ISRE12

IPSWICH CHORD

Ground Investigation

for C Spencer Ltd

November 2012

HEADLAND ARCHAEOLOGY Ltd

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IPSWICH CHORD

Ground Investigation

for C Spencer Ltd

November 2012

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Project Manager	Joe Abrams
Author	Scott Timpany & Nuala C. Woodley
Fieldwork	James McNicoll-Norbury & Nuala C. Woodley
Graphics	Julia Bastek – illustration Caroline Norrman – typesetting
Specialists	Scott Timpany – environmental
Approved by	Joe Abrams – Project Manager

Headland Archaeology (UK) Ltd

South & East

Headland Archaeology
Technology Centre, Stanbridge Road
Leighton Buzzard LU7 4QH
01525 850878
leighton.buzzard@headlandarchaeology.com

www.headlandarchaeology.com

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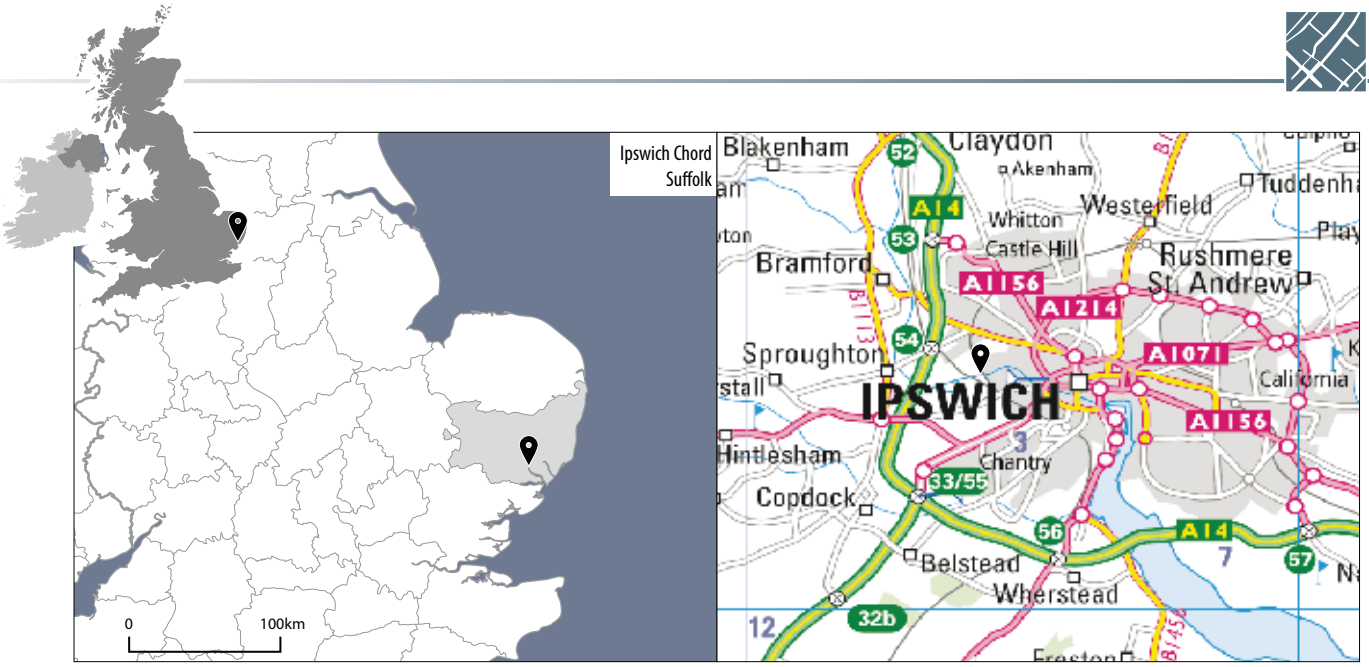
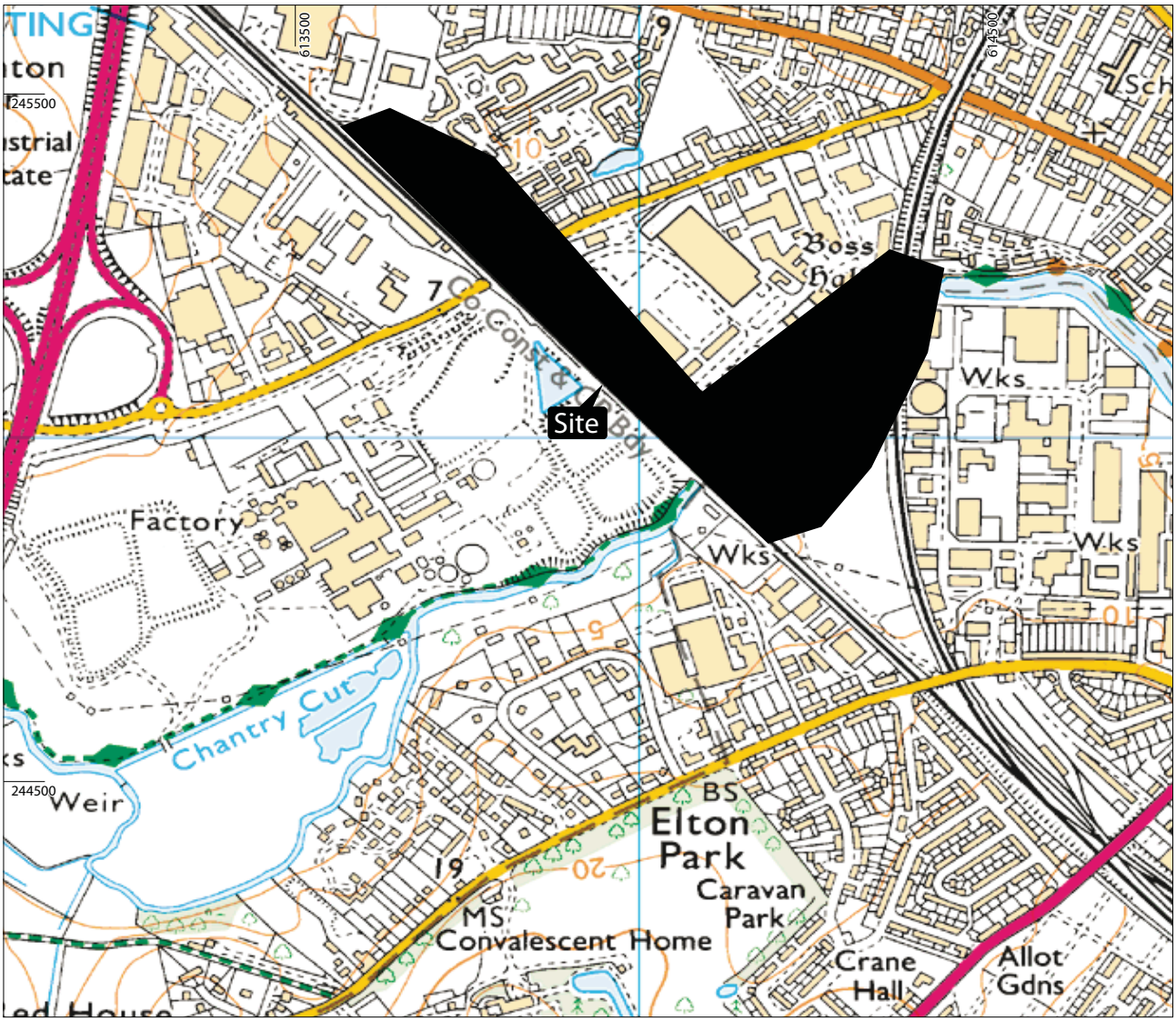




Reproduced using survey data provided by Arup.	**scale** 1:10,000 @ A4 N	0 500m

Illus 1

Site location

IPSWICH CHORD

Ground Investigation

Headland Archaeology (UK) Ltd conducted an archaeological evaluation (via monitoring of geotechnical works) on a new rail track project designed to connect the LTN1 main line to the ESK line at the Ipswich Chord Site. The work was commissioned by C Spencer Ltd, having been advised by Arup (working on behalf of Network Rail). No significant archaeological remains were identified during the monitoring of the trial pits, although our work has recorded the depth at which such remains may be preserved if they are present. Our geoarchaeological study of the site via borehole logs and test pit data has revealed alluvium and peat deposits which retain the potential to contain ecofacts and (potentially) artefacts of cultural heritage interest.

