was provisionally identified as possible *Phragmites australis* (common reed) or *Equisetum* sp.(horsetail).

Sample <4> contained little organic material, with some root material and rare very small charcoal flecks observed.

Discussion

Assessment of the four samples reveals that very little charred material is present, therefore providing no evidence for the burning of waterside vegetation which, it had been suggested, may have been carried out at the site in prehistory. Occasional charcoal flecks and one or two charred, or partially charred, plant stems perhaps represent the burning of material at some distance, but do not approach the frequency that would be expected had burning had been carried out close by.

The lack of charred material also has implications for the availability of material suitable for radiocarbon dating. However, waterlogged material was present in the peat samples, being best preserved in sample <3>. Although waterlogged seeds were scarce and individually small, the flots were large, and it may be possible to extract enough material for dating if enough of the flot is examined. Failing this, it may be possible to date waterlogged wood fragments from sample <3>.

APPENDIX E. SITE DETAILS

Site name:	Severnside West Pipeline Diversion, South Gloucestershire
Site code:	BRSMG:2015/11
Grid reference:	Centred on ST 555 825
Type:	Evaluation (20 trenches)
Date and duration:	2015
Summary of results:	The archaeological evaluation comprised the mechanical excavation of 20 trenches measuring 30m by 2m, comprising a 4% sample of the proposed route. The trenches were positioned to investigate the results of geophysical survey and to investigate areas unavailable to survey at the time. In addition, four geoarchaeological test pits were excavated within the trenches, and four boreholes in order to map the underlying sediments, and to investigate the presence/extent of any charcoal and peat layers. Several undated ditches was identified in the north-west area of the route that have been interpreted as water drainage ditches associated with agricultural practices in the post-medieval period. The remaining trenches were devoid of archaeological remains, and only ceramic land drains and clearly modern features were recorded.
Location of archive:	The archive is currently held at OA, Janus House, Osney Mead, Oxford, OX2 0ES, and will be deposited with the City of Bristol Museum and Art Gallery.

