A12 Chelmsford to A120 widening scheme

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6.3 ENVIRONMENTAL STATEMENT APPENDIX 7.8 PALAEOLITHIC AND PALAEOENVIRONMENTAL EVALUATION REPORT – PART 1

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ENVIRONMENTAL STATEMENT APPENDIX 7.8 PALAEOLITHIC AND PALAEOENVIRONMENTAL EVALUATION REPORT - PART 1

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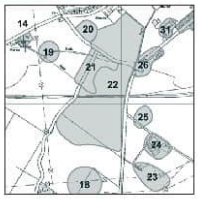






A12 ARCHAEOLOGICAL EVALUATION (JUNCTION 19/CHELMSFORD – JUNCTION 25/A120)

Fieldwork Phase 1 – Quaternary Landscape Evaluation Report
CLIENT REF. HE551497-COS-EHR-3_S0-RP-X-0009
PART 1 REPORT

Headland Archaeology Midlands & West
Unit 1 | Clearview Court | Twyford Rd | Hereford HR2 6JR

for Costain Group plc
on behalf of National Highways

19/11/2021

HEADLAND ARCHAEOLOGY

PROJECT INFORMATION:

PROJECT NAME	A12 Archaeological Evaluation (Chelmsford-A120)
TYPE OF WORK	Evaluation
PLANNING REF.	-
CONSULTANT/AGENT	Jacobs
CLIENT	Costain Group plc, on behalf of National Highways
PROJECT CODE	ATTT21
NGR	Proposed Scheme centred on TL 83997 16574
PARISH	Witham; Rivenhall and Silver End; Kelvedon; Inworth; Messing and Feering
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FIELDWORK DATES	17th May 2021 – 20th October 2021
OASIS REF.	HEADLAND1-501874
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PROJECT TEAM:

PROJECT MANAGER	Ailsa Westgarth
AUTHOR	Aroa Garcia-Suarez, Jason Stewart, Martin Bates, Matthew Pope, Matthew Stringfellow, Michael Wallace, Steve Cox
FIELDWORK	Armi Utriainen, Aroa Garcia-Suarez, Harry Gregory, Jacob Spriggs, Jason Stewart, Lois Turnbull, Lucy Pryce-Rattle, Martin Bates, Matthew Pope
GRAPHICS	Beata Wieczoreck-Oleksy, Rafael Maya Torcelly
ENVIRONMENTAL	John Whittaker, Kathryn Turner, Michael Wallace
FINDS	Barry Bishop

PROJECT SUMMARY

Development of the A12 Widening Scheme (Junction 19 – Junction 23) impacts a corridor of land of approximately 24km between Chelmsford and Colchester, Essex. Within this area, there are known Palaeolithic archaeology and palaeoenvironmental sequences of national and international significance, including at Colemans Farm Quarry and Marks Tey. The high potential for further significant deposits to be encountered during development is reflected in regional research frameworks, scheme desk-based assessments and the current written scheme of investigation.

Headland Archaeology (UK) Ltd were commissioned by Costain Group plc on behalf of National Highways to conduct an archaeological evaluation of the accessible areas of the scheme. The Palaeolithic element of these works took a Quaternary landscape evaluation approach. Geoarchaeological techniques were employed to enhance understanding of landscape evolution and, in turn, locate deposits with the potential to contain Palaeolithic archaeology and palaeoenvironmental sequences.

Fieldwork included the excavation of test pits and boreholes. Test pits were used to evaluate deposits, and for artefact screening. Boreholes allowed for deeper deposits to be evaluated, especially where construction is expected to have a deep impact. These techniques were supplemented with geophysics to map the distribution of sub-surface deposits, and to conduct a preliminary palaeoenvironmental assessment.

Reporting of the current works comprises two elements: the present Assessment Report (HE551497-COS-EHR-3_S0-RP-X-0009) and the forthcoming (early 2022) Stage 2 Review (HE551497-COS-EHR-3_S0-RP-X-0010). The former summarises the fieldwork, presents the results for test pits and a priority set of boreholes, and provides an initial re-assessment palaeoenvironmental and Palaeolithic potential (PQ Zones). The latter report will add borehole data to produce a scheme-wide deposit model for use in re-zoning the scheme based on a potential-and-significance matrix, with the intention to develop further robust and targeted evaluation and mitigation strategies.

Key results to date include:

- Lake deposits at the south of the scheme, contain palaeoenvironmental remains and may have high potential for Palaeolithic archaeology.
- Deposits across the scheme mapped as Head are highly varied, with some having greater potential than others.
- Understanding of Blackwater Terraces has been enhanced, including refinement of the parts of these deposits most likely to yield archaeology.
- The area around Colemans Farm Quarry – though the quarry itself was outside the scope of works - has proven to be more complex than anticipated, increasing the likelihood of in-situ Palaeolithic remains.
- Development of palaeosols and hiatus at the Till surface were detected.
- Sub-Till Kesgrave Formation deposits were sampled.
- The high potential area around Marks Tey was not included in the scope of current works.

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A12 ARCHAEOLOGICAL EVALUATION (JUNCTION 19/CHELMSFORD – JUNCTION 25/A120)

QUATERNARY LANDSCAPE EVALUATION

1. INTRODUCTION

This document constitutes the assessment report for archaeological evaluation undertaken by Headland Archaeology (UK) Ltd, with support from Pre-Construct Archaeology (PCA), as part of the A12 (Junction 19 Chelmsford – Junction 25 A120) Widening Scheme. The work was commissioned by Costain Group plc on behalf of National Highways. The investigation comprised archaeological trial trenching and Palaeolithic evaluation. All works were undertaken in compliance with a Written Scheme of investigation (WSI) prepared by Headland Archaeology. The WSI was produced as part of an application on behalf of National Highways for a Development Consent Order (DCO) regarding improvements to the A12 in Essex ('the scheme'). The document relates to the evaluation of palaeoenvironmental and Palaeolithic potential. The archaeological trial trenching report is presented elsewhere (Headland Archaeology 2021).

The scheme boundary runs from Junction 19 of the A12 at Boreham to Junction 25 at Marks Tey (NGR TL 74145 09410 to TL 91689 23815) and encompasses a total of 1039 hectares of land of which approximately 25 hectares is made up of the existing highway and land which will not be impacted by construction. The route of the scheme runs through a gently rolling landscape which varies between 18 m above Ordnance Datum (AOD) and 55 m AOD (Illus 1). In addition to widening the existing dual carriageway to three lanes throughout, the scheme includes safety improvements such as closing off existing accesses, the construction of new road structures including roundabouts and bridges, re-routing of the road in some areas, and providing alternative routes for walkers, cyclists, and horse riders. At the time of the fieldwork, the majority of the route was used for agricultural purposes – both arable and pastoral farming.

A consultation scoping document (Jacobs 2020a) was produced following discussion with stakeholders relevant to the scheme – representatives of Essex County Council, Colchester Borough Council and Historic England and Historic England's Regional Advisor on Archaeological Sciences. Costain commissioned Headland Archaeology to produce a WSI for the works which was approved by the stakeholders and conformed to a scope of works produced by Jacobs (Jacobs 2020b). Headland Archaeology was also commissioned to undertake the trial trenching, Palaeolithic evaluation, post-excavation assessment, reporting and the creation and deposition of an ordered archive.

The purpose of the stage of the works reported here (hereafter referred to as Fieldwork Phase 1: Quaternary Landscape Evaluation) is to provide data that will inform the evaluation of the Quaternary landscape and contribute to determining its potential to contain Palaeolithic archaeology and palaeoenvironmental sequences. The programme of this first stage of evaluation took place between 17th May and 20th October 2021, and this report presents the results of test pitting, geophysics, priority boreholes and preliminary palaeoenvironmental assessment. The results presented here will feed into the forthcoming Stage 2 Review (Document: HE551497-COS-

EHR-3_S0-RP-X-0010) which incorporates a review of all purposive geoarchaeological works and ground investigation works.

1.1. PLANNING BACKGROUND AND RESEARCH PRIORITIES

A Cultural Heritage Desk-Based Assessment (DBA) (Highways England 2018) was prepared for the scheme, which identified 881 cultural heritage assets within the project baseline. In addition, a specialist Palaeolithic DBA was prepared (Wenban-Smith 2020) for the scheme, which identified key Palaeolithic sites along the route, including:

- sites west and southwest of Witham, mapped as Boulder Clay or Glacial Sand and Gravel
- sites to the northeast of Witham with varied deposits i.e. Blackwater Terrace 3 sand/gravel overlying Hoxnian lacustrine deposits, and Blackwater Terrace 2 sand/gravel deposits, including in situ palaeo-environmental and artefactual remains;
- Roman Kelvedon excavation site on Blackwater Terrace 3 gravel which include possible upper Palaeolithic human skull fragments from the base of the Holocene alluvium;
- sites in and near the Hoxnian interglacial lacustrine sediments at Marks Tey, including artefactual finds and palaeo-environmental records (molluscs, mammal fossils, pollen and plant macro-fossils);
- sites at the northeast end of the A12 scheme containing reworked artefacts from pre-Anglian deposits and residual finds from post-Anglian activity in glacial Sand and Gravel.

In addition to the two DBAs mentioned above, previous archaeological work relating to the project comprised two phases of geophysical survey (Headland Archaeology 2020a and 2020b) and a cropmark analysis (Place Services 2021). These identified anomalies of potential archaeological significance including settlement anomalies and groups of linear and discrete anomalies. Several dipolar anomalies were detected which were consistent with modern activity. In general, the majority of the scheme contained no anomalies of archaeological potential.

The scheme offered opportunities to contribute to the research themes and priorities identified in both the Research Agenda and Strategy for the Eastern Counties (Brown & Glazebrook 2000), and the Revised Framework for the East of England (Medlycott 2011). The WSI set out the research priorities for the investigation which were intended to deliver the most appropriate generation of knowledge and the best benefit to the public within the constraints of a construction programme and budget.

In general, these priorities were:

- To better understand the chronology through the use of scientific dating and statistical analysis.
- To develop better sampling strategies for paleoenvironmental sampling and analysis.
- To assist with the development of a future mitigation strategy for the scheme.

The specific priorities relating to the Palaeolithic period were as follows:

- To identify deposits that have a potential to contain evidence of in situ Palaeolithic occupation.
- To identify deposits that might contribute to understanding the contemporary environment.
- To recover artefacts from secondary deposits.

1.2. GEOMORPHOLOGICAL SETTING

The landscape of the scheme corridor is defined by the drainage patterns of the major rivers in the region, namely the Blackwater and Chelmer Rivers and their tributaries, the River Brain and River Ter, respectively (Illus 1). These rivers form a NW to SE pattern west of the scheme corridor, but both rivers (Blackwater/Chelmer) subsequently turn through 90° into a SW to NE trending valley. This pattern is broadly parallel with the main topographic feature east of the route corridor, the Tiptree Ridge, and to the south, the Danbury Ridge (Illus 1). Both rivers merge at the gap between the ridges before swinging in a south easterly direction into the Blackwater Estuary around Maldon. The current tidal head of the Blackwater is at Beeleigh Weir (Water Matters, nd), although canalisation of the Chelmer and the construction of mills in the area between Maldon and Langford has made it difficult to ascertain where the Holocene tidal head of the river would lie, let alone the head of the tidal river during successive Pleistocene interglacial periods.

Today, the River Blackwater is a shallow river with gravel stretches. Similar conditions would have prevailed in the past in the River Chelmer, but the construction of the canal in 1797 (Cumberlidge, 2009) impacted the river and it is now an artificial channel. At the northern end of the route corridor, the scheme impacts on the Roman River Valley that feeds into the River Colne, downstream of Colchester.

1.3. GEOLOGICAL SETTING

Bedrock

Pre-Quaternary Bedrock geology along the scheme corridor consists of London Clay, a compact clay-dominated sediment deposited under marine conditions in the Eocene (56-34 million years before present). In places, small outcrops of older Thanet Formation or Lambeth Formation sediments form elongated inliers at Kelvedon and Witham according to the British Geological Survey mapping (Geology of Britain Viewer, accessed 21/10/21). The Thanet Formation is formed mainly of a pale grey or buff fine-grained glauconitic sand that is interbedded with silts and clays towards the base of the formation. At its base is the Bullhead Bed that consists of flint pebbles. The Lambeth Formation (formerly known as the Woolwich and Reading Beds) consist of a complex of vertically and laterally varying gravels, sands, silts and clays deposited between 56-55 million years before present. Older sources (Bristow, 1985, Figure 10) suggest a more extensive distribution of the Lower London Tertiaries (i.e. the Thanet and Lambeth Formations) across the area from Witham to Kelvedon.

Pleistocene sediments

The Pleistocene geology of the route corridor can be subdivided into three groups of deposits that are both temporally and spatially discrete (Illus 2; Appendix 1, Table A1.1). These consist of:

- The Kesgrave/Colchester Formation[1] of pre-Anglian age.
- The Lowestoft Formation of Anglian age.
- The post-Anglian Blackwater Valley sequence of sediments.

The Kesgrave/Colchester Formation

Sands and gravels have been widely mapped across East Anglia that belong to a former course of the river Thames that diverged from the modern course at Reading and extended north eastwards through St. Albans towards Colchester and thence to the modern coastline east of Norwich (Rose et al., 1976; Whiteman, 1992; Bridgland, 1994a; Rose et al., 1999). These sands and gravels are considered to be older than c. 450,000 years before present (Marine Isotope Stage (MIS) 12; Appendix 1, Table A1.1). The Kesgrave Formation/Colchester Formation has been divided up into a series of Members (a geological term for classifying deposits) by Whiteman (1992) and these are in effect individual terraces of the pre-diversion Thames where the youngest occur at the lowest elevations, while older terraces occur at higher elevations. These form a series of mappable units lying at the surface in the west but buried beneath glacial sediments of the Lowestoft Formation to the east and through the scheme location. Within the scheme boundary the deposits that have been mapped by Rose et al. (1999) that belong to the Kesgrave Formation are the Ardleigh and Wivenhoe Gravels (Appendix 1, Table A1.1).

Sediments associated with the Kesgrave Formation are dominated by sands and gravels that are usually devoid of palaeoenvironmental material. However, some of the younger parts of this formation, such as the Ardleigh and Wivenhoe Gravels, do contain important palaeoenvironmental records. For example, at Wivenhoe (Bridgland, 1994b) two cold climate gravels (the Wivenhoe Upper and Lower Gravel) are separated by an organic silty clay containing fossils from a warm or temperate climate. Organic material includes insect remains, plant macrofossils and pollen (Bridgland et al., 1988; Bridgland, 1994b). At Ardleigh, Bridgland (1988, 1994a), Bridgland et al., (1988) and Bridgland and Gibbard (1990) have described the complex deposits that include up to 7.5 m of pale gravels at the base of the quarry, that in places include a dark grey sand rich in organic matter that include plant macrofossils and pollen. The biological remains indicate that these deposits are also of temperate character (i.e. temperatures

[1] The terminology used to describe these deposits has changed over the years and their use by different authors reflects the current state of understanding of deposits in the area. The BGS use of nomenclature often differs from the use of names by authors such as Philip Gibbard and David Bridgland.

were similar to those of the present warm period) belonging to an interglacial in the Early Middle Pleistocene (Bridgland and Gibbard, 1990), perhaps around 700,000 years before present. Higher in the sequence (i.e. stratigraphically overlying the interglacial deposits but separated from them by gravels) dark grey silty deposits occurred as beds and lenses towards the top of the gravel. These deposits also contain plant and pollen remains but they are indicative of arctic climates. Occasional vertebrate remains were also found in the gravels above the interglacial sediments.

The interglacial sediments that have been located in the Kesgrave Formation usually occurred in small pockets that are probably fragments of isolated channels and the biological data suggest that different parts of the interglacial are recorded in the different channels. This evidence indicates that while the Kesgrave/Colchester Formation is complex and typically devoid of important palaeoenvironmental material, isolated pockets and patches of sediment may contain nationally important sequences in parts of the formation.

The Lowestoft Formation

The Lowestoft Formation (Lee et al., 2004) is used loosely here to describe a sequence of deposits laid down by the ice in East Anglian during MIS 12 (Appendix 1, Table A1.2). Lowestoft Formation *sensu stricto* consists of a chalky till with a clay matrix and common chalk and flint clasts. The carbonate content of the till may be up to 30% in places. We also include sands and gravels mapped as Glaciofluvial Deposits by the British Geological Survey within the overall group of the Lowestoft Formation for simplicity. Additional clay and silt dominated deposits mapped as Glaciolacustrine Deposits may also be grouped under the broad classification of the Lowestoft Formation.

The history and timing of ice advance into the study area remains opaque and the precise impact on the pre-existing landscape of the Kesgrave Formation is likely to have varied across time and space. It is thought that ice was held up by the Tiptree Ridge (Illus 1) while meltwater processes beneath the ice or at the ice margins were impacting on the Kesgrave landscape and in due course meltwater created a deep tunnel valley (a subglacial meltwater channel cut beneath the ice by water and entrained sands and gravels) between Witham and Kelvedon (Bristow, 1985) (Illus 2). Other features that may be associated with the Anglian Glaciation have been suggested by Turner (in Rose and Turner, 1973) who argued that the highest terraces of the Blackwater (see below) may be kame terraces of Anglian age rather than fluvial terraces per se. The surface of the Lowestoft Formation forms the template on which sediments from the Later Middle Pleistocene are deposited.

Post-Anglian Blackwater Valley sequence

A range of different types of sediment are associated with the post-Anglian landscapes of the route corridor that are broadly associated with the Blackwater drainage system that include the interglacial lacustrine sequences (lakes) exemplified by those at Mark's Tey (Turner, 1970; Tey et al., 2016) and fluvial sediments of the river Blackwater (Illus 2).

The most complete sequence of sediments dated to the Hoxnian Interglacial (MIS 11, immediately post-dating the Anglian Glaciation) has been located immediately to the north of the current scheme at Marks Tey and Copford. The sediments consist of at least 19 m of sediments lying between c. +16 m and -2 m O.D. (Turner, 1970; Tey et al., 2016; Candy et al., 2021). Of significance to our study is the presence, within the immediate vicinity of the proposed extraction area around Rivenhall End, of interglacial lacustrine sediments similar to those at Marks Tey as well as river terrace deposits associated with the fluvial system of the Blackwater (Illus 3). Although the lake deposits remain to be independently dated, the lacustrine sediments are likely to be Hoxnian in age (by comparison with those at Marks Tey – Turner, 1970) and are rich in palaeoenvironmental evidence. Their palaeoenvironmental potential has been demonstrated by previous work at the Colemans Farm Quarry site by one of the authors (in 2006/2009 along with Francis Wenban-Smith of Southampton University). This work focused on test pitting and borehole drilling in a field near Rivenhall Bridge. The ongoing work has so far demonstrated the nature of the lacustrine sediments, that they contain well preserved molluscs, ostracods and small mammal remains and pollen intermittently. Pollen of the unknown Type X species has been recovered from these sediments (Pete Coxon pers. comm.). This reinforces a possible MIS 11 age (although the presence of Type X pollen in deposits of MIS 9 age also remains a possibility).

The lake margin position and the relationship of the lake deposits to the mapped fluvial terrace deposits remain to be demonstrated, although fluvial sediments are clearly present above and below lake deposits at Colemans Farm Quarry (Illus 3). Five river terraces have been mapped by the BGS in the area (Illus 2) but both the nature of their deposition and age remains difficult to ascertain. For example, it is possible to equate the five terraces with three post-Hoxnian cold stages (MIS 10-8-6) and the complex Devensian (MIS 5d-2) in much the same fashion as Bridgland has argued for the Lower Thames (Bridgland, 2006) (Appendix 1, Table A1.1). In contrast Turner (in Rose

and Turner, 1973) has suggested that Terraces 4 and 5 (the highest terraces of the Blackwater) are kame terraces formed during the Anglian glaciation meaning that Terraces 1-3 would span nearly 400,000 years of time suggesting considerable hiatus between some known sequences. Furthermore, there appears to be some confusion regarding the status of Terrace 3 whereby Bristow (1985, p.68) has argued that the sands and gravels underlying the Hoxnian lake deposits belong to Terrace 3, while Turner (in Rose and Turner, 1973) suggests that Terrace 3 deposits overlie the lake deposits. What does however seem clear is that there is a close association (as one might expect) between the lacustrine deposits and fluvial sediments associated with Terrace 3.

Work during the summer of 2020 (in the Colemans Farm Quarry) has also demonstrated that important fossiliferous deposits lie beneath gravels mapped as Terrace 2 by the British Geological Survey) (Illus 3). These are different in character, and probably of Devensian age, to those of the lake deposits and represent colder climate environments.

1.4. QUATERNARY STRATIGRAPHY AND LIKELY CONTEXTS FOR THE PRESERVATION OF ARCHAEOLOGY

The base line mapping undertaken by the British Geological Survey creates the foundation for our geological understanding of the area. This mapping, in conjunction with Stage 1 Review that included data from selected ground investigation, as well as an understanding of the landscape history of the region, has allowed several discrete stratigraphic units to be identified in the study area. It should be noted that, while these are broadly chronological elements in this system, Head deposits, for example, are likely to be multi-aged and do not conform to a strict chronological timeline for modelling purposes. Furthermore, the age of the Blackwater Terraces 4 and 5 is debated (see above) and, consequently, their relationship with the interglacial lake sediments remains uncertain. All elements are described in Appendix 1 (Table A1.2).

Holocene alluvium

These deposits are likely to be restricted to the valleys of the Blackwater, Chelmer, Brain, Ter and Roman River. Their distribution is relatively well understood from the BGS mapping. The deposits are likely to be dominated by sands and silts with occasional organic sequences. Tufa has been mapped by the BGS around Witham in places, and this is likely to be intercalated with organic silts and peats when present at the edge of the floodplain, and more widespread across the floodplain. Archaeological material may be present within or beneath the alluvium either as in situ spreads of material, structures along channel margins, or as discarded material in fine grained sequences or reworked material in coarser gravels and sands. Gravels are likely to underlie Holocene alluvium in places, and will date to the end of the last cold stage c. 11,700-17,000 years.

Head

Head is mapped extensively in the route corridor and is a term applied to cover a wide range of environments of deposition. Typically, Head deposits are associated with slopes where downslope movement of sediment may occur during both warm and cold periods. In colder climates, freeze/thaw and spring melt results in the movement of mixes of gravels, sands, silts and clays (solifluction) under gravity that results in the accumulation of unsorted sediments at the base of the slope. Wetter periods may result in channelling of these deposits and the production of discontinuous sequences of channel fills. Less severe environments may result in fine grained sheet wash sediments accumulating as bedded sheets of sediment parallel to slopes. Head deposits may often overlie, and bury, fluvial sediments associated with the river terrace sequences (Illus 4). In the Holocene, colluvium resulting from deforestation would be covered by the term Head. Head deposits may also include soil horizons from periods of slope stability. As a consequence, both in situ and reworked material may occur in Head. Head deposits of any age may exist in the area of the route corridor above the Till (see below). Examples of Palaeolithic material being recovered in Head or solifluction deposits are at Harnham (Bates et al., 2014), at Ebbsfleet Baker's Hole (Wenban-Smith et al., 2020) and at Dartford (Wenban-Smith et al., 2010).

Blackwater Terrace 1

As the lowest of the 5 terraces of the Blackwater, this is likely to be the most recently formed of the river terraces. No models currently exist explaining the fluvial sequences associated with the Blackwater terraces and, consequently, we have adopted a simplified version of the Bridgland model for river terraces based on his work in the lower Thames (Illus 4) (Bridgland, 2006). It should be noted that not all English rivers follow patterns of sedimentation similar to that proposed by Bridgland for the lower Thames, and rivers such as the Severn/Avon system (Maddy et al., 1991) and the Axe (Brown et al., 2015) contain different sedimentary architectures to the lower

Thames. The fluvial sediments underlying this terrace are likely to consist of a basal gravel or sand and gravel forming the main body of the terrace. The age of these gravels is constrained by findings associated with Terrace 2 (see below), and therefore suggest that Terrace 1 would probably date to around the last glacial maximum (35,000-20,000 years before present). Archaeological and palaeontological material may be incorporated into the gravels and are likely to be reworked, although channel cut and fill sequences within the gravels may preserve organic material and offer contexts in which archaeological material may be in primary context.

Blackwater Terrace 2

The fluvial sediments underlying this terrace are likely to consist of a gravel, or sands and gravels, forming the main body of the terrace. Observations at Colemans Farm Quarry (Illus 3C) illustrate these deposits and have demonstrated that an intermittently preserved organic rich sand/silt is present at the base of the quarry in places. This organic unit contains molluscs, ostracods, pollen and insect remains. Pollen assessment indicates deposition of this sediment under cool climate conditions, probably in the Devensian. Large mammal remains, including mammoth and horse, are also being recovered from the base of these gravels in the quarry and appear typical of a Devensian faunal assemblage. Archaeological material may be incorporated into the gravels and are likely to be reworked, although the finer grained organic sequences towards the base of the gravels may preserve contexts in which archaeological material may be in primary context.

Blackwater Terrace 3

The fluvial sediments underlying this terrace are likely to consist of a gravel, or sands and gravels, forming the main body of the terrace. The possibility exists that finer grained sediments associated with the interglacial floodplain of the river may exist in places over the sand and gravels (if present, this is most likely to occur where the fluvial sediments adjoin the rising bedrock surface at the inside of the terrace – Illus 4). Head deposits may overlie fluvial sediments close to the inside of the terrace. The age of the terrace is not well constrained, but it clearly overlies the interglacial lake deposits (below) at places such as Colemans Farm Quarry. The age of these deposits (Appendix 1, Table A1.2) depends, in part, on the interpretation of Terraces 4 and 5 (see below) and, consequently, the Terrace 3 sediments may date to between 374,000 and 125,000 years. Archaeological material may not only exist as reworked artefacts in the body of sands and gravels, but in primary context associated with interglacial sediments. Both reworked and primary context material may be present in any Head deposits that bury the fluvial sequences. Biological material is most likely to be present in the interglacial sediments.

Blackwater Terrace 4 and 5

These are mapped as discrete patches of material on the left bank of the Blackwater, at the foot of the Tiptree Ridge (Illus 2). Sediments are likely to be dominated by sands and gravels. Depending on the interpretation of the deposits, these either belong to the end of the Anglian Glaciation, MIS 12 (Appendix 1, Table A1.1), or to one of the post-Hoxnian cold stages (MIS 8 and MIS 10). If the sequences belong to the MIS 12 glaciation, they are likely to date to sometime around 450,000-430,000 years. Contained archaeology would be reworked artefacts from the pre-Anglian period derived from the sub-till sands and gravels of the Kesgrave/Colchester Formations. If they belong to cold stages MIS 8 and 10, they are likely to consist of a gravel, or sands and gravels. The possibility exists that finer grained sediments associated with the interglacial floodplain of the river may exist in places over the sand and gravels (Illus 4), although the isolated nature of the patches of Terrace 4 and 5 suggests that they are less likely to preserve this sort of sequence. Head deposits may overlie fluvial sediments in places. It is also possible that these patches of fluvial sediments have been modified by solifluction processes and mobilised downslope.

Interglacial lake sediments

These sediments have previously been reported by the British Geological Survey in the area, and work at Colemans Farm Quarry (Illus 3A/B) illustrates some of these deposits. Similar deposits are present to the north, at Marks Tey (Turner, 1970; Tye et al., 2016; Candy et al., 2021). Two distinct suites of deposits are presently identified in these lake sequences:

- Shallow sequences (4-7 m typically) of pale yellow soft calcareous silts overlying dark grey/greenish-grey clay-silts in the Colemans Farm area (Illus 3).
- Deep (15-30 m) dark grey, "brecciated" clay silts of the type site at Marks Tey.

The relationship between the two types of sequences are unclear at present, and whether they represent discrete and distinct basin stratigraphies or whether they relate to shallower and deeper parts of the same basin is presently unclear. Precise environments of deposition for the sediments remain to be determined and, consequently, the

position of lake edges remains of key importance. Archaeological material may well be preserved in these sequences and, if present, it is likely to be in primary context. The position of archaeological sensitive sequences in the lake sequences is unclear due to the poor understanding of lake sequence development and the presence or not of temporary surfaces within and below the lake sediments. Currently, any lake deposit sequences are considered of high archaeological potential.

Sub-lake sands and gravels

These are relatively unknown and either represent outwash during the de-glaciation of the area in the late Anglian (Appendix 1, Table A1.1) or infilling of the lake basin in the early Hoxnian. Artefacts in these deposits are likely to be reworked to a large extent from the sub-till sands and gravels of the Kesgrave/Colchester Formations.

Till

These deposits are well mapped by the BGS and spread across much of the route corridor. Included in this group are also glacio-fluvial sands and gravels, both above and below the till, that belong to the same event, i.e. the Anglian Glaciation in MIS 12 (Appendix 1, Table A1.1 and A1.2). These deposits will all have low archaeological and palaeoenvironmental potential, containing reworked material collected by the ice from the pre-existing landscape.

Sub-Till sands and gravels

These deposits belong to the Kesgrave/Colchester Formations deposited by the pre-Anglian Thames system, draining the study area in a north easterly direction. These sands and gravels belong to cold stage braided channel environments in most cases, although, in places, organic channel fills of both interglacial and arctic character have been noted in the sediments (e.g. at Ardleigh (Bridgland, 1988, 1994a; Bridgland et al., 1988; Bridgland and Gibbard, 1990) and Wivenhoe (Bridgland, 1994b) (Appendix 1, Table A1.1). Artefacts are scarce in these deposits, although two flint flakes were recovered in the organic clays at Wivenhoe Gravel Pit (Bridgland, 1994b). A number of sites exist in the UK that broadly date to a similar period to the later parts of the Kesgrave/Colchester Formation, including Boxgrove (Roberts and Parfitt, 1999), Happisburgh (Parfitt et al., 2010), Pakefield (Parfitt et al., 2005), as well as a number of sites in the Bytham River system (Davis et al., 2021). It might therefore be expected that the sub-glacial sediments contain important palaeoenvironmental and archaeological records in both reworked states as well as in primary context, in finer grained lenses and channel fills.

1.5. PALAEOLITHIC ARCHAEOLOGY SETTING AND RESEARCH CONTEXT

Essex has a rich Palaeolithic record, one which is comparable with the other counties of East Anglia and Kent, and which is preserved as part of a regionally consistent suite of Pleistocene sediments. Over 200 Palaeolithic individual localities are currently mapped in Essex ranging from findspots of individual artefacts to sites preserving primary context or in-situ evidence for Palaeolithic activity. These sites also include locales preserving important suites of palaeoenvironmental material including large mammal remains, small vertebrates, insects, pollen and micropalaeontology. They include multiple locales designated as Site of Special Scientific Interest (SSSI) for their important Pleistocene records (O'Connor 2015). Within the scheme surrounding areas, archaeological remains in sediments associated with the Wivenhoe Gravel are scarce, but two flint flakes have been reported from the organic clays at Wivenhoe Gravel Pit (Bridgland, 1994b). Other find spots noted by O'Connor (2015) that may be associated with these sediments include those north of Hall Farm, Weeley (615200 222100) and at Daking's Pit/Hillhouse Farm (615400 223300). The scarcity of finds is unsurprising given the paucity of sites in East Anglia from the period to which these sediments are thought to date.

In evolutionary and chronological terms, the Essex record spans in excess of half a million years of the early human adaptation to northern global latitudes, encompassing at least seven interglacial-glacial cycles and consequently at least that number of unique reoccupation events by a range of early human species including *Homo antecessor*, *Homo heidlebergnesis*, *Homo neanderthalenesis* and *Homo sapiens*. This period encompasses a vast range of technological variation underpinned by cognitive evolution, environmental adaptation and culture, and includes Lower, Middle and Upper Palaeolithic cultures from at least 600,000 years BP through to Upper Palaeolithic records from the very end of the last cold stage. Consequently, the Palaeolithic Essex represents an internationally important span of evolutionary human adaptation.