1. INTRODUCTION

1.1 Background

Headland Archaeology (UK) Ltd was commissioned by C Spencer Ltd to conduct archaeological monitoring of Ground Investigation works on the new rail track construction project designed to connect the LTN1 main line to the ESK line at the Ipswich Chord site. This work is the first stage in a phased programme of archaeological work. Each phase will inform (and help determine a need, or not, for the next stage). This stage of work comprised archaeological monitoring of test-pits carried out by BAM Ritchies, and a geoarchaeological study of the BAM Ritchies borehole and test-pit logs. The work was centred on TM 14248 45051 (*Illus 1*).

The specification for these works was supplied by Arup Cultural Heritage (2012) and provided instructions on the methodology to be applied both in the field and during post-excavation reporting for the phased programme of archaeological works.

The monitoring of the Ground Investigations took place between 8th August and 14th September 2012 and this report documents the results.

1.2 Site location

The Development Area (DA) is located approximately 1.5km northwest of Ipswich town centre (*Illus 1*). The broadly triangular piece which it occupies was formerly occupied by the Harris Meat Factory (now disused). The extant buildings associated with the meat processing plant comprise the former cold store and factory. The site is fairly flat, with ground levels around 5m AOD, and the railway lines to the east and southwest are on approximately 5m high embankments. The area adjacent (to the east) of LTN1 is currently housing (railway cottages) and a business park (Boss Hall Business Park). The river Gipping runs NE-SW across the site (*Illus 1*).

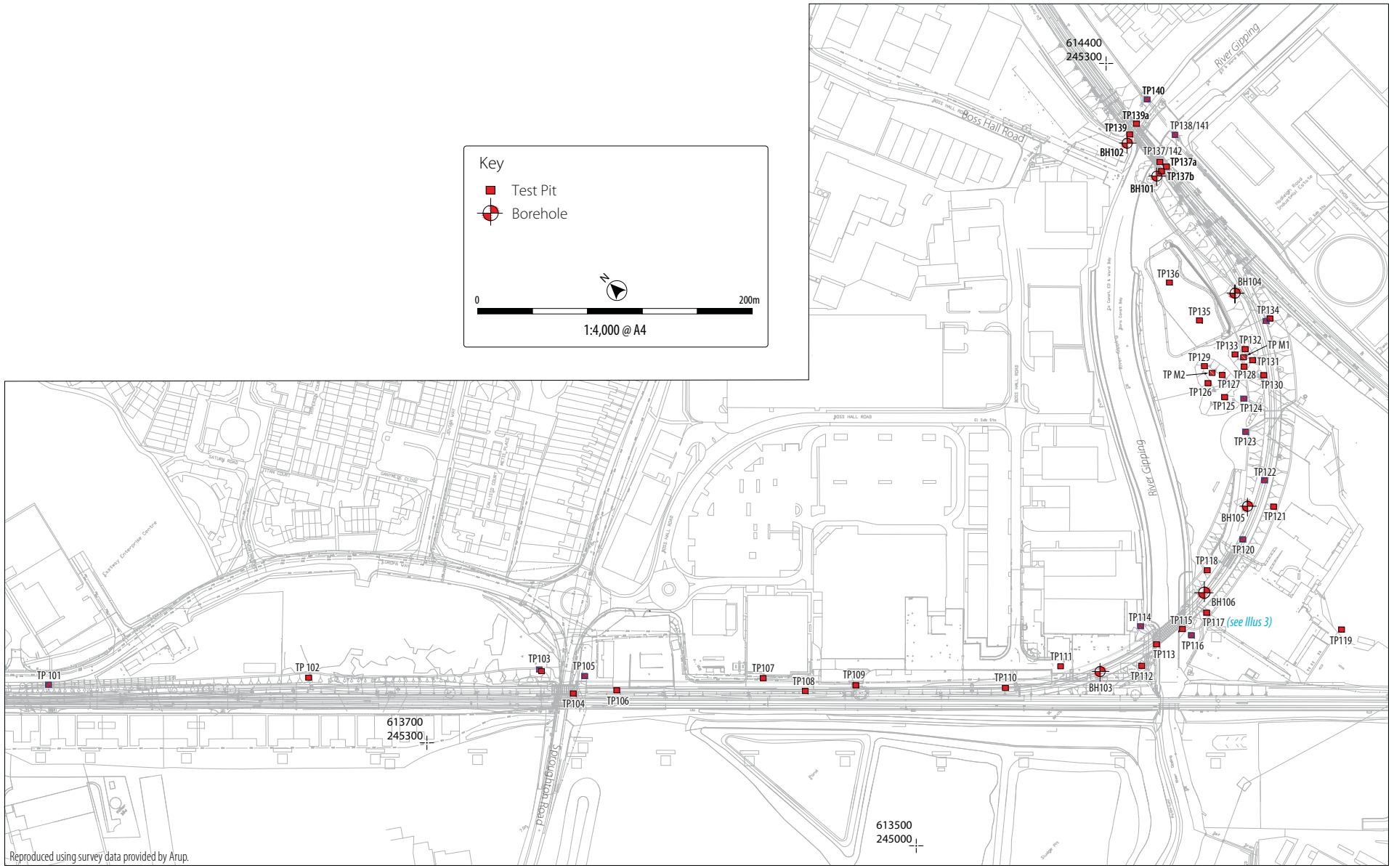
1.3 Archaeological and historical background

The archaeological background is described in detail in the Written Scheme of Investigation (Arup Cultural Heritage, 2012). The following text summarises these findings:

Prehistory The earliest phase of activity dates to the Palaeolithic period (30,000-10,000BC) and is represented by flint implements found at a nearby quarry site. The evidence for Mesolithic (10,000-4000BC) and Neolithic (4,000-2,5000BC) within the area is limited to find spots of a Tranchet axe and a worked flint axe head. More formalised activity is identified during the Bronze Age period and is predominantly funerary comprising two urns for cremations and a double ring ditch.

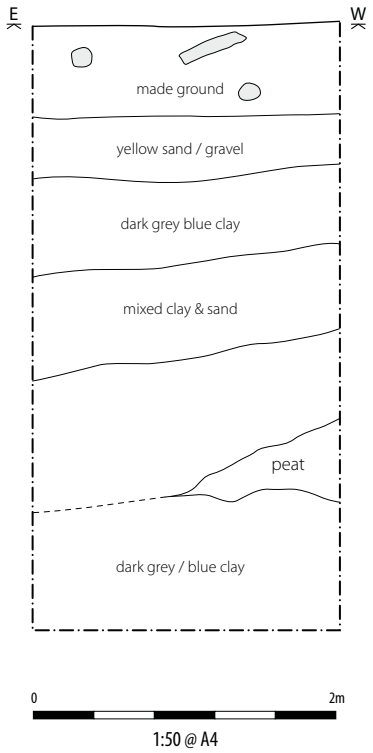
Saxon and early medieval An Anglo-Saxon (AD 450-1066) inhumation and cremation cemetery, located 325m to the north-west of the site, is the earliest activity in the area and dates to the 7th century. Possible domestic settlement was identified in an archaeological evaluation 400m to the east of the site. Other evidence for Anglo-Saxon activity includes finds of pottery.

Medieval Later medieval activity (1066-1540) in the area includes a bronze circular brooch dating between the 9th and 11th century. A moated manor is located 50m north of the site and has been dated to the mid 14th century with a hall being constructed in the central area in the early 17th century.



Illus 2

Trial Pits and Borehole locations



◄ Illus 3
Example of test pit results (TP117)

Post-medieval and industrial The site experienced some development during the post-medieval period particularly with the advent of the railways and the later industry which developed, including the Beet factory and the Harris Meat factory.