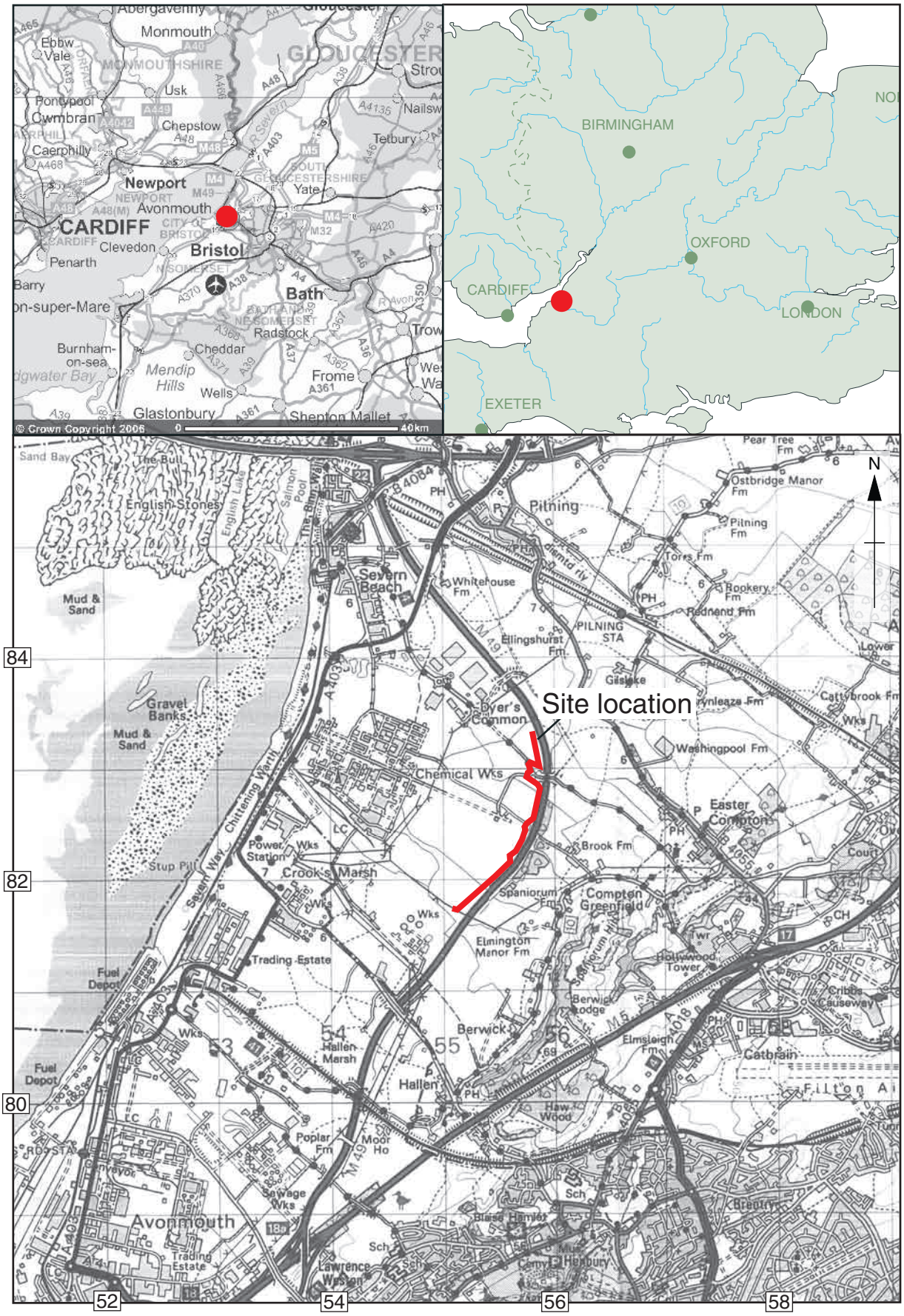


Figure 1: Site location

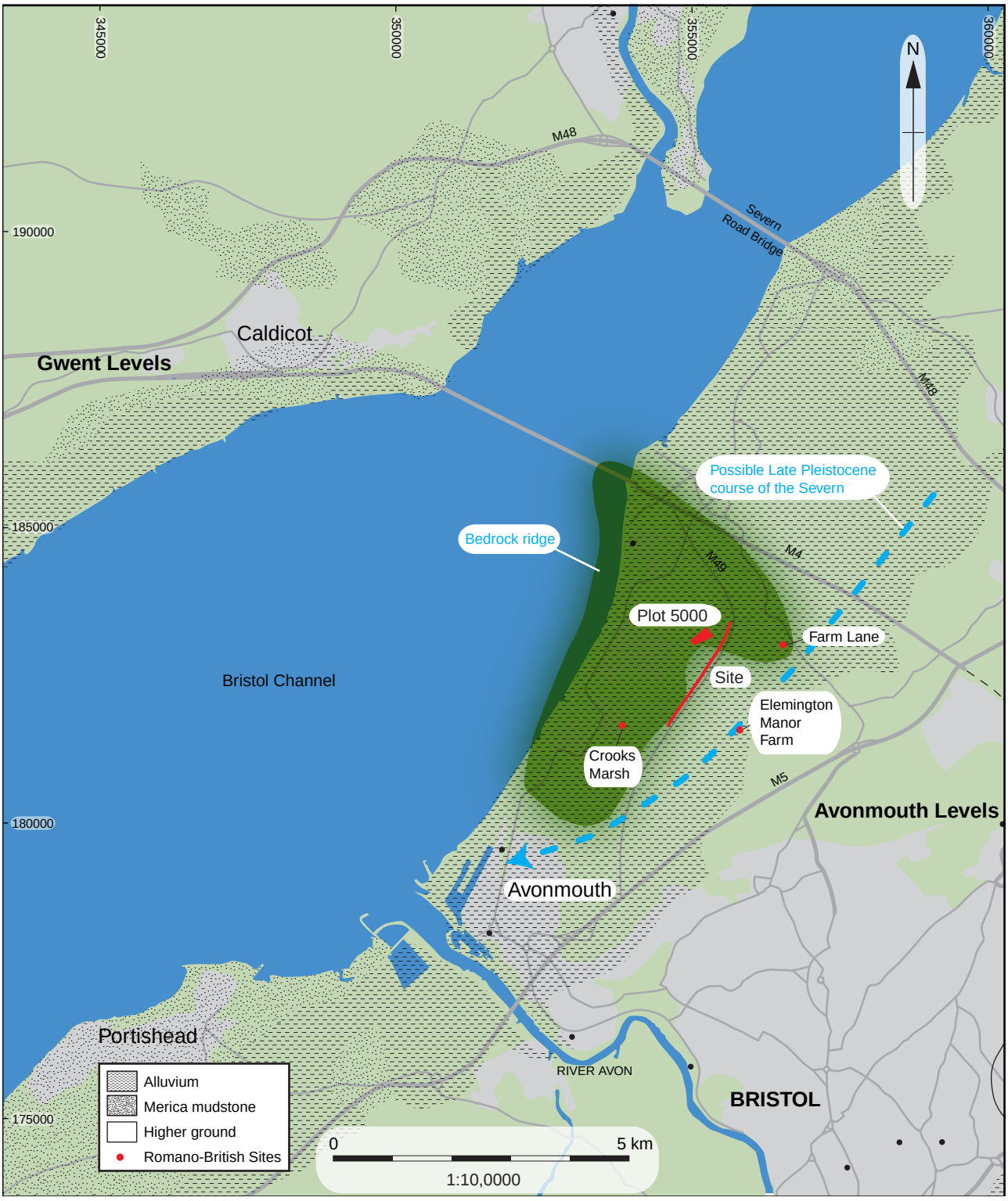


Figure 2: Romano-British sites around Avonmouth and possible ridge of high ground associated with rise in Mercia Mudstone