Two frameworks exist for key research questions identified by the wider scientific and curatorial community for the Palaeolithic in Essex. These are the Research and Conservation Framework for the British Palaeolithic (Historic England, 2008) and the Revised Archaeological Research Framework for the East of England (Medlycott 2011). From

these two documents the following research questions have been identified as relevant to the range and nature of the Quaternary record along the scheme corridor:

From RCFBP (Historic England 2008):

- Recognition of the potential impact of development and other land-use change in order to protect and conserve the diminishing Palaeolithic resource. The process of informing decision makers within local authorities of this potential must continue
- What effect did Pleistocene climate change have upon British environments and faunal communities?
- How much of Pleistocene time saw the presence of hominins in Britain or on the adjacent continental shelf?
- What were the specific environmental and climatic tolerances of hominins in Britain? Were there regional cultural differences in this or changes over time? Were there some cold-adapted cultures just as there are now? Where were the refugia?
- How did hominin subsistence, technical and social strategies respond to climate change over the long-term? Some aspects of the record are well understood, the majority is not.
- Further research is necessary into the record's strengths, weaknesses, formation processes, taphonomy and preservation bias. We need further elucidation of the value of both primary and secondary context resources.
- Did a significant population crash occur over Lower Palaeolithic/Middle Pleistocene time?
- The further development of dating methods to confirm the chronology of very early sites pertinent to the earliest hominin dispersal into Britain (OSL, AAR, Tephra studies)

From the RARFEE (Medlycott 2011):

- Increased emphasis is needed in development control work to address the historic environment of the Palaeolithic and Pleistocene, this should include the development of evaluation and excavation methodologies, appropriate inclusion within archaeological briefs, the listing of contractors appropriately qualified to undertake the fieldwork and the sharing of best practice and experience both within the region and beyond. There is a perceived need for educating archaeological professionals both in artefact recognition and in evaluation and excavation techniques for these periods. Specialist input should be sought, and professional links made across the disciplines
- Further evidence should be sought for pre-Anglian occupation…particular attention should be given to sieving for artefacts and fieldwalking programmes where these deposits are present.
- Lower/Middle Palaeolithic artefactual evidence should be sought in the various channel deposits of the region. These are usually deep-lying, and so have been little investigated, but the prolific evidence from the Clacton Channel has demonstrated that any remains present may be abundant, minimally disturbed and associated with good faunal and palaeoenvironmental material.
- Recovery of larger and well-provenanced artefact assemblages from gravel bodies… should be a priority. The spatial concentration of finds within terrace bodies should be investigated—are they evenly scattered, or do they occur as distinct spatial concentrations; similarly, are finds evenly dispersed vertically through a gravel body, or are they associated with a specific horizon?
- Early Upper Palaeolithic and particularly late Upper Palaeolithic (long blade) issues need further study to characterise and model the EUP/LUP evidence for human activity within the region.
- A geographical extension of the Middle Thames Northern Tributaries project should be a priority, both in terms of identification and management of the resource, but also related to characterising late Upper Palaeolithic and early Mesolithic settlement in the area. More detailed investigation of key sites should then follow.

The Managing Palaeolithic Essex Project was conceived directly in response to some of these national and regional research agendas as a county-wide consideration of Palaeolithic potential based on known sites and known mapped Pleistocene deposits (O'Connor 2015). This strategic document can be used to underpin initial consideration to the management of the Palaeolithic resource in the development process, but the value of the document will only be maintained if it's modelling of potential is tested and result of individual projects are fed back into it for future revision. The first steps in developing an approach to the A12 was the commissioning of Palaeolithic Desk Based Assessment for part of the route. This DBA was developed directly in relation to all previous national, regional and county research frameworks and resource assessments and itself formed the basis of our approach in the initial stage of evaluation reported on here.

2. FIELDWORK PHASE 1: QUATERNARY LANDSCAPE EVALUATION

2.1. AIMS AND OBJECTIVES

The investigation was structured around testing and ground truthing extant data and previous works on the project. Prior to commencing the field investigation program detailed consideration of part of the route corridor had been undertaken on the basis of extant Palaeolithic finds; this work resulted in the creation of a series of Palaeolithic and Quaternary (PQ) zones of differing Palaeolithic archaeological potential (Wenban-Smith, 2020). However, no detailed consideration has yet been given to existing ground investigation data held by the British Geological Survey (BGS) of that produced as part of scheme specific ground investigations. The aims of the investigation were, therefore, to:

- Ground truth the British Geological Survey mapping of the route corridor.
- To place the sequences within the known geological history of the area.
- To re-examine the PQ zones and in particular their potential for the presence of palaeoenvironmental sequences and Palaeolithic archaeology.
- To provide baseline data for integration with the wider GI database at a later stage in the project in order to potentially re-draw the PQ zone boundaries where necessary.

In turn, objectives of the investigation were to:

- Conduct a rapid review of a selection of the extant GI data and locate a series of boreholes and test pits to be undertaken as part of the first phase of field evaluation for the Palaeolithic part of the project.
- Excavate a series of test pits along the parts of the route corridor accessible for archaeological evaluation to evaluate encountered deposits and screen for artefacts and ecofacts.
- Record and sample sediments encountered in the test pits.
- Drill a series of boreholes along the parts of the route corridor accessible for archaeological evaluation to sample sequences below the maximum depth that could be achieved in the test pits.
- Record and sample sediments in the boreholes.
- To use the borehole and test pit information to determine inferred environments of deposition of sampled sediments.

As a ground-truthing evaluation, this phase of work was tailored to the project aims by sampling through transects of test pits and boreholes. The test pits were sited within standard archaeological evaluation trenches and consequently only areas subject to trial trenching were evaluated. Key areas outside of the scheme are noted at Colemans Farm Quarry and Marks Tey.

An additional limitation is the extent to which the distribution and density of Palaeolithic archaeology can be meaningfully mapped across the scheme. As the test pits were organised in transects, not arrays, the methodology should not be considered as a sampling exercise to determine the presence or distribution of Palaeolithic archaeology. However, the work will usefully inform and constrain the development of a programme of sampling for Palaeolithic archaeology in subsequent stages.

2.2. SCOPE OF THE REPORT

This document reports on the purposive geoarchaeological test pit and borehole programme conducted along the A12 in May to October 2021. It provides an account of the geoarchaeological background of the area, the fieldwork and analytical methodologies, the results of the test pit survey and a selected range of priority boreholes, and the conclusions and implications of those results including a re-assessment of the PQ zones. This represents the first stage of fieldwork evaluation following the Fieldwork Stage 1, and will be followed by a forthcoming Stage 2 Review. The Stage 2 Review will report on the remaining boreholes extracted during Fieldwork Stage 1, and produce a scheme-wide deposit model. In some cases, terminology has changed between the logging of the sediments in the field and the production of the interpretations included in this report. A re-examination of this will be included in the Stage 2 Review.

3. METHODOLOGY

3.1. TEST PITS

Rationale for test pit locations

The location of test pits was designed to evaluate the Quaternary landscape by ground truthing the British Geological Survey (BGS) mapping of superficial deposits. The scale of BGS mapping is too coarse to be used for scheme planning, and may lack important geological information needed to understand the formation of the scheme's landscape. Test pits focused on direct sampling of key mapped deposits within the scheme boundary. As test pitting was constrained to those land plots in which trial trenching was planned, the distribution of test pits (and boreholes – see below) does not necessarily reflect a structured approach to a scheme-wide, landscape-based programme of works, but rather a pragmatic evaluation of accessible deposits of note.

Test pits were located where major mapped units of interest were close to the ground surface (i.e. where sufficient information could be gained in a 3 m deep test pit). An initial strategy based on a mix of 3 m and 5 m deep test pits was abandoned early in the programme due to safety concerns regarding the deeper test pits. The 5 m deep test pits were replaced by boreholes (see below). Test pits (and boreholes) were arranged in transects, in most cases parallel to the scheme corridor, though in some instances transects were located by reference to geomorphological features. Examples of the latter include a perpendicular transect through the trend of the river terrace deposits, which was chosen to create a profile across the terrace sequence through to the potential margin of Hoxnian lakes to identify the lake margin deposits.

Excavation

Test pits (Appendix 2, Table A2.1) were excavated at one end of selected 30 m long trial trenches after it was established that no later archaeological features survived at these locations. The whole perimeter of the test pitting area was secured with barriers using Herras and pedestrian fencing prior to excavation, and was maintained until the completion of backfilling (Illus 5). The position of each test pit was surveyed and georeferenced using a Trimble Global Navigation Satellite System equipped for Real Time Kinematic Survey. A Cable Avoidance Tool (CAT) was used at every test pitting location prior to excavation to scan the ground in order to identify the presence of buried services. For each test pit, the scan was repeated at c. 0.2 m intervals until 1m depth, maximum safe depth in which operatives were permitted to enter an excavation.

Each test pit was excavated by a mechanical excavator with a 1.8 m to 2.2 m wide toothless ditching bucket. The test pits were one bucket-width wide, approximately 3 m to 6 m long and up to c. 3 m deep (Illus 6). Excavation ceased at a shallower depth in the occurrence of section collapse or flooding of the test pit.

Each test pit was taken down in horizontal spits of 0.1 m or 0.2 m, respecting the interface between sedimentary units when unit changes were encountered. Each test pit was backfilled and levelled with the pre-existing ground surface as soon as possible following excavation and recording. No test pits were left open unattended or overnight after surpassing the maximum safe depth.

Palaeo-environmental evidence and finds retrieval

Test pit spit-samples of c. 150 l were set aside at regular 25 cm depth intervals as excavation progressed through Holocene/Pleistocene sediments in which Palaeolithic material may occur. Each spit-sample was numbered, its position in the lithological sequence recorded, and 100 l from each sample was dry-sieved on site through a 25 mm mesh for recovery of lithic artefacts and faunal remains (Illus 7). When the sediment encountered was not suitable for dry-sieving (i.e. too clayey), excavation proceeded in shallower spits of c. 5-10 cm, looking carefully for the presence of any archaeological evidence, and the spit samples were carefully investigated by hand (using archaeological trowels) for any artefactual or biological evidence.

Finds were recovered by hand during the course of the excavation and bagged by context. All finds were given a unique small find number. The presence/potential for palaeo-environmental micro-biological evidence such as pollen, insects, molluscs and small vertebrates was assessed for each sediment unit by field inspection. Suitable deposits were sampled (20 l each) at 0.5 m intervals for palaeoenvironmental assessment and/or amino acid racemisation dating.

Recording

The sequence of sedimentary units was recorded as machine excavation progressed, following standard descriptive practices in accordance with Historic England Guidelines for Geoarchaeology (2015). The sediments were described on a summary proforma, according to standard methodologies based on Jones et al. (1999).

Test pits were entered at the maximum safe depth (1 m from the surface) to record the upper lithology. After excavation progressed beyond this depth, recording took place without entering the test pit. The lithological sequence was described from a safety observation platform, whereas the discrete deposits were examined outside the fenced area after extraction by the machine driver.

All three accessible sections from each test pit were photographed in colour (digital) once excavation reached its full depth, and at appropriate stages during excavation when features of interest were revealed.

3.2. BOREHOLES

Rationale for borehole locations

As with the test pits (above), the boreholes were located to evaluate the Quaternary landscape by ground truthing the British Geological Survey (BGS) mapping of superficial deposits. Boreholes were located where major mapped units of interest were too deep to be evaluated from test pits (including where 5 m test pits were initially planned). In addition, some boreholes targeted either Holocene alluvial valleys or Hoxnian lake margin areas. Alluvium has potential for the preservation of organic remains that have palaeoenvironmental value. Constraining the distribution of lake margins is important as they represent environments most likely associated with Palaeolithic human activity.

Borehole drilling and on-site recording

The position of each borehole was surveyed and georeferenced using a Trimble Global Navigation Satellite System equipped for Real Time Kinematic Survey. A Cable Avoidance Tool was used at every location prior to drilling to scan the ground in order to identify the presence of buried services. In addition, a 1.2 m inspection pit was dug prior to drilling and scanned every 0.2 m.

Three forms of borehole rig were deployed: window sampler (WS), cable percussion (CP) and dynamic sampler/rotary corer (DS/RC). Boreholes targeting shallower sequences, such as transect across Holocene river valleys and in places where Hoxnian lake deposits were suspected close to the surface, were drilled using the WS method. The DS/RC rigs were used in areas of high Palaeolithic potential (i.e. the central part of the scheme). Elsewhere the CP rigs were used. WS rigs typically recover to maximum depths of c. 5 m, and the CP and DS/RC rigs were used to drill to 10m below surface. The rigs used were a Dando Terrier Rig (WS), Dando 2000 (CP) and a Comacchio GEO205 and a GEO300 (DS/RC). Water bowsers and compressors were utilised to aid extraction as required on advice of the drilling crew.

The WS and DS/RC rigs collected samples in 1 m or 1.5 m clear plastic tubes, while the CP rigs recovered U100 samples in plastic tubes 0.45 m in length with a 0.05 m disaggregated sample collected as a bulk. Where sediment could not be collected as an intact core due to compaction or retrieval issues, the deposits were collected as bulk samples. The recovered cores were marked on site by the second drill operative and checked by the supervising geoarchaeologist. The sediments recovered in the top and base of the sample and sediments from the inspection pit were logged on proforma recording sheets. Holes were reinstated with bentonite pellets and sediment from the inspection pit.

Off-site recording

The core samples were recovered to Headland Archaeology's Midland & West Office where they were opened, cleaned (by trowel, to eliminate smears and reveal sediment structure), photographed and recorded. All recording was completed by a qualified geoarchaeologist. Sediments were recorded following standard descriptive practices in accordance with Historic England guidelines for geoarchaeology (2015). The sediments were described on a digital summary proforma, according to standard methodologies based on Jones (1999). This included a description of colour, texture, sorting, inclusions (including shape and material) and boundaries. Any artefact and ecofact inclusions were noted and sub-sampled where appropriate.

3.3. GEOPHYSICS

Electrical Resistivity Imaging Technique

Different rocks/objects/saturating fluids exhibit different values of electrical resistivity. An electrical resistivity image describes the distribution of electrical resistivity as a function of depth and horizontal distance. A theoretical background to the technique is provided in Appendix 3.

Equipment

The equipment employed was the IRIS Instruments Syscal Pro system. Seventy-two equally spaced electrodes are connected via multicore cables to a Syscal Pro earth resistance meter. Addressable electronic switching units allow any four electrodes to be connected directly to the resistance meter. The measurement scheme is designed on a laptop computer, and then uploaded to the Syscal Pro. Measurements are taken automatically by the Syscal Pro as per the pre-defined survey sequence.

Rationale for ERT transect design

Two ERT lines were acquired to form a single ERT transect in land plot P/23.2. The Dipole-Dipole array configuration was used due to the increased sensitivity of discrete vertical features located laterally along the line offered by this particular method. All the electrodes on the survey line were located using a Leica Geosystems Survey Equipment, providing accurate location data referenced to the Ordnance Survey OSGB36 National Grid system.

Table 1: Summary of Resistivity Survey Lines.

ERT Line no.	Total Length (m)	No. Electrodes	Electrode Spacing (m)	Start (electrode1) (E and N, m)		End (electrode 139) (E and N, m)	
1	276	139	2	583840.560	216853.594	584112.886	216883.031
2	276	139	2	584120.844	216884.544	584381.392	216968.078

ERT Data Processing and Presentation

Raw resistivity data were filtered and 'despiked' to remove any erroneous data points. Topography was added to the resistivity data file, which was subsequently processed using the specialist software RES2DINV. Following initial processing, further manual removal of any remaining spurious or bad data points was undertaken, and an inversion algorithm was run. The final resistivity depth data were calculated with all topographical effects accounted for to produce a two-dimensional pseudo section of apparent resistivity variation with depth.

The final resistivity profiles have been presented as contoured cross-sections, which are colour-optimised to aid interpretation of subsurface features. The data are presented on a logarithmic scale ranging from 0 to 50 Wm, with shades of blue indicating low resistivity values through to shades of red indicating relatively higher resistivity values. The resistivity variations observed are attributed to a combination of the variations in the electrical properties of subsurface materials and in the fluid contained in pores and voids within them. As such, any lateral or vertical changes in the resistivity may be due to a change in material or lithology, man-made features, or pore fluid saturation and chemistry, or a combination of the two.

CMD

In electromagnetic surveying the electrical properties of the ground are measured as a function of depth and/or horizontal distance. Different rocks (and buried structures/objects) exhibit different values of electrical conductivity. Mapping variations in electrical conductivity can identify anomalous areas worthy of further geophysical or intrusive investigation. See Appendix 3 for background information on this technique.

Equipment

The equipment used was the CMD Explorer manufactured by GF Instruments. This consists of a transmitter and receiver coils separated at a distances of 1.48 m, 2.82 m and 4.49 m mounted on a single beam. The coil separation is such that the measurements recorded represent ground conditions down to an effective depth of 2.3 m, 4.2 m and 6.7 m respectively. The CMD Explorer has the facility to record two types of measurement as the secondary

field may be separated into the quadrature component and the in-phase response. The quadrature response measures the bulk electrical properties of the ground. The electrical properties are expressed as an apparent electrical conductivity in millisiemens per metre (mS/m). The in-phase response is essentially the same as a metal detector and is expressed in units of parts per thousand of the primary transmitted field.

Rationale for CMD transect design

EM data targeted potential Hoxnian lake deposits in the central area of the scheme. Several containing high and moderate potential PQ zones. Transects spaced at 10 m spaced were deployed, where access allowed. Continuous GPS measurements of the acquired data were collected using a dGPS attached to the CMD Explorer.

EM data processing and presentation

EM data were downloaded from the logger using the CMD Data Transfer software then exported as .DAT format. Data were then imported into Aarhus GeoSoftware's specialist software Workbench. Within this software data are manipulated in a number of ways. Positional data are transformed from WGS84 format to British National Grid Co-ordinates, before data are filtered to remove spurious or bad data points and interrogated to remove or correct for other sources of 'noise'.

Following this the data was inverted using a spatially constrained inversion with manually defined smooth 20-layer model going down to 8 m as this is the maximum depth of investigation. The software was then used to produce depth slices at 1 m depth intervals along with ordnance datum slices based on the surface elevation recorded within the dataset. Relatively high conductivity values are displayed with shades of red and pink, through yellows and greens, with shades of blue and purple representing lower conductivity values.

3.4. PALAEOENVIRONMENTAL PRELIMINARY ASSESSMENT

The purpose of the work was to undertake a rapid assessment of any palaeoenvironmental materials, including microfossils that may aid in refining depositional environments of the lithological sequences from which the samples are derived, palaeoenvironmental reconstructions as well as providing some possible biostratigraphic information or material suitable for dating.

All samples were weighed and processed. First, they were thoroughly dried in an oven, then they were then soaked in hot water overnight, with a little sodium carbonate added to aid breakdown by removing the clay fraction. Careful and gentle sieving was through a 75 µm sieve, using hand-hot water. The residues were then dried in an oven and examined under a binocular microscope, their contents being noted.

4. RESULTS

4.1. TEST PITS

A total of 88 test pits were excavated to a depth of c. 3 m or less. A total of 162 spits were sieved for artefacts, equating to approximately 16,190 l of sediment. The logs of the individual test pits are given in Appendix 2, Table A2.1, organised by Quaternary Landscape Evaluation (QLE) Area. As all test pits were located within the end of a trial trench, the test pit identification numbers relate to the corresponding trial trench number.

Quaternary Landscape Evaluation Area 1 (Illus 9A-9B)

Topography and ground conditions

QLE Area 1 comprises test pit zones Bolton South and Bolton Paynes Lane and includes land parcels P/14.1 and P/14.3, in PQ Area 29, classified as Moderate Palaeolithic Potential. The landscape is slightly undulating across the area, with much of it lying between 35 m and 20 m OD. According to the BGS, the mapped superficial deposits in this zone consist of Head deposits to the north and south surrounding glaciolacustrine deposits from the Middle Pleistocene, and Blackwater Terrace 1 and Alluvium to the south-east. Middle Pleistocene glaciofluvial deposits have been mapped to the north-east. The bedrock in this area is constituted by London Clay Formation.

Ten test pits were excavated in this area, six in land parcel P/14.1, distributed along a slightly offset N-S axis, and four in land parcel P/14.3 (Illus 9A-9B). On the ground, the area in land parcel P/14.1 was substantially flat, with mild east slopes by TP13. TP48 and TP38 were located a few metres to the south of a present-day stream. TP60 was situated to the north of that same stream, on a mild south slope. Land parcel P/14.3 is divided by a stream running

northwest-southeast, with both sides of the field sloping steeply towards this water body. All the test pits were situated in ploughed fields.

Lithology

Approximately 0.30 m of topsoil overlay a clayish orangish brown deposit in all test pitting locations. This deposit displays a generally low coarse component consisting of subrounded/subangular clasts of flint, Tertiary flint and quartz. Towards the north of land parcel P/14.1, in TP48, TP38 and TP60, this layer contains carbonate nodules, including degraded carbonates, and more clasts.

Orangish brown sandy flinty gravels ranging in thickness between ca. 0.5 m and 1 m were identified in TP13, TP48, TP38, TP60, TP118, TP121, TP130 and TP141. Moderately to strongly developed Fe/Mn pans have been observed to occur in these deposits. These units are formed by medium to coarse sands and subrounded/rounded gravels. The deposits show a sharp, slightly wavy contact with the overlaying and underlaying lithological units.

Very hard bluish grey clay deposits displaying patches of bright orangish brown sediment and a blocky/platy structure were found underlying coarse, gravelly sediments in TP13, TP48, TP38 and TP60, and immediately below topsoil in TP2912 and TP2906, showing a weathered upper part in the latter. At 3 m depth in TP2912 and TP2906, a sharp change in carbonate concentration as well as the presence of sands was identified. Occasional inclusions of darkened, degraded plant matter and abundant mollusc shells were observed to occur in these deposits, which were sampled. At depths where shell inclusions became less abundant, carbonate nodules were observed, their occurrence probably related to shell degradation.

TP121 and TP141 appear to be bottomed by a hard, structureless clay deposit virtually devoid of clasts. Carbonates have been observed to occur in this unit, including Septarian nodules.

A total of 14 samples (270 l) were collected from these test pits. Screening of 1600 l of sediment material yielded no artefacts.

Interpretation of results

The sandy gravels identified in TP13, to the southern extreme of QLE Area 1, could potentially be part of the Blackwater River Terrace 1, as mapped by the BGS. Test pits TP48, TP38 and TP60, to the north of land plot P/14.1, display water-laid sands and gravels underlying head/colluvium. These fluvial units overlie possible lake deposits represented by hard bluish grey clay sediments. TP2906 and TP2912 appear dominated by these possible lacustrine deposits, which display a weathered upper part (head/colluvium inputs in these sediments is also plausible).

Fine- to coarse-grained head/colluvium appears to be topping TP118, TP121, TP130 and TP141, in land parcel P/14.3, as mapped by the BGS. The relationship of the sandy and gravelly deposits identified in TP118, TP130 and TP141 to the Blackwater Terrace 1 is currently unknown. These fluvial sediments could be related to the distribution of the Holocene sediments rather than the Blackwater Terraces. Bedrock London Clay appears to have been reached in TP121 and TP141.

Quaternary Landscape Evaluation Area 2 (Illus 10A-10C)

Topography and ground conditions

QLE Area 2 comprises test pit zones Ratcliffe & Rayleigh Wedge-Bellway, Rayleigh 1 & 2, Ulting & Wood-Kennels, Vellacot and Granville & Wood-Gas and includes land parcels P/104, P/113.2, P/112, P/51 and P/02.2, in PQ Areas 26 and 29, classified as Moderate Palaeolithic Potential, and PQ Area 27, classified as Low Palaeolithic Potential. The landscape is relatively flat towards the west and centre and more undulating to the east, with much of the area lying between 30 m and 20 m OD. To the west of this Area, the mapped superficial deposits consist of Head deposits and Alluvium, with Middle Pleistocene Glacio-fluvial Deposits occurring to the east and west. To the middle part of QLE Area 2, the BGS mapped superficial deposits comprise Lowestoft Formation, with spreads of Head to the north-east and south-west, and localised patches of brickearth. To the east, this Area comprises Head and River Terrace deposits and fine alluvial deposits corresponding to Blackwater Terrace 3. The bedrock in this Area is formed by London Clay Formation.

Twenty-one test pits were excavated in this area. To the west, these were distributed along a slightly offset N-S axis (Illus 10A-10B), aimed at examining the Head and the margins of the Alluvium. To the centre and east, test pits were distributed along several, slightly offset, SW-NE axes (Illus 10B-10C), with the goal of improving our understanding of the lithological sequences. On the ground, the westernmost part of this area was a grassland

slopping smoothly to the east, with steeper slopes closer to the course of the River Ter. The central land plots of QLE Area 2 were formed by relatively flat ploughlands and grazing fields, occasionally displaying steep depressions within the landscape.

Lithology

In the westernmost part of this Area, approximately 0.30 m of topsoil overlay a clayish orangish brown deposit TP269 and TP258. This deposit is extremely fine-grained, with <1% clasts over 2 mm size, and structureless. Very homogeneous, the presence of manganese mottling was noted throughout. A possible palaeochannel feature was identified c. 0.80 m from the surface in TP269, running NW-SE, formed by grey clayish sediments containing well-preserved fragments of darkened, rooted plant matter (c. 5% abundance). The bottom of this silty clay deposit was reached only in TP258, at 2.4 m from the surface. Here, a coarse layer of poorly sorted well-rounded to sub-rounded gravels in a silty clayey matrix was identified. The average clast size in this deposit is 2 cm. Excavation had to stop in both locations prior to reaching 3 m depth due to groundwater flowing rapidly into the test pits.

In the central part of this area, approximately 0.30 m to 0.40 m of topsoil overlay a medium orangish brown deposit formed by sandy silty clay sediments in TP2728, TP2742, TP2753, TP2764, TP340, TP345, TP355, TP364, TP382, TP397, TP597, TP901, TP903 and TP918. This structureless deposit displays a generally low (<10% abundance) coarse component consisting of poorly-sorted sub-angular to well-rounded clasts of flint, Tertiary flint and quartz, with traces of quartzite, sandstone and chalk. The rock inclusions range in size between 20 cm and 2 mm. Manganese flecks were observed throughout. The thickness of this deposit varies greatly throughout the area, from 0.1 m to c. 2.9 m in TP597. A unit of greyish brown clayish gravels was identified underlying this deposit in TP2753. This layer measures 0.4 m in thickness and is formed by poorly sorted sub-angular to rounded clasts of flint, quartz, quartzite and chalk. The coarse component varies between 60% abundance (top of unit) and 10% (bottom of unit).

A homogeneous deposit of chalky yellowish brown sandy silty clay sediments was identified at the bottom of TP2728, TP2742, TP2753, TP2764, TP477, TP510, TP340, TP345, TP355, TP364, TP382 and TP629. This deposit is found immediately below topsoil in TP477 and TP510. The coarse component of this unit displays an average size of 5 cm and consist of sub-angular to well-rounded unsorted inclusions of flint, chalk, Tertiary flint, quartz, sandstone and quartzite. In TP2742, a possible palaeosol was identified in section, immediately overlying the chalky pale deposit. This potential palaeosol consists of a fine-grained, dark reddish brown sediment, c. 15-20 cm thick.

The eastern part of QLE Area 2 displays a more complex lithological sequence. Here, reddish brown sandy gravels, showing a consistency that ranges between compacted and cemented, have been found interbedded with finer deposits in TP629, TP901, TP903, TP918, TP920 and TP922. These lithological units vary in thickness between 0.4 m and c. 2.20 m and are formed by up to 80% poorly sorted subangular to well rounded clasts of flint, Tertiary flint, quartz and quartzite displaying an average size of c. 5 cm. Sub-layering has been observed to occur frequently in these units, in the form of moderately to well defined variations in sediment colour and the presence of discrete pockets of medium to coarse sands. Significantly, in TP397, these sandy gravels were found underlying a chalky yellowish brown silty clay deposit at 2.5 m from the surface.

A deposit of sandy clayey gravels was identified in TP903 at 0.55 m and 1.30 m from the test pit surface. This firm deposit is characterised by yellowish to orangish matrix supported sediments formed by up to 50% subangular to well-rounded flint, Tertiary flint and quartz inclusions. Clast sizes range between 1 cm and 8 cm and appear moderately sorted. Gravels occur in moderately well-defined clusters, increasing gradually in abundance with depth. Manganese flecks were observed throughout, up to 2 cm in size.

Finer units of soft orangish brown sandy clay were observed in TP901, TP918 and TP922. The clast content of these deposits varies greatly, between 1% and 20% of the unit, and is constituted by subrounded to well rounded clasts of flint, Tertiary flint and quartz. The sand content varies within these sediments, occasionally forming discrete laminations. Abundant manganese aggregates have been observed to occur throughout.

A sample of darkened, rooted plant materials found embedded in the fine-grained deposits was collected during excavation. Screening of 5440 l of sediment material yielded an unretouched lithic artefact.

Interpretation of results

To the west of QLE Area 2, TP258 and TP269 display fine grained sediments, likely alluvium with some potential colluvial inputs, overlying fluvial gravels. The sequences are probably associated with the existing valley of the River Ter.

To the centre of this Area, Anglian till is overlain by Head deposits of variable thickness. In TP397, fluvial sands and gravels were identified beneath till, possibly representing an outcrop of the Kesgrave Formation. In TP629, sands and gravels were observed overlying till, possibly associated with the Blackwater terraces.

To the east of QLE Area 2, TP901, TP903, TP918, TP920 and TP922 show thick fluvial sequences of interbedded gravels, sands and alluvial clays consistent with the known geological mapping of Blackwater Terrace 3.

Quaternary Landscape Evaluation Area 3 (Illus 11A-11D)

Topography and ground conditions

QLE Area 3 comprises test pit zone Brice West, and includes land parcel P/57.3, in PQ Areas 5 and 7, classified as High and Low Palaeolithic Potential respectively. The area consists of higher ground (c. 30-35 m OD) to the northwest, and a spread of broadly level ground between c. 18 m and 23 m OD to the southeast, along the northwest side of the Blackwater valley and abutting the higher ground of the chalky Boulder Clay further to the northwest. According to the BGS, the Quaternary sediments in this area consist of Boulder Clay to the northwest and of patches of fine-grained organic-rich clayey silts/sands, overlying sands/gravels to the southeast, which in turn overlie chalky/gravelly clay. The organic-rich clayey silts/sands occur (where present) close beneath the ground surface in many places, but are buried beneath 1-2 m of sandy/gravelly deposits along the northwest side of this area, where the ground surface slopes up. The superficial deposits in this land plot have been mapped as Lowestoft Formation to the northwest, alluvium in the centre, and Head deposits to the southeast. The bedrock in this Area is constituted by London Clay Formation.

Ten test pits were excavated in this Area, distributed along two NW-SE transects (Illus 11B), aimed at mapping the lake margins and assessing their preservation from incision by fluvial activity in this area. On the ground, the area in land parcel P/57.3 was substantially undulating, slopping smoothly to the south. All the test pits were situated in ploughed fields.

Lithology

To the northwest of this Area, in test pits TP1022, TP1018, TP1019, TP1015, TP1037 and TP1029, a remarkably consistent sedimentary profile is encountered, consisting of approximately 40 cm of topsoil overlaying a thick light yellowish brown clayish deposit containing up to 40% of unsorted chalk, flint, Tertiary flint, quartz, quartzite and sandstone clasts. In test pit TP1016, reddish brown clayey medium sands is encountered immediately below topsoil and overlying the yellowish-brown clayish deposit, reaching a thickness of 2.40 m.

To the southeast of this area, a more complex lithological sequence emerges. Here, an orangish brown sandy clay deposit of variable thickness (0.2 m to 1.5 m) overlies a unit of friable light yellowish brown silty clay displaying <1% clast inclusions in test pits TP1030 and TP1027. This same lithological unit overlies chalky yellowish brown clay deposits rich in sub-angular to rounded clasts in TP1025.

A total of 7 samples (130 l) were collected from these test pits. Screening of 400 l of sediment material yielded no artefacts.

Interpretation of results

Potential lacustrine sediments have only been identified in test pits TP1030 and TP1027, to the southeast of the land parcel. The stratified sandy deposits identified in three of the test pits (TP1016, TP1027 and TP1025), also to the southeast of the Area, correspond to fluvial sedimentation and could possibly belong to Blackwater Terrace 3. Anglian till dominates the north and western parts of the land parcel. The sandy deposits found below topsoil in test pits TP1027, TP1030 and TP1025 are possibly slopewash sediments that have come in over the lacustrine sediments from the higher ground to the northwest of this Area.