1.4 Aims and objectives

This phase of archaeological work was to ascertain the extent of past development impacts upon the site and identify any areas which may retain archaeological potential. In general, the aims of the archaeological investigation were:

- to determine, as far as reasonably practicable, the presence/absence, location, extent, date, character, condition and significance of any archaeological remains present at the site; and
- to establish the ecofactual and environmental potential of archaeological deposits and features encountered.

More specifically the work intended to determine if prehistoric settlement or other types of prehistoric activity remains existed on site, and whether there was survival of post-medieval building foundations.

2. MONITORING OF GEOTECHNICAL WORK

Nuala C. Woodley

2.1 Methodology

A total of 61 test-pits (including infiltration pits) and 8 boreholes were excavated by specialist ground investigation contractors. A JCB equipped with a flat bucket excavated the trial pits to the required depth by the ground investigation team. Twenty-nine test-pits were archaeologically monitored with the remainder not observed due to their location in areas which had already been monitored, or when they were in spoil heaps or where they were located immediately adjacent to modern buildings and where they would be entirely within disturbed ground (e.g. at the rail bridge over the Gipping and at Morrisons Supermarket). Records from all test-pits and all boreholes are considered in this report.

The final locations of the geotechnical trial pits and boreholes were positioned and surveyed by representatives from C Spencer Ltd. A full photographic record comprising colour slide and black and white print photographs was taken, supplemented with digital photography.

All recording was in accordance with the Code of Conduct Institute of Field Archaeologists 2010; and Standard and Guidance for Archaeological Field Evaluations (Institute of Field Archaeologists 1994, rev 2008). All contexts were given unique numbers, were required, and all recording was undertaken on pro forma record cards that conform to accepted archaeological standards. All stratigraphic relationships were recorded.

2.1.1 Results

Test-pits north-west of the river (Illus 2)
The pits observed to the west of the river revealed various soil profiles (full descriptions of all test pit can be found in Appendix 1). Only one pit had potential to show the original soil profile as it was located in unaffected ground where topsoil lay above subsoil overlying natural gravels and sands. All other areas had been affected by some building or demolition activity. Particularly at TP 103 and 103a which were located in land that had been previously stripped of topsoil and the ground level drastically reduced. This was evident as the test pit revealed natural geology of sands and gravels directly under the overgrowth. The previously stripped material perhaps was used to create the banks of the railway track.

No significant archaeological features were identified in these test-pits.

Test-pits south-east of the river Gipping (Illus 2)
All of the test-pits in this area revealed deposits of made-ground overlying natural geological deposits. Two large mounds located in the centre of the area were confirmed as being created in the modern period (demonstrated by 10 trial pits which revealed topsoil material with inclusion of rubble and building debris to below the current ground level).

Other test-pits demonstrated that made-ground overlay natural deposits of alluvial material. Alluvium was present in many of the pits, this had been anticipated given the proximity of the Gipping (Section 3 and Appendix 1).

No significant archaeological features were identified in these test-pits.

Illus 4

Site conditions, looking west towards Harris Meat Factory

Illus 5

The Gipping

Illus 6

Test Pit 106

3. GEOARCHAEOLOGICAL ASSESSMENT

Dr Scott Timpany

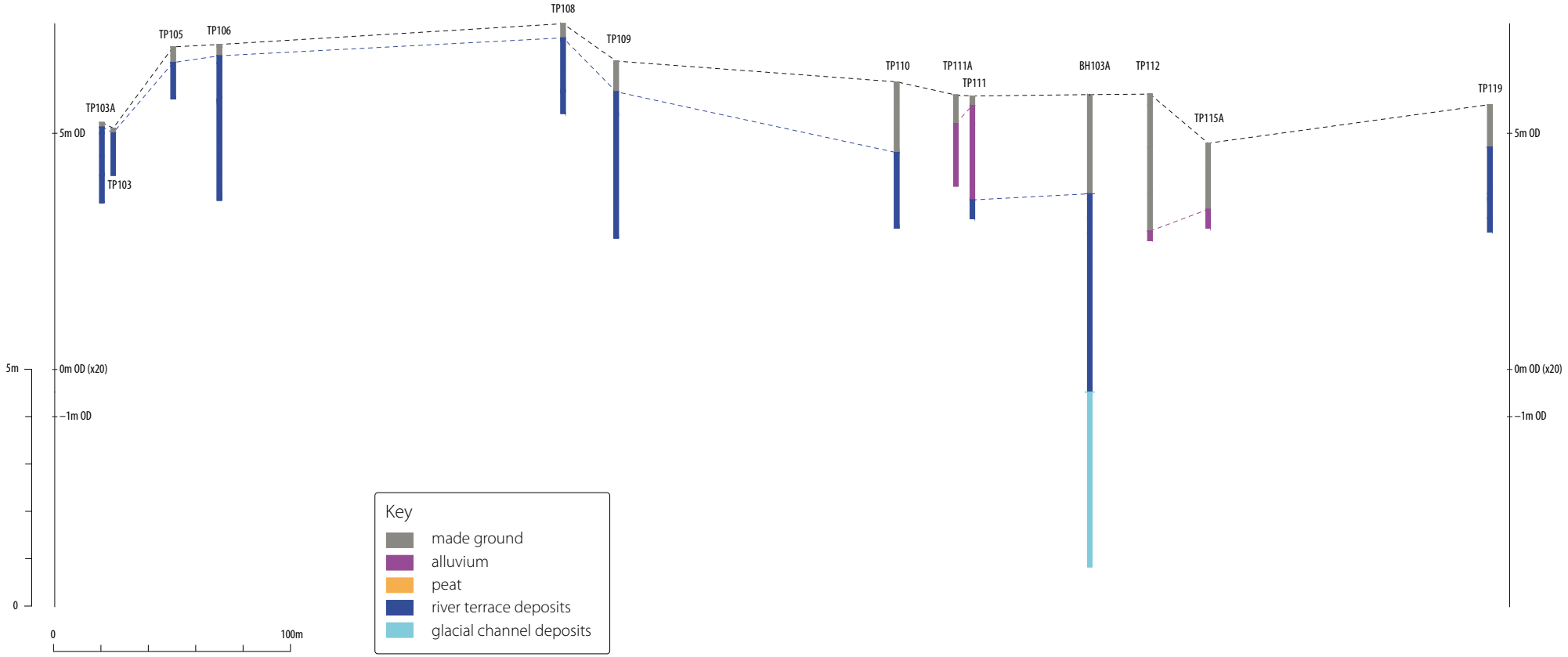
3.1 Introduction

This report presents a geoarchaeological assessment of borehole and test pit records from across the Development Area (DA – *Illus 2*). The boreholes penetrated to a maximum depth of approximately -20.31m OD whilst the test-pits had a maximum penetration of 0.1m OD. The archaeological and palaeoenvironmental implications of this data set are assessed below.