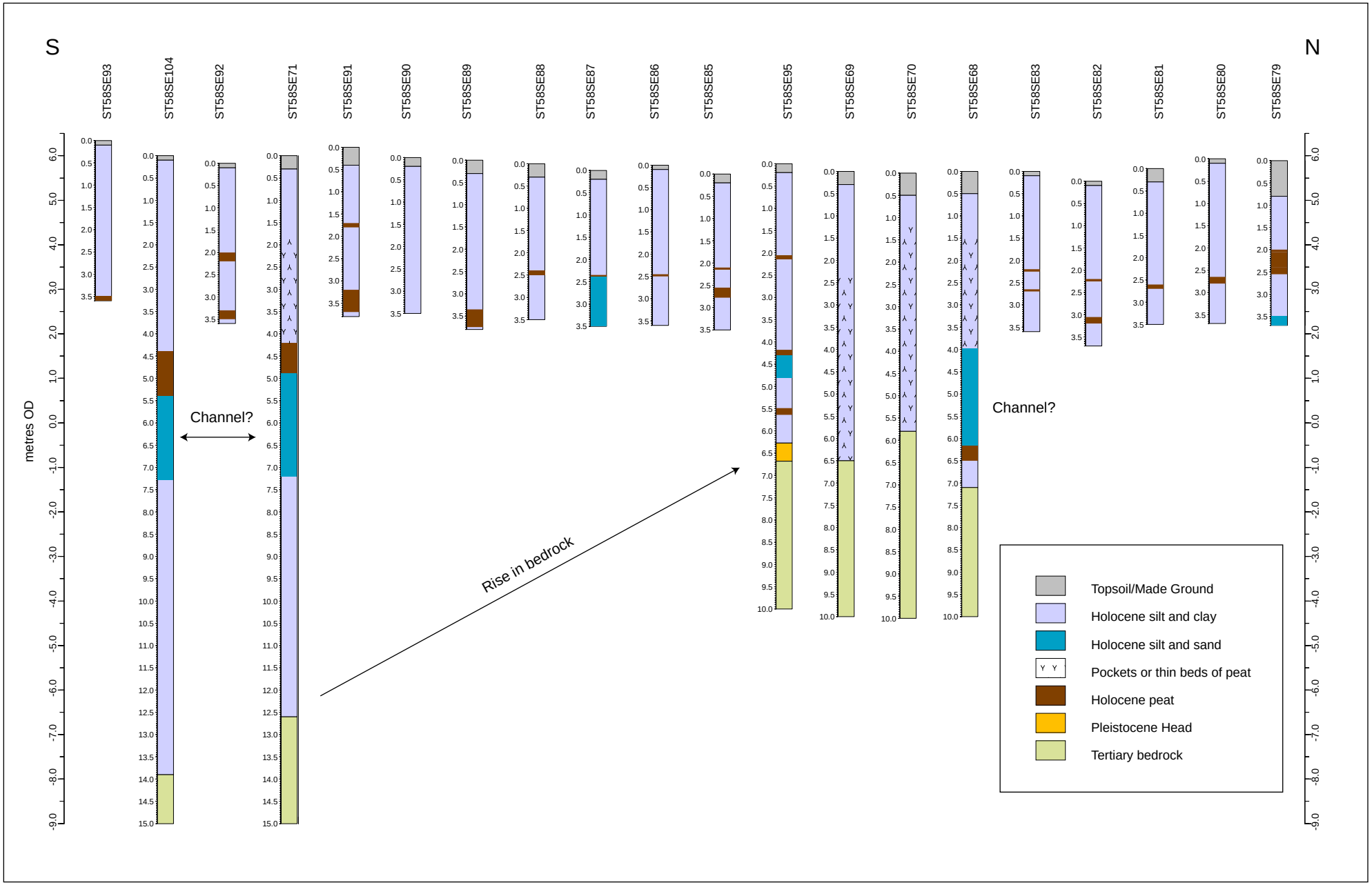