Quaternary Landscape Evaluation Area 4 (Illus 12A-12B)

Topography and ground conditions

QLE Area 4 comprises test pit zones Sawdon & Bunting & Belchem, Bunting 1 & 2 and Bunting North, and includes land parcels P/120.1, P/118.1, P/118.2, P/118.4 and P/118.6, in PQ Areas 13b and 16, classified as Moderate and Uncertain Palaeolithic Potential respectively. To the south and west, the zone is constituted by the lower slopes of the southeastern side of the Blackwater valley, with the ground slopping down towards the northwest from c. 35 m to 25 m OD. Outcrops of Blackwater terrace deposits T3 consisting of fluvial gravels with zones of alluvium have

been documented in this area by the BGS, overlying till formed at the base during the Anglian. Patches of T4 and T5 are also widespread across this area. To the north and east, QLE Area 4 comprises higher ground above the southeast side of the Blackwater, slopping down to the northwest from c. 45-25 m OD. According to the BGS, numerous patches and some wider spreads of river deposits (sandy gravel) are present in this area, overlying a wide spread of chalk/gravelly clay that slopes down to the northwest. The northwestern end of this Area is a very complex region, with the presence of possible Blackwater fluvial sediments (sands, gravels and fine alluvium), Head deposits (clay and silt) and Lowestoft Formation. Situated at the base of the slope and close to the Blackwater valley erosion, this zone appears to display rapid lateral changes in lithology. The bedrock across this Area is constituted by London Clay Formation.

Twenty-two test pits were excavated in QLE Area 4, mainly distributed along the Blackwater terrace margins in the south, an east-west transect in the centre, and the northeastern corner of this Area (Illus 12A-12B). These test pits were aimed at determining the presence, nature, thickness and distribution of Quaternary sediments in this Area. On the ground, the landscape is generally undulating, displaying marked slopes at places. All the test pits were situated in ploughed fields.

Lithology

To the south of this Area, in land plots P/120.1, P/118.1 and P/118.2, approximately 0.3 m of topsoil overlie coarse sediments in the northernmost test pits. In TP1420, poorly sorted orangish brown sandy gravels containing up to 70% subrounded to well-rounded clasts of flint, Tertiary flint and quartz were identified below topsoil. This deposit, which displays highly variable thicknesses, was also observed deeper in the sequence of TP1381, TP1418, TP1408, TP1416 and TP2667, often over- and/or underlain by sandy clays, or clayey sands. A lithological unit formed by poorly sorted orangish brown sandy clay was identified in TP1381 and TP2667, below topsoil and at 1.5 m depth from the surface, respectively. Fine-grained, orangish brown silty clay deposits, ranging in thickness between 0.1 m and 2.2 m, were encountered in TP1418, TP1420, TP1408, TP2667 and TP2967. These units were characterised by a low clast content (c. 5%), the occurrence of oxidation/reduction features such as manganese mottling, and the occasional presence of decayed plant matter. Orangish grey clayey medium to coarse sands were found in TP1381, TP1420 and TP1416, either directly over- or underlaying sandy gravels, and in TP2667 and TP2967 overlying clay deposits. These sandy units contained highly variable proportions (c. 10-50%) of poorly sorted sub-angular to rounded clasts of flint, Tertiary flint, quartz, and quartzite displaying average sizes of c. 2 cm.

Clayey sand deposits were also identified in TP1642, TP1701 and TP1702, to the southeast of land plot P/118.4. The nature of this lithological unit, however, differs from the one described above. In these test pits, loose reddish brown sand deposits were found below a thick unit of sandy silty clay containing abundant unsorted clasts of chalk and flint. These units displayed an average of 10% moderately sorted subrounded to well-rounded clasts of flint, Tertiary flint and quartz with few areas of manganese staining. In TP1702, this deposit is partially overlain by a thin layer of sandy gravels.

A lithological unit of orangish brown sandy silty clay underlies topsoil in TP2942, TP1416, TP1578, TP1564, TP1546, TP1702, TP1701, TP1642, TP1818 and TP1817. The thickness of this deposit varies substantially, particularly across the central and northern areas of QLE Area 4, where it ranges between c. 0.1 m and 1.1 m. This layer contains an average of c. 20% poorly sorted clasts of subangular to well-rounded clasts of flint, Tertiary flint, quartz and quartzite, and occasional manganese aggregates. In TP1569, TP1544, TP1548 and TP1572, this unit appears as a thin veneer of material overlying massive chalky sandy silty clay sediments.

A hard deposit of yellowish brown sandy silty clay containing up to 40% subangular to well-rounded clasts of unsorted chalk, flint, Tertiary flint, quartz and sandstone bottoms TP1408, TP2942, TP2970, TP2981, TP1578, TP1569, TP1544, TP1548, TP1572, TP1564, TP1546, TP1812 and TP1817, and overlies sandy deposits in TP1702, TP1701 and TP1642. The presence of polygonal structures within this unit was noted in most of these test pits.

In TP1418, just a few metres away from the A12, the top 1.3 m of its depositional sequence are formed by dark grey sandy silty clay materials corresponding to made ground.

No samples were collected from these test pits. Screening of 4300 l of sediment material yielded no artefacts.

Interpretation of results

The southernmost area of QLE Area 4 comprises well stratified fluvial sands and gravels and, in some test pits, thin units of alluvial silty clay, likely corresponding to the Blackwater Terraces 3 and 4. TP2967, also in this area, contains a thick sequence of clayish sediments possibly corresponding to slope colluvium deposits. TP1408, TP2942, TP2970

and TP2981 are dominated by Anglian till emerging close to ground level and overlain by thin layers of Head in some locations.

In the centre and north of this Area, all test pits showed till near to the surface with a very thin veneer of Head in places and no traces of river terrace sands and gravels. In TP1701, TP1702 and TP1642, however, sands and gravels were present below the till. These deposits possibly represent outcrops of the underlaying Kesgrave Formation.

Quaternary Landscape Evaluation Area 5 (Illus 13A-13D)

Topography and ground conditions

QLE Area 5 comprises test pit Areas Bunting East & Crown Estate & Swiftbow & Wickham, Sherwood West, Sherwood East and West, and includes land parcels P/145.2, P/153.1, P/152.1, P/152.2, P/152.3, P/157 and P/159.1, in PQ Areas 17, classified as Moderate Palaeolithic Potential, and PQ Areas 19 and 20, classified as Low Palaeolithic Potential. To the south, QLE Area 5 consists of a wide spread of ground between the Blackwater and the Domsey Brook, rising from c. 25 m OD around its southern and western edges, where it abuts these water courses, to >35 m OD in the northeast. To the centre and north, this area is formed by a wide undulating plain, with the landsurface dipping shallowly down from c. 40-30 m OD from northwest to southeast.

According to the BGS, the dominant deposit to the south of QLE Area 5 is sand/gravel, mapped as Blackwater Terrace 3 and representing late Anglian and early Hoxnian meltwater outwash, overlain in places by later gravelly/sandy clay-silt Head deposits infilling minor dry valleys and depressions in the surface of the Terrace 3 spread. Chalky/gravelly clay, with occasional areas where variably gravelly/sandy clay-silt infills minor depressions and the heads of dry valleys, form the central and northern edges of this Area. The clay is underlain by a major body up to 10 m thick of sands and gravels. The superficial deposits in these land plots have been mapped as sands and gravels of Blackwater Terraces 1 and 2, alluvium and coarse to fine Head and to the south, and Lowestoft Formation to the centre and north. The bedrock in this Area is constituted by London Clay Formation.

Twenty-five test pits were excavated in this area, mainly distributed along a NE-SW transect and, in some parts, NW-SE transects (Illus 13A-13D), aimed at determining the nature, thickness and distribution of Quaternary sediments in this area. On the ground, the landscape varies between slightly undulating (south) to substantially flat (centre and north), displaying a general smooth slope to the south and east. All the test pits were situated in ploughed fields.

Lithology

Throughout this Area, a remarkably uniform lithological sequence has been observed to occur. Between 0.3 m and 0.5 m of topsoil overlie an orangish brown sandy silty clay deposit in all test pits for the exception of TP1878, TP1904 and TP1937, to the southern end of QLE Area 5. This lithological unit varies considerably across the areas, ranging from c. 0.15 m to 1.5 m in thickness. Clast content fluctuates between 2% and 30% of the whole deposit, with an average of 10% coarse components. These consist mainly of poorly sorted subangular to subrounded flint, Tertiary flint and quartz, with traces of quartzite and chalk, the latter becoming abundant towards the contact with the lower unit. Lower depositional boundaries are generally abrupt and irregular to wavy.

Underlying this unit and bottoming every test pit for the exception of TP1878 lies a thick structureless deposit of chalky yellowish brown sandy silty clay, hard to very hard in consistency, and displaying c. 40% subangular to subrounded inclusions of chalk, flint, Tertiary flint, sandstone and quartz. Clasts are unsorted and have an average size of c. 5 cm, but some have been observed to measure up to 60 cm in diameter.

Test pits TP1878 and TP1904, to the south end of the Area, show a different lithological sequence from the one described above. A soft orangish brown deposit formed by silty clay sediments was documented below topsoil in TP1878, overlying a layer of poorly sorted clayey medium sands displaying 10% sub-angular to well-rounded small clasts of flint, Tertiary flint and quartz. In TP1904, a layer of reddish brown poorly sorted sandy gravels was observed to overlie the same unsorted chalky clay deposit identified in all the test pits to the north of this location.

No samples were collected from these test pits. Screening of 3950 l of sediment material yielded no artefacts.

Interpretation of results

To the south, the sand/gravel deposits identified in test pits TP1878 and TP1904 possibly correspond to Blackwater Terrace 3. These fluvial deposits are overlain by a thick sequence of head/colluvium.

The chalky/gravelly clay at the higher central and northern areas of QLE Area 5 is Boulder Clay laid down under the Anglian ice-sheet. The gravelly/sandy clay-silt overlying till and water-laid sediments throughout the area is a Head deposit with possible colluvial inputs in some areas. Head deposits vary considerably in thickness throughout QLE Area 5, from thin spreads of sediment on top of till to thick layers up to c. 1.5 m.

4.2. BOREHOLES

The total of 113 purposive geoarchaeological boreholes were drilled as part of these works (Appendix 2, Table A2.2). Thirteen of these boreholes have been selected for assessment in this report. The remaining boreholes are to be reported in the forthcoming Stage 2 Review, which will include a deposit model for the scheme and results from further palaeoenvironmental assessment.

A representative selection of 13 boreholes have been selected to broadly characterise the nature of the sedimentary sequence across the scheme (Appendix 2, Table A2.3). It should be noted that these isolated boreholes form part of larger transects, and assessment of their related boreholes will provide a more detailed understanding.

Table 2. Quantification of Fieldwork Phase 1 boreholes (* evaluated depth is total linear metres recorded from inspection pits, retrieved in cores and represented by disturbed bulk samples).

Borehole type	Borehole locations (no.)	Depth evaluated* (m)	Purpose
Window sampler	28	101.5	Transects across valleys containing Holocene alluvium to inform models of landscape evolution
Window sampler	12	58	Transects across areas suspected to contain lake margin deposits to confirm their presence and distribution
Dynamic sampler / rotary corer	34	254.65	Transects in areas of high potential for Palaeolithic archaeology, chosen for quality of core recovery, to inform scheme deposit modelling and evaluation
Cable percussion	39	301.25	Transects in areas of low or moderate potential for Palaeolithic archaeology to inform scheme deposit modelling and evaluation

Quaternary Landscape Evaluation Area 2 (Illus 10A-10C)

This area is located to the west of the Scheme. The trial pit evaluation (TP258 and TP269) shows the west of this area to be generally characterised by fine grained alluvium with some potential colluvial inputs, overlying fluvial gravels probably associated with the existing valley of the River Ter.

To the centre of this Area are fluvial sands and gravels, possibly representing an outcrop of the Kesgrave Formation overlain by till which is overlain by sands and gravels, possibly associated with the Blackwater terraces in TP629 and Anglian till overlain by Head deposits (TP397). Further east is a thick fluvial sequence of interbedded gravels, sands and alluvial clays consistent with the known geological mapping of Blackwater Terrace 3 (TP901, TP903, TP918, TP920 and TP922).

Boreholes RAYL09, ULWK07 and VELL04 are located near the centre of QLE Area 2 to examine sediments mapped as Head and brickearth by BGS (Illus 10B and 10C).

Borehole RAYL09 reached a depth of 9.5 m at 37.19 m OD. The base of this sequence was sands interpreted as part of the Kesgrave Formation to 38.36 m OD overlain by till to 44.69 m OD (2 m BGL). Overlaying the till is a thin veneer of Head 0.8 m thick. This deposit is described as hard medium orangish brown slightly sandy silty clay with clasts of 5 mm-15 mm moderately sorted sub-angular to sub-rounded structureless flint. A soil with distinct subsoil and topsoil horizons has developed on this deposit from 45.49 m OD (1.2 m BGL).

Borehole ULWK07 was drilled to a depth of 34.93 m OD to target sediments mapped as a separate Head deposit to that in RAYL09 by the BGS (Illus 10B). The sequence is remarkably like that of RAYL09 with sands interpreted as part of the Kesgrave Formation to 35.93 m OD overlain by till to 40.04 m OD (2.84 m BGL). The Head deposit in this

sequence is 1.34 m thick and described as firm medium orangish brown clayey sandy silt with clasts of <5 mm well sorted sub-angular structureless flint. Again, the sequence is sealed by soil with distinct subsoil and topsoil horizons from at least 41.68 m OD (1.2 m BGL) although a void is present in the sequence between 1.2 m and 1.5 m BGL.

Borehole VELL04 was drilled to a depth of 7.95 m BGL to examine sediments mapped as brickearth by the BGS. Till was present from the base of the borehole at 28.97 m OD to 34.82 m OD (1.2 m BGL) where it was overlain by a 0.3 m thick layer of head described as firm light greyish yellow clay. Brickearth deposits of firm medium orangish brown silt with a thickness of 0.5 m were observed overlying the head between 35.12 m OD (0.9 m BGL) and 35.62 m OD (0.4 m BGL). The sequence is sealed by topsoil.

These boreholes demonstrate that Head and Brickearth deposits are present where mapped by BGS. However, there is potential for these deposits to extend further than the mapped boundaries, for example the head deposits found in borehole VELL04 are not shown on the BGS map (Illus 10C). The complexity of the Head deposits also requires further investigation as it is not clear from the BGS records or from this rapid assessment if the head deposits are of similar date and environments of deposition. The marked difference in lithology, particularly between the deposit in VELL04 and the other two boreholes suggests multiple episodes of deposition.

Quaternary Landscape Evaluation Area 3 (Illus 11A-11D)

The test pit evaluation revealed potential lacustrine sediments to the south east of the land parcel (TP1030 and TP1027). These were overlain by sandy deposits of possible slopewash from the higher ground to the northwest of this Area in test pits TP1027, TP1030 and also TP1025. The Blackwater Terrace 3 has potentially been identified as stratified sandy deposits in three of the test pits (TP1016, TP1027 and TP1025), also to the southeast of the area.

Boreholes BRQU02, BRQU05, SSBE09, SNJA10, SNJA11, SNJA13 and SNJA15 all targeted the possible Hoxnian lake deposits identified in test pits TP1030 and TP1027. Boreholes BRQU02 and BRQU05 are located to the south of these test pits (Illus 11A) while the others are all to the NE (Illus 11C and 11D).

In BRQU02, Till was overlain by lacustrine deposits at 11.76 m OD (5.35 m BGL). These deposits are described as hard medium grey clay. Overlying this is a thick sequence of fluvial sands and fine-grained alluvium alternating approximately every 0.25 m at depth with thicker alluvium deposits nearer the surface. At 15.91 m OD (1.2 m BGL) there is a transition from fluvial sands to fine grained head deposits described as firm medium reddish yellow sandy clay. The sequence is sealed by topsoil from 16.51 m OD (0.6 m BGL).

No lacustrine deposits were observed in BRQU05. Till was overlain by head of firm medium greyish brown clayey silty sand with clasts of 5 mm-15 mm moderately sorted sub-angular to sub-rounded structureless flint at 17.05 m OD (1.74 m BGL). Overlaying the Head are fluvial sands from 17.59-17.89 m OD (0.9-1.2 m BGL) on which a well-developed soil with both subsoil and topsoil horizons is present.

A thick deposit of lacustrine deposits is present at the base of SSBE09 extending beyond the maximum depth drilled of 3.69 m OD (17.5 m BGL) to 12.69 m OD (8.7 m BGL). This deposit is described as firm medium brownish grey sandy clayey silt with intermittent laminations to soft dark blueish grey sandy clayey silt. This unit is at least 9 m thick, (although a 1m void immediately above means it was probably thicker but has suffered some compaction in the drilling process) which represents a deeper than average sequence of lake deposits by comparison to the typical Colemans Farm Quarry type sequence. Overlying the lacustrine deposits are fluvial sands and gravels with a topsoil forming from 20.83 m OD (0.36m BGL).

The sequence in SNJA10 is typical of the Colemans Farm Quarry type lake sequences. Till is overlain by a complex of lacustrine sediments at 16.07 m OD (7.3 m BGL). These deposits are 6.2 m thick and described as soft dark blueish grey clayey silt to firm light yellowish grey silty medium sand. They are overlain by head deposits of firm light yellowish brown sandy clay at 22.27-23.07 m OD (0.3-1.1 m BGL) on which a topsoil has formed.

SNJA11 shows a remarkably similar sequence to SNJA10 and the Colemans Farm Quarry lake sequences, with till overlain by lacustrine sediments at 17.21 m OD (7.84 m BGL) and head at 23.05-24.70 m OD (0.35-2 m BGL) on which a topsoil has formed. Although it should be noted that the head deposits are thicker here with a greater number of distinct units described (Appendix 2, Table A2.3).

No lacustrine deposits were present in SNJA13 with head overlying till at 26.44 m OD (1.1 m BGL) on which a soil has developed to 26.89 m (0.65 m BGL).

There is question over whether the fine-grained deposits overlying till at 26.19 m OD (3.25 m BGL) in SNJA15 are alluvial or lacustrine in nature. They are described as soft dark brownish grey sandy silt with clasts of 5 mm-15 mm moderately sorted sub-rounded to sub-angular coarsening upwards flint, quartz. These clasts are more indicative of alluvial deposits but further work including a deposit model should help to clarify this. Overlying the fine-grained sediment are fluvial sands and gravels at 26.44-27.54 m OD (1.2-3 m BGL). Head deposits are present above this with soil development to 28.77 m OD (0.7 m BGL).

These boreholes demonstrate extensive lacustrine deposits in the area (BRQU02, SSBE09, SNJA10, SNJA11 and possibly SNJA15) with a thickness of greater than 9 m at SSBE09. These deposits are believed to date to the Hoxnian and have high potential for scientific dating and for high resolution palaeoenvironmental archives. The margins of this lake are also considered of high Palaeolithic archaeological potential, it is therefore imperative that the full extent of this deposit is better constrain in the separate review which will include a predictive deposit model. The fluvial sands and gravels identified in boreholes BRQU02 and BRQU05 belong to one of the terrace deposits known to exist in the area, most likely the Blackwater Terrace 3 identified in the nearby test pits. It is important to not the presence of fine grained alluvium as well as sands in this unit as these have a higher potential for containing material suitable for scientific dating and palaeoenvironmental analysis. As with QLE Area 2, the Head deposits are more extensive in this area than shown by the BGS mapping.

Quaternary Landscape Evaluation Area 4 (Illus 12A-12B)

BUNT01. This borehole was drilled to examine a mapped patch of Blackwater Terrace 4. No fluvial sediments were present. The test pits to the southernmost area of QLE Area 4 comprises well stratified fluvial sands and gravels and thin units of alluvial silty clay, likely corresponding to the Blackwater Terraces 3 and 4. Borehole BUNT01 was drilled to examine a mapped patch of Terrace 4 deposits (Illus 12A). Till, present from the maximum depth drilled of 17.57 m OD (10 m BGL) to 22.57 m OD (5 m BGL) was overlain by head deposits to 25.07 m OD (2.5 m BGL) described as hard medium greyish brown silty clay (with a void at 3-4 m BGL). Above this fluvial alluvium and gravel are present to 26.67 m OD (0.9 m BGL) on which a topsoil has formed. Head deposits were also found to the north of this area in the trial trenches (see above).

As with QLE Area 3, the presence of fine-grained alluvium in the terrace deposits shows potential for scientific dating and palaeoenvironmental analysis.

Quaternary Landscape Evaluation Area 5 (Illus 13A-13D)

To the south of QLE Area 5, test pits (TP1878 and TP1904) have demonstrated the presence of sand/gravel deposits which possibly correspond to Blackwater Terrace 3 overlain by a thick sequence of head/colluvium. At the higher central and northern areas of QLE Area 5 no such deposits are mapped with Boulder Clay and Head deposits of varying thickness with possible colluvial inputs identified in some areas by the test pits. Boreholes WEST08 and SHRE09 were selected for this rapid assessment to check the sequence is similar where no test pit data was available.

Till is present at the base of both WEST08, to 32.25 m OD (1.2 m BGL), and SHRE09 to 38.83 m OD (1.9 m BGL). In SHRE09 it is overlain by head of firm light greyish brown sandy silt on which a soil has formed from 32.85 m OD (0.6 m BGL). In WEST08 there is also head described as firm medium brownish grey slightly sandy silty clay with clasts of <5 mm well sorted sub-angular flint. But here it is overlain by colluvium from 39.53 m OD (1.2 m BGL). This colluvium is firm medium yellowish orange silty clay and sealed by a topsoil and subsoil from 40.03 m OD (0.7 m BGL).

As with the other QLE areas Head deposits appear to be more widespread in this area than expected and the presence of colluvium shows some potential for material suitable for scientific dating and palaeoenvironmental analysis. The depth to till is however somewhat shallower in this area than others.

4.3. FINDS

A single stone artefact was recovered from fine-grained head deposits at c. 0.5 m depth from surface in TP397. This artefact is of probable Holocene date, likely Mesolithic/Neolithic (Headland Archaeology 2021, Volume 3).

4.4. PALAEOENVIRONMENTAL

Thirty-seven sediment samples were sent to John Whittaker for rapid screening of palaeoenvironmental remains. Samples were taken from test pit bulk samples from the Bolton (PQ29), Paynes Lane (PQ29) and Brice West (PQ7 and PQ5) areas. Samples were also taken from boreholes in the Siggers (PQ8/PQ9) area.

The rapid assessment focused on the lake deposits as they are known to have good potential for palaeoenvironmental evidence, and can often be used assess the environment of deposition. This was especially important for the lacustrine deposits to the south of the scheme, for which their chronology – and whether it overlaps with human occupation of Britain - is unknown.

Quaternary Landscape Evaluation Area 1 (Illus 9A-9B)

Bolton area (Illus 9A)

TP48-04 (context 10012), depth 2.5 m. Contains earthworm granules, molluscs (fragments) a little plant debris and freshwater ostracods (common juvenile *Candona* – probably all *C.neglecta* and a few *Ilyocypris* sp.), Suggests lake margin.

TP60-04 (context 10005), depth 1.4 m. Clay. Virtually no residue remaining after processing. Just fine "organics". A palynological preparation might be the only means of arriving at an environmental indication.

TP60-04 (context 10008), depth 2.9 m. Clay. Virtually no residue remaining after processing. Just one specimens of *Ilyocypris* (undiagnostic) found plus some "organics". A palynological preparation might be useful with a larger sample.

Paynes Lane area (Illus 9B)

TP141-07 (context 10014), depth 3.2 m. Clay. Virtually no residue remaining after processing. Plant debris only. A palynological preparation might be the only means of arriving at an environmental indication.

Quaternary Landscape Evaluation Area 3 (Illus 11A-11D)

Brice West area (Illus 11B)

TP1030-03 (context 10016), depth 1.4 m. Contains molluscs and common *Bithynia opercula*.

TP1030-03 (context 10020), depth 3.1 m. Contains common *Bithynia opercula* and freshwater ostracods (*Candona neglecta* juveniles)

TP1027-03 (context 10021), depth 0.8 m. Contains abundant rhizoliths, rare moilluscs (fragments) plant debris and freshwater ostracods (*Candona neglecta* juveniles and *Ilyocypris* sp., both rare). Suggests lake margin, the rhizoliths indicating drying out.

All samples from Brice West were typical of the Hoxnian lake sediment and microfaunas at this locality (based on previous experience of John Whittaker of deposits from Colemans Farm). As *Bithyna opercula* are calcitic and the shells are aragonitic, the latter are usually not preserved. Rhizoliths are formed round rootlets in shallow water, subject to desiccation. The ostracods are invariably represented by juveniles and this associated with the rhizoliths in context 10021 suggests lake margin with substrate liable to drying out.

SNJA11 (Illus 11C)

Samples 20051 – 20054 all contain molluscs (both snails and bivalves, usually fragmentary, but there is a well preserved large snail in 20053 which could be *Bithynia tentaculata*). *Bithynia opercula* are often common. Freshwater ostracods, usually juveniles of *Candona* spp. Adults are rare but always partially pyritised: that in 20052 is *Candona neglecta*. In 20054 there is a possible *Fabaeformiscandona balatonica*. This pyritisation may be of environmental significance. Samples 20054 also has a few small invertebrate/amphibian bones.

The lowest sample, 20055 (at 7.70-7.72 m) is a quite distinct facies, being rather organic with different molluscs, composed especially of panorbid ramshorn snails; there are no *Bithynia opercula*. The freshwater ostracods are also different, dominated by common *Cytherissa lacustris*. which might signify cooler or deeper lacustrine conditions.

Larger samples and more time would be necessary to further the ecology of this core. At present, there are no noticeable biostratigraphic markers. The *Bithynia opercula* offer a means of dating.

SNJA10 (Illus 11C)
A 4.78m section in core, interval 2.46-2.50 m (samples 20012, 20013-20021) down to 7.22-7.24 m (sample 20011). Lithologically, the sediments range, in descending order, from a white clay (sample 20012) though yellow clays (samples 20013 and 20014; the significance of these colours not being presently known) followed by 2.34 m of grey silt (samples 20015-20020), with finally, an organic grey silt (20011) in the lowest sample.

The microfaunas are genuinely poor, the freshwater molluscs of both snails and bivalves are inevitably fragmentary. There are some rare *Bithynia opercula* but they are fragmentary too, though larger samples might provide enough material for AAR dating. The freshwater ostracods from samples 20012-20019 (2.48 m down to 6.52 m) are represented only by juvenile *Candona*, probably all *C. neglecta*. However sample 20020 (6.96-6.98 m), whilst maintaining the same grey silt lithology, contains large numbers of *Cytherissa lacustris*, which occurred at 7.70-72 m depth in the nearby core SNJA-11, but in a more organic facies; it, nevertheless, may signify deeper lacustrine or cooler conditions at this point in time. The lowest sample in the core (20011; 7.82-7.84 m) is rather organic, as in the basal sample of SNJA-11. It has much woody debris and would benefit from a palynological analysis if time was available. Although the freshwater ostracods are again represented only by juvenile *Candona* (and curiously, no *Cytherissa lacustris* in the basal sample this time) this lowest sample does however, contain many charophyte oogonia which seem to make it ecological unique in the present situation.

SSBE09 (Illus 11C)
An 8.59 m section in core, interval 8.67-8.69 m down to 17.24-17.26 m (samples 20033-20042, 20043-20050). Grey silts. These all broke down well on processing, leaving a residue almost entirely of <250 microns fraction size.

The results were a surprise, and will require further investigation to determine their significance. There were no contemporary mollucs or freshwater ostracods whatsoever in any of the samples. The microfossils, appear it be reworked Cretaceous foraminifera (hedbergellas) and ostracods (e.g. *Cytherellodea*), probably coming from of the Till which underlies these sediments. What was most interesting however, was a black component in the residues - throughout but particularly noticeable in the lower part of the core (and of larger fragment size below sample 20048; 15.70 m). Some of it is probably plant remains as there are certainly some megaspores, apparent stem impressions and the odd "thorn" possibly carbonised. A palynological analysis of one of the better samples would be useful. However, much of it could be tephra (volcanic fall-out) which could have come from Quaternary Icelandic eruptions or also be reworked from the Till. A further suggestion is it could be vitrified lignite from the London Clay which underlies the Till. In short, this sequence in SSBE-09 requires a much more detailed analysis.

4.5. GEOPHYSICS

Results of CMD and ERT surveys are shown for selected depth slices in Appendix 6. These depict inferred resistivity at different depths below surface.

CMD Area 2

No easily discernible patterns although there are some subtle changes in resistance seen on the 2-3 m depth slice. Apart from the near surface interval ground electrical resistance appears to increase steadily with depth. Profile constructed from EM data shows a three layer model at either end of profile but a two layer model in the central part of profile possibly indicating two different sequences of geology represented in the profile.

CMD Area 3

No easily discernible patterns and results heavily impacted on by the presence of two large pipes/mains. Apart from the near surface interval ground electrical resistance appears to increase steadily with depth. Profile constructed from EM data shows a three layer model where the central layer appears to vary along profile possibly indicating changing geologies.

CMD Area 4

Clear set of patterns between lower and higher resistances across the middle of Area 4 in the top 4 m that might reflect the distribution of lacustrine/fluvial sediments against Till. Below 4m no patterns easily visible. Need to expand survey over full area of test pitting. Profiles constructed from EM data shows very clear and replicable

profiles in a NW to SE direction (4b/4c) with clearly changing electrical resistances along profiles that probably reflect changing geologies from till in the north west to lake/fluvial in the south east. Profile 4a reflects similar changes.

CMD Area 5

Highly resistant near surface giving way to moderate resistances below 2 m. Clear patterns in data between 2 m and 4 m depth. Below 4 m moderate resistances with little patterning. Profile constructed from EM data shows a four layer model varying to 3 layer model along profiles possibly indicating a number of different sequences of geology represented in the profile.

CMD Area 7

Resistant near surface layer with moderate resistances increasing with depth below 1 m. Some patterning in data in 1-3 m, nothing obvious below 3 m. Possibly reflects lake edge. Below 3 m moderate resistances with little patterning. Need to expand survey over full area of test pitting and conventional geophysics. Two ERT profiles across this area clearly exhibit discernible patterns from NW to SE between low resistance and high resistance areas, confirms the patterning in the EM data noted but bigger geological structures are present at depth in this profile certainly between 10 m and 15 m depth.

ERT Area 7

Two ERT profiles across this area clearly exhibit discernible patterns from NW to SE between low resistance and high resistance areas, confirming the patterns in the EM data noted but with larger geological structures present at depth in this profile – certainly between 10 m and 15 m depth. ERT profiling (along with the pseudo profiles created from the EM data) has demonstrated their usefulness in depicting buried structure of the sediments that should considerably enhance our ability to detect features such as the shape and nature of the lake basin, edge of gravel terraces etc. This potentially offers the opportunity to fine tune test pit locations in further phases of fieldwork.

CMD Area 8

Resistant near surface layer with moderate resistances increasing with depth below 1 m. Extensive patterning in data in 1-4 m, nothing obvious below 4 m. Possibly reflects lake edge and streams into lake. Below 4 m moderate resistances with little patterning. Need to expand survey over full area of test pitting and conventional geophysics. Profiles constructed from EM data shows a complex four layer model indicating complex geologies in the profile.

CMD Area 9

Very clear patterning of data matches mapped geology of terrace edge. Apart from the near surface interval ground electrical resistance appears to increase steadily with depth. Need to expand survey over full area of test pitting and conventional geophysics. Profile constructed from EM data shows a three layer model with very clear patterns associated with the projected terrace edge and different sequences of geology represented in the profile.

5. DISCUSSION

5.1. OVERVIEW OF LITHOLOGICAL SEQUENCE AND ITS INTERPRETATION

The programme of test pitting and borehole works has revealed a highly complex geomorphological sequence across the scheme. The complexity of the scheme area and the presence of areas with high potential for Palaeolithic archaeology were recognised in the desk-based assessment. Fieldwork and evaluation to date has confirmed the general expectations of the desk-based assessment and has demonstrated how the boundaries between areas can be re-drawn and sub-divided in order to adequately assess these areas. Fieldwork provided only limited direct evidence of Palaeolithic activity, but this was not the focus of the current stage of works. There remains considerable potential for further Palaeolithic archaeology to be encountered across the scheme. This assessment report and the forthcoming Stage 2 Review will allow those areas of potential to be constrained and mitigation strategies to be developed.

Much of the mapped geology of the route corridor has been verified. British Geological Survey mapping is typically only accurate to a few hundred metres and smaller patches, potentially with contained archaeology may be absent from the regional mapping. Important deposits have been recognised across the scheme that are either absent

from the mapping or mapped only coarsely. The distribution of these deposits will be essential information for the planning for future intrusive works.

Areas of Blackwater Terraces 4 and 5 are notable as, in some areas, they lack fluvial gravels associated with them. This may be explained by mapping based on morphological flats in the landscape and, therefore, these may be platforms cut into till without overlying sediments. Further, some areas mapped as Head may overlie fluvial sediments at the inner margins of the river terraces burying potentially more complete sequences of sediments documenting change (potentially with contained archaeology) between cold/warm/cold stages.