3.2 Methods

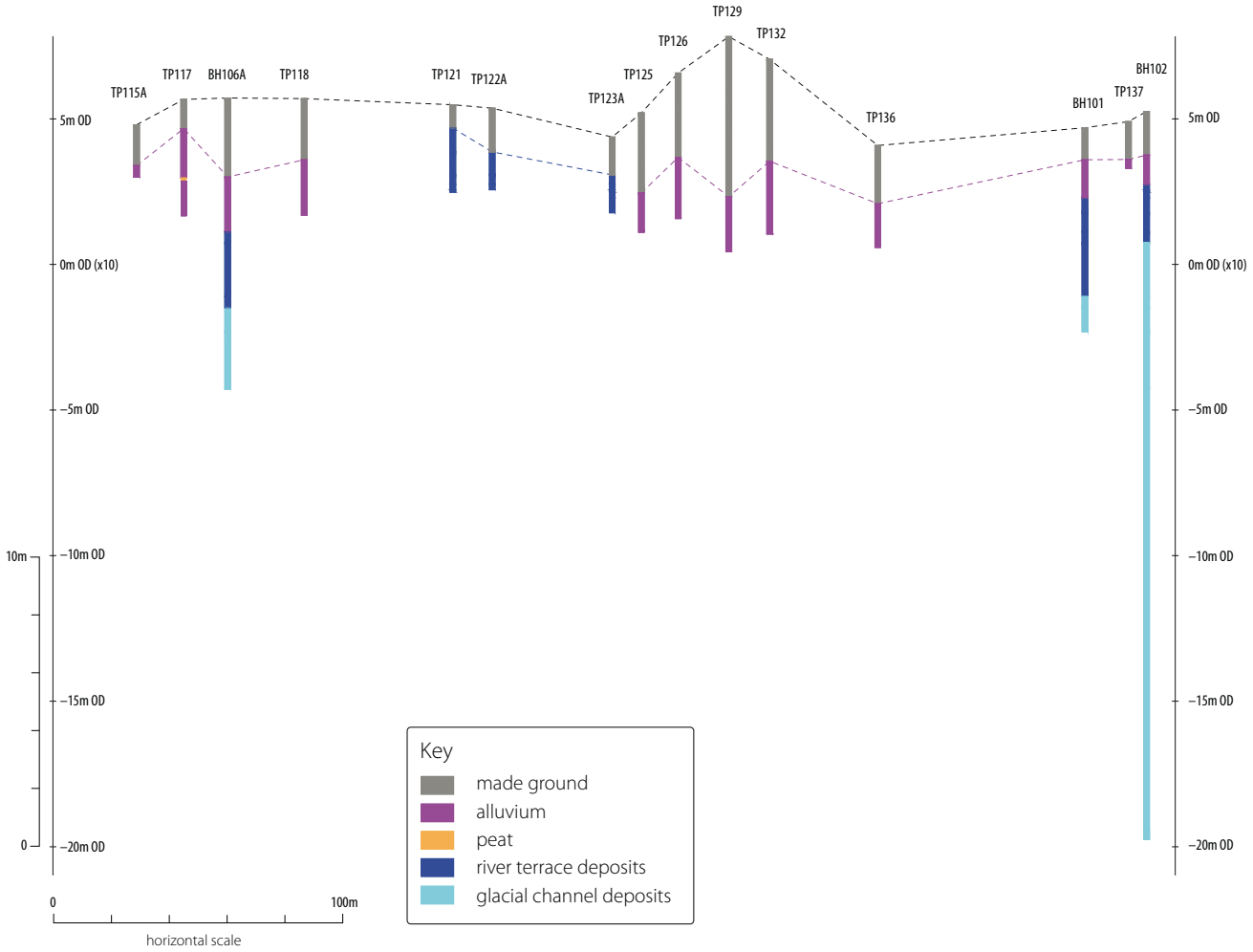
In order to assess the palaeoenvironmental and the archaeological potential of the sediments in the development area, the borehole and test-pit logs from the geotechnical report by Bam Ritchies (2012) was consulted. In particular, sediments containing organic materials such as peats and organic clays were targeted as such deposit types have a high potential to contain waterlogged plant materials such as pollen and plant macrofossils, together with insect remains, which are important for reconstructing past landscapes and informing of human activity. Such sediments also have the potential to contain cultural material such as wooden objects and structures (e.g. fish traps, platforms).

Data from the borehole logs were used to construct three transect diagrams across the Development Area (DA) in order to detail the sediments present and any changes in the deposition sequence (*Illus 7–10*). The boreholes were split into three transects, broadly going from north to south across the DA and are presented in *Illus 7–9*. Transects have been colour coded to show the five main facies present across this area, together with denoting the occurrence of



Illus 7

Trial Pit and Borehole Transect 1



Illus 8

Trial Pit and Borehole Transect 2

peat deposits. The transect diagrams were constructed using a digital surface mapping and contouring program (Surfer 10) using the data from the borehole and test pit logs. An overview of where surviving Alluvium and Peat deposits are located in the DA is also presented in Illustration 10.

3.3 Results

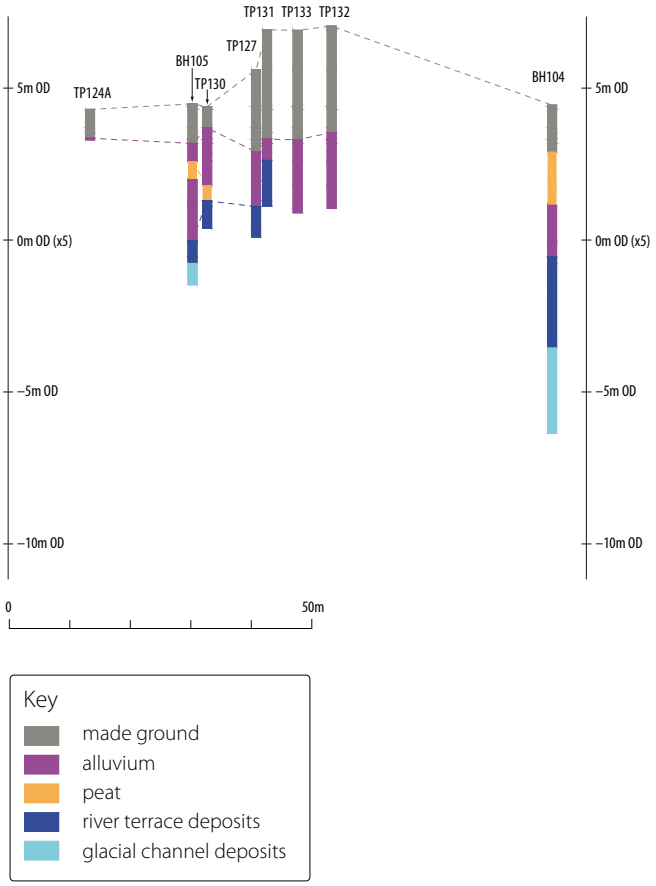
The deposition sequence of the sediments present within the DA in respect to the borehole and test pit records is evaluated below in chronological order; from the oldest to the youngest sediments. The sedimentary sequence across the DA is illustrated from north to south through transect drawings presented in Illustrations 7-9. The results of the geotechnical information from all the borehole and test pit logs are provided in Appendix 1.

3.3.1 Glacial Channel Deposits (Facies 1)

The oldest deposits encountered on the DA are Glacial Channel Deposits comprising of silts, sands, clays and gravels (clasts of angular to rounded chalk and flint). These deposits overlie the older Chalk Group Formation, which dates to the Upper Cretaceous period (Woods ***et al***, 2007). The upper levels of these deposits were penetrated in six of the boreholes (BH101, BH102, BH103A, BH104, BH105 and BH106A) but only bottomed at two of these locations (BH101 and BH104) so their true depth is still largely unknown. In the two borehole locations where the base of the Glacial Channel Deposits was recorded, they measured between 1.2m (BH101) and 2.8m (BH104) in thickness (*Illus 8–9*). Thus there is some variation in the depth of these deposits across the DA. It is thought these sediments would have been deposited during the Pleistocene when such high energy riverine and coastal systems were dominant across this landscape (Rose, 2009, 2010).

3.3.2 River Terrace Deposits (Facies 2)

Overlying the Glacial Channel Deposits was a unit predominantly consisting of sands and gravels (clasts of flint and chert), with occasional clays. These deposits were recorded in 6 of the borehole records and 15 test pit records (Appendix 1). However the basal depths of this layer were only recorded in the borehole logs. The upper surface of this layer was encountered in the DA at depths of between 7.02m OD (TP108) and -0.56m OD (BH104) and extended down to depths of between 0.75m OD (BH102) and -1.49m OD (BH106A). The borehole records indicate that this layer has a variable thickness of between 0.79m (BH105) and 4.2m (BH103A). The variation in the thickness of these deposits is likely to reflect the different rates of sedimentation caused by shifting channels when



Illus 9

Trial Pit and Borehole Transect 3

this area was under the influence of a braided channel system. The undulating surface of the gravel deposits was caused as gravels were laid down and then reworked and redeposited by channels incising these gravels. It is thought this would have been during the Late Glacial to Early Holocene period following the retreat of the ice sheets in this part of south-east England.