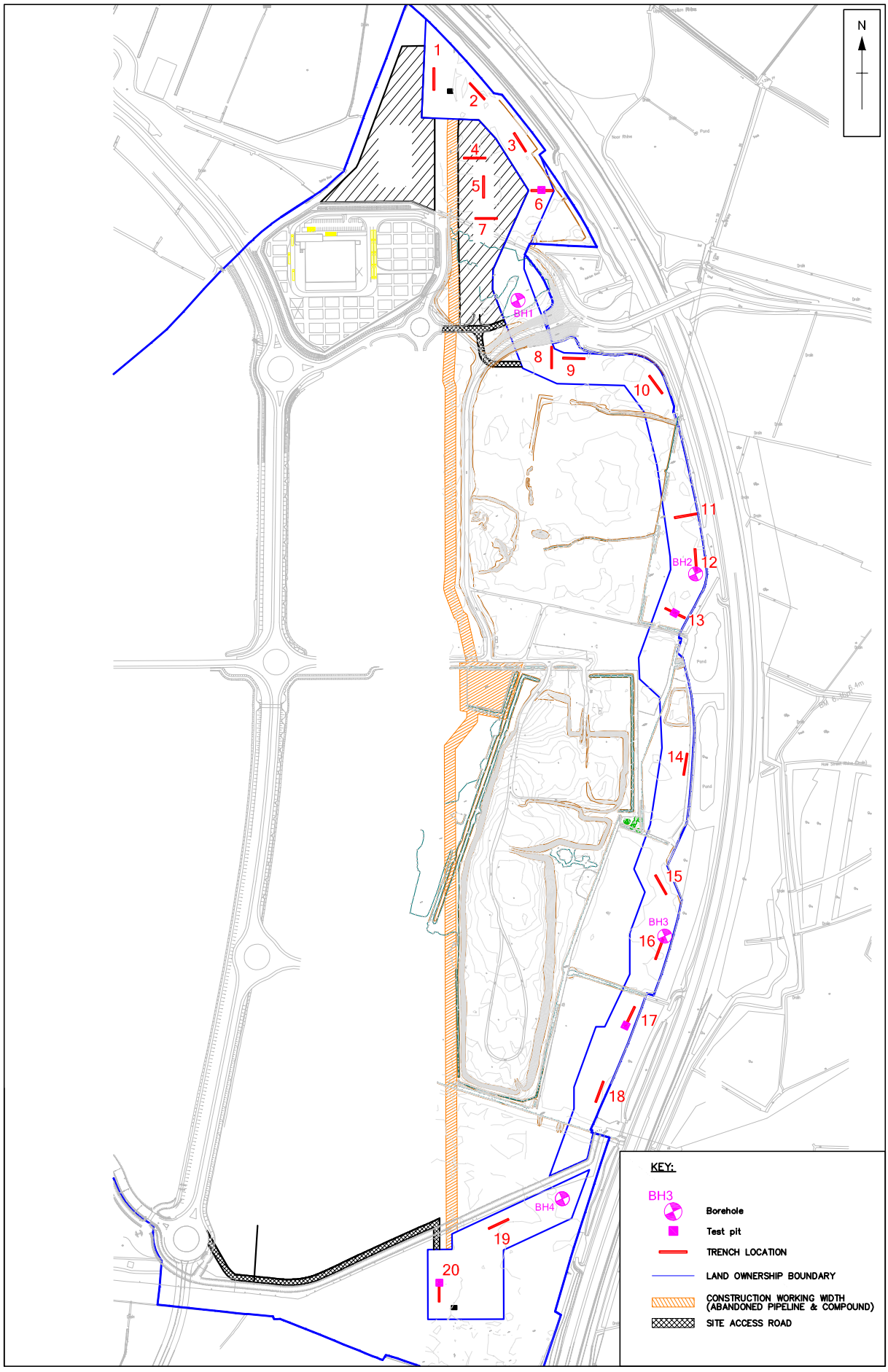