Crucially, areas around palaeo-lakes may be more complex than anticipated. At the very south of the scheme (QLEA1), potential lake margin deposits were uncovered which may have potential for Palaeolithic archaeology dependant on chronology of those lakes. In the central (QLEA3) the known Hoxnian lakes have a more complex history than previously anticipated. This may include an extended wetland environment along the north of the palaeo-lake, in the vicinity of the planned Siggers borrow pit.

5.2. THE PALAEOLITHIC POTENTIAL OF DEPOSITS WITHIN THE SCHEME BOUNDARY

The sedimentary framework for mapped deposits along the route of the A12 provided above firmly established that deposits encompass much of the full chronological scope of the wider Essex and East Anglian Palaeolithic record. The oldest members of the Kesgrave Formation appear to be absent from the route suggesting the potential for evidence relating to the earliest occupation of Britain, evidenced by sites such as Happisburgh 3 (Norfolk) and Pakefield (Suffolk), is highly unlikely. However, the presence of younger elements of the Kesgrave Formation suggest that evidence for pre-Anglian human presence may exist in the area of the route for Palaeolithic records from 700,000 years BP onwards, spanning much of the Middle Pleistocene and Late Pleistocene.

In this section the evidence for Palaeolithic archaeology within each of the sedimentary unit set out above is presented for the route of the A12. This summary is based on the Managing Palaeolithic Essex document (O'Connor 2015) and Wenban-Smith's comprehensive desk based assessment for part of the route (Wenban-Smith 2020). These documents give excellent frameworks for understanding the potential for Palaeolithic archaeology at, respectively, the scales of the wider County and that of the route.

Wenban-Smith (2020) desk-based assessment covers part of the route of the development, but it is important to note that areas of the route not covered also have Palaeolithic potential and should be properly characterised to a similar standard in the next stage of work. The DBA as its stands usefully divides the routes into Palaeolithic and Quaternary Character (PQ) Zones which divided the route into areas of potential based on the current state of knowledge about existing Palaeolithic finds and the palaeoenvironmental potential of sediments demonstrated by previous investigations and discoveries. 104 individual find spots or localities which were already documented on the Colchester Borough Council List, the Essex County Council HER or the English Rivers Palaeolithic Project (Wessex 1997) were identified within the DBA as having been documented within the route corridor or within a 3km buffer zone around it. This is around half of all known Palaeolithic sites in Essex. These include Lower Palaeolithic surface finds (mainly handaxes), typologically clear Late Middle Palaeolithic tools, Upper Palaeolithic tool types and locations preserving Pleistocene mammal fauna or other significant Palaeoenvironmental remains. The DBA provides a very well researched and comprehensive framework for Palaeolithic potential, including sound methodological suggestions for the evaluation and, once extended to cover the whole route, provides a blueprint for developing the scope of targeted evaluation for the Palaeolithic to be developed in conjunction with the ground-truthing exercise presented in this report.

The Palaeolithic Potential of the Kesgrave Gravels

Archaeological remains in sediments associated with the Wivenhoe Gravel are scarce but two flint flakes have been reported from the organic clays at Wivenhoe Gravel Pit (Bridgland, 1994b). Other find spots noted by O'Connor (2015), that may be associated with these sediments, include those north of Hall Farm, Weeley (615200 222100) and at Daking's Pit/Hillhouse Farm (615400 223300). The scarcity of finds is unsurprising given the paucity of sites in East Anglia from the period to which these sediments are thought to date.

The Palaeolithic Potential of the Lowestoft Formation

While the glacial origin of these deposits can lead to an assumption that their potential for Palaeolithic archaeology would be very limited, a surprising number of findspots are mapped in associated with these MIS12 cold stage deposits. The artefacts in question will include those reworked from previous interglacial and, potentially,

interstadial periods but may also include artefacts which relate to early MIS11 human activity. At least 47 Palaeolithic find spots are recorded in Essex from locations mapped as Anglian Till or outwash sands and gravels, close to a quarter of recorded find spots for the county (O'Connor 2015).

The DBA lists 21 finds within the corridor which are mapped as associated with these deposits. These include a handaxe apparently found stratified in till from a pit close to Coggeshall Church (585450 223350), two handaxes and a flake from outwash sands at West Bergholt (595960 227600), and a handaxe from Blunts Hall, Witham (580770, 214300).

The Palaeolithic Potential of the Lacustrine Deposits

The deposits with the highest potential for very well preserved, high resolution or even in-situ Palaeolithic archaeology are the MIS 11 lake deposits mapped between Chelmsford and Colchester. More widely Essex and East Anglia has a very significant MIS 11 record including the Clacton sites of Jaywick and West Cliff and the Breckland sites of Barnham and Elveden and the record of human occupation for this interglacial is greater than for any other interglacial. The combination of relatively intense human occupation through the full extent of the interglacial, the important environmental affordance of lake edge landscape for early humans and the low energy depositional regime combine to such a high potential for significant Palaeolithic sites. Within the route corridor two handaxes, flint flakes and an important palaeoenvironmental record including red deer bones have been found associated with lake edge deposits at Collier's Pit, Marks Tey (591220 224275), while a further handaxe was found at the margins of lake deposits close to their boundary with the mapped till underlying them in a railway cutting at Marks Tey (591300 223900). Wymer (1985) suggest that the 35 palaeolithic artefacts from excavations of a Roman site at Witham could have come from adjacent lake deposits (O'Connor 2015).

The Palaeolithic Potential of the Fluvial Deposits of the River Blackwater

Further evidence for episodic human occupation and associated palaeoenvironmental material, from MIS11 through to the end of the Pleistocene, comes from the fluvial deposits of the Blackwater river system. Deposits mapped as part of this fluvial sequence have the potential to preserve a range of depositional environmental from high energy braided river deposits with low potential for primary context Palaeolithic archaeology through to low energy channel edge environments and more terrestrial interglacial deposits. The latter more likely to be preserved at depth close to the margins of channels or on the inside of the terrace where sequences may be buried by colluvium (See Illus 4). More widely in Essex important sites associated with gravels of this age from other contemporary rivers systems include East Mersea, Barling, Shoeburyness, Tillingham and East Hyde (O'Connor 2015).

Within the route corridor the DBA (Wenban-Smith 2020) identifies at least 25 find spots from the fluvial terrace deposits of the Blackwater, Chelmer and Colne. These largely comprise finds of isolated handaxes but include flakes sieved directly from gravels at Durwards Hall, Rivenhall (584340 216780), flakes and cores from Kelvedon (586360 218615), a very large handaxe and records of excellent faunal and palaeoenvironmental preservation at Colemans Quarry (583630 215720) and another well preserved suite of organic deposits, including insect remains, at Lexden Brickpit (597760 225475)

The Palaeolithic Potential of the Deposits Mapped as Head and Brickearth

Terrestrial deposits relating to a range of depositional processes including gelifluction, in-situ cryoturbation, slope movement and aeolian deposition are mapped by the BGS along the route of the development and are probably widespread even where not presently mapped. Careful consideration should be given to them as contexts for preserving Palaeolithic archaeology for a number of reasons but mainly because they can contain deposits with potential for in-situ or minimally disturbed archaeological signatures and that they can mask underlying deposits with potential, especially on the inside of Pleistocene channel margins. While most head and brickearth deposits within the route corridor date to the last cold stage (MIS 5d – 2), earlier head deposits are likely to be present. In some cases, artefacts mapped as relating to other Pleistocene sediment types may in fact originate in unmapped head deposits at particular locations. However, given that the vast majority of these deposits do relate to the last cold stage, it is here that entire record of reoccupation of Britain by late *Homo neanderthalensis* populations and their subsequent replacement by populations of *Homo sapiens* would be preserved. Technologically this could include Late Middle Palaeolithic, Initial, Early, Final and Terminal Upper Palaeolithic material. Where Pleistocene head deposits are overlain by Holocene colluvium the potential also exists for Late Prehistoric and more recent archaeology.

Within the route corridor covered by the DBA are significant finds which evidence this potential. These include two Late Middle Palaeolithic handaxes, one in fresh condition, and flakes from fields SW of Durwards Hall (584435 216925 and 584400216650), flakes of Upper Palaeolithic character from Durwards Park (584410 216800) and an Upper Palaeolithic tanged point from Rose Cottage (584540 216390).

5.3. PQ ZONE RE-ASSESSMENT

The Palaeolithic DBA (Wenban-Smith 2020) created a series of zones of different Quaternary character and Palaeolithic potential for the scheme, 'PQ zones'. These PQ zones, including inference from O'Connor (2015) for the south of the scheme, rated each area in terms of its potential for Palaeolithic archaeology. Below, these PQ Zones are -re-assessed with evidence available to date. This re-assessment should be considered an initial process, and may be further revised upon completion of the borehole and ground investigation data review and deposit modelling. Table 3 defines the system used for providing potential 'scores', and the significance ratings (Table 4) and the risk matrix (Table 5) provide a framework under which the Stage 2 Review will be conducted. Also included are considerations for further fieldwork stages, though these too are subject to location-specific revision.

Table 3. Definitions of Palaeolithic and Palaeoenvironmental Potential Classification Used in This Report.

Potential	Criteria	Description
Very High	• Proven association in well-provenanced horizons of artefacts and/or palaeo-environmental remains • Deposits laid down under conditions suitable for human occupation • Deposits known to be suitable for good preservation and survival of artefacts and/or palaeo-environmental remains	Very High potential is given to any area in which Palaeolithic archaeology or palaeoenvironmental potential has been proven to be preserved within a Pleistocene sedimentary context.
High	• Confident association of deposits with artefacts and/or palaeo-environmental remains • Adjacent to deposits that are categorised as "Very High" • Direct borehole or other evidence of deposit presence • Deposits laid down under conditions suitable for human occupation • Deposits likely to be suitable for reasonable preservation and survival of artefacts and/or palaeo-environmental remains	High potential is given to any area in which Hoxnian lake sediments and lake margins may be present. High Palaeoenvironmental potential is ascribed to sequences in which we are reasonably certain palaeoenvironmental material such as pollen, molluscs, vertebrates etc may be preserved. On the basis of previous work in the area the lake sediments, dated to the Hoxnian period around Rivenhall End, are such sequences have been shown to contain important palaeoenvironmental materials.
Moderate	• Possible presence of deposits with artefacts and/or palaeo-environmental remains • Adjacent to deposits that are categorised as "High" • Deposits with occasional Palaeolithic findspots of uncertain provenance, probably from different • Quaternary deposits than are mapped • Holocene or pre-Quaternary deposits that have produced Palaeolithic finds, and therefore may contain unmapped Quaternary deposits with Palaeolithic potential	Moderate Palaeolithic archaeological potential is given to any area in which there is a reasonable chance of discovering artefacts but where our current knowledge is patchy. For example, fluvial sediments associated with river deposits may contain secondary context artefacts while primary context/in situ artefact occurrences may occur in well preserved fluvial sequences close to the inner margin of a terrace where Head deposits may bury fluvial sequences. the Hoxnian this may enhance the chances of recovery of Palaeolithic material.
Low	• Deposits laid down under conditions prohibitive to human occupation	Low Palaeolithic archaeological potential is given to any area where it is thought unlikely that material may be present. For example in

	• Areas where potentially relevant Quaternary sediments are known to have been mostly extracted or otherwise substantially removed by development • Quaternary deposits contemporary with known hominin occupation, but without any known Palaeolithic or palaeo-environmental remains • Areas of pre-Quaternary bedrock without any known Palaeolithic finds but adjacent to areas of higher potential	deposits of till laid down by the Anglian Glaciation. Low potential might also be ascribed to fluvial sediments immediately either side of the last interglacial when common consensus suggests no human activity in Britain at the time. Low palaeoenvironmental potential is ascribed to sequences in which palaeoenvironmental material may be absent such as the till.
Minimal	• No association with any known Palaeolithic or palaeo-environmental remains • Areas where potentially relevant Quaternary sediments are known to have been completely extracted or otherwise entirely removed by development • Pre-Quaternary bedrock that shares no boundaries with Quaternary deposits of any Palaeolithic potential	For example completely worked out sand and gravel pits, areas where basement construction or foundation have demonstrably removed all Quaternary deposits.
Uncertain	• Insufficient data to reach any conclusions as to the nature/period of any deposits, or their Palaeolithic potential	Uncertain Palaeolithic potential is given to any area where we are either unsure of the large-scale sedimentary environments of deposition or where the age of the sequences are uncertain. Uncertain palaeoenvironmental potential is given to any set of deposits we know little about.

Table 4: Definitions of Palaeolithic and Palaeoenvironmental Significance.

Significance	Criteria
Very High	• Exceptional, in-situ preservation in fine -grained sediments of Palaeolithic activity. • Datable, primary context Palaeolithic archaeology from a period/ technology thought previously absent from the British record. • Exceptional, high-resolution, multi-proxy and datable palaeoenvironmental signatures providing regional-scale records of climate and environmental change. • Hominin remains
High	• Palaeolithic activity area preserved in primary sedimentary context. • Datable, primary context Palaeolithic archaeology from a period/ technology thought previously absent from the regional record. • Multi-proxy and datable palaeoenvironmental signatures
Moderate	• Palaeolithic archaeology preserved in datable secondary contexts. • Palaeolithic artefact preserved in primary sedimentary context • Coarse resolution but broadly datable palaeoenvironmental signatures.
Low	• Palaeolithic archaeology in secondary contexts relating to reworking from earlier climatic stages or subject to long distance transport. • Absent or poorly preserved palaeoenvironmental records precluding paleoclimatic of ecological reconstruction. • Deposits unsuitable for dating by any means.

Table 5: Risk Matrix for Palaeolithic and Palaeoenvironmental Records Based on Assessment of Potential and Significance. White: Minimal, Green: Low, Yellow: Moderate, Orange: Moderate, High: Orange. Very High: Red.

		Significance			
		Low	Moderate	High	Very High
Potential	Very High				
	High				
	Moderate				
	Low				
	Minimal				

PQ29 (Quaternary Landscape Evaluation Area 1; Illus 9A-9B).

Area around Bolton South (P/14.2). This area is mapped as one in which Blackwater 1 Terrace is replaced northwards by Head deposits and then Glaciolacustrine deposits. TP13 lies on mapped Head, TP2912, TP2906, TP48, and TP38 are through glaciolacustrine sediments and TP60 is on Head. TP13 appears to have fluvial gravels that may be part of Blackwater River Terrance 1 buried below Head/Colluvium. TP2912 and TP2906 may well be dominated by lake or Head/Colluvium. TP48 and TP38 appear to have fluvial gravels overlying possible lake deposits (rapid assessment of TP48 identified freshwater ostracods as well as earthworm granules in these deposits). TP60 might contain lake sediments beneath fluvial deposits. This is a complex area to interpret. Fine grained waterlain sediments are present in places as are coarser gravels. The geomorphology of this area is more complex to interpret than anticipated at the pre-excavation stage. Variation in the elevation of deposits across this area suggests multiple ages are represented. The lake fill deposits have the potential to provide palaeoenvironmental evidence for landscape characterisation, and lake margins have the potential to yield Palaeolithic archaeology dependant on the age of the lake deposits. As this is a such a complex and poorly understood area, further work will be required in the field and laboratory to understand the sequences and the potential in this zone.

Area around Bolton Paynes Lane (P/14.3). This area is mapped as Head (PQ29) with a thin tongue of alluvium in the centre (PQ31). All four test pits are excavated on mapped Head whose significance at present is unknown and this will only become apparent through further excavation. A sequence of shallow boreholes was drilled across the alluvium. Bedrock London Clay appears to have been reached in TP121 and TP141. Fluvial sand and gravel are present in TP118, TP121, TP141 and TP130, and Head deposits in all pits. The relationship of these gravels to the Blackwater Terraces is unknown. It is possible that these fluvial sediments are related to the distribution of the Holocene sediments rather than the Blackwater Terraces, and so have the potential to yield Upper Palaeolithic or more recent archaeology. Ages of deposits are unknown.

Revised palaeoenvironmental potential: Moderate

Revised Palaeolithic potential: Uncertain

Initial mitigation considerations: Around lake deposits that are possibly contemporaneous with Palaeolithic activity: ERT/EM survey to map the changes in electrical properties of the sub-surface sediments in both horizontal and vertical directions as they reflect changing sub-surface geology. Borehole transects to further ground truth the BGS mapping and provide samples for palaeoenvironmental assessment and dating. Determination of the age of deposit, e.g. OSL. Moderate density test pitting array to constrain distribution of Palaeolithic archaeology, if deemed necessary. Around head deposits: Low density test pitting array targeting Head and sands and gravel. Determine age of deposit to decide Palaeolithic potential.

PQ31 (Quaternary Landscape Evaluation Area 2; Illus 10A-10C)

Area around Ratcliffe and Rayleigh Wedge-Bellway (P/113 and P/104). This area is mapped as Head with a thin nearly north/south tract of alluvium. Two test pits (TP269 and TP258) were excavated at the boundary between the Head and Alluvium. Both pits have fine grained sediments (alluvium/colluvium) overlying fluvial gravels. The sequences are probably associated with the valley. The alluvial deposits provide potential for the preservation of palaeoenvironmental evidence of possible significance for landscape evolution modelling. It is possible that PQ29 deposits underlie PQ29.

Revised palaeoenvironmental potential: Moderate

Revised Palaeolithic potential: Low

Initial mitigation considerations: Minimal intervention required for Palaeolithic assessment. Borehole work may be required to retrieve palaeoenvironmental samples.

PQ27 (Quaternary Landscape Evaluation Area 2; Illus 10A-10C)

Area around Rayleigh 1 and 2 (P/113.2). Six test pits were dug in this area. Sediments are Lowestoft Till (TP2728, TP2742, TP2753, TP2764, TP477, TP510) and Head. The distribution of Head is wider than mapped by the British Geological survey. All test pits bottomed onto Till. In test pits TP2728, TP2742 and TP2753 fine grained Head deposits (possibly windblown silts) were present as a thin veneer on the till.

Area around Ulting and Wood - Kennels (P/112). Test pits were all excavated onto mapped Till. All test pits contained till beneath a variable depth of Head. In TP397 fluvial sands and gravels were present beneath till, which was confirmed by boreholes in the area. These deposits might represent a near surface sub-crop of the Kesgrave Formation but this remains to be determined. If they are Kesgraves they will have a different clast lithology to them so gravel counting might help along with dating. If they are Kesgraves there is a low but distinct possibility that they contain archaeology and palaeoenvironemtnal material as outlined in the background data.

Area around Vellacot (P/51). Two test pits excavated here into mapped till. TP597 produced a possible thickness of Head deposits while TP629 bottomed onto Till. The origin and nature of the Head in this area is uncertain. Brickearth is also mapped in this zone but was not examined with test pits only boreholes. The potential of these deposits will be examined in the Stage 2 review. Boreholes in this recorded Head/Brickearth, which may also have some potential for Palaeolithic archaeology.

Revised palaeoenvironmental potential: Low.

Revised Palaeolithic potential: Low

Initial mitigation considerations: Minimal investigation required. Low density test pit arrays targeting Head and Brickearth deposits to check for palaeosols and late Palaeolithic archaeology. investigation may be required if Kesgraves are confirmed. Low density test pit arrays around possible Kesgrave Formation initially, increasing density if archaeology is encountered.

PQ27 (Quaternary Landscape Evaluation Area 2; Illus 10A-10C)

Area around Granville and Wood - Gas (P/01, P/02.2-5). Five test pits were excavated across this zone. TP901 was excavated into Head the remaining 4 into sediments mapped by the British Geological Survey as Blackwater Terrace 3. All five test pits encountered gravel consistent with the geological mapping. The gravels were well bedded and were not bottomed onto older sediments. In TP901 a more complex sequence of sediments were present including a basal gravel, sands an upper gravel and Head. This potentially represents a more complete sequence of river terrace deposits towards the inside of the terrace where the cold/warm/cold sequences associated with river terrace models are most likely to be complete, the area potentially contains an importance transect across the Blackwater Terrace 3 sequences.

Revised palaeoenvironmental potential: Moderate

Revised Palaeolithic potential: Moderate.

Initial mitigation considerations: Moderate density test pit arrays along inside edge of terrace and through the Head (which probably buries fluvial sediments – e.g. GRWG-01). ERT/EM to map the changes in electrical properties

of the sub-surface sediments in both horizontal and vertical directions as they reflect changing sub-surface geologies. Boreholes to ground truth the BGS mapping and provide samples for palaeoenvironmental assessment and dating.

PQ5 (Quaternary Landscape Evaluation Area 3; Illus 11A-11D)

Area around Brice Quarry and Brice West (P/57.1-3). Ten test pits were dug as two transects across the northern edge of PQ5 and into PQ7. A number of boreholes were drilled as well including some of the priority boreholes (see above) The sequences mapped till (test pits TP1022, TP1018, TP1019, TP1037, TP1029 and TP1030) with TP1027 and TP1025 excavated into Head and TP1015 and TP1016 into glaciolacustrine deposits. Test pits TP1022, TP1018, TP1019, TP1015, TP1037 and TP1029 all have till beneath the topsoil. Test pits TP1015 and TP1025 contain well stratified sands and gravels below a Head like deposit and bottom onto till. Test pits TP1030 and TP1027 both contain sediments consistent with lacustrine sedimentation with these lake deposits resting on fluvial sands and gravels in TP1027 before till is encountered. The logs for the boreholes in this area unexpectedly produced Till, especially in BRQU-05 that was dominated by Till. This implies the edge on the east side of the lake may be within the Brice Quarry area or immediately to the east of it, demonstrating that the geomorphology is highly complex. BRQU-01 shows fluvial sands and gravels above till., which may represent the lake margin This remains a very high potential zone for both Palaeolithic archaeology and palaeoenvironmental evidence, but sub-division of the zone into higher and lower potential areas is likely possible following a full review of the borehole data. These results broadly confirm the zonation of the area into PQ5 - palaeoenvironmental potential is high, Palaeolithic potential is high - and with the low potential PQ7 further to the south and east than mapped in the desk-based assessment. The precise boundary between these two zones is difficult to place at present. EM and ERT surveys required with high intensity test pit survey to map edge of lake deposits and associated fluvial sediments.

The boundary between PQ5 and PQ7 is difficult to place at present but works for PQ5 (see above) will refine the mapping of these areas and their potential.

Revised palaeoenvironmental potential: Minimal

Revised Palaeolithic potential: Minimal

Initial mitigation considerations: Intensive investigation will be required, likely including high density test pit arrays, geophysics, boreholes and palaeoenvironmental sampling. More detailed recommendations will be provided following the review of boreholes in the forthcoming Stage 2 Review.

PQ7 (Quaternary Landscape Evaluation Area 3; Illus 11A-11D)

Area around Brice West (p/57.3). This PQ zone represents Anglian boulder clay of minimal palaeoenvironmental and Palaeolithic potential. The deposits were encountered in the north of the Brice West area as expected, and they were confirmed to have minimal potential. Unexpectedly similar deposits were encountered in Brice Quarry (P/56.1). This indicates the distribution of this PQ zone may require substantial revision.

Revised palaeoenvironmental potential: Minimal

Revised Palaeolithic potential: Minimal

Initial mitigation considerations: Minimal investigation required.

PQ1 (Quaternary Landscape Evaluation Area 3; Illus 11A-11D)

Areas around Siggers (P/23 and P.23.1) and Bunting (P/12). Alluvial deposits targeted by two sequences of boreholes to east and west of the zones extent within the scheme. A full review of these boreholes will be provided in the forthcoming Stage 2 Review. It is presently assumed that the alluvial sequences are Holocene, with some palaeoenvironmental potential but little potential for Palaeolithic deposits. It is possible, however, underlying deposits may have greater potential.

Revised palaeoenvironmental potential: Moderate

Revised Palaeolithic potential: Low

Initial mitigation considerations: Minimal intervention required for Palaeolithic assessment. Borehole work may be required to retrieve palaeoenvironmental samples.

PQ9 (Quaternary Landscape Evaluation Area 3; Illus 11A-11D)

Area around Siggers (P/23). This area of high potential was investigated through borehole drilling. The boreholes will be reporting in full in the forthcoming Stage 2 Review. To date, the boreholes have confirmed the presence of lake fill clays and Till to the north. The distribution of Till indicates that the boundary between the high potential PQ9 and the low potential PQ8 may shift northwards, indicating that a large proportion of the scheme falls within PQ9. Preliminary examination of the lake fill deposits indicates the possibility of drying phases and terrestrial input, which may indicate a protracted history of changes between drier and wetter conditions in the area of the lake as it shrank and dried and expanded and became wetter. If confirmed this would extend the high potential of Palaeolithic archaeology from the lake margin to throughout lake deposits.

Revised palaeoenvironmental potential: Very High

Revised Palaeolithic potential: Very High

Initial mitigation considerations: Intensive investigation will be required, likely including high density test pit arrays, geophysics, boreholes and palaeoenvironmental sampling. More detailed recommendations will be provided following the review of boreholes in the forthcoming Stage 2 Review.

PQ8 (Quaternary Landscape Evaluation Area 3; Illus 11A-11D)

Area around Siggers (P/23.2). This PQ zone represents Anglian boulder clay of minimal palaeoenvironmental and Palaeolithic potential. The deposits were encountered in some of the boreholes along the northernmost transect within SIggers, but not in all as was expected. It appears that the boundary between PQ9 and PQ8 is further north than predicted. Deposits, where recorded, were confirmed to have minimal potential.

Revised palaeoenvironmental potential: Minimal

Revised Palaeolithic potential: Minimal

Initial mitigation considerations: Minimal investigation required.

PQ10 (Quaternary Landscape Evaluation Area 3; Illus 11A-11D)

Area around Jarwen (P/88). The boreholes taken within this area have yet to be fully reviewed, and therefore further information will be available in the forthcoming Stage 2 Review. It is currently predicted that this area will comprise patches of low palaeoenvironmental and Palaeolithic potential, with some areas rated as high potential for both types of evidence.

Revised palaeoenvironmental potential: Low or High

Revised Palaeolithic potential: Low or High

Initial mitigation considerations: Pending Stage 2 Review.

PQ11 (Quaternary Landscape Evaluation Area 3; Illus 11A-11D)

Area around Bunting (P/12). The boreholes taken within this area have yet to be fully reviewed, and therefore further information will be available in the forthcoming Stage 2 Review. It is currently predicted that this area will have an overall moderate palaeoenvironmental and Palaeolithic potential, but some areas may be rated higher.

Revised palaeoenvironmental potential: Moderate or High

Revised Palaeolithic potential: Moderate or High

Initial mitigation considerations: Pending Stage 2 Review.

PQ13b (Quaternary Landscape Evaluation Area 4; Illus 12A-12B)

Area around Sawdon (P/120.1) and Bunting (P/118.1-2 & 4). This zone is mapped as Blackwater Terrace 3 (test pits TP1381, TP1418, TP1420, TP1416 and TP2667), Alluvium (TP1408, TP2942 and TP2970), Lowestoft Till (TP2967) and Blackwater Terrace 4 (TP2981). Fluvial sands and gravels are present in TP1381, TP1418, TP1420, TP1416 and TP2667 as expected, appearing as well stratified sands within gravels in many cases. This confirms that a potentially important terrace edge sequence is preserved in this area (Illus 4). Test pits TP1408, TP2942 and TP2970 are dominated by till with a thin veneer of sands and gravels and Head. TP2967 contains a thick sequence of probable

slope colluvium deposits, while TP2981 exhibits till only. This is a complex area which makes it difficult to ascribe a single ranking of potential to the zone. It is likely this area will be heavily re-zoned to areas of differing potential.

Revised palaeoenvironmental potential: Uncertain

Revised Palaeolithic potential: Moderate

Initial mitigation considerations: Moderate intensity test pit sampling along inside margins of terrace (on both sides of the strip of Holocene alluvium), possibly include some ERT and EM geophysics – may require additional boreholes.

PQ16 (Quaternary Landscape Evaluation Area 4; Illus 12A-12B)

Area around Bunting (P/118.4 & 7). Ten test pits were dug in this area on sediments mapped as Blackwater Terraces 4 and 5 (TP1578, TP1548 and TP1546) and till for the remainder. All test pits showed till near to the surface with a very thin veneer of Head in places and no traces of terrace sands and gravels. In two instances (TP1701 and TP1642) fluvial sands and gravels were present beneath till. These may represent a near surface expression of the underlhing Kesgrave Formation. Palaeoenvironmental potential is low, Palaeolithic potential is low. However, the presence of Kesgrave Formation close to the surface may suggest that in some areas increased potential for Palaeolithic material may exist within these sub-till sands and gravels. Relatively focused investigation required in this area – some low intensity test pit sampling around TP1701 and TP1642 to examine possible Kesgrave Formation; some test pitting around mapped Blackwater Terrace TP1548 and TP1572 in order to attempt to recover samples suitable for dating.

PQ16 around Bunting North (P/118). Two test pits were excavated on till at the northern end of the zone. Both revealed till beneath a thin veneer of Head.

Revised palaeoenvironmental potential: Low

Revised Palaeolithic potential: Low (discrete areas of Uncertain)

Initial mitigation considerations: Focused investigation targeting Head in a limited number of places, with focus on machine-dug trenches to Till surface where thicker Head may conceal buried soils and possible Late Palaeolithic artefacts

PQ17 (Quaternary Landscape Evaluation Area 5; Illus 13A-13C)

Area around Crown (P/145.2). Test pits TP1878 and TP1904 were dug into Blackwater Terrace 3 deposits. Test pit 1 exhibited fluvial sediments beneath a thick sequence of probable colluvium. TP1904 revealed Head on top of Till. A terrace edge (of Blackwater Terrace 3) is probably present buried by Head in this area and potentially an important buried terrace sequence may be preserved between TP1878 and TP1904. The remaining area is till near the surface.

Revised palaeoenvironmental potential: Uncertain.

Revised Palaeolithic potential: Moderate.

Initial mitigation considerations: Moderate intensity test pit arrays targeting the inside terrace edge. Possible ERT and EM survey to map terrace edge distribution. Possible boreholes to confirm.

PQ19 (Quaternary Landscape Evaluation Area 5; Illus 13A-13C)

Area around Carter (P/153) and Sherwood (P/152.1). Test pits TP1934 and TP1937 were excavated in Head, and TP1920 and TP1977 were dug into Lowestoft Till. All test pits exhibited thin spreads of Head over till.

Revised palaeoenvironmental potential: Uncertain.

Revised Palaeolithic potential: Low.

Initial mitigation considerations: Minimal investigation required. Low density test pit arrays targeting Head deposits to check for palaeosols and late Palaeolithic archaeology.

PQ20 (Quaternary Landscape Evaluation Area 5; Illus 13A-13C)

Area around Carter (P/153). TP1958 and TP1957 were dug into Lowestoft Till. Both test pits exhibited thin spreads of Head over till. In PQ 20 palaeoenvironmental potential is low, Palaeolithic potential is low. Focused investigation of machine-dug trenches to the Till surface in limited places where thicker Head may conceal buried soils and possible Late Palaeolithic material.

Area around Sherwood West (P/152.1-2). Three test pits were excavated in this area, all onto mapped till. Test pits demonstrated that till is present in all test pits below a thin veneer of Head.

Area around Sherwood East (P/152.2-3). Ten test pits were excavated in this area, all onto mapped till. Test pits demonstrated that till is present in all test pits below a thin veneer of Head. Revised palaeoenvironmental potential: Low (previously Low)

Revised palaeoenvironmental potential: Low

Revised Palaeolithic potential: Low

Initial mitigation recommendations: Focused investigation of machine excavation to the Till surface in limited places where thicker Head may conceal buried soils and possible Late Palaeolithic material.

Unevaluated PQ Zones

Several of the PQ zones mapped with the vicinity of the scheme (see Illus 14) were either outside of the scheme boundary or in areas not subject to archaeological investigation. There areas include:

- PQ30 and PQ32, low potential areas located outside the scheme in QLEA 1.
- PQ2 and PQ25, low potential areas south of the A12 at the intersection of QLEA2 and QLEA3.
- PQ3 and PQ24, high potential areas in QLEA3 which were outside the archaeological scope of works.
- PQ1, PQ4, PQ6, PQ12, PQ14 and PQ15 – all moderate potential areas in QLEA3 outside the archaeological scope of works.
- PQ18, moderate potential area located outside the scheme between QLEA 4 and QLEA5.
- PQ21, PQ22a and PQ22b, uncertain potential area located outside the scheme south of QLEA5.
- PQ23, high potential area around Marks Tey which was outside the archaeological scope of works.