3.3.3 Alluvium (Facies 3)

The third facies present on the DA is a layer of alluvium, which consists predominantly of silts and clays and occasionally sands, is present in three locations within the DA (*Illus 10*). The alluvium is also recorded as containing organic materials, which in some locations are present as peaty silt (e.g. BH104) or as bands of peat within the alluvium (e.g. BH101). In some locations layers of peat are also present within the alluvium and these are discussed below. Where present the alluvium is encountered at depths of between 5.59m OD (TP111) and 1.14m OD (BH104). The basal depth of the alluvium layer was only recorded in nine locations (Appendix and *Illus 7–9*) and was present at depths ranged between 3.59m OD (TP111) and -0.56m OD (BH104). Based on the records present which contain the full sequence of alluvium, this layer can be seen to vary in thickness from 2m (TP111) to 5m (BH104) within the DA; the thickest alluvium deposits occurring in the western part of the site where the greatest area of alluvium is recorded (*Illus 10*).

The alluvium can be seen to vary in thickness across transects (*Illus 7–9*) indicating changes in the depositional environment even over relatively short distances. The deposition of a made ground layer across the DA is likely to have impacted upon the underlying alluvium. It is probable that a significant amount of alluvium has been removed as a result, reducing archaeological potential across much of the DA. The alluvium is likely to have been deposited during a low energy flooding period and marks a change from the previous high energy braided river system witnessed in the Gravel Terrace Deposits to this entire area being flooded. Periods of terrestrialization did occur in some areas and these are shown by the presence of peats (below).

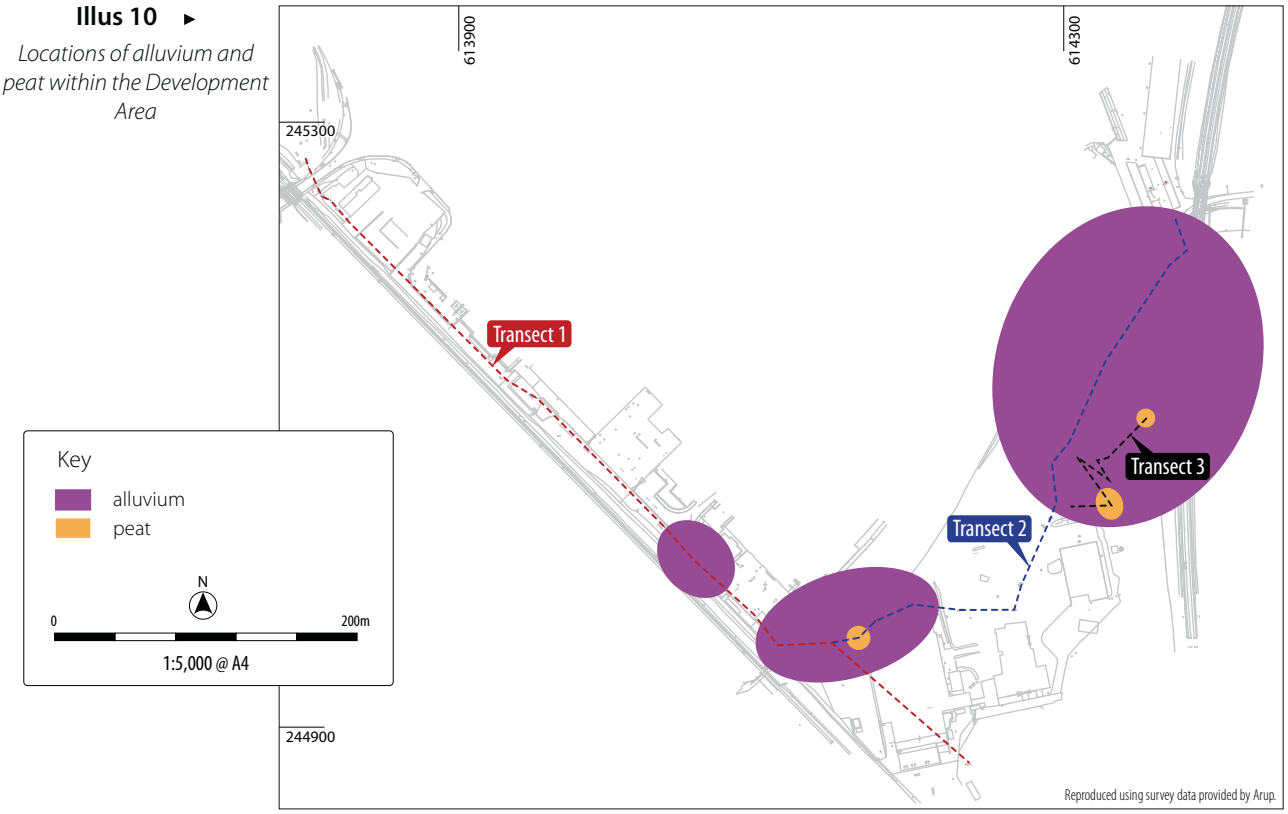
The alluvium layer is likely to have an Early to Mid-Holocene date. Records for Relative Sea Level (RSL) change for this area are relatively sparse (e.g. Devoy, 1982) in comparison to the more studied areas of the south-east, such as the Fenlands (e.g. Shennan 1986; Waller, 1994; Andrews ***et al***, 2000) largely due to the perceived absence of suitable deposits for study. RSL change data presented by Shennan and Horton (2002) indicates that RSL rose rapidly in this area during the Early Holocene, from around 9950 BP and then steadied from around 5000 BP. The effects of RSL rise in this area are further complicated by the effects of isostacy (re-adjustment of land following retreat of ice sheets) within this area of England; as it has undergone steady subsidence of approximately 0.9mm per year since the melting of the ice sheets at the end of the Last Glacial period (Shennan and Horton, 2002). The deposition of alluvium is likely to relate to the former extent of the Orwell Estuary, which would have taken in the current area around the River Gripping (Devoy, 1982). The alluvium deposits then representing flooded or salt marsh environments (Wilkinson and Murphy, 2007).

3.3.4 Peats (Facies 4)

Peats were present in the alluvium in four locations; in the central and western areas of the DA (Appendix 1 and *Illus 10*). The upper layers of peats were present between 2.96m OD (TP117) and 1.79m OD (TP130) with the basal layers of the peat lying at depths of between 2.86m OD (TP117) and 1.14m OD (BH104). Thickness of the peats varied with the thinnest peat present in the central part of the DA at TP117, which had a thickness of 0.1m. The peats are then seen to thicken moving to the north-west of the DA at BH104 where peats of 1.75m in thickness are recorded. As with the alluvium the impact of the Made Ground across the DA means that peat is likely to no longer be present in areas where it may once have formed and so the data presented here is rather limited and it is unknown whether peat developed in pockets or as a continuous layer within the DA. It is suspected that the

Illus 10 ▸

Locations of alluvium and peat within the Development Area



former may be true based on where peat has developed within the sequences. At TP130, along Transect 3, peat is recorded as developing directly over the River Terrace Deposits (*Illus 9*), where as in the other locations where peat is recorded it has developed within the alluvium (*Illus 8–9*). This suggests there are two potential phases of peat accretion in the DA; an earlier peat lying directly over the River Terrace Deposits at 1.79 to 1.29m OD and a second peat within the Alluvium, which extends to a later period, lying between 1.14 to 2.96m OD.

The presence of peat indicates that the rate of vegetation growth in parts of the DA was occurring faster than the alluvial sedimentation rates allowing plants to gain a foothold across areas long enough for peats to develop and become terrestrialized. The presence of alluvium above the peats indicates that at some period even these terrestrial areas were flooded, with in washed minerogenic sediments burying the peats. Bands of peats recorded in the alluvium across parts of the DA indicate that this process happened multiple times, presenting a complex stratigraphy in some locations with thin bands of peat representing short-lived periods of terrestrialization followed by subsequent flooding and then terrestrialization once more. In the north-west part of the DA that contains the deepest peats it is likely these terrestrial deposits represent a former peat 'island' with nearby test-pits (e.g. TP131-133) showing alluvial sediments present at the same heights, indicating the submergence of the surrounding area (*Illus 9*). The slow down in sea-level rise witnessed in the projected curve for RSL change in this area by Shennan and Horton (2002) suggests this may be when peat began to accrue in this area; with peat forming at a higher rate than sea-level rise and submergence of the landscape.