Figure 3: South-North transect of BGS geotechnical interventions

Basemap and Survey Data supplied by :
Jacobs on behalf of National Grid



X:\a\Avonmouth, Severnside West\10Geomatics\02 CAD\ALSEPIEV_trench plan_040615.dwg(Figure 4 Trench Locations)***Avonmouth Severnside*carl.champness* 25 Jan 2018

Figure 4: Trench, test pit and borehole locations

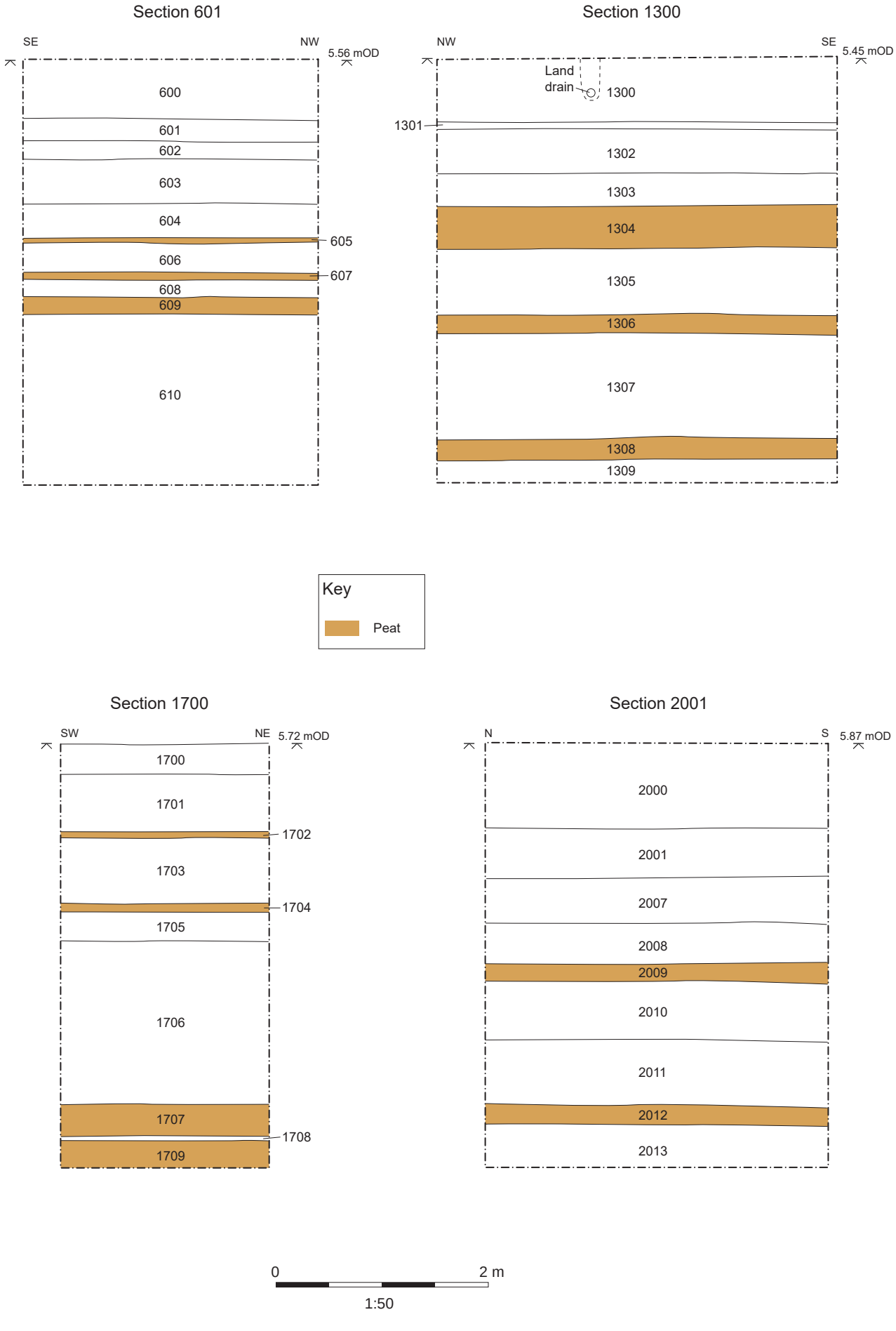


Figure 5: Test pit sections

Plate 1: Trench 1 looking south (1m and 2m scales)

Plate 2: Trench 3 looking south east (1m and 2m scales)

Plate 3: Trench 10 looking south east (1m and 2m scales)

Plate 4: Trench 16 looking south east (1m and 2m scales)

Plate 5: Humic deposits within Trench 16 (2m scale)

Plate 6: Modern drainage ditch within Trench 20 (2m scale)

Plate 7: Test pit 6a northeast facing section (2m scale)

Plate 8: Test pit 13 Southwest facing section (2m scale)

Plate 9: Test pit 17 southeast facing section (2m scale)

Plate 10: Test pit 20 Southwest facing section (2m scale)

Plate 11: Borehole sampling of the Middle Wentlooge Formation

Plate 12: Sedimentary sequence within OABH1 to a depth of 5m (1m scale)

Plate 13: Sedimentary sequence within OABH2 to a depth of 5m (1m scale)

Plate 14: Sedimentary sequence within OABH3 to a depth of 5m (1m scale)

Plate 15: Close up of the upper humic layer within OABH3 at 1.20m depth (0.06m scale)

Plate 16: Sedimentary sequence within OABH4 to a depth of 5m (1m scale)

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