6. PROPOSAL FOR FURTHER WORKS

Taking account of all presently available information it is possible to produce a plausible map of the project life-cycle that, as suggested in the Palaeolithic DBA (Wenban-Smith 2020) takes a multi-phase, iterative approach. The indicative programme below outlines current expectations for the project, and further detail is the then provided on the next two stages of works, the Stage 2 Review (commissioned) and Fieldwork Phase 2 (proposed).

6.1. INDICATIVE PROJECT PROGRAMME

Table 6 details a possible programme for the scheme life-cycle, incorporating previous, current and future stages of work. This is for illustrative purposes only, but it is intended to demonstrate an iterative approach the scheme's Palaeolithic archaeology and palaeoenvironmental record.

6.2. STAGE 2 REVIEW

The forthcoming Stage 2 Review will utilise all relevant extant data (archaeological test pit data presented in this report, purposive geoarchaeological borehole data, finalised Ground Investigation records and ground-truthed geophysics) in order to constrain the distribution of known geological units - and identify any unknown geological units - along the route corridor. It will provide of a zoning of the scheme that identifies the potential and significance of deposits in terms of palaeoenvironmental sequences and Palaeolithic archaeology, and it will also identify those parts of the scheme lacking purposive geoarchaeological data which remain unevaluated. Zoning will take account of current scheme design and expected impact depth, recognising the detailed design phase will not be completed and so provide flexibility for scheme design change.

Table 6: Proposed Project Programme.

Stage	Timing	Purpose
Desk-based assessment	Completed	Assessment of available information for the scheme area to characterise the setting and the potential for Palaeolithic archaeology to be encountered.
Written Scheme of Investigation for Fieldwork Phase 1	Completed	Provides a summary of known and potential archaeology within the scheme area and provides a structured approach for their evaluation.
Stage 1 Review	Completed	Review of geotechnical and geophysical data with the DBA and geological mapping to improve the Fieldwork Phase 1 evaluation.
Fieldwork Phase 1: Quaternary Landscape Evaluation	Completed	Fieldwork (boreholes and test pits) to characterise the Quaternary landscape of the scheme, and to evaluate deposits within for the palaeoenvironmental and Palaeolithic potential.
Stage 2 Review (see below)	January 2022	Review of available data. Production of predictive deposit models, refined zoning of the scheme for palaeoenvironmental and Palaeolithic potential, and recommendations for next fieldwork stages.
Project-wide Written Scheme of Investigation	Proposed	Production of a framework WSI that provides a blueprint for all future stages of the project.
Fieldwork Phase 2a: Advance Works (see below)	Proposed	Targeted geophysics, borehole drilling, palaeoenvironmental and OSL data to refine the intervention strategy for Fieldwork Phase 2.
Fieldwork Phase 2b: Targeted Palaeolithic and Palaeoenvironmental Evaluation (see below)	Proposed	Targeted assessment of area with the potential for palaeoenvironmental or Palaeolithic potential. The primary aim of which is to locate and constrain relevant deposits, and to evaluate their significance.
Updated Written Scheme of Investigation and Research Framework for Fieldwork Phase 3	If required	Builds on the new data from Fieldwork Phase 2 and the Framework WSI to develop a informed strategy for Fieldwork Phase 3.
Fieldwork Phase 3: Targeted Palaeoenvironmental and Palaeolithic Mitigation	If required	Works to mitigate the impact of the scheme on deposits with palaeoenvironmental significance and/or Palaeolithic archaeology of significance. May include open-area excavation of in-situ Palaeolithic sites and/or watching brief on construction works.
Final Assessment Reporting and Updated Project Design	If required	Final report summarising all previous works and providing recommendations for future post-excavation works (if required).
Analysis Phase	If required	Post-excavation analysis of samples and updated reporting.
Publication and Dissemination Phase	Proposed	Dissemination of the final findings to academic and public audiences.

The deposit model resulting from this work will be used to map the distribution of buried deposits of archaeological interest as they intersect with the route corridor. The purpose of the deposit model, according to the national guidelines (Historic England, 2020) will be to:

- avoid blanket coverage of trenching (and, by extension, test pitting)
- identify areas of low archaeological/palaeoenvironmental potential
- identify areas of high archaeological/palaeoenvironmental potential
- guide the selection of appropriate evaluation and mitigation techniques and
- facilitate the reconstruction of the palaeoenvironment

The review of the various data sources will be supplemented by the results of the targeted palaeoenvironmental assessment of samples taken from key boreholes drilled (and yet to be reported) as well as the results of the first set of samples to be dated from the sequences.

The process will commence with the examination of all borehole/test pit logs for the route corridor to identify the full range of sediment types present and their likely stratigraphic relationships. This task will identify the set of stratigraphic units that will form the basis of the deposit model. Upon creation of the stratigraphic framework all lithological units reported in the records (geoarchaeological purposive test pits/boreholes and GI records) will be assigned to the appropriate stratigraphic unit. This data can then be used to:

- Create transects along/across the route corridor
- Model stratigraphic surfaces (where sufficient data density is available)
- Provide the information to map out the thickness and distribution of key stratigraphic units (of archaeological/palaeoenvironmental potential) within the different areas of the route corridor.

The purpose of this exercise will be to re-examine the PQ zones as defined in the original Palaeolithic DBA (Wenban-Smith 2020). The deposit model will be read alongside what is known about the Palaeolithic record at the site, local and regional scales to update existing PQ zones or define new ones. These revised PQ zones will create a more granular model of Palaeolithic and palaeoenvironmental potential and offer a considered overview of the potential impact deposits of archaeological significance.

The final part of the Stage 2 Review will comprise designing a recommended programme of further fieldwork, tailored for each PQ zone (extant or new). For parts of the route zoned as having moderate to very high Palaeolithic or palaeoenvironmental potential further evaluation phases prior to full mitigation, likely comprising arrays of geoarchaeological test pits, may be recommended in a staged approach aimed at identifying, constraining, and understanding areas for possible mitigation.

6.3. CONSIDERATIONS FOR PROPOSED FIELDWORK PHASE 2

The purpose of Fieldwork Phase 2a/b would be to target deposits of potential, and to assess their significance in terms of palaeoenvironmental and Palaeolithic evidence. Areas may then be constrained on the potential-significance matrix (Table 5) as aid to the development of a mitigation strategy.

Fieldwork Phase 2 would include an advance works phase (2a) – potentially occurring during planned ground investigations work – which would be designed to answer targeted questions regarding the potential and significance of deposits in areas sensitive to the scheme development (this would also significantly provide cost savings on mobilisation costs etc.). Advanced works would likely focus on geophysics, borehole drilling, additional palaeoenvironmental assessment and dating (OSL and further AAR). Geophysical results have demonstrated their utility for mapping sub-surface strata (see above), and further deployment would refine the distribution of test pits in the main Fieldwork Phase 2b. Borehole cores will refine key geomorphological boundaries and provide samples for palaeoenvironmental assessment and dating, both of which can contribute to the assessment of Palaeolithic potential – for example in the Terrace 4 and 5 deposits within the Bunting area.

It is proposed that the main Fieldwork Phase 2b works is centred around arrays of test pits. The distribution and density of these test pits will be constrained during the forthcoming Stage 2 Review and any advance works (Phase 2a). In future test pit areas, test pits would be initially excavated in lower densities with deposits screened for artefacts. Encountered artefacts would require an increase in the density and size of test pits to map artefact distribution and, if present, locate areas of concentrated artefact deposition, which may represent an in-situ Palaeolithic site, and for which access to the test pits would be required. Further works would also likely include, but should not be limited to, boreholes to better understand the geomorphological character of the landscape

and assess the potential of deposits at dept, palaeoenvironmental assessment to determine the potential of deposits to inform past environment modelling and dating techniques (radiocarbon and OSL) to refine the chronology of the scheme's deposits.

7. CONCLUSION

The A12 Widening Scheme corridor passes through part of the Essex landscape of known high potential for both palaeoenvironmental sequences and Palaeolithic archaeology of national and international significance. Fieldwork Phase 1 took a geoarchaeology-based approach of characterising the Quaternary landscape, enabling deposits of archaeological importance to be identified and evaluated across the scheme. British Geological Survey mapping (British Geological Survey 2021) and Palaeolithic zonation models (O'Connor 2015, Wenban-Smith 2020) were ground-truthed using test pits, boreholes and geophysical techniques. This work demonstrates the importance of updating zonation in light of new data (O'Connor 2015: 141-142; Wenban-Smith 2020: 31-32) as a means to progress understanding of the Essex Palaeolithic landscape.

The primary aim of this phase of work was to evaluate the Quaternary landscape as a whole, and it is therefore not unexpected that direct evidence of Palaeolithic activity was not retrieved. We can be confident that none of the test pits, to the depths excavated, intersected with Palaeolithic artefact concentrations. The lack of Palaeolithic finds retrieval should not be taken, however, as an indication of a lack of Palaeolithic archaeology within the scheme boundary. Indeed, the landscape-level approach has produced information that constrains the areas most likely to require further archaeological works including areas of very high potential, as well as providing new indicators for past depositional environments. Key results to date include:

- Lake deposits detected at the south of the scheme (Bolton area). Here, a sequence of sediments is present in places that consists of colluvium resting on lake deposits (perhaps temperate as opposed to cold climate, as mapped by the BGS). The date of these lakes, and whether they are contemporaneous with human habitation, is uncertain. Ascertaining their chronology will be crucial in determining the potential and significance of these deposits. The lake deposits also include a rich palaeoenvironmental sequence that can provide a record of environmental change.
- Several areas mapped by BGS as Head were encountered across the scheme. The character of these deposits varies considerably, as does their potential to yield primary and secondary Palaeolithic artefact depositions. Each deposit of Head within the scheme boundary will require a specific strategy ranging from minimal to intensive intervention.
- Examination of the Blackwater Terraces has begun to localise parts of these sequences most likely to yield Palaeolithic archaeology, including low energy, fine deposits. Substantial areas of Terraces 4 and 5 are within the scheme boundary, and the importance of resolving their chronology is paramount in developing appropriate mitigation strategies.
- It has long been recognised that the area around Colemans Farm Quarry contains one or more palaeo-lakes dated to the Hoxnian. These lake(s), and especially their margins, were favourable habitats for hominin exploitation and, therefore, places where Palaeolithic evidence is expected. Preliminary interpretation of some boreholes in this area indicates that (i) additional lake margin areas may exist, including to the west (Brice Quarry entrance), and (ii) a large area of deposits may have evidence of terrestrial input. The latter point is suggestive of a deep lake basin surrounded by an extended wetland habitat. If confirmed, this would extend the area in which there is high potential for in-situ Palaeolithic archaeology.
- Development of palaeosols and hiatus at some of the Till surfaces were detected. These deposits may provide important palaeoenvironmental evidence relating to the immediate post-glaciation period, as well as land surfaces upon which Palaeolithic human activity may have occurred.

Substantial parts of the scheme have been shown to be of least concern or were unevaluated during the current phase of works:

- The mapping of Till deposits, especially those in the vicinity of Colemans Farm Quarry, has been improved, and their minimal potential for palaeoenvironmental or Palaeolithic data has been confirmed.
- Suspected Kesgrave Formation deposits were detected in isolated near-surface outcrops, but are typically at depths beyond the reach of current evaluation methods. The archaeological potential of these deposits has not been evaluated.

- Areas outside of the scope of trial trenching were not evaluated with purposive geoarchaeological interventions. Notably, this includes Colemans Farm Quarry and areas near to Marks Tey at the very NW of the scheme.

In sum, the current works have enabled us to:

- Ground truth the British Geological Survey mapping of the route corridor.
- Place the sequences within the known geomorphological and geological history of the area.
- Review the PQ zones designated in the DBA in terms of potential for the presence of Palaeolithic archaeology and palaeoenvironmental sequences.
- Provide baseline data for integration with the wider ground investigation database for the Stage 2 Review in order to re-draw the PQ zone boundaries where necessary.

The scheme has a whole continues to have high potential for significant palaeoenvironmental sequences and Palaeolithic archaeology. In-situ Palaeolithic sites are rare, but when found, are of exceptional significance: they have the potential to re-shape our understanding of early human development. Re-deposited Palaeolithic evidence (including artefacts and osteological remains) and palaeoenvironmental evidence also provide important insights into early human activity. Further phases of fieldwork are needed to thoroughly test for the presence of archaeologically significant remains, and the current work, coupled with the forthcoming Stage 2 Review, provide a baseline framework for managing the Palaeolithic record of the scheme.

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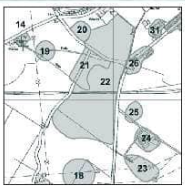
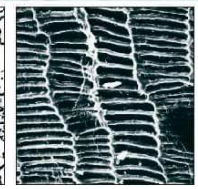
ATTT21










A12 ARCHAEOLOGICAL EVALUATION (JUNCTION 19/CHELMSFORD – JUNCTION 25/A120)

Fieldwork Phase 1 – Quaternary Landscape Evaluation Report
CLIENT REF. HE551497-COS-EHR-3_S0-RP-X-0009
PART 2 ILLUSTRATIONS AND APPENDICES

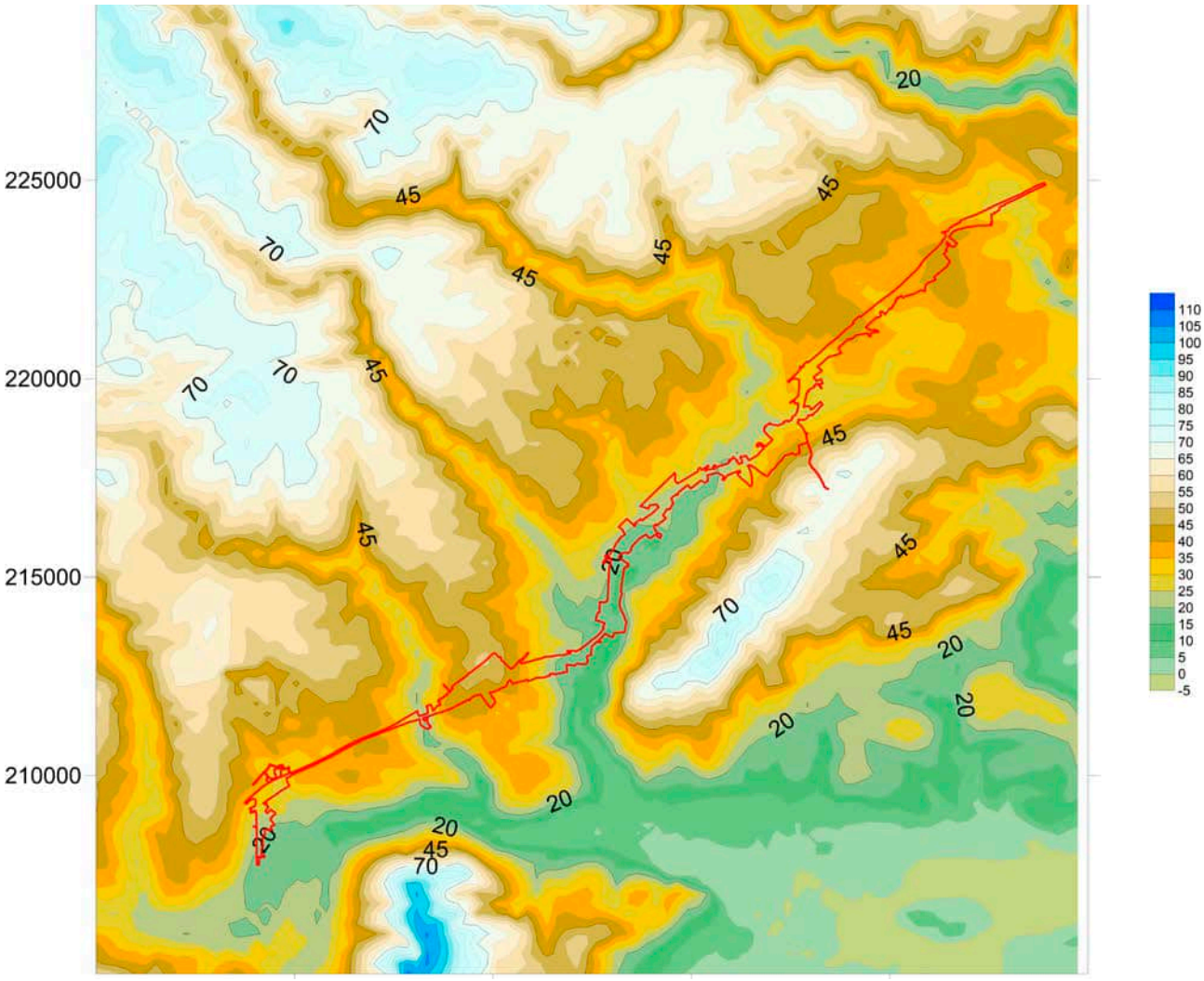
Headland Archaeology Midlands & West
Unit 1 | Clearview Court | Twyford Rd | Hereford HR2 6JR

for Costain Group plc
on behalf of National Highways

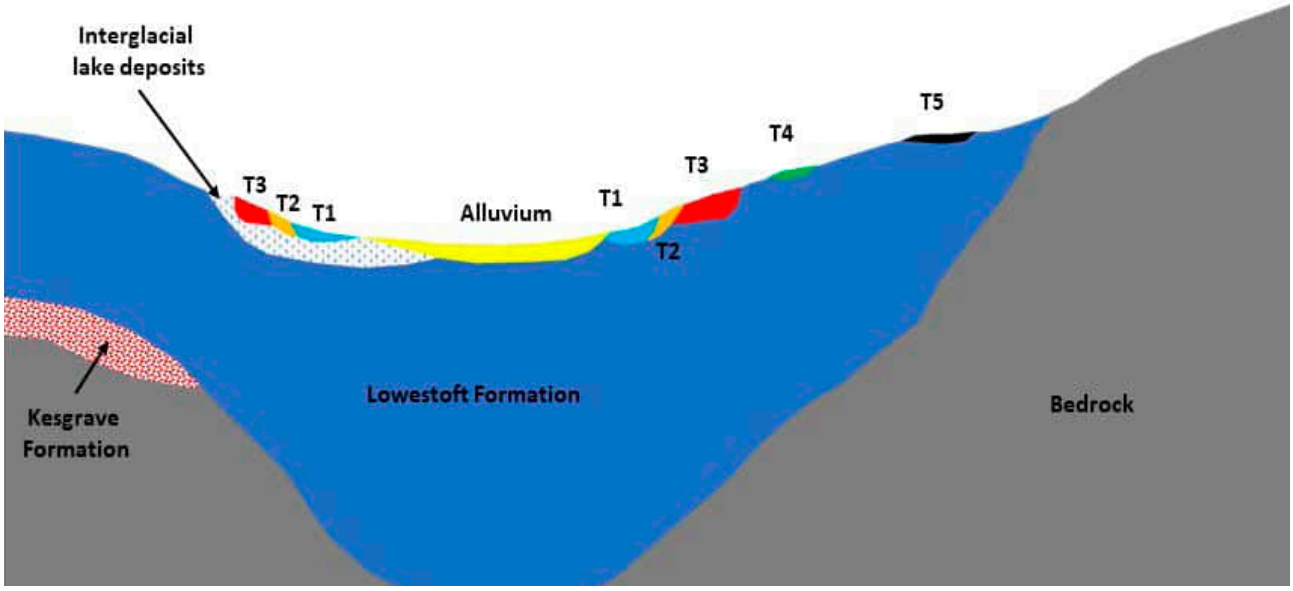
19/11/2021

HEADLAND ARCHAEOLOGY

LIST OF ILLUSTRATIONS

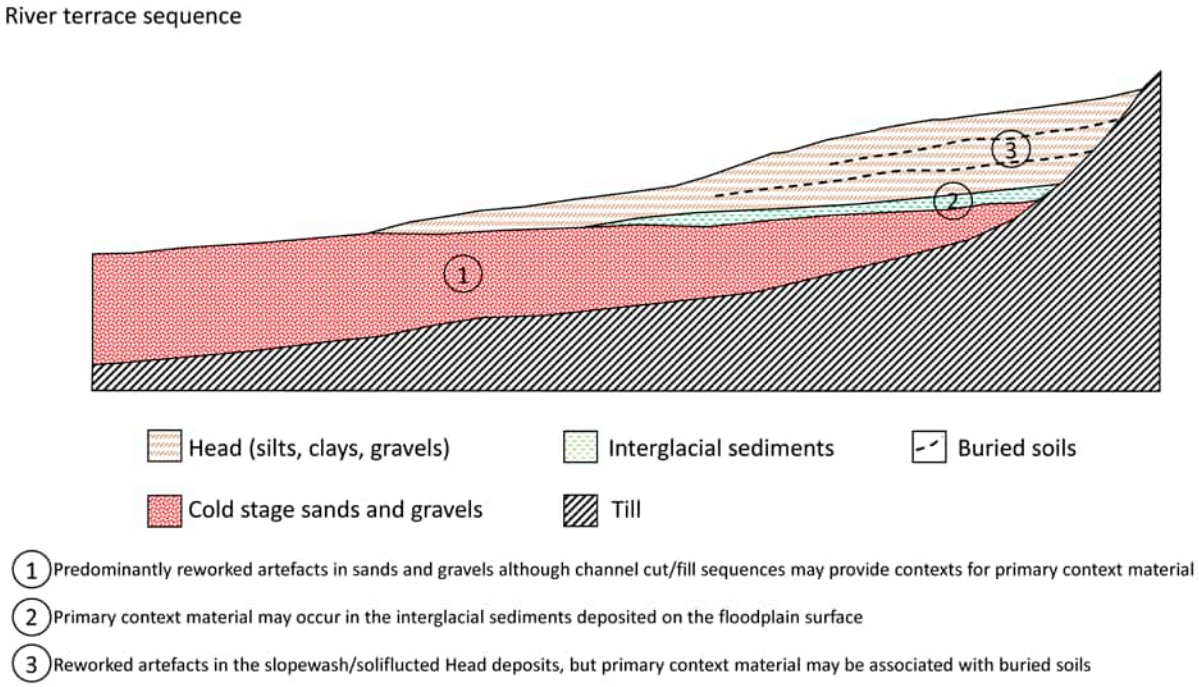


ILLUS 1 Topographic map for the scheme boundary and surrounding area



ILLUS 2 Schematic profile of major Pleistocene sediment units in the study area

ILLUS 3 Photographs of key deposits associated with the scheme locality. All photographs taken by Martin Bates in the Colemans Farm area. For illustrative purposes only, works were not conducted by Headland Archaeology (UK) Ltd as part of the A12 Trial Trenching programme or otherwise. A: Pale yellow white lacustrine sediments (to left of scale) uncomformably overlying fluvial sands and gravels of probable Late Anglian age below. B: Lake deposits beneath sediments of Terrace 2. C: Organic sediments at the base of Terrace 2



ILLUS 4 Simplified version of the Bridgland model (Bridgland, 2006) for river terraces based on his work in the lower Thames

ILLUS 5 Safety set up of test pits, including an observation bridge, Herras fencing, and pedestrian fencing

ILLUS 6 Dimensions of standard test pit

ILLUS 7 Sieving of test pit deposits

BGS SUPERFICIAL DEPOSITS 1:50,000 SCALE

- Glaciofluvial deposits, mid Pleistocene - Sand and gravel
- Kesgrave catchment subgroup - Sand and gravel
- Lowestoft formation - Diamicton
- Glaciolacustrine deposits, mid Pleistocene - Clay and silt
- Alluvium - Clay and silt
- Head - Diamicton
- River terrace deposits, 1 to 2 - Sand and gravel
- Interglacial lacustrine deposits - Clay and silt
- Tidal flat deposits - Clay and silt
- Peat - Peat
- Lowestoft formation - Sand and gravel
- Brickearth - Clay, silt and sand

ILLUS 13D
ILLUS 13C
ILLUS 13B
ILLUS 13A
ILLUS 12B
ILLUS 12A
ILLUS 11D
ILLUS 11C
ILLUS 11B
ILLUS 11A
ILLUS 10C
ILLUS 10B
ILLUS 10A
ILLUS 9B
ILLUS 9A

225000
220000
215000
210000
205000
570000
575000
580000
585000
590000
595000

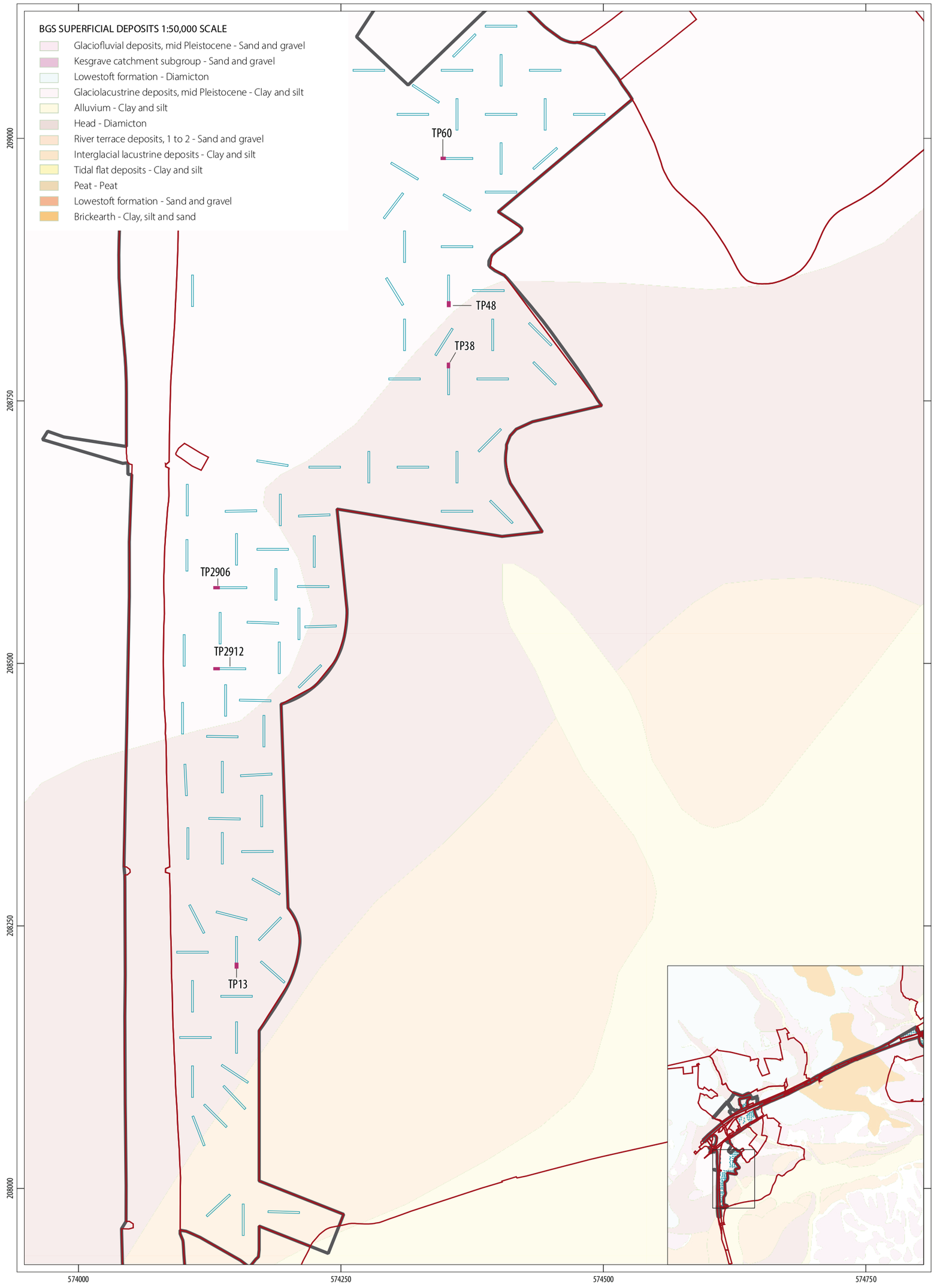
- scheme location
- land parcel
- test pit/borehole location
- ERT transect location

QUATERNARY LANDSCAPE EVALUATION AREAS

- QLEA1
- QLEA2
- QLEA3
- QLEA4
- QLEA5

0 2Km
1:85,000 @ A3

ILLUS 8 Plan of scheme area showing the five Quaternary Landscape Evaluation Areas



ILLUS 9A Test pit and borehole locations in Quaternary Landscape Evaluation Area 1

BGS SUPERFICIAL DEPOSITS 1:50,000 SCALE

- Glaciofluvial deposits, mid Pleistocene - Sand and gravel
- Kesgrave catchment subgroup - Sand and gravel
- Lowestoft formation - Diamicton
- Glaciolacustrine deposits, mid Pleistocene - Clay and silt
- Alluvium - Clay and silt
- Head - Diamicton
- River terrace deposits, 1 to 2 - Sand and gravel
- Interglacial lacustrine deposits - Clay and silt
- Tidal flat deposits - Clay and silt
- Peat - Peat
- Lowestoft formation - Sand and gravel
- Brickearth - Clay, silt and sand

TP141
TP121
TP130
TP118
HABH04(V1)
HABH05(V1)
HABH02(V1)
HABH03(V1)
HABH01(V1)

209900
209800
209700
209600

574400
574500
574600
574700
574800
574900

scheme location
land parcel
trench location
test pit location

BOREHOLE LOCATION
window sampler

0 25m
1:1,500 @ A3

ILLUS 9B Test pit and borehole locations in Quaternary Landscape Evaluation Area 1

BGS SUPERFICIAL DEPOSITS 1:50,000 SCALE

- Glaciofluvial deposits, mid Pleistocene - Sand and gravel
- Kesgrave catchment subgroup - Sand and gravel
- Lowestoft formation - Diamicton
- Glaciolacustrine deposits, mid Pleistocene - Clay and silt
- Alluvium - Clay and silt
- Head - Diamicton
- River terrace deposits, 1 to 2 - Sand and gravel
- Interglacial lacustrine deposits - Clay and silt
- Tidal flat deposits - Clay and silt
- Peat - Peat
- Lowestoft formation - Sand and gravel
- Brickearth - Clay, silt and sand

HABH07(V2)
HABH06(V2)
HABH08(V2)
HABH09(V2)
HABH10(V2)
TP269
TP258

211400
211300
211200
578100
578200
578300
578400
578500

scheme location
land parcel
trench location
test pit location

BOREHOLE LOCATION
window sampler

0 25m
1:1,500 @ A3

ILLUS 10A Test pit and borehole locations in Quaternary Landscape Evaluation Area 2

BGS SUPERFICIAL DEPOSITS 1:50,000 SCALE

- Glaciofluvial deposits, mid Pleistocene - Sand and gravel
- Kesgrave catchment subgroup - Sand and gravel
- Lowestoft formation - Diamicton
- Glaciolacustrine deposits, mid Pleistocene - Clay and silt
- Alluvium - Clay and silt
- Head - Diamicton
- River terrace deposits, 1 to 2 - Sand and gravel
- Interglacial lacustrine deposits - Clay and silt
- Tidal flat deposits - Clay and silt
- Peat - Peat
- Lowestoft formation - Sand and gravel
- Brickearth - Clay, silt and sand

RAYL-08
RAYL-09
RAYL-10
RAYL-07
TP510
TP477
TP2764
TP2753
TP2742
TP2728
ULWK-09
TP397
TP382
TP364
TP355
TP345
TP340
ULWK-07
ULWK-08

213000
212750
212500
212250
212000
579250
579500
579750
580000
580250
580500
580750

scheme location
land parcel
trench location
test pit location

BOREHOLE LOCATION
cable percussion

0 100m
1:5,000 @ A3

ILLUS 10B Test pit and borehole locations in Quaternary Landscape Evaluation Area 2

BGS SUPERFICIAL DEPOSITS 1:50,000 SCALE

- Glaciofluvial deposits, mid Pleistocene - Sand and gravel
- Kesgrave catchment subgroup - Sand and gravel
- Lowestoft formation - Diamicton
- Glaciolacustrine deposits, mid Pleistocene - Clay and silt
- Alluvium - Clay and silt
- Head - Diamicton
- River terrace deposits, 1 to 2 - Sand and gravel
- Interglacial lacustrine deposits - Clay and silt
- Tidal flat deposits - Clay and silt
- Peat - Peat
- Lowestoft formation - Sand and gravel
- Brickearth - Clay, silt and sand

213250
213000
212750
212500
212250

580750 581000 581250 581500 581750 582000 582250 582500

TP901 TP903 TP918 TP920 TP922

VELL-09 VELL-08 VELL-04 VELL-05 VELL-06 VELL-10

TP629 TP597

scheme location
land parcel
trench location
test pit location

BOREHOLE LOCATION
cable percussion

0 100m
1:5,000 @ A3

ILLUS 10C Test pit and borehole locations in Quaternary Landscape Evaluation Area 2