3.3.5 Made Ground (Facies 5)

The borehole sequences are capped in each transect by modern Made Ground deposits (*Illus 7–9*). This deposit directly impacts the alluvium (and peats) below, which were removed during the construction of this layer. The Made Ground was recorded as being present between 8.4m OD (TP139A) and 4.3m OD (TP124A); effectively at surface level across the DA. Unfortunately the construction of this deposit masks the former height of the alluvium and may have also led to the destruction of potential peat deposits in the upper layers of alluvium, such as those at TP117 (above).

3.4 Statement of palaeoenvironmental and archaeological potential

No significant archaeological features were observed during this evaluation suggesting the land has a relatively low potential to contain significant archaeological remains. However, significant archaeological remains have been identified in this area in the past; if remains are present on this site, they would be most likely to occur in areas of good preservation, such as those which contain alluvium and peat (*Illus 10*).

The geoarchaeological potential of the site was more clearly defined; the results of borehole and test pit data indicating that waterlogged sediments exist within the site and have the potential to contain materials of palaeoenvironmental significance. The presence of peat deposits in the north west of the site were up to 1.75m thick and have high potential to provide palaeoenvironmental information on the landscape history of this area. These peats will contain micro- and macrofossils such

as pollen grains and waterlogged plant remains (seeds and wood) that can be used to reconstruct the landscape history of this area. The peats in this area may represent a former 'island' and as such these sediments have moderate potential to contain cultural materials such as preserved wooden objects. The peats are suggested to be of Mid-Holocene date but this should be confirmed through radiocarbon dating of the sequence. These radiocarbon dates may also provide sea-level index points for this area, which is currently shy of related studies.

Alluvial sediments across the site have been recorded as up to 5m in thickness and also have the potential to contain materials of palaeoenvironmental potential such as pollen, diatoms and foraminifera. These materials have high potential to investigate the nature of the flooding episodes across the site and to provide further information on sea-level change in this area, although it is recognised that there are problems in using such sediments for studies such as pollen (e.g. through sediment mixing). It is thought these sediments have an earliest date of Mid-Holocene when sea-level rise slowed enough to allow peats to develop. These deposits are likely to have continued to accumulate into the medieval period when drainage programmes were undertaken to reclaim land. That these sediments represent flooded areas indicates that there is low potential for cultural materials such as fish traps to be present.

The River Gravel deposits also have low potential to contain materials of cultural significance, such as lithic artefacts. The high energy nature of this environment means that lithics deposited in locations upstream may have been re-deposited in this area, with the river being able to carry a high sediment load.

Asset	Potential HA significance	Location of HA
Palaeoenvironmental remains	High	Illus 10
Mid Holocene Peat	High	Illus 10
Alluvium (Mid-Holocene)	Medium	Illus 10

Table 1

Impact upon Heritage Assets (prior to mitigation)

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5. APPENDICES

Appendix 1 Borehole and Test Pit data

Key:		
	1	Made Ground
	2	Peat
	3	Alluvium
	4	River Terrace Deposits
	5	Glacial Channel Deposits
	6	White Chalk

Borehole (BH) / Test pits (TP)	Depth top (m)	Depth bottom (m)	Unit thickness (m)	Sediment Description	Unit	Ground Level (mOD)	Easting	Northing
BH101	0	1.1	1.1	Made Ground	1	4.69	614362.9	245209.32
	1.1	2.4	1.3	Soft-greyish blue and black, peaty silty Clay with bands of pseudo-fibrous peat and shells	3			
	2.4	5.8	3.4	Dark brown clayey very fine to coarse sandy, fine to coarse angular to rounded flint Gravels	4			
	5.8	7	1.2	Soft dark greenish brown sandy, silty Clay with occasional chalk fragments	5			
	7	25	18	Structureless white Chalk, composed of soft silt with gravel bands and occasional cobbles. Gravel is fine to coarse angular to rounded flint. Cobbles are flint	6			
BH102	0	0.1	0.1	Top Soil	–	5.25	614366.93	245239.2
	0.1	1.5	1.4	Made Ground	1			
	1.5	2.5	1	Soft brown black sandy slightly gravelly Silt with peat bands. Frequently roots and occasional flint cobbles. Gravel is fine to coarse rounded flint.	3			
	2.5	4.5	2	Dark grey sandy fine to coarse angular to rounded flint Gravel.	4			
	4.5	9	4.5	Firm light grey sandy gravelly Clay. Gravel is fine angular chalk.	5			
	9	15	6	Grey white slightly sandy fine to coarse angular to rounded flint and chalk Gravel.	5			
	15	25	10	White Chalk composed of sandy, silty fine to coarse angular medium density moderately weak Gravel	5			
BH103	0	0.1	0.1	Concrete	1	5.78	614090.22	244980.6
	0.1	1	0.9	Made Ground				
BH103A	0	2.1	2.1	Made Ground	1	5.82	614093.47	244983.89
	2.1	5	2.9	Multicoloured sandy fine to coarse angular to rounded flint Gravel with occasional flint cobbles	4			
	5	6.3	1.3	Grey beige gravelly fine to coarse Sand. Gravel is fine to coarse angular to rounded flint.	4			

Borehole (BH) / Test pits (TP)	Depth top (m)	Depth bottom (m)	Unit thickness (m)	Sediment Description	Unit	Ground Level (mOD)	Easting	Northing
	6.3	7.6	1.3	Firm grey sandy Clay	5			
	7.6	10	2.4	Stiff grey slightly gravelly Clay. Gravel is fine angular chalk and flint.	5			
BH104	0	1.55	1.55	Made Ground	1	4.44	614347.42	245109.43
	1.55	3.3	1.75	Firm dark brownish black slightly clayey silty Peat	2			
	3.3	5	1.7	Dark brownish black slightly clayey peaty, fine and medium Sand with shells.	3			
	5	6.6	1.6	Brown very gravelly fine to coarse Sand. Gravel is fine and medium occasionally coarse angular to rounded flint.	4			
	6.6	6.8	0.2	Soft to stiff light grey sandy Clay. Sand is fine and medium.	4			
	6.8	7.1	0.3	Dark greenish brown clayey sandy fine and medium angular to sub-rounded flint Gravel. Sand is fine to coarse.	4			
	7.1	8	0.9	Dark greenish grey speckled white fine and medium Sand with rare fine to coarse chalk.	5			
	8	10.8	2.8	Firm and stiff greenish grey slightly sandy Clay with occasional chalk. Sand is fine and medium.	5			
	10.8	15.45	4.65	Structureless white Chalk, composed of soft silt with gravel bands and occasional cobbles. Gravel is fine to coarse angular to rounded flint. Cobbles are flint	6			
BH105	0	1.3	1.3	Made Ground	1	4.48	614324.44	245051.43
	1.3	1.9	0.6	Soft grey black sandy Silt	3			
	1.9	2.5	0.6	Brown soft spongy pseudo-fibrous Peat	2			
	2.5	4.5	2	Soft black sandy Silt with brown pseudo-fibrous peat bands	3			
	4.5	5.25	0.75	Medium dense grey sandy fine to coarse angular to rounded flint Gravel	4			
	5.25	5.95	0.7	Firm light grey slightly sandy gravelly Clay. Gravel is fine to coarse angular to rounded flint and chalk.	5			
BH106	0	0.12	0.12	Top soil	1	5.71	614169.91	244975.97
BH106A	0	3	3	Made Ground	1	5.71	614169.91	244975.97
	3	4	1	Soft dark grey and bluish grey silty Clay with bands of pseudo-fibrous and fibrous peat.	3			
	4	4.6	0.6	Dark grey and black slightly gravelly clayey fine and medium Sand.	3			
	4.6	7.2	2.6	Light brown fine to coarse Sand and fine and medium occasionally coarse angular to rounded flint Gravel	4			
	7.2	10	2.8	Light greenish grey fine to coarse Sand.	5			

Borehole (BH) / Test pits (TP)	Depth top (m)	Depth bottom (m)	Unit thickness (m)	Sediment Description	Unit	Ground Level (mOD)	Easting	Northing
TPM1	0	2.8	2.8	Made Ground	1	7.14	614319.1	245074.1
TPM2	0	4	4	Made Ground	1	8.29	614294.31	245078.48
TP101	0	1.02	1.02	Made Ground	1	8.32	613563.94	245508.47
TP102	0	3.2	3.2	Made Ground	1	8.28	613705.35	245368.14
TP103	0	0.1	0.1	Made Ground	1	5.11	613798.12	245273.83
	0.1	0.67	0.57	Dark brownish orange gravelly fine and medium Sand with roots. Gravel is fine to coarse angular to rounded flint.	4			
	0.67	1	0.33	Dark brownish orange sandy fine to coarse angular to rounded flint Gravel. Sand is fine and medium.	4			
TP103A	0	0.1	0.1	Made Ground	1	5.23	613796.45	245279.13
	0.1	0.29	0.19	Dark brownish orange gravelly fine and medium Sand with roots. Gravel is fine to coarse angular to rounded flint.	4			
	0.29	1.3	1.01	Dark brownish orange sandy fine to coarse angular to rounded flint Gravel. Sand is fine and medium.	4			
	1.3	1.7	0.4	Dark brown sandy fine to coarse angular to rounded flint Gravel. Sand is coarse.	4			
TP103B	0	0.31	0.31	Made Ground	1	–	–	–
	0.31	1.2	0.89	Dark brownish orange, gravelly fine and medium Sand with roots. Gravel is coarse angular to rounded flints.	4			
	1.2	1.4	0.2	Dark orangish brown sandy fine to coarse angular to rounded flint Gravel. Sand is fine and medium.	4			
	1.4	1.45	0.05	Dark brown sandy fine to coarse angular to rounded flint Gravel. Sand is coarse.	4			
TP104	0	0.65	0.65	Made Ground	1	5.97	613807.03	245254.33
TP105	0	0.33	0.33	Made Ground	1	6.83	613812.6	245252.02
	0.33	0.72	0.39	Dark brownish orange, gravelly fine and medium Sand with roots. Gravel is coarse angular to rounded flints.	4			
	0.72	1.1	0.38	Dark brownish orange sandy fine to coarse angular to rounded flint Gravel. Sand is fine and medium.	4			
TP106	0	0.24	0.24	Made Ground	1	6.88	613825.42	245237.02

Borehole (BH) / Test pits (TP)	Depth top (m)	Depth bottom (m)	Unit thickness (m)	Sediment Description	Unit	Ground Level (mOD)	Easting	Northing
	0.24	0.56	0.32	Dark brownish orange, gravelly fine and medium Sand with roots. Gravel is coarse angular to rounded flints.	4			
	0.56	1.3	0.74	Dark brownish orange sandy fine to coarse angular to rounded flint Gravel. Sand is fine and medium.	4			
	1.3	2.9	1.6	Light yellowish brown very gravelly fine and medium Sand. Gravel is fine to coarse angular to rounded flint.	4			
	2.9	3.2	0.3	Yellowish brown and orange fine to coarse Sand and fine to coarse angular to rounded flint Gravel with occasional cobbles. Cobbles are angular to rounded flint.	4			
	3.2	3.3	0.1	Yellowish brown and orange sandy fine to coarse angular to rounded flint Gravel with frequent cobbles. Cobbles are angular to rounded flint. Sand is fine to coarse.	4			
TP107	0	1.6	1.6	Made Ground	1	6.43	613918.24	245152.48
TP107A	0	1.5	1.5	Made Ground	1	6.45	613923.22	245147.83
TP107B	0	1.5	1.5	Made Ground	1	6.44	613932.86	245140.72
TP108	0	0.3	0.3	Made Ground	1	7.32	613928.43	245133.97
	0.3	2.2	1.9	Yellow brown gravelly medium to coarse Sand. Gravel of flint and chert.	4			
TP109	0	0.65	0.65	Made Ground	1	6.53	613948.11	245122.19
	0.65	1.8	1.15	Light yellow brown very gravelly fine to medium Sand. Gravel is fine to medium and angular to sub-rounded of flint and chert.	4			
	1.8	2.7	0.9	Brown coarse Sand and fine to medium Gravel of flint.	4			
	2.7	3.75	1.05	Brown coarse Sand and fine to coarse Gravel of chalk, flint and chert.	4			
TP110	0	1.5	1.5	Made Ground	1	6.09	614031.8	245037.65
	1.5	2	0.5	Yellow brown gravelly fine to medium Sand. Gravel of flint and chert.	4			
	2	3.1	1.1	Yellow brown gravelly fine to medium Sand and fine to coarse Gravel of flint and chert.	4			
TP111	0	0.7	0.7	Made Ground	1	5.79	614053.43	245013.78
	0.7	2.2	1.5	Light brown gravelly Silt. Gravel of chert and flint.	3			
	2.2	2.6	0.4	Yellow brown medium to coarse very gravelly Sand. Gravel of flint and chert.	4			

Borehole (BH) / Test pits (TP)	Depth top (m)	Depth bottom (m)	Unit thickness (m)	Sediment Description	Unit	Ground Level (mOD)	Easting	Northing
TP111A	0	0.6	0.6	Made Ground	1	5.81	614048.55	245018.77
	0.6	1.9	1.3	Brown gravelly clayey Silt. Gravel of chert and flint. Becoming increasingly gravelly with depth.	3			
TP112	0	2.9	2.9	Made Ground	1	5.83	614106.27	244960.1
	2.9	3.1	0.2	Dark grey firm to stiff Clay	3			
TP113	0	0.45	0.45	Made Ground	1	4.67	614133.06	244978.65
TP113A	0	0.7	0.7	Made Ground	1	4.7	614134.13	244980.23
TP113B	0	0.9	0.9	Made Ground	1	4.95	614133.02	244982.3
TP113C	0	1.2	1.2	Made Ground	1	4.5	614135.4	244986.65
TP114	0	0.8	0.8	Made Ground	1	5.75	614127.05	244988.49
TP114A	0	1.5	1.5	Made Ground	1	5.9	614130.24	244995.4
TP115	0	1.8	1.8	Made Ground	1	4.84	614144.9	244964.96
TP115A	0	1.4	1.4	Made Ground	1	4.79	614141.3	244961.91
	1.4	1.8	0.4	Dark grey blue soft to firm very organic silty Clay	3			
TP116	0	1.1	1.1	Made Ground	1	5.21	614149.11	244959.27
TP117	0	1	1	Made Ground	1	5.66	614159.12	244965.16
	1	2.3	1.3	Dark grey slightly clayey gravelly Sand. Gravel is fine to coarse angular to rounded flint.	3			
	2.3	2.7	0.4	Soft greyish blue silty Clay	3			
	2.7	2.8	0.1	Soft dark black clayey pseudo-fibrous Peat	2			
	2.8	4	1.2	Soft greyish blue silty Clay with bands of pseudo-fibrous peat.	3			
TP118	0	2.1	2.1	Made Ground	1	5.69	614194.55	244986.94
	2.1	4	1.9	Soft to firm dark bluish grey slightly sandy Clay	3			
TP119	0	0.9	0.9	Made Ground	1	5.61	614231.27	244883.46
	0.9	1.2	0.3	Dark orange gravelly fine to coarse Sand. Gravel is fine to coarse angular to rounded flint.	4			