BGS SUPERFICIAL DEPOSITS 1:50,000 SCALE

- Glaciofluvial deposits, mid Pleistocene - Sand and gravel
- Kesgrave catchment subgroup - Sand and gravel
- Lowestoft formation - Diamicton
- Glaciolacustrine deposits, mid Pleistocene - Clay and silt
- Alluvium - Clay and silt
- Head - Diamicton
- River terrace deposits, 1 to 2 - Sand and gravel
- Interglacial lacustrine deposits - Clay and silt
- Tidal flat deposits - Clay and silt
- Peat - Peat
- Lowestoft formation - Sand and gravel
- Brickearth - Clay, silt and sand

BRQU-05
HABH34(L2)
HABH35(L2)
HABH36(L2)
BRQU-02
HABH38(L2)
BRQU-03
BRQU-01

215600
215400
215200
215000
582800
583000
583200
583400
583600

scheme location
land parcel
trench location

BOREHOLE LOCATION
window sampler
dynamic sampler rotary cored

0 50m
1:2,500 @ A3

ILLUS 11A Test pit and borehole locations in Quaternary Landscape Evaluation Area 3

BGS SUPERFICIAL DEPOSITS 1:50,000 SCALE

- Glaciofluvial deposits, mid Pleistocene - Sand and gravel
- Kesgrave catchment subgroup - Sand and gravel
- Lowestoft formation - Diamicton
- Glaciolacustrine deposits, mid Pleistocene - Clay and silt
- Alluvium - Clay and silt
- Head - Diamicton
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- Interglacial lacustrine deposits - Clay and silt
- Tidal flat deposits - Clay and silt
- Peat - Peat
- Lowestoft formation - Sand and gravel
- Brickearth - Clay, silt and sand

TP1037
TP1029
TP1030
TP1027
TP1022
TP1018
TP1019
TP1025
TP1015
TP1016

216400
216300
216200
216100
583200
583300
583400
583500
583600

scheme location
land parcel
trench location
test pit location

0 25m
1:1,500 @ A3

ILLUS 11B Test pit and borehole locations in Quaternary Landscape Evaluation Area 3

BGS SUPERFICIAL DEPOSITS 1:50,000 SCALE

- Glaciofluvial deposits, mid Pleistocene - Sand and gravel
- Kesgrave catchment subgroup - Sand and gravel
- Lowestoft formation - Diamicton
- Glaciolacustrine deposits, mid Pleistocene - Clay and silt
- Alluvium - Clay and silt
- Head - Diamicton
- River terrace deposits, 1 to 2 - Sand and gravel
- Interglacial lacustrine deposits - Clay and silt
- Tidal flat deposits - Clay and silt
- Peat - Peat
- Lowestoft formation - Sand and gravel
- Brickearth - Clay, silt and sand

SNJA-14
SNJA-13
SNJA-06
SNJA-05
SNJA-11
SNJA-10
SNJA-04
SNJA-09
SNJA-03
SNJA-07
HABH49(L1)
HABH50(L1)
SNJA-02
HABH48(L1)
HABH47(L1)
SNJA-01
SNJA-08
SSBE-06
SSBE-10
SSBE-08
SSBE-09
SSBE-07
HABH14(V3)
HABH15(V3)
HABH46(L1)
HABH13(L2)
HABH45(L1)
SSBE-05
SSBE-04
SSBE-03
SSBE-02
SSBE-01
HABH11(V3)
HABH12(L2)

217500
217250
217000
216750
216500

583750
584000
584250
584500
584750
585000
585250

scheme location
land parcel
trench location
ERT transect

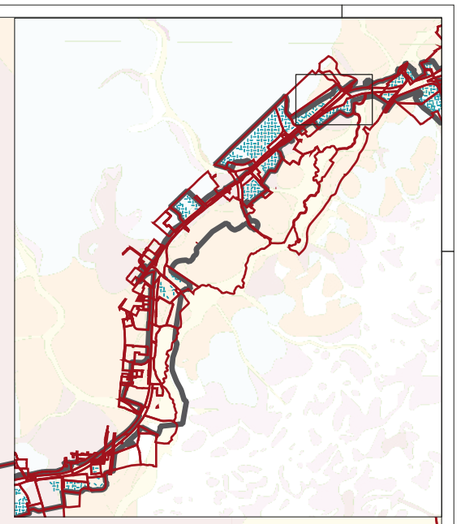
BOREHOLE LOCATION
window sampler
dynamic sampler rotary cored

0 100m
1:5,000 @ A3

ILLUS 11C Test pit and borehole locations in Quaternary Landscape Evaluation Area 3

BGS SUPERFICIAL DEPOSITS 1:50,000 SCALE

- Glaciofluvial deposits, mid Pleistocene - Sand and gravel
- Kesgrave catchment subgroup - Sand and gravel
- Lowestoft formation - Diamicton
- Glaciolacustrine deposits, mid Pleistocene - Clay and silt
- Alluvium - Clay and silt
- Head - Diamicton
- River terrace deposits, 1 to 2 - Sand and gravel
- Interglacial lacustrine deposits - Clay and silt
- Tidal flat deposits - Clay and silt
- Peat - Peat
- Lowestoft formation - Sand and gravel
- Brickearth - Clay, silt and sand



HABH19(V4)
HABH23(V4)
HABH22(V4)
HABH21(V4)
HABH18(V4)
BNTW-01
BNTW-02
BNTW-03
SNJA-12
SNJA-15
SNJA-14
SNJA-13

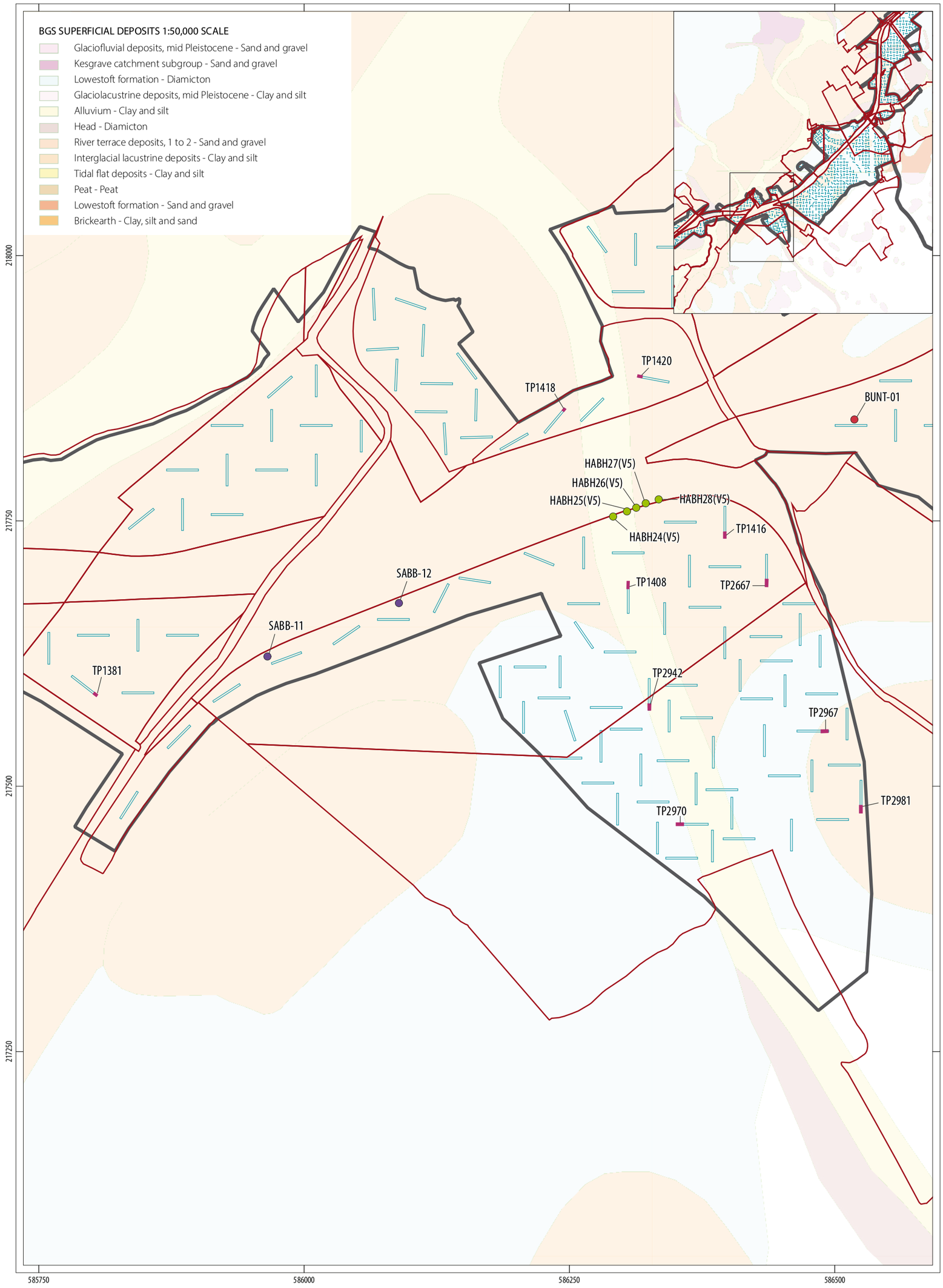
217800
217650
217500
217350
584850
585000
585150
585300
585450
585600

scheme location
land parcel
trench location

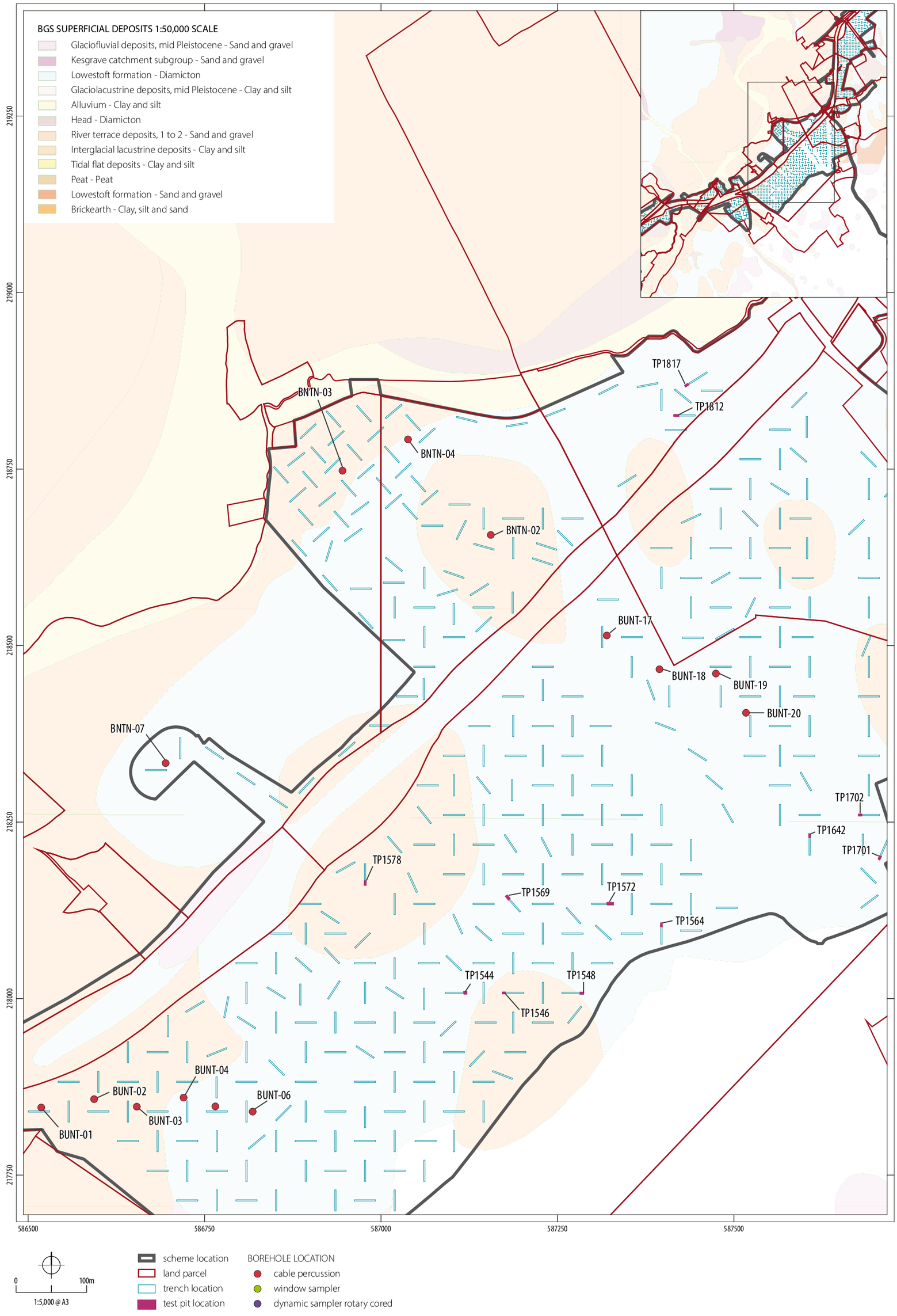
BOREHOLE LOCATION
window sampler
dynamic sampler rotary cored

0 50m
1:2,500 @ A3

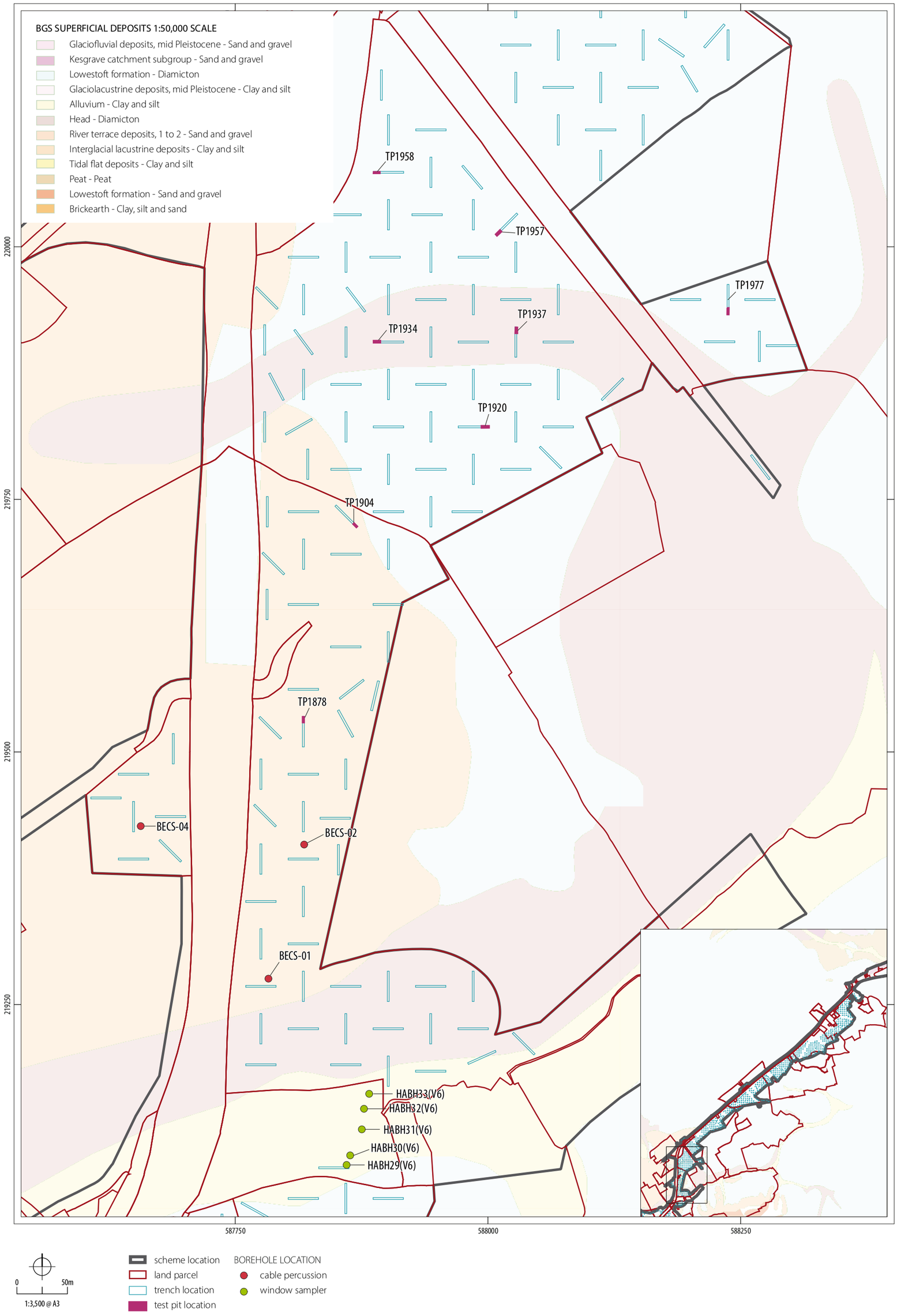
ILLUS 11D Test pit and borehole locations in Quaternary Landscape Evaluation Area 3



ILLUS 12A Test pit and borehole locations in Quaternary Landscape Evaluation Area 4



ILLUS 12B Test pit and borehole locations in Quaternary Landscape Evaluation Area 4



ILLUS 13A Test pit and borehole locations in Quaternary Landscape Evaluation Area 5

BGS SUPERFICIAL DEPOSITS 1:50,000 SCALE

- Glaciofluvial deposits, mid Pleistocene - Sand and gravel
- Kesgrave catchment subgroup - Sand and gravel
- Lowestoft formation - Diamicton
- Glaciolacustrine deposits, mid Pleistocene - Clay and silt
- Alluvium - Clay and silt
- Head - Diamicton
- River terrace deposits, 1 to 2 - Sand and gravel
- Interglacial lacustrine deposits - Clay and silt
- Tidal flat deposits - Clay and silt
- Peat - Peat
- Lowestoft formation - Sand and gravel
- Brickearth - Clay, silt and sand

TP2226
TP2218
TP2680
TP2190
TP2198
TP2145
TP2136
TP2115
SHRW-05
SHRW-03
SHRW-02

221250
221000
220750
220500
220250

588250
588500
588750
589000
589250
589500
589750

scheme location
land parcel
trench location
test pit location

BOREHOLE LOCATION
cable percussion

0 100m
1:5,000 @ A3

ILLUS 13B Test pit and borehole locations in Quaternary Landscape Evaluation Area 5

BGS SUPERFICIAL DEPOSITS 1:50,000 SCALE

- Glaciofluvial deposits, mid Pleistocene - Sand and gravel
- Kesgrave catchment subgroup - Sand and gravel
- Lowestoft formation - Diamicton
- Glaciolacustrine deposits, mid Pleistocene - Clay and silt
- Alluvium - Clay and silt
- Head - Diamicton
- River terrace deposits, 1 to 2 - Sand and gravel
- Interglacial lacustrine deposits - Clay and silt
- Tidal flat deposits - Clay and silt
- Peat - Peat
- Lowestoft formation - Sand and gravel
- Brickearth - Clay, silt and sand

TP2378
TP2360
TP2346
TP2340
TP2312
SHRE-10
SHRE-11
SHRE-09
TP2257
TP2240

222500
222250
222000
221750
221500

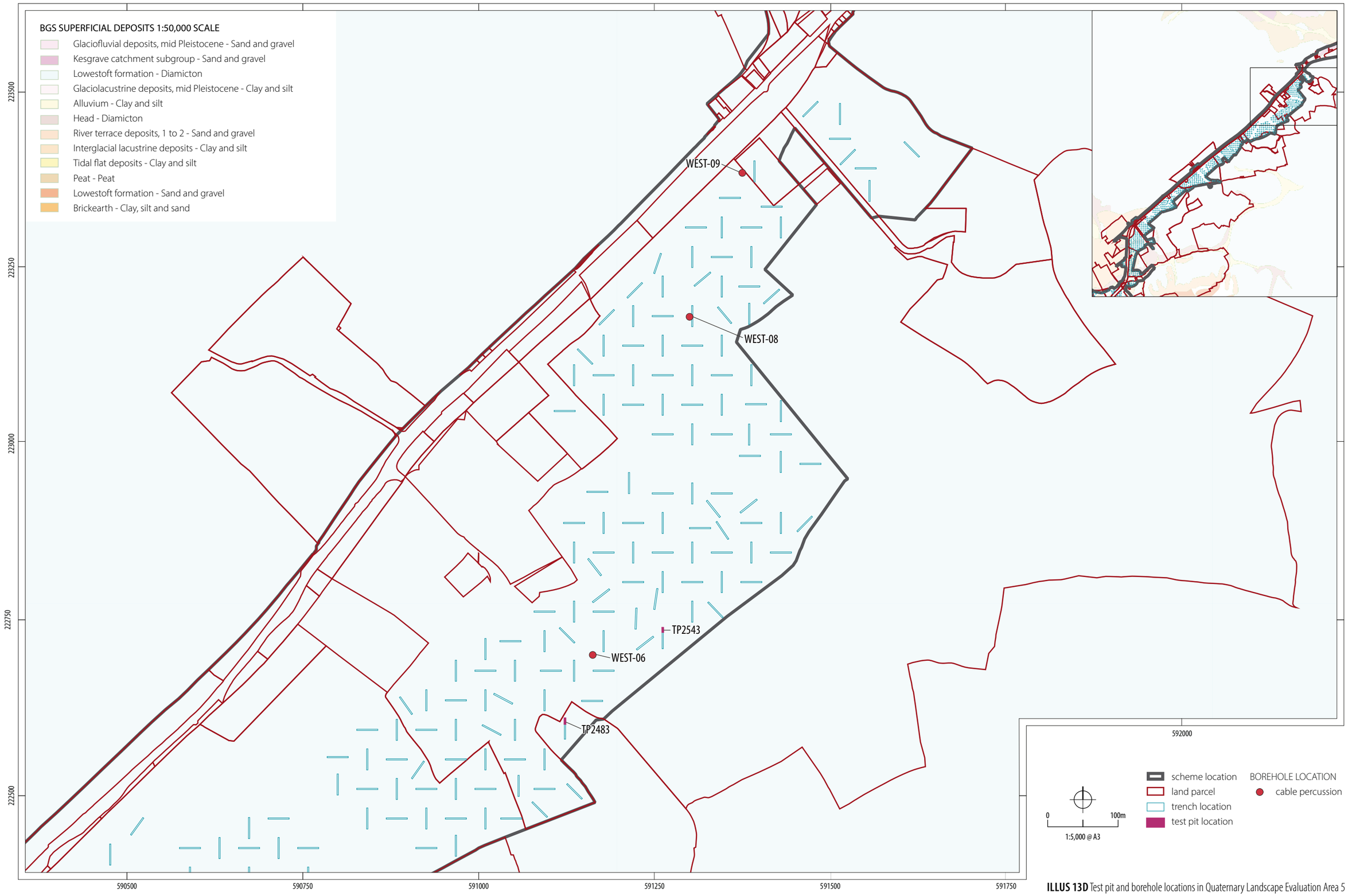
589500
589750
590000
590250
590500
590750
591000
591250

- scheme location
- land parcel
- trench location
- test pit location

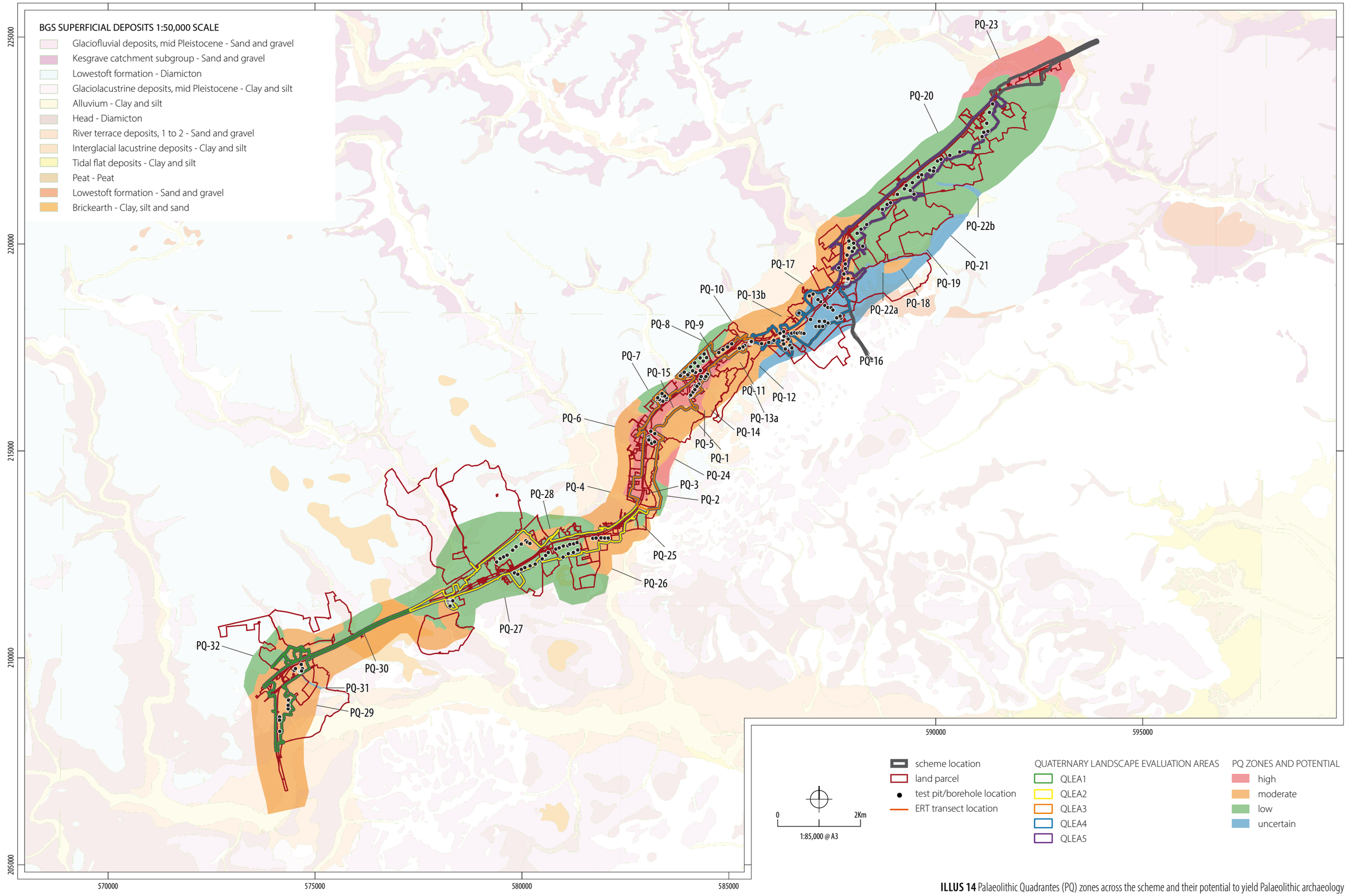
BOREHOLE LOCATION
- cable percussion

0 100m
1:5,000 @ A3

ILLUS 13C Test pit and borehole locations in Quaternary Landscape Evaluation Area 5



ILLUS 13D Test pit and borehole locations in Quaternary Landscape Evaluation Area 5



ILLUS 14 Palaeolithic Quadrantes (PQ) zones across the scheme and their potential to yield Palaeolithic archaeology

APPENDIX 1 SUMMARY OF THE QUATERNARY

Table A1.1. Summary of Quaternary events, key geological sequences, likely sediment and environmental evidence, key archaeological sites and events in East Anglia during the Quaternary (based on Bridgland (1994), Hosfield (2011) and Pettitt and White (2012). Blue indicates cool to cold glacial conditions; orange indicates warm interglacial/interstadial conditions.

MIS	Stages	Key geological sequences[1]	Key geological sequences[2]	Likely associated sediment types	Like palaeoenvironmental material	Key archaeological sites	East Anglian events
1	Holocene						
2-5d	Devensian	T1/2	T1/2	Fluvial sands and gravels, occasional organic beds	Large/small mammals, ostracods, molluscs, plant macrofossils, pollen	Lynford Bramford Road Guildford Road Firestation Three Ways Wharf Oldbury	*Glaciation of extreme north of East Anglia*
5e	Ipswichian						
6		T3	T3?	Fluvial sands and gravels		Pontnewydd?	*Possible glaciation in East Anglia*
7						Aveley Stanton Harcourt Creffield Road Crayford	
8	Saalian Complex	T4	T3?	Fluvial sands and gravels		Bakers Hole Harnham	
9						Purfleet Cuxton Wolvercote Furze Platt Stoke Newington	
10		T5	T3?	Fluvial sands and gravels			
11	Hoxnian	Interglacial lake sequences	Interglacial lake sequences	Fine grained clays/silts with occasional organic beds	Large/small mammals, ostracods, molluscs, plant macrofossils, pollen	Swanscombe Barnham Elvedon Beeches Pit Southfleet Road Clacton Hoxne	
12	Anglian	Lowestoft Formation	Lowestoft Formation (including T4/5)	Dense clays with flint/chalk clasts, some sands and gravels		Boxgrove (Eartham Formation) Caversham	*Main glaciation of East Anglia*
13				Fine grained clays/silts with occasional organic beds	Large/small mammals, ostracods, molluscs, plant macrofossils, pollen	Boxgrove (Slindon Formation) Thurmaston Member High Lodge Corfe Mullen Waverly Wood Member Warren Hill (Fresh)	*?Wivenhoe interglacial sediments?*

14		Kesgrave Formation	Kesgrave Formation	Fluvial sands and gravels, occasional organic beds			*?Wivenhoe Lower Gravel*
15				Fine grained clays/silts with occasional organic beds	Large/small mammals, ostracods, molluscs, plant macrofossils, pollen	Maids Cross Hill Warren Hill (rolled) Kents Cavern? Fordwich?	
16		Kesgrave Formation	Kesgrave Formation	Fluvial sands and gravels, occasional organic beds			
17						Pakefield?	'Cromer Forest Bed Formation'
18		Kesgrave Formation	Kesgrave Formation	Fluvial sands and gravels, occasional organic beds			Ardleigh Formation
19						Pakefield?	'Cromer Forest Bed Formation'
20		Kesgrave Formation	Kesgrave Formation	Fluvial sands and gravels, occasional organic beds			
21						?Happisburgh 3	
22		Kesgrave Formation	Kesgrave Formation	Fluvial sands and gravels,			
23							
24		Kesgrave Formation	Kesgrave Formation	Fluvial sands and gravels,			
25						?Happisburgh 3	

[1] Here the Blackwater Terraces are all considered to be typical fluvial sequences

[2] Here terraces 4 and 5 of the Blackwater are considered as kame terraces of the Anglian ice sheet, the age of terrace 3 is difficult to ascertain.

Table A1.2. Details of the discrete stratigraphic units within the scheme. Highlighted rows indicate alternative interpretations of the sequences for Blackwater Terrace 4 and 5.