Borehole (BH) / Test pits (TP)	Depth top (m)	Depth bottom (m)	Unit thickness (m)	Sediment Description	Unit	Ground Level (mOD)	Easting	Northing
	1.2	2.1	0.9	Light orange gravelly fine to coarse Sand. Gravel is fine to coarse angular to rounded flint.	4			
	2.1	2.7	0.6	Light orange fine to coarse Sand and fine to coarse angular to rounded flint Gravel.	4			
TP120	0	1	1	Made Ground	1	5.2	614226.13	244983.35
TP121	0	0.8	0.8	Made Ground	1	5.48	614261.09	244983.48
	0.8	1.8	1	Soft light orangish brown sandy very gravelly Clay. Gravel is fine to coarse angular to rounded flint.	4			
	1.8	3	1.2	Dark brownish orange slightly clayey, sandy fine to coarse angular to rounded flint Gravel.	4			
TP122	0	1	1	Made Ground	1	5.36	614265.14	245000.33
TP122A	0	1.5	1.5	Made Ground	1	5.36	614265.8	244999.75
	1.5	2.1	0.6	Soft dark brown very sandy very gravelly Clay. Gravel is fine to coarse angular to rounded flint. Sand is fine to coarse.	4			
	2.1	2.8	0.7	Dark brown slightly clayey very sandy fine to coarse angular to rounded flint Gravel. Sand is fine to coarse.	4			
TP123	0	0.9	0.9	Made Ground	1	4.4	614280.38	245037.66
TP123A	0	1.3	1.3	Made Ground	1	4.37	614284.78	245043.07
	1.3	2.6	1.3	Dark grey blue soft organic Clay	4			
TP124	0	1	1	Made Ground	1	4.3	614298.56	245051.13
TP124A	0	0.95	0.95	Made Ground	1	4.3	614298.56	245051.13
	0.95	1	0.05	Soft greyish blue and black peaty, silty Clay with bands of pseudo-fibrous peat.	3			
TP125	0	2.75	2.75	Made Ground	1	5.2	614288.8	245054.42
	2.75	4.1	1.35	Dark black speckled white, slightly peaty, silty, sandy Clay with frequent shell fragments. Sand is fine.	3			
TP126	0	2.9	2.9	Made Ground	1	6.57	614285.74	245079.47
	2.9	5	2.1	Soft greyish blue and black silty peaty Clay with bands of pseudo-fibrous peat.	3			
TP127	0	2.7	2.7	Made Ground	1	5.6	614302.23	245083.73

Borehole (BH) / Test pits (TP)	Depth top (m)	Depth bottom (m)	Unit thickness (m)	Sediment Description	Unit	Ground Level (mOD)	Easting	Northing
	2.7	4.5	1.8	Soft dark grey and black silty sandy Clay. Sand is fine to medium.	3			
	4.5	5.5	1	Dark black silty gravelly fine to coarse Sand with frequent shells. Gravel is fine and medium angular to rounded flint.	4			
TP128	0	2.2	2.2	Made Ground	1	7.06	614314.65	245073.86
TP129	0	5.5	5.5	Made Ground	1	7.82	614297.14	245093.25
	5.5	5.8	0.3	Soft to firm dark bluish grey slightly gravelly, very sandy Clay with frequent shells. Gravel is fine to coarse angular to rounded flint and rare chalk.	3			
	5.8	6	0.2	Soft greyish blue and black slightly gravelly slightly peaty silty Clay with bands of pseudo-fibrous peat. Gravel is fine and medium angular to rounded flint.	3			
TP130	0	0.7	0.7	Made Ground	1	4.39	614322.08	245056.56
	0.7	1.4	0.7	Soft light grey brown sandy Silt	3			
	1.4	2.6	1.2	Soft grey black slightly sandy Silt	3			
	2.6	3.1	0.5	Soft spongy pseudo-fibrous Peat	2			
	3.1	4	0.9	Loose grey sandy fine to coarse angular to rounded flint Gravel	4			
TP131	0	3.6	3.6	Made Ground	1	6.92	614322.83	245068.81
	3.6	4.3	0.7	Soft greyish blue and black slightly gravelly peaty, silty Clay with bands of pseudo-fibrous peat. Gravel is fine and medium angular to rounded flint.	3			
	4.3	5.8	1.5	Light blue sandy, clayey fine to coarse angular to rounded flint Gravel. Sand is fine to coarse.	4			
TP132	0	3.5	3.5	Made Ground	1	7.04	614322.43	245083.03
	3.5	6	2.5	Soft greyish blue and black peaty silty Clay with bands of pseudo-fibrous peat.	3			
TP133	0	3.6	3.6	Made Ground	1	6.9	614315.56	245081.47
	3.6	6	2.4	Soft greyish blue and black peaty silty Clay with bands of pseudo-fibrous peat.	3			
TP134	0	1.1	1.1	Made Ground	1	4.22	614350.19	245073.98
TP134A	0	1	1	Made Ground	1	4.25	614342.04	245074.26
TP134B	0	1	1	Made Ground	1	4.41	614336.85	245075.32

Borehole (BH) / Test pits (TP)	Depth top (m)	Depth bottom (m)	Unit thickness (m)	Sediment Description	Unit	Ground Level (mOD)	Easting	Northing
TP135	0	4	4	Made Ground	1	4.1	614319.98	245113.46
TP136	0	2	2	Made Ground	1	4.08	614321.06	245146.59
	2	3.5	1.5	Soft grey black sandy gravelly Silt	3			
TP137	0	1.3	1.3	Made Ground	1	4.9	614374.3	245219.05
	1.3	1.6	0.3	Firm dark grey black slightly organic Clay.	3			
TP137A	0	1.6	1.6	Made Ground	1	7.95	614380.22	245213.11
TP137B	0	1.4	1.4	Made Ground	1	8	614376.29	245211.61
TP138	0	1.07	1.07	Made Ground	1	4.33	614392.02	245221.1
TP139	0	0.62	0.62	Made Ground	1	7.6	614380.82	245256.25
TP139A	0	1.71	1.71	Made Ground	1	8.4	614387.38	245259.43
TP139B	0	2.34	2.34	Made Ground	1	–	–	–
TP140	0	1	1	Made Ground	1	5.33	614421.8	245258.36
TP141 (NW)	0	0.9	0.9	Made Ground	1	4.6	614384.58	245223.42
TP141 (SW)	0	1.6	1.6	Made Ground	1	4.6	614384.58	245223.42
TP142	0	0.7	0.7	Made Ground	1	4.88	614377.66	245219.43

Appendix 2 Site registers

Appendix 2.1 Photographic register

Shot	Direction	Description
001	E	General shot
002	SE	General shot
003	W	General shot
004	SE	TP 134 (b) – abandoned due to Asbestos
005	NE	TP 121 – unstable sides, no scale
006	NE	TP 121 - unstable sides, no scale
007	SE	TP 119
008	SW	TP 119 – spoil
009	S	TP 117 – spoil
010	E	TP 117 (difficult conditions for taking photos)
011	SE	TP 117 (difficult conditions for taking photos)
012	E	Working shot of test pits in small mound
013	SE	TP 128 – topsoil / concrete
014	S	View of site from smaller mound
015	SW	View of site from smaller mound
016	W	TP M1 (bad light)
017	W	TP M1
018	NE	Infiltration pit TP 124
019	NW	Infiltration pit TP 120
020	N	Infiltration pit TP 105
021	NW	TP 106 (topsoil, subsoil)
022	W	TP 106
023	NW	General shot at TP 105 and 106
024	N	General shot at TP 105 and 106
025	NE	General shot at TP 105 and 106
026	NE	General shot of area at TP 103
027	N	TP 103 - abandoned due to collapse
028	NE	Infiltration TP 101
029	W	TP 102 – abandoned due to asbestos
030	SW	TP 102 – spoil (all made ground)
031	N	TP 140 Infiltration pit working shot
032	S	The Gipping

North East

Headland Archaeology
13 Jane Street
Edinburgh EH6 5HE
0131 467 7705
office@headlandarchaeology.com

North West

Headland Archaeology
10 Payne Street
Glasgow G4 0LF
0141 354 8100
glasgowoffice@headlandarchaeology.com

Midlands & West

Headland Archaeology
Unit 1, Premier Business Park, Faraday Road
Hereford HR4 9NZ
01432 364 901
hereford@headlandarchaeology.com

South & East

Headland Archaeology
Technology Centre, Stanbridge Road
Leighton Buzzard LU7 4QH
01525 850878
leighton.buzzard@headlandarchaeology.com

www.headlandarchaeology.com