'Formation'	East Anglian events	Likely age	Associated sediment types	Likely environments of deposition	Likely contexts for archaeological material
Holocene alluvium		11,700 - present	Clays-silts-peats with some sands and gravels	Low energy meandering channels with overbank floodplain surfaces	On floodplain surfaces, on channel margins and on edge of floodplain at boundary with higher, drier ground. Mixture of primary context material and reworked material in higher energy areas
Head		Any age post-Anglian (425,000 – present)	Poorly sorted mixes of clay-silt-sand with beds of gravel, structureless or bedded and with occasional palaeosols	Slopes across which sheet flow or channel flow occurs in temperate environments and solifluction in cold environments. Stable environments result in soil formation. Head may bury deposits of any other type/period	Reworked artefacts present in sediments as deposits move downslope. Primary context artefacts may occur in association with palaeosols.
Blackwater Terrace 1		MIS 2, Last Glacial Maximum?	Bedded sands and gravels with occasional fine grained organic horizons. Overlain by Head deposits and potential palaeosols	High energy braided channels giving way to lower energy channel and overbank flooding. Capped by slope wash sequences	Reworked material in high energy gravels with possible primary context material in finer grained sediments. Reworked material in slope wash or solifiuction deposits, primary context material associated with palaeosols
Blackwater Terrace 2		MIS 5d-2 (115,000-11,700)	Bedded sands and gravels with occasional fine grained organic horizons, close to base of gravels. Overlain by Head deposits and potential palaeosols	High energy braided channels giving way to lower energy channel and overbank flooding. Capped by slope wash sequences	Reworked material in high energy gravels with possible primary context material in finer grained sediments. Reworked material in slope wash or solifiuction deposits, primary context material associated with palaeosols
Blackwater Terrace 3		? MIS 6/8/10 ?	Bedded sands and gravels with occasional fine grained organic horizons. Overlain by possible fine grained silts. Head deposits and potential palaeosols	High energy braided channels giving way to lower energy channel and overbank flooding, perhaps in interglacial. Capped by slope wash sequences with solifluction during cold stages	Reworked material in high energy gravels with possible primary context material in finer grained floodplain sediments. Reworked material in slope wash or solifiuction deposits, primary context material associated with palaeosols
Blackwater Terrace 4		? MIS 8	Bedded sands and gravels with occasional fine grained organic horizons. Overlain by	High energy braided channels giving way to lower energy channel and overbank flooding,	Reworked material in high energy gravels with possible primary context material in finer grained floodplain sediments. Reworked material in slope wash or solifiuction deposits, primary context material associated with palaeosols

			possible fine grained silts. Head deposits and potential palaeosols	perhaps in interglacial. Capped by slope wash sequences with solifluction during cold stages	
Blackwater Terrace 4		Late MIS 12	Bedded sands and gravels	High energy fluvial during outwash from ice sheet	Reworked material in sands and gravels
Blackwater Terrace 5		? MIS 10	Bedded sands and gravels with occasional fine grained organic horizons. Overlain by possible fine grained silts. Head deposits and potential palaeosols	High energy braided channels giving way to lower energy channel and overbank flooding, perhaps in interglacial. Capped by slope wash sequences with solifluction during cold stages	Reworked material in high energy gravels with possible primary context material in finer grained floodplain sediments. Reworked material in slope wash or solifiuction deposits, primary context material associated with palaeosols
Blackwater Terrace 5		Late MIS 12	Bedded sands and gravels	High energy fluvial during outwash from ice sheet	Reworked material in sands and gravels
Interglacial lake sediments		MIS 11 (425,000-374,000)	Fine grained silts and clays with intercalated peats	Lake edge and lake basin	Primary context material possible around edge of lake or at base of lake prior to lake formation
Sub-lake sands and gravels		? late MIS 12/early MIS 11 ?	Bedded sands and gravels	High energy fluvial during outwash from ice sheet	Reworked material in sands and gravels
Till (including sands and gravels)	Lowestoft Formation	MIS 12 (480,000 – 425,000)	Dense clays with flint and chalk clasts	Sub-glacial and extra-glacial locations	Reworked material in clays
Sub-till sands and gravels	Kesgrave/Colchester Formation	Pre-MIS 12, >480,000	Sands and gravels with intercalated organic sands and silts	High energy braided channels with lower energy, possible interglacial channels	Reworked material in sands and gravels, possible primary context and reworked material in the finer grained channel fills.

APPENDIX 2 REGISTERS AND RESULTS

A2.1 Results for test pits. Results of test pit recording. Each row represents a depositional unit, and alternating colours indicate different test pits. Depths shown in metres below ground level and metres Above Ordnance Datum. Interpretation subject to review.

AREA	PLOT	PQ AREA	TEST PIT	DEPOSIT	DEPTH (m)	SPITS	Description and transition	Interpretation
Bolton South	P/14.1	29	TP13	TP13-01	0.00 - 0.25 m BGL (17.80 - 17.55 m AOD)	No	Medium greyish brown sandy silty clay. - - - - -	Topsoil
Bolton South	P/14.1	29	TP13	TP13-02	0.25 - 0.90 m BGL (17.55 - 16.90 m AOD)	No	Medium orangish brown silty clay. Matrix supported. Deposit is structureless. Clasts are 1% of unit, and 0.01 to 0.03m in size. Sub-rounded to rounded. Clasts are flint and tertiary flint. - - Abrupt and irregular transition - -	Lacustrine deposit
Bolton South	P/14.1	29	TP13	TP13-03	0.90 - 2.10 m BGL (16.90 - 15.70 m AOD)	Yes (400 l sifted)	Medium reddish brown clayey sandy gravel. Matrix supported. Deposit is bedded. Clasts are 60% of unit, and 0.01 to 0.1m in size. Sub-rounded to rounded. Clasts are flint, tertiary flint and quartz. - - Sharp and wavy transition - -	Fluvial sand
Bolton South	P/14.1	29	TP13	TP13-04	2.10 - 2.20 m BGL (15.70 - 15.60 m AOD)	Yes	Medium blueish grey clay. Matrix supported. Deposit is bedded. - - end of test pit - -	Lacustrine deposit
Bolton South	P/14.1	29	TP2912	TP2912-01	0.00 - 0.30 m BGL (20.81 - 20.51 m AOD)	No	Light yellowish brown sandy silty clay. - - - - -	Topsoil
Bolton South	P/14.1	29	TP2912	TP2912-02	0.30 - 3.00 m BGL (20.51 - 17.81 m AOD)	Yes	Medium orangish brown silty clay. Matrix supported. Deposit is bedded. Clasts are 1% of unit, and 0.01 to 0.03m in size. Sub-angular to sub-rounded. Clasts are flint and tertiary flint. - - - - -	Lacustrine deposit
Bolton South	P/14.1	29	TP2912	TP2912-03	3.00 - 3.20 m BGL (17.81 - 17.61 m AOD)	Yes	Medium greyish brown sandy silty clay. Matrix supported. Deposit is bedded. Clasts are 3% of unit, and 0.01 to 0.06m in size. Sub-angular to rounded. Clasts are flint, tertiary flint, quartzite and quartz. - - end of test pit - -	Lacustrine deposit
Bolton South	P/14.1	29	TP2906	TP2906-01	0.00 - 0.30 m BGL (21.34 - 21.04 m AOD)	No	Light yellowish brown sandy silty clay. - - - - -	Topsoil
Bolton South	P/14.1	29	TP2906	TP2906-02	0.30 - 0.60 m BGL (21.04 - 20.74 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 1% of unit, and 0.02 to 0.05m in size. Sub-rounded to rounded. Clasts are flint. - - Sharp and irregular transition - -	Lacustrine deposit

Bolton South	P/14.1	29	TP2906	TP2906-03	0.60 - 3.20 m BGL (20.74 - 18.14 m AOD)	No	Medium yellowish brown silty clay. Matrix supported. Deposit is bedded. - - end of test pit - -	Lacustrine deposit
Bolton South	P/14.1	29	TP48	TP48-01	0.00 - 0.30 m BGL (20.58 - 20.28 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Bolton South	P/14.1	29	TP48	TP48-02	0.30 - 0.50 m BGL (20.28 - 20.08 m AOD)	No	Medium yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 20% of unit, and 0 to 0.06m in size. Sub-rounded to rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and irregular transition - -	Colluvium
Bolton South	P/14.1	29	TP48	TP48-03	0.50 - 1.60 m BGL (20.08 - 18.98 m AOD)	Yes (300 l sifted)	Medium orangish brown clayey sandy gravel. Matrix supported. Deposit is bedded. Clasts are 50% of unit, and 0 to 0.15m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Sharp and wavy transition - -	Fluvial sand
Bolton South	P/14.1	29	TP48	TP48-04	1.60 - 3.20 m BGL (18.98 - 17.38 m AOD)	Yes	Medium blueish grey silty clay. Matrix supported. Deposit is bedded. - - end of test pit - -	Lacustrine deposit
Bolton South	P/14.1	29	TP38	TP38-01	0.00 - 0.30 m BGL (20.31 - 20.01 m AOD)	No	Medium greyish brown sandy silty clay. - - - - -	Topsoil
Bolton South	P/14.1	29	TP38	TP38-02	0.30 - 0.60 m BGL (20.01 - 19.71 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 3% of unit, and 0 to 0.05m in size. Sub-angular to sub-rounded. Clasts are flint and tertiary flint. - - Abrupt and irregular transition - -	Colluvium
Bolton South	P/14.1	29	TP38	TP38-03	0.60 - 1.70 m BGL (19.71 - 18.61 m AOD)	Yes (300 l sifted)	Medium orangish brown clayey sandy gravel. Matrix supported. Deposit is bedded. Clasts are 50% of unit, and 0 to 0.09m in size. Sub-rounded to rounded. Clasts are flint, tertiary flint and quartz. - - Sharp and wavy transition - -	Fluvial sand
Bolton South	P/14.1	29	TP38	TP38-04	1.70 - 2.90 m BGL (18.61 - 17.41 m AOD)	Yes	Medium orangish grey silty clay. Matrix supported. Deposit is structureless. Clasts are 20% of unit, and 0 to 0.15m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Sharp and irregular transition - -	Fine-grained head deposit
Bolton South	P/14.1	29	TP38	TP38-05	2.90 - 3.00 m BGL (17.41 - 17.31 m AOD)	Yes	Medium blueish grey silty clay. Matrix supported. Deposit is bedded. - - end of test pit - -	Lacustrine deposit
Bolton South	P/14.1	29	TP60	TP60-01	0.00 - 0.40 m BGL (22.06 - 21.66 m AOD)	No	Medium greyish brown sandy silty clay. - - - - -	Topsoil

Bolton South	P/14.1	29	TP60	TP60-02	0.40 - 0.90 m BGL (21.66 - 21.16 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 1% of unit, and 0 to 0.03m in size. Sub-rounded to rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and irregular transition - -	Colluvium
Bolton South	P/14.1	29	TP60	TP60-03	0.90 - 1.30 m BGL (21.16 - 20.76 m AOD)	Yes (100 l sifted)	Medium orangish brown clayey sandy gravel. Matrix supported. Deposit is structureless. Clasts are 50% of unit, and 0 to 0.08m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Sharp and wavy transition - -	Fluvial sand
Bolton South	P/14.1	29	TP60	TP60-04	1.30 - 3.20 m BGL (20.76 - 18.86 m AOD)	Yes	Medium blueish grey silty clay. Matrix supported. Deposit is bedded. - - end of test pit - -	Lacustrine deposit
Bolton Paynes Ln & Countryside Zest	P/14.3	29	TP118	TP118-01	0.00 - 0.35 m BGL (27.36 - 27.01 m AOD)	No	Medium greyish brown sandy silty clay. - - - - -	Topsoil
Bolton Paynes Ln & Countryside Zest	P/14.3	29	TP118	TP118-02	0.35 - 1.40 m BGL (27.01 - 25.96 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 1% of unit, and 0.01 to 0.04m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and irregular transition - -	Fine-grained head deposit
Bolton Paynes Ln & Countryside Zest	P/14.3	29	TP118	TP118-03	1.40 - 1.70 m BGL (25.96 - 25.66 m AOD)	Yes (100 l sifted)	Medium orangish brown clayey sandy gravel. Matrix supported. Deposit is bedded. Clasts are 30% of unit, and 0.01 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and irregular transition - -	Coarse-grained head deposit
Bolton Paynes Ln & Countryside Zest	P/14.3	29	TP118	TP118-04	1.70 - 2.10 m BGL (25.66 - 25.26 m AOD)	Yes (100 l sifted)	Medium yellowish brown silty sandy gravel. Matrix supported. Deposit is fining upwards. Clasts are 85% of unit, and 0 to 0.15m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, quartz and quartzite. - - end of test pit - -	Fluvial gravel
Bolton Paynes Ln & Countryside Zest	P/14.3	29	TP121	TP121-01	0.00 - 0.40 m BGL (26.46 - 26.06 m AOD)	No	Medium greyish brown sandy silty clay. - - - - -	Topsoil
Bolton Paynes Ln & Countryside Zest	P/14.3	29	TP121	TP121-02	0.40 - 0.70 m BGL (26.06 - 25.76 m AOD)	No	Medium orangish brown silty clay. Matrix supported. Deposit is bedded. Clasts are 25% of unit, and 0 to 0.05m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Sharp and wavy transition - -	Fine-grained head deposit

Bolton Paynes Ln & Countryside Zest	P/14.3	29	TP121	TP121-03	0.70 - 1.40 m BGL (25.76 - 25.06 m AOD)	No	Medium blueish grey sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 1% of unit, and 0.01 to 0.03m in size. Sub-rounded to rounded. Clasts are flint and tertiary flint. - - Abrupt and irregular transition - -	Fine-grained head deposit
Bolton Paynes Ln & Countryside Zest	P/14.3	29	TP121	TP121-04	1.40 - 1.90 m BGL (25.06 - 24.56 m AOD)	Yes (200 l sifted)	Medium blueish grey clayey coarse sand. Matrix supported. Deposit is structureless. Clasts are 50% of unit, and 0.01 to 0.08m in size. Sub-rounded to rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and irregular transition - -	Fine-grained head deposit
Bolton Paynes Ln & Countryside Zest	P/14.3	29	TP121	TP121-05	1.90 - 2.90 m BGL (24.56 - 23.56 m AOD)	No	Medium reddish brown silty clay. Matrix supported. Deposit is structureless. - - end of test pit - -	Solid geology
Bolton Paynes Ln & Countryside Zest	P/14.3	29	TP141	TP141-01	0.00 - 0.30 m BGL (27.07 - 26.77 m AOD)	No	Medium greyish brown sandy silty clay. - - - - -	Topsoil
Bolton Paynes Ln & Countryside Zest	P/14.3	29	TP141	TP141-02	0.30 - 1.00 m BGL (26.77 - 26.07 m AOD)	No	Medium orangish brown clayey silty fine sand. Matrix supported. Deposit is structureless. Clasts are 20% of unit, and 0 to 0.25m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and irregular transition - -	Coarse-grained head deposit
Bolton Paynes Ln & Countryside Zest	P/14.3	29	TP141	TP141-03	1.00 - 1.80 m BGL (26.07 - 25.27 m AOD)	No	Medium reddish brown silty fine sand. Matrix supported. Deposit is structureless. Clasts are 20% of unit, and 0 to 0.15m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and irregular transition - -	Fluvial sand
Bolton Paynes Ln & Countryside Zest	P/14.3	29	TP141	TP141-04	1.10 - 1.80 m BGL (25.97 - 25.27 m AOD)	No	Dark reddish brown sandy silty clay. Matrix supported. Deposit is bedded. Clasts are 30% of unit, and 0.01 to 0.2m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and irregular transition - -	Fine-grained alluvium
Bolton Paynes Ln & Countryside Zest	P/14.3	29	TP141	TP141-05	1.80 - 2.80 m BGL (25.27 - 24.27 m AOD)	Yes (400 l sifted)	Medium orangish brown clayey sandy gravel. Matrix supported. Deposit is bedded. Clasts are 60% of unit, and 0 to 0.2m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and irregular transition - -	Fluvial gravel
Bolton Paynes Ln & Countryside Zest	P/14.3	29	TP141	TP141-06	2.80 - 3.00 m BGL (24.27 - 24.07 m AOD)	No	Medium reddish brown silty medium sand. Matrix supported. Deposit is structureless. - - Sharp and wavy transition - -	Fluvial sand

Bolton Paynes Ln & Countryside Zest	P/14.3	29	TP141	TP141-07	3.00 - 3.30 m BGL (24.07 - 23.77 m AOD)	Yes	Medium blueish grey clay. Matrix supported. Deposit is structureless. - - end of test pit - -	Solid geology
Bolton Paynes Ln & Countryside Zest	P/14.3	29	TP130	TP130-01	0.00 - 0.30 m BGL (25.75 - 25.45 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Bolton Paynes Ln & Countryside Zest	P/14.3	29	TP130	TP130-02	0.30 - 0.70 m BGL (25.45 - 25.05 m AOD)	No	Medium greyish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 30% of unit, and 0 to 0.1m in size. Sub-rounded to rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and wavy transition - -	Colluvium
Bolton Paynes Ln & Countryside Zest	P/14.3	29	TP130	TP130-03	0.70 - 1.10 m BGL (25.05 - 24.65 m AOD)	No	Dark greyish brown sandy clay. Matrix supported. Deposit is bedded. Clasts are 15% of unit, and 0 to 0.06m in size. Sub-rounded to rounded. Clasts are flint and tertiary flint. - - Abrupt and irregular transition - -	Coarse-grained head deposit
Bolton Paynes Ln & Countryside Zest	P/14.3	29	TP130	TP130-04	1.10 - 1.60 m BGL (24.65 - 24.15 m AOD)	No	Medium orangish brown clayey silty fine sand. Matrix supported. Deposit is structureless. Clasts are 2% of unit, and 0.01 to 0.1m in size. Sub-rounded to rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and irregular transition - -	Fluvial sand
Bolton Paynes Ln & Countryside Zest	P/14.3	29	TP130	TP130-05	1.60 - 2.30 m BGL (24.15 - 23.45 m AOD)	Yes (100 l sifted)	Medium orangish brown sandy gravel. Matrix supported. Deposit is bedded. Clasts are 70% of unit, and 0.01 to 0.15m in size. Sub-rounded to rounded. Clasts are flint, tertiary flint and quartz. - - end of test pit - -	Fluvial gravel
Ratcliffe & Rayleigh Wedge-Bellway	P/104	29	TP269	TP269-01	0.00 - 0.25 m BGL (18.58 - 18.33 m AOD)	No	Medium orangish brown sandy silty clay. - - - - -	Topsoil
Ratcliffe & Rayleigh Wedge-Bellway	P/104	29	TP269	TP269-02	0.25 - 1.25 m BGL (18.33 - 17.33 m AOD)	No	Medium orangish brown silty clay. Matrix supported. Deposit is structureless. Clasts are 1% of unit, and 0.01 to 0.05m in size. Sub-rounded to rounded. Clasts are flint and tertiary flint. - - Sharp and wavy transition - -	Fine-grained alluvium
Ratcliffe & Rayleigh Wedge-Bellway	P/104	29	TP269	TP269-03	1.25 - 1.80 m BGL (17.33 - 16.78 m AOD)	No	Medium brownish grey silty clay. Matrix supported. Deposit is structureless. - - Sharp and wavy transition - -	Fine-grained alluvium
Ratcliffe & Rayleigh Wedge-Bellway	P/104	29	TP269	TP269-04	1.80 - 1.80 m BGL (16.78 - 16.78 m AOD)	No	Medium orangish brown silty clay. Matrix supported. Deposit is structureless. - - end of test pit - -	Fine-grained alluvium

Ratcliffe & Rayleigh Wedge-Bellway	P/104	29	TP258	TP258-01	0.00 - 0.30 m BGL (19.15 - 18.85 m AOD)	No	Medium orangish brown sandy silty clay. - - - - -	Topsoil
Ratcliffe & Rayleigh Wedge-Bellway	P/104	29	TP258	TP258-02	0.30 - 2.40 m BGL (18.85 - 16.75 m AOD)	No	Medium orangish brown silty clay. Matrix supported. Deposit is structureless. Clasts are 1% of unit, and 0.01 to 0.04m in size. Sub-rounded to rounded. Clasts are flint and tertiary flint. - - Abrupt and irregular transition - -	Fine-grained alluvium
Ratcliffe & Rayleigh Wedge-Bellway	P/104	29	TP258	TP258-03	2.40 - 2.50 m BGL (16.75 - 16.65 m AOD)	Yes (40 l sifted)	Medium orangish brown silty clayey gravel. Matrix supported. Deposit is structureless. Clasts are 70% of unit, and 0.01 to 0.25m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, quartzite and quartz. - - end of test pit - -	Fluvial gravel
Rayleigh 1 & 2	P/113.2	27	TP2728	TP2728-01	0.00 - 0.40 m BGL (46.04 - 45.64 m AOD)	No	Dark brownish brown sandy silty clay. - - - - -	Topsoil
Rayleigh 1 & 2	P/113.2	27	TP2728	TP2728-02	0.40 - 2.20 m BGL (45.64 - 43.84 m AOD)	Yes (400 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 10% of unit, and 0.01 to 0.15m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, quartzite and quartz. - - Abrupt and irregular transition - -	Fine-grained head deposit
Rayleigh 1 & 2	P/113.2	27	TP2728	TP2728-03	2.20 - 2.90 m BGL (43.84 - 43.14 m AOD)	No	Light orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0.01 to 0.3m in size. Sub-angular to sub-rounded. Clasts are flint and chalk. - - end of test pit - -	Till
Rayleigh 1 & 2	P/113.2	27	TP2742	TP2742-01	0.00 - 0.40 m BGL (46.31 - 45.91 m AOD)	No	Medium brownish brown sandy silty clay. - - - - -	Topsoil
Rayleigh 1 & 2	P/113.2	27	TP2742	TP2742-02	0.40 - 1.30 m BGL (45.91 - 45.01 m AOD)	Yes (200 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 1% of unit, and 0 to 0.05m in size. Sub-angular to sub-rounded. Clasts are flint, chalk, quartz and sandstone. - - Abrupt and irregular transition - -	Fine-grained head deposit
Rayleigh 1 & 2	P/113.2	27	TP2742	TP2742-03	1.30 - 2.90 m BGL (45.01 - 43.41 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.2m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and sandstone. - - end of test pit - -	Till
Rayleigh 1 & 2	P/113.2	27	TP2753	TP2753-01	0.00 - 0.35 m BGL (46.16 - 45.81 m AOD)	No	Medium brownish brown sandy silty clay. - - - - -	Topsoil

Rayleigh 1 & 2	P/113.2	27	TP2753	TP2753-02	0.35 - 1.10 m BGL (45.81 - 45.06 m AOD)	Yes (300 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 1% of unit, and 0 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint and chalk. - - Sharp and wavy transition - -	Fine-grained head deposit
Rayleigh 1 & 2	P/113.2	27	TP2753	TP2753-03	1.10 - 1.50 m BGL (45.06 - 44.66 m AOD)	Yes (100 l sifted)	Medium greyish brown sandy silty clay. Matrix supported. Deposit is coarsening upwards. Clasts are 40% of unit, and 0 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint, chalk, quartzite and quartz. - - Abrupt and irregular transition - -	Fine-grained alluvium
Rayleigh 1 & 2	P/113.2	27	TP2753	TP2753-04	1.50 - 2.90 m BGL (44.66 - 43.26 m AOD)	No	Medium yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.25m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and sandstone. - - end of test pit - -	Till
Rayleigh 1 & 2	P/113.2	27	TP2764	TP2764-01	0.00 - 0.30 m BGL (45.67 - 45.37 m AOD)	No	Dark brownish brown sandy silty clay. - - - - -	Topsoil
Rayleigh 1 & 2	P/113.2	27	TP2764	TP2764-02	0.30 - 0.50 m BGL (45.37 - 45.17 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 10% of unit, and 0 to 0.2m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and irregular transition - -	Fine-grained head deposit
Rayleigh 1 & 2	P/113.2	27	TP2764	TP2764-03	0.50 - 2.90 m BGL (45.17 - 42.77 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.5m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and chalk. - - end of test pit - -	Till
Rayleigh 1 & 2	P/113.2	27	TP477	TP477-01	0.00 - 0.40 m BGL (47.94 - 47.54 m AOD)	No	Medium yellowish brown sandy silty clay. - - - - -	Topsoil
Rayleigh 1 & 2	P/113.2	27	TP477	TP477-02	0.40 - 3.00 m BGL (47.54 - 44.94 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.2m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and sandstone. - - end of test pit - -	Till
Rayleigh 1 & 2	P/113.2	27	TP510	TP510-01	0.00 - 0.40 m BGL (48.37 - 47.97 m AOD)	No	Medium greyish brown sandy silty clay. - - - - -	Topsoil
Rayleigh 1 & 2	P/113.2	27	TP510	TP510-02	0.40 - 3.00 m BGL (47.97 - 45.37 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.5m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk and sandstone. - - end of test pit - -	Till

Ulting & Wood-Kennels	P/112	27	TP340	TP340-01	0.00 - 0.30 m BGL (40.75 - 40.45 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Ulting & Wood-Kennels	P/112	27	TP340	TP340-02	0.30 - 1.05 m BGL (40.45 - 39.70 m AOD)	Yes (400 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 10% of unit, and 0 to 0.15m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk and quartz. - - Abrupt and irregular transition - -	Fine-grained head deposit
Ulting & Wood-Kennels	P/112	27	TP340	TP340-03	1.05 - 3.00 m BGL (39.70 - 37.75 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 1m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk, quartz and sandstone. - - end of test pit - -	Till
Ulting & Wood-Kennels	P/112	27	TP345	TP345-01	0.00 - 0.25 m BGL (43.25 - 43.00 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Ulting & Wood-Kennels	P/112	27	TP345	TP345-02	0.25 - 0.40 m BGL (43.00 - 42.85 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Clasts are 10% of unit, and 0 to 0.04m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk and quartz. - - Abrupt and discontinuous transition - -	Fine-grained head deposit
Ulting & Wood-Kennels	P/112	27	TP345	TP345-03	0.40 - 2.90 m BGL (42.85 - 40.35 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.15m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk, quartz and sandstone. - - end of test pit - -	Till
Ulting & Wood-Kennels	P/112	27	TP355	TP355-01	0.00 - 0.25 m BGL (44.04 - 43.79 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Ulting & Wood-Kennels	P/112	27	TP355	TP355-02	0.25 - 0.35 m BGL (43.79 - 43.69 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 5% of unit, and 0 to 0.05m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and quartz. - - Abrupt and discontinuous transition - -	Fine-grained head deposit
Ulting & Wood-Kennels	P/112	27	TP355	TP355-03	0.35 - 2.90 m BGL (43.69 - 41.14 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.15m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and sandstone. - - end of test pit - -	Till
Ulting & Wood-Kennels	P/112	27	TP364	TP364-01	0.00 - 0.25 m BGL (43.82 - 43.57 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil

Ulting & Wood-Kennels	P/112	27	TP364	TP364-02	0.25 - 0.30 m BGL (43.57 - 43.52 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 5% of unit, and 0 to 0.05m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and chalk. - - Abrupt and discontinuous transition - -	Fine-grained head deposit
Ulting & Wood-Kennels	P/112	27	TP364	TP364-03	0.30 - 2.90 m BGL (43.52 - 40.92 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk and sandstone. - - end of test pit - -	Till
Ulting & Wood-Kennels	P/112	27	TP382	TP382-01	0.00 - 0.30 m BGL (41.48 - 41.18 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Ulting & Wood-Kennels	P/112	27	TP382	TP382-02	0.30 - 0.80 m BGL (41.18 - 40.68 m AOD)	Yes (200 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 20% of unit, and 0 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk, quartz and sandstone. - - Abrupt and irregular transition - -	Fine-grained head deposit
Ulting & Wood-Kennels	P/112	27	TP382	TP382-03	0.80 - 3.15 m BGL (40.68 - 38.33 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.25m in size. Sub-angular to sub-rounded. Clasts are flint, chalk, quartz and sandstone. - - end of test pit - -	Till
Ulting & Wood-Kennels	P/112	27	TP397	TP397-01	0.00 - 0.30 m BGL (40.48 - 40.18 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Ulting & Wood-Kennels	P/112	27	TP397	TP397-02	0.30 - 0.75 m BGL (40.18 - 39.73 m AOD)	Yes (200 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 5% of unit, and 0 to 0.15m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and irregular transition - -	Fine-grained head deposit
Ulting & Wood-Kennels	P/112	27	TP397	TP397-03	0.75 - 2.50 m BGL (39.73 - 37.98 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 35% of unit, and 0 to 0.25m in size. Sub-angular to sub-rounded. Clasts are flint, chalk, quartz and sandstone. - - Sharp and irregular transition - -	Till
Ulting & Wood-Kennels	P/112	27	TP397	TP397-04	2.50 - 3.20 m BGL (37.98 - 37.28 m AOD)	Yes (300 l sifted)	Medium orangish yellow sandy gravel. Matrix supported. Deposit is structureless. Clasts are 60% of unit, and 0 to 0.2m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, quartzite and quartz. - - end of test pit - -	Fluvial gravel

Vellacot	P/51	27	TP597	TP597-01	0.00 - 0.30 m BGL (31.19 - 30.89 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Vellacot	P/51	27	TP597	TP597-02	0.30 - 3.20 m BGL (30.89 - 27.99 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Deposit is coarsening upwards. Clasts are 1% of unit, and 0 to 0.03m in size. Sub-angular to sub-rounded. Clasts are flint, chalk, quartz and sandstone. - - end of test pit - -	Fine-grained head deposit
Vellacot	P/51	27	TP629	TP629-01	0.00 - 0.35 m BGL (28.58 - 28.23 m AOD)	No	Dark brownish grey silty sandy clay. - - - - -	Topsoil
Vellacot	P/51	27	TP629	TP629-02	0.35 - 1.60 m BGL (28.23 - 26.98 m AOD)	Yes (400 l sifted)	Medium reddish brown clayey sandy gravel. Matrix supported. Deposit is bedded. Clasts are 50% of unit, and 0.01 to 0.15m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, quartz and quartzite. - - Abrupt and wavy transition - -	Fluvial sand
Vellacot	P/51	27	TP629	TP629-03	1.60 - 3.00 m BGL (26.98 - 25.58 m AOD)	No	Medium orangish grey sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 30% of unit, and 0 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and chalk. - - end of test pit - -	Till
Granville & Wood-Gas	P/02.2	26	TP901	TP901-01	0.00 - 0.30 m BGL (18.02 - 17.72 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Granville & Wood-Gas	P/02.2	26	TP901	TP901-02	0.30 - 0.50 m BGL (17.72 - 17.52 m AOD)	Yes (100 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 20% of unit, and 0 to 0.15m in size. Sub-angular to sub-rounded. Clasts are flint and quartz. - - Diffuse and irregular transition - -	Fine-grained head deposit
Granville & Wood-Gas	P/02.2	26	TP901	TP901-03	0.50 - 1.50 m BGL (17.52 - 16.52 m AOD)	Yes (200 l sifted)	Medium reddish brown sandy gravel. Matrix supported. Deposit is coarsening upwards. Clasts are 50% of unit, and 0 to 0.2m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and wavy transition - -	Fluvial sand
Granville & Wood-Gas	P/02.2	26	TP901	TP901-04	1.50 - 2.30 m BGL (16.52 - 15.72 m AOD)	No	Medium orangish brown sandy clay. Matrix supported. Deposit is fining upwards. Clasts are 5% of unit, and 0 to 0.1m in size. Sub-rounded to rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and irregular transition - -	Fine-grained alluvium

Granville & Wood-Gas	P/02.2	26	TP901	TP901-05	2.30 - 3.00 m BGL (15.72 - 15.02 m AOD)	Yes (200 l sifted)	Medium greyish orange sandy gravel. Matrix supported. Deposit is structureless. Clasts are 60% of unit, and 0.01 to 0.4m in size. Sub-rounded to rounded. Clasts are flint, tertiary flint, quartzite, quartz and sandstone. - - end of test pit - -	Fluvial gravel
Granville & Wood-Gas	P/02.2	26	TP903	TP 903-01	0.00 - 0.30 m BGL (16.97 - 16.67 m AOD)	No	Medium greyish brown sandy silty clay. - - - - -	Topsoil
Granville & Wood-Gas	P/02.2	26	TP903	TP 903-02	0.30 - 0.55 m BGL (16.67 - 16.42 m AOD)	Yes (100 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 15% of unit, and 0 to 0.06m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and irregular transition - -	Fine-grained head deposit
Granville & Wood-Gas	P/02.2	26	TP903	TP 903-03	0.55 - 0.90 m BGL (16.42 - 16.07 m AOD)	Yes (200 l sifted)	Medium orangish brown sandy clayey gravel. Matrix supported. Deposit is structureless. Clasts are 50% of unit, and 0.01 to 0.08m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and irregular transition - -	Fluvial gravel
Granville & Wood-Gas	P/02.2	26	TP903	TP 903-04	0.90 - 1.30 m BGL (16.07 - 15.67 m AOD)	No	Dark reddish brown clayey sandy gravel. Matrix supported. Deposit is structureless. Clasts are 80% of unit, and 0.01 to 0.1m in size. Sub-rounded to rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and irregular transition - -	Fluvial gravel
Granville & Wood-Gas	P/02.2	26	TP903	TP 903-05	1.30 - 2.10 m BGL (15.67 - 14.87 m AOD)	Yes (200 l sifted)	Light yellowish brown sandy clayey gravel. Matrix supported. Deposit is structureless. Clasts are 50% of unit, and 0.01 to 0.08m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and irregular transition - -	Fluvial gravel
Granville & Wood-Gas	P/02.2	26	TP903	TP 903-06	2.10 - 2.60 m BGL (14.87 - 14.37 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 1% of unit, and 0 to 0.02m in size. Sub-angular to sub-rounded. Clasts are flint. - - Sharp and irregular transition - -	Fine-grained alluvium
Granville & Wood-Gas	P/02.2	26	TP903	TP 903-07	2.60 - 2.70 m BGL (14.37 - 14.27 m AOD)	No	Dark reddish brown clayey sandy gravel. Matrix supported. Deposit is structureless. Clasts are 80% of unit, and 0.01 to 0.1m in size. Sub-rounded to rounded. Clasts are flint, tertiary flint and quartz. - - end of test pit - -	Fluvial gravel
Granville & Wood-Gas	P/02.2	26	TP918	TP918-01	0.00 - 0.30 m BGL (16.71 - 16.41 m AOD)	No	Medium greyish brown sandy silty clay. - - - - -	Topsoil

Granville & Wood-Gas	P/02.2	26	TP918	TP918-02	0.30 - 1.05 m BGL (16.41 - 15.66 m AOD)	Yes (300 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 15% of unit, and 0.01 to 0.08m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and irregular transition - -	Fine-grained head deposit
Granville & Wood-Gas	P/02.2	26	TP918	TP918-03	1.05 - 1.70 m BGL (15.66 - 15.01 m AOD)	Yes (200 l sifted)	Medium reddish brown clayey sandy gravel. Matrix supported. Deposit is bedded. Clasts are 70% of unit, and 0.01 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Sharp and wavy transition - -	Fluvial gravel
Granville & Wood-Gas	P/02.2	26	TP918	TP918-04	1.70 - 2.10 m BGL (15.01 - 14.61 m AOD)	Yes (100 l sifted)	Dark greyish brown sandy clay. Matrix supported. Deposit is structureless. Clasts are 20% of unit, and 0.01 to 0.05m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Sharp and irregular transition - -	Fine-grained alluvium
Granville & Wood-Gas	P/02.2	26	TP918	TP918-05	2.10 - 3.10 m BGL (14.61 - 13.61 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Deposit is bedded. Clasts are 1% of unit, and 0 to 0.02m in size. Sub-angular to sub-rounded. Clasts are flint and quartz. - - Sharp and irregular transition - -	Fine-grained alluvium
Granville & Wood-Gas	P/02.2	26	TP918	TP918-06	3.10 - 3.10 m BGL (13.61 - 13.61 m AOD)	No	Medium reddish brown sandy gravel. Matrix supported. Deposit is structureless. Clasts are 60% of unit, and 0.01 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - end of test pit - -	Fluvial gravel
Granville & Wood-Gas	P/02.2	26	TP920	TP920-01	0.00 - 0.30 m BGL (16.64 - 16.34 m AOD)	No	Medium greyish brown sandy silty clay. - - - - -	Topsoil
Granville & Wood-Gas	P/02.2	26	TP920	TP920-02	0.30 - 2.50 m BGL (16.34 - 14.14 m AOD)	Yes (700 l sifted)	Medium reddish brown clayey sandy gravel. Matrix supported. Deposit is bedded. Clasts are 75% of unit, and 0 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - end of test pit - -	Fluvial gravel
Granville & Wood-Gas	P/02.2	26	TP922	TP922-01	0.00 - 0.30 m BGL (16.80 - 16.50 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Granville & Wood-Gas	P/02.2	26	TP922	TP922-02	0.30 - 2.50 m BGL (16.50 - 14.30 m AOD)	Yes (500 l sifted)	Medium orangish brown clayey sandy gravel. Matrix supported. Deposit is bedded. Clasts are 80% of unit, and 0 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and irregular transition - -	Fluvial gravel

Granville & Wood-Gas	P/02.2	26	TP922	TP922-03	2.50 - 3.20 m BGL (14.30 - 13.60 m AOD)	Yes (200 l sifted)	Medium orangish brown sandy clay. Matrix supported. Deposit is laminated (intermittent). Clasts are flint and quartz. - - end of test pit - -	Fine-grained alluvium
Brice West	P/57.3	7	TP1022	TP1022-01	0.00 - 0.30 m BGL (26.21 - 25.91 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Brice West	P/57.3	7	TP1022	TP1022-02	0.30 - 3.10 m BGL (25.91 - 23.11 m AOD)	No	Light orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.25m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk and sandstone. - - end of test pit - -	Till
Brice West	P/57.3	7	TP1018	TP1018-01	0.00 - 0.40 m BGL (25.21 - 24.81 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Brice West	P/57.3	7	TP1018	TP1018-02	0.40 - 2.90 m BGL (24.81 - 22.31 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0.01 to 0.15m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk, quartzite and sandstone. - - end of test pit - -	Till
Brice West	P/57.3	5	TP1019	TP1019-01	0.00 - 0.30 m BGL (24.72 - 24.42 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Brice West	P/57.3	5	TP1019	TP1019-02	0.30 - 2.90 m BGL (24.42 - 21.82 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.2m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk, quartzite, quartz and sandstone. - - end of test pit - -	Till
Brice West	P/57.3	5	TP1015	TP1015-01	0.00 - 0.30 m BGL (24.27 - 23.97 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Brice West	P/57.3	5	TP1015	TP1015-02	0.30 - 3.00 m BGL (23.97 - 21.27 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.15m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk and sandstone. - - end of test pit - -	Till
Brice West	P/57.3	5	TP1016	TP1016-01	0.00 - 0.40 m BGL (22.07 - 21.67 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil

Brice West	P/57.3	5	TP1016	TP1016-02	0.40 - 0.90 m BGL (21.67 - 21.17 m AOD)	Yes (200 l sifted)	Medium orangish brown clayey medium sand. Matrix supported. Deposit is bedded. Clasts are 40% of unit, and 0 to 0.08m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk, quartz and sandstone. - - Abrupt and irregular transition - -	Fluvial sand
Brice West	P/57.3	5	TP1016	TP1016-03	0.90 - 2.80 m BGL (21.17 - 19.27 m AOD)	No	Medium yellowish brown silty medium sand. Matrix supported. Deposit is bedded. Clasts are 10% of unit, and 0 to 1m in size. Sub-rounded to rounded. Clasts are flint, tertiary flint, quartz and sandstone. - - Abrupt and irregular transition - -	Fluvial sand
Brice West	P/57.3	5	TP1016	TP1016-04	2.80 - 2.90 m BGL (19.27 - 19.17 m AOD)	No	Medium brownish grey sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.2m in size. Sub-angular to sub-rounded. Clasts are flint and chalk. - - end of test pit - -	Till
Brice West	P/57.3	7	TP1037	TP1037-01	0.00 - 0.30 m BGL (26.48 - 26.18 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Brice West	P/57.3	7	TP1037	TP1037-02	0.30 - 3.00 m BGL (26.18 - 23.48 m AOD)	No	Medium yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 30% of unit, and 0 to 0.2m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk and sandstone. - - end of test pit - -	Till
Brice West	P/57.3	5	TP1029	TP1029-01	0.00 - 0.30 m BGL (24.24 - 23.94 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Brice West	P/57.3	5	TP1029	TP1029-02	0.30 - 3.00 m BGL (23.94 - 21.24 m AOD)	No	Medium yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.2m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk and sandstone. - - end of test pit - -	Till
Brice West	P/57.3	5	TP1030	TP1030-01	0.00 - 0.40 m BGL (22.30 - 21.90 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Brice West	P/57.3	5	TP1030	TP1030-02	0.40 - 0.60 m BGL (21.90 - 21.70 m AOD)	No	Medium reddish brown clayey coarse sand. Matrix supported. Deposit is structureless. Clasts are 30% of unit, and 0 to 0.07m in size. Sub-angular to sub-rounded. Clasts are flint and quartz. - - Abrupt and irregular transition - -	Fine-grained head deposit
Brice West	P/57.3	5	TP1030	TP1030-03	0.60 - 3.10 m BGL (21.70 - 19.20 m AOD)	Yes	Medium yellowish brown silty clay. Matrix supported. Deposit is bedded. - - end of test pit - -	Lacustrine deposit

Brice West	P/57.3	5	TP1027	TP1027-01	0.00 - 0.25 m BGL (20.33 - 20.08 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Brice West	P/57.3	5	TP1027	TP1027-02	0.25 - 0.50 m BGL (20.08 - 19.83 m AOD)	No	Dark reddish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 5% of unit, and 0 to 0.06m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and chalk. - - Abrupt and irregular transition - -	Fine-grained head deposit
Brice West	P/57.3	5	TP1027	TP1027-03	0.50 - 0.90 m BGL (19.83 - 19.43 m AOD)	Yes (100 l sifted)	Light yellowish brown clayey silt. Matrix supported. Deposit is bedded. Clasts are 1% of unit, and 0.01 to 0.03m in size. Sub-angularClasts are chalk. - - Abrupt and irregular transition - -	Lacustrine deposit
Brice West	P/57.3	5	TP1027	TP1027-04	0.90 - 1.70 m BGL (19.43 - 18.63 m AOD)	Yes	Medium reddish brown sandy gravel. Matrix supported. Deposit is bedded. Clasts are 40% of unit, and 0 to 0.3m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, quartz and quartzite. - - Abrupt and wavy transition - -	Fluvial sand
Brice West	P/57.3	5	TP1027	TP1027-05	1.70 - 2.50 m BGL (18.63 - 17.83 m AOD)	No	Medium orangish brown silty medium sand. Matrix supported. Deposit is bedded. Clasts are 5% of unit, and 0 to 0.04m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk, quartz and quartzite. - - Sharp and irregular transition - -	Fluvial sand
Brice West	P/57.3	5	TP1027	TP1027-06	2.50 - 3.10 m BGL (17.83 - 17.23 m AOD)	No	Medium brownish grey sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0.01 to 0.5m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and chalk. - - end of test pit - -	Till
Brice West	P/57.3	5	TP1025	TP1025-01	0.00 - 0.30 m BGL (19.02 - 18.72 m AOD)	No	Medium greyish brown sandy silty clay. - - - - -	Topsoil
Brice West	P/57.3	5	TP1025	TP1025-02	0.30 - 1.40 m BGL (18.72 - 17.62 m AOD)	No	Medium orangish brown silty sandy clay. Matrix supported. Deposit is structureless. Clasts are 1% of unit, and 0 to 0.04m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and quartz. - - Abrupt and irregular transition - -	Fine-grained head deposit
Brice West	P/57.3	5	TP1025	TP1025-03	1.40 - 1.80 m BGL (17.62 - 17.22 m AOD)	Yes (100 l sifted)	Medium orangish brown silty sandy clay. Matrix supported. Deposit is structureless. Clasts are 25% of unit, and 0 to 0.4m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk and quartz. - - Abrupt and irregular transition - -	Coarse-grained head deposit

Brice West	P/57.3	5	TP1025	TP1025-04	1.80 - 3.10 m BGL (17.22 - 15.92 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.25m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk and sandstone. - - Abrupt and wavy transition - -	Till
Brice West	P/57.3	5	TP1025	TP1025-05	3.10 - 3.20 m BGL (15.92 - 15.82 m AOD)	No	Medium orangish brown silty clay. Matrix supported. Deposit is structureless. Clasts are 1% of unit, and 0 to 0.01m in size. Sub-roundedClasts are chalk. - - end of test pit - -	Solid geology
Sawdon, Bunting & Belchem	P/120.1	13	TP1381	TP1381-01	0.00 - 0.30 m BGL (22.56 - 22.26 m AOD)	No	Dark orangish brown sandy silty clay. - - - - -	Topsoil
Sawdon, Bunting & Belchem	P/120.1	13	TP1381	TP1381-02	0.30 - 0.50 m BGL (22.26 - 22.06 m AOD)	No	Dark orangish brown sandy clay. Matrix supported. Deposit is fining upwards. Clasts are 10% of unit, and 0 to 0.07m in size. Sub-angular to sub-rounded. Clasts are flint and tertiary flint. - - Sharp and irregular transition - -	Fine-grained head deposit
Sawdon, Bunting & Belchem	P/120.1	13	TP1381	TP1381-03	0.50 - 1.90 m BGL (22.06 - 20.66 m AOD)	Yes (200 l sifted)	Medium orangish brown clayey sandy gravel. Matrix supported. Deposit is bedded. Clasts are 80% of unit, and 0 to 0.2m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Sharp and irregular transition - -	Fluvial gravel
Sawdon, Bunting & Belchem	P/120.1	13	TP1381	TP1381-04	1.90 - 2.70 m BGL (20.66 - 19.86 m AOD)	Yes (100 l sifted)	Medium orangish brown clayey silty medium sand. Matrix supported. Deposit is structureless. Clasts are 10% of unit, and 0 to 0.06m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and irregular transition - -	Fluvial sand
Sawdon, Bunting & Belchem	P/120.1	13	TP1381	TP1381-05	2.70 - 3.20 m BGL (19.86 - 19.36 m AOD)	No	Medium orangish brown clayey sandy gravel. Matrix supported. Deposit is bedded. Clasts are 80% of unit, and 0.01 to 0.15m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - end of test pit - -	Fluvial gravel
Sawdon, Bunting & Belchem	P/118.2	13	TP1418	TP1418-01	0.00 - 0.30 m BGL (24.06 - 23.76 m AOD)	No	Medium greyish brown sandy silty clay. - - - - -	Topsoil
Sawdon, Bunting & Belchem	P/118.2	13	TP1418	TP1418-02	0.30 - 1.30 m BGL (23.76 - 22.76 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Made ground

Sawdon, Bunting & Belchem	P/118.2	13	TP1418	TP1418-03	1.30 - 1.40 m BGL (22.76 - 22.66 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 5% of unit, and 0 to 0.08m in size. Sub-rounded to rounded. Clasts are flint and tertiary flint. - - Abrupt and irregular transition - -	Fine-grained alluvium
Sawdon, Bunting & Belchem	P/118.2	13	TP1418	TP1418-04	1.40 - 3.10 m BGL (22.66 - 20.96 m AOD)	Yes (500 l sifted)	Medium orangish brown clayey sandy gravel. Matrix supported. Deposit is bedded. Clasts are 60% of unit, and 0.01 to 0.15m in size. Sub-rounded to rounded. Clasts are flint, quartzite and quartz. - - end of test pit - -	Fluvial gravel
Sawdon, Bunting & Belchem	P/118.2	13	TP1420	TP1420-01	0.00 - 0.25 m BGL (21.82 - 21.57 m AOD)	No	Medium greyish brown sandy silty clay. - - - - -	0.00
Sawdon, Bunting & Belchem	P/118.2	13	TP1420	TP1420-02	0.25 - 0.60 m BGL (21.57 - 21.22 m AOD)	Yes (100 l sifted)	Medium orangish brown clayey sandy gravel. Matrix supported. Deposit is structureless. Clasts are 70% of unit, and 0 to 0.17m in size. Sub-rounded to rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and wavy transition - -	Fluvial gravel
Sawdon, Bunting & Belchem	P/118.2	13	TP1420	TP1420-03	0.60 - 0.70 m BGL (21.22 - 21.12 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Deposit is laminated (intermittent). Clasts are 5% of unit, and 0 to 0.05m in size. Sub-rounded to rounded. Clasts are flint and tertiary flint. - - Abrupt and irregular transition - -	Fine-grained alluvium
Sawdon, Bunting & Belchem	P/118.2	13	TP1420	TP1420-04	0.70 - 0.90 m BGL (21.12 - 20.92 m AOD)	No	Medium brownish grey clayey sandy gravel. Matrix supported. Deposit is fining upwards. Clasts are 50% of unit, and 0.01 to 0.4m in size. Sub-rounded to rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and irregular transition - -	Fluvial gravel
Sawdon, Bunting & Belchem	P/118.2	13	TP1420	TP1420-05	0.90 - 1.30 m BGL (20.92 - 20.52 m AOD)	No	Medium orangish grey clayey medium sand. Matrix supported. Deposit is fining upwards. Clasts are 2% of unit, and 0 to 0.01m in size. Sub-angular to sub-rounded. Clasts are flint and tertiary flint. - - end of test pit - -	Fluvial sand
Sawdon, Bunting & Belchem	P/118.1	13	TP1408	TP1408-01	0.00 - 0.30 m BGL (25.00 - 24.70 m AOD)	No	Medium greyish brown sandy silty clay. - - - - -	Topsoil
Sawdon, Bunting & Belchem	P/118.1	13	TP1408	TP1408-02	0.30 - 0.90 m BGL (24.70 - 24.10 m AOD)	Yes (200 l sifted)	Light orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 2% of unit, and 0 to 0.1m in size. Sub-rounded to rounded. Clasts are flint, tertiary flint, chalk, quartzite and quartz. - - Sharp and irregular transition - -	Fine-grained alluvium

Sawdon, Bunting & Belchem	P/118.1	13	TP1408	TP1408-03	0.90 - 1.10 m BGL (24.10 - 23.90 m AOD)	Yes (200 l sifted)	Medium reddish brown silty clayey medium sand. Matrix supported. Deposit is structureless. Clasts are 70% of unit, and 0 to 0.15m in size. Sub-rounded to rounded. Clasts are flint, tertiary flint, chalk, quartzite and quartz. - - Abrupt and irregular transition - -	Fluvial gravel
Sawdon, Bunting & Belchem	P/118.1	13	TP1408	TP1408-04	1.10 - 3.10 m BGL (23.90 - 21.90 m AOD)	No	Light greyish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0.02 to 0.3m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and sandstone. - - end of test pit - -	Till
Sawdon, Bunting & Belchem	P/118.1	13	TP2942	TP2942-01	0.00 - 0.30 m BGL (27.12 - 26.82 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Sawdon, Bunting & Belchem	P/118.1	13	TP2942	TP2942-02	0.30 - 0.60 m BGL (26.82 - 26.52 m AOD)	Yes (200 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 25% of unit, and 0.01 to 0.15m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and chalk. - - Abrupt and irregular transition - -	Fine-grained head deposit
Sawdon, Bunting & Belchem	P/118.1	13	TP2942	TP2942-03	0.60 - 3.20 m BGL (26.52 - 23.92 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.3m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk and sandstone. - - end of test pit - -	Till
Sawdon, Bunting & Belchem	P/118.1	16	TP2970	TP2970-01	0.00 - 0.25 m BGL (28.78 - 28.53 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Sawdon, Bunting & Belchem	P/118.1	16	TP2970	TP2970-02	0.25 - 3.00 m BGL (28.53 - 25.78 m AOD)	No	Medium greyish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0.01 to 0.4m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk and sandstone. - - end of test pit - -	Till
Sawdon, Bunting & Belchem	P/118.1	13	TP1416	TP1416-01	0.00 - 0.35 m BGL (27.63 - 27.28 m AOD)	No	Dark greyish brown sandy silty clay. . Deposit is . - - and transition - -	Topsoil
Sawdon, Bunting & Belchem	P/118.1	13	TP1416	TP1416-02	0.35 - 0.60 m BGL (27.28 - 27.03 m AOD)	Yes (100 l sifted)	Medium orangish brown silty sandy clay. Matrix supported. Deposit is fining upwards. Clasts are 15% of unit, and 0.01 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartzite. - - Abrupt and irregular transition - -	Fine-grained head deposit

Sawdon, Bunting & Belchem	P/118.1	13	TP1416	TP1416-03	0.60 - 2.00 m BGL (27.03 - 25.63 m AOD)	Yes (200 l sifted)	Medium greyish orange clayey silty coarse sand. Matrix supported. Deposit is laminated (intermittent). Clasts are 10% of unit, and 0.01 to 0.05m in size. Sub-angular to sub-rounded. Clasts are flint and tertiary flint. - - Abrupt and irregular transition - -	Fluvial sand
Sawdon, Bunting & Belchem	P/118.1	13	TP1416	TP1416-04	2.00 - 3.10 m BGL (25.63 - 24.53 m AOD)	Yes (400 l sifted)	Medium reddish brown silty sandy gravel. Matrix supported. Deposit is fining upwards. Clasts are 90% of unit, and 0.01 to 0.2m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - end of test pit - -	Fluvial gravel
Sawdon, Bunting & Belchem	P/118.1	13	TP2667	TP2667-01	0.00 - 0.35 m BGL (28.59 - 28.24 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Sawdon, Bunting & Belchem	P/118.1	13	TP2667	TP2667-02	0.35 - 0.90 m BGL (28.24 - 27.69 m AOD)	Yes (200 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 20% of unit, and 0 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk and quartz. - - Abrupt and irregular transition - -	Fine-grained head deposit
Sawdon, Bunting & Belchem	P/118.1	13	TP2667	TP2667-03	0.90 - 1.50 m BGL (27.69 - 27.09 m AOD)	Yes (200 l sifted)	Medium orangish brown silty clayey coarse sand. Matrix supported. Deposit is structureless. Clasts are 30% of unit, and 0 to 0.1m in size. Sub-rounded to rounded. Clasts are flint, tertiary flint and quartz. - - Sharp and wavy transition - -	Fluvial sand
Sawdon, Bunting & Belchem	P/118.1	13	TP2667	TP2667-04	1.50 - 3.10 m BGL (27.09 - 25.49 m AOD)	No	Light orangish brown silty sandy clay. Matrix supported. Deposit is structureless. Clasts are 1% of unit, and 0 to 0.05m in size. Rounded to . Clasts are flint. - - Sharp and irregular transition - -	Fine-grained alluvium
Sawdon, Bunting & Belchem	P/118.1	13	TP2667	TP2667-05	3.10 - 3.10 m BGL (25.49 - 25.49 m AOD)	No	Medium reddish brown clayey sandy gravel. Clast supported. Deposit is structureless. Clasts are flint. - - end of test pit - -	Fluvial gravel
Sawdon, Bunting & Belchem	P/118.1	16	TP2967	TP2967-01	0.00 - 0.25 m BGL (31.26 - 31.01 m AOD)	No	Medium greyish brown clayey silty sand. - - - - -	Topsoil

Sawdon, Bunting & Belchem	P/118.1	16	TP2967	TP2967-02	0.25 - 1.00 m BGL (31.01 - 30.26 m AOD)	Yes (200 l sifted)	Medium orangish brown clayey medium sand. Matrix supported. Deposit is structureless. Clasts are 60% of unit, and 0.01 to 0.4m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, quartzite and quartz. - - Diffuse and irregular transition - -	Fluvial gravel
Sawdon, Bunting & Belchem	P/118.1	16	TP2967	TP2967-03	1.00 - 3.10 m BGL (30.26 - 28.16 m AOD)	Yes (200 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is coarsening upwards. Clasts are 25% of unit, and 0 to 0.3m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, quartzite and quartz. - - Sharp and wavy transition - -	Fine-grained alluvium
Sawdon, Bunting & Belchem	P/118.1	16	TP2967	TP2967-04	3.10 - 3.20 m BGL (28.16 - 28.06 m AOD)	No	Light blueish grey sandy silty clay. Matrix supported. Deposit is structureless. - - end of test pit - -	Fine-grained alluvium
Sawdon, Bunting & Belchem	P/118.1	16	TP2981	TP2981-01	0.00 - 0.25 m BGL (32.38 - 32.13 m AOD)	No	Medium greyish brown sandy silty clay. - - - - -	Topsoil
Sawdon, Bunting & Belchem	P/118.1	16	TP2981	TP2981-02	0.25 - 3.00 m BGL (32.13 - 29.38 m AOD)	No	Light greyish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.2m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk, quartzite and sandstone. - - end of test pit - -	Till
Bunting 1&2	P/118.4	16	TP1578	TP1578-01	0.00 - 0.50 m BGL (36.72 - 36.22 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Bunting 1&2	P/118.4	16	TP1578	TP1578-02	0.50 - 1.60 m BGL (36.22 - 35.12 m AOD)	Yes (300 l sifted)	Medium reddish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 20% of unit, and 0 to 0.2m in size. Sub-angular to sub-rounded. Clasts are flint and quartzite. - - Sharp and irregular transition - -	Fine-grained head deposit
Bunting 1&2	P/118.4	16	TP1578	TP1578-03	1.60 - 3.10 m BGL (35.12 - 33.62 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.4m in size. Sub-angular to sub-rounded. Clasts are flint and chalk. - - end of test pit - -	Till
Bunting 1&2	P/118.4	16	TP1569	TP1569-01	0.00 - 0.40 m BGL (38.36 - 37.96 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Bunting 1&2	P/118.4	16	TP1569	TP1569-02	0.40 - 3.28 m BGL (37.96 - 35.08 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0.02 to 0.25m in size. Sub-angular to sub-rounded. Clasts are flint and chalk. - - end of test pit - -	Till

Bunting 1&2	P/118.4	16	TP1544	TP1544-01	0.00 - 0.45 m BGL (38.01 - 37.56 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Bunting 1&2	P/118.4	16	TP1544	TP1544-02	0.45 - 3.05 m BGL (37.56 - 34.96 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 30% of unit, and 0.02 to 0.3m in size. Sub-angular to sub-rounded. Clasts are flint and chalk. - - end of test pit - -	Till
Bunting 1&2	P/118.4	16	TP1548	TP1548-01	0.00 - 0.74 m BGL (41.86 - 41.12 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Bunting 1&2	P/118.4	16	TP1548	TP1548-02	0.74 - 3.00 m BGL (41.12 - 38.86 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0.01 to 0.5m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and sandstone. - - end of test pit - -	Till
Bunting 1&2	P/118.4	16	TP1572	TP1572-01	0.00 - 0.50 m BGL (40.81 - 40.31 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	0.00
Bunting 1&2	P/118.4	16	TP1572	TP1572-02	0.50 - 3.00 m BGL (40.31 - 37.81 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.7m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk and quartzite. - - end of test pit - -	Till
Bunting 1&2	P/118.4	16	TP1564	TP1564-01	0.00 - 0.40 m BGL (42.38 - 41.98 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Bunting 1&2	P/118.4	16	TP1564	TP1564-02	0.40 - 0.70 m BGL (41.98 - 41.68 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 10% of unit, and 0 to 0.15m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and chalk. - - Abrupt and irregular transition - -	Fine-grained head deposit
Bunting 1&2	P/118.4	16	TP1564	TP1564-03	0.70 - 2.90 m BGL (41.68 - 39.48 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.2m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and chalk. - - end of test pit - -	Till
Bunting 1&2	P/118.4	16	TP1546	TP1546-01	0.00 - 0.40 m BGL (39.54 - 39.14 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Bunting 1&2	P/118.4	16	TP1546	TP1546-02	0.40 - 0.65 m BGL (39.14 - 38.89 m AOD)	Yes (200 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 5% of unit, and 0 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint and tertiary flint. - - Abrupt and irregular transition - -	Fine-grained head deposit

Bunting 1&2	P/118.4	16	TP1546	TP1546-03	0.65 - 3.10 m BGL (38.89 - 36.44 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.25m in size. Sub-angular to sub-rounded. Clasts are flint and chalk. - - end of test pit - -	Till
Bunting 1&2	P/118.4	16	TP1702	TP1702-01	0.00 - 0.35 m BGL (43.47 - 43.12 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Bunting 1&2	P/118.4	16	TP1702	TP1702-02	0.35 - 0.55 m BGL (43.12 - 42.92 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 10% of unit, and 0 to 0.3m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Sharp and discontinuous transition - -	Fine-grained head deposit
Bunting 1&2	P/118.4	16	TP1702	TP1702-03	0.55 - 1.00 m BGL (42.92 - 42.47 m AOD)	Yes (100 l sifted)	Medium reddish brown clayey medium sand. Matrix supported. Deposit is bedded. Clasts are 50% of unit, and 0 to 0.08m in size. Sub-rounded to rounded. Clasts are flint, quartz and tertiary flint. - - Diffuse and wavy transition - -	Fluvial gravel
Bunting 1&2	P/118.4	16	TP1702	TP1702-04	0.80 - 3.20 m BGL (42.67 - 40.27 m AOD)	Yes (200 l sifted)	Medium orangish brown clayey medium sand. Matrix supported. Deposit is structureless. Clasts are 5% of unit, and 0 to 0.07m in size. Sub-rounded to rounded. Clasts are flint, tertiary flint, quartzite and quartz. - - - - -	Fluvial sand
Bunting 1&2	P/118.4	16	TP1702	TP1702-05	0.70 - 1.60 m BGL (42.77 - 41.87 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.15m in size. Sub-angular to sub-rounded. Clasts are flint and chalk. - - end of test pit - -	Till
Bunting 1&2	P/118.4	16	TP1701	TP1701-01	0.00 - 0.30 m BGL (44.16 - 43.86 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Bunting 1&2	P/118.4	16	TP1701	TP1701-02	0.30 - 0.60 m BGL (43.86 - 43.56 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 10% of unit, and 0 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk and quartzite. - - Abrupt and irregular transition - -	Fine-grained head deposit
Bunting 1&2	P/118.4	16	TP1701	TP1701-03	0.60 - 2.20 m BGL (43.56 - 41.96 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.2m in size. Sub-rounded to rounded. Clasts are flint, tertiary flint, chalk, quartzite and sandstone. - - Sharp and irregular transition - -	Till

Bunting 1&2	P/118.4	16	TP1701	TP1701-04	2.20 - 3.20 m BGL (41.96 - 40.96 m AOD)	Yes (300 l sifted)	Medium reddish brown clayey medium sand. Matrix supported. Deposit is structureless. Clasts are 20% of unit, and 0.05 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint, quartzite and quartz. - - end of test pit - -	Fluvial sand
Bunting 1&2	P/118.4	16	TP1642	TP1642-01	0.00 - 0.40 m BGL (41.51 - 41.11 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Bunting 1&2	P/118.4	16	TP1642	TP1642-02	0.40 - 0.50 m BGL (41.11 - 41.01 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 10% of unit, and 0 to 0.2m in size. Sub-angular to sub-rounded. Clasts are flint and chalk. - - Abrupt and discontinuous transition - -	Fine-grained head deposit
Bunting 1&2	P/118.4	16	TP1642	TP1642-03	0.50 - 1.90 m BGL (41.01 - 39.61 m AOD)	No	Light yellowish brown silty sandy clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.2m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk and quartzite. - - Sharp and irregular transition - -	Till
Bunting 1&2	P/118.4	16	TP1642	TP1642-04	1.90 - 3.20 m BGL (39.61 - 38.31 m AOD)	No	Medium orangish brown clayey sandy medium sand. Matrix supported. Deposit is structureless. Clasts are 10% of unit, and 0 to 0.1m in size. Sub-rounded to rounded. Clasts are flint, tertiary flint and quartz. - - end of test pit - -	Fluvial sand
Bunting North	P/118.6	16	TP1812	TP1812-01	0.00 - 0.30 m BGL (28.12 - 27.82 m AOD)	No	Dark greyish brown sandy silty clay. . Deposit is . - - and transition - -	Topsoil
Bunting North	P/118.6	16	TP1812	TP1812-02	0.30 - 0.55 m BGL (27.82 - 27.57 m AOD)	Yes (100 l sifted)	Dark reddish brown silty clayey coarse sand. Matrix supported. Deposit is structureless. Clasts are 25% of unit, and 0 to 0.3m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk and quartz. - - Sharp and irregular transition - -	Coarse-grained head deposit
Bunting North	P/118.6	16	TP1812	TP1812-03	0.55 - 3.10 m BGL (27.57 - 25.02 m AOD)	No	Medium brownish grey sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0.01 to 0.4m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk and sandstone. - - end of test pit - -	Till
Bunting North	P/118.6	16	TP1817	TP1817-01	0.00 - 0.35 m BGL (24.41 - 24.06 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil

Bunting North	P/118.6	16	TP1817	TP1817-02	0.35 - 0.45 m BGL (24.06 - 23.96 m AOD)	Yes (100 l sifted)	Dark reddish brown silty sandy clay. Matrix supported. Deposit is bedded. Clasts are 15% of unit, and 0.01 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk and quartz. - - Sharp and irregular transition - -	Coarse-grained head deposit
Bunting North	P/118.6	16	TP1817	TP1817-03	0.45 - 3.00 m BGL (23.96 - 21.41 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0.01 to 0.4m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk and sandstone. - - end of test pit - -	Till
Bunting East & Crown Estate & Swiftbow & Wickham	P/145.2	17	TP1878	TP1878-01	0.00 - 0.35 m BGL (33.02 - 32.67 m AOD)	No	Medium greyish brown sandy silty clay. - - - - -	Topsoil
Bunting East & Crown Estate & Swiftbow & Wickham	P/145.2	17	TP1878	TP1878-02	0.35 - 1.90 m BGL (32.67 - 31.12 m AOD)	No	Medium orangish brown silty clay. Matrix supported. Deposit is fining upwards. Clasts are 1% of unit, and 0 to 0.01m in size. Sub-angular to sub-rounded. Clasts are flint and quartz. - - Diffuse and wavy transition - -	Fine-grained alluvium
Bunting East & Crown Estate & Swiftbow & Wickham	P/145.2	17	TP1878	TP1878-03	1.90 - 3.30 m BGL (31.12 - 29.72 m AOD)	No	Medium orangish brown clayey medium sand. Matrix supported. Deposit is fining upwards. Clasts are 10% of unit, and 0 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - end of test pit - -	Fluvial sand
Bunting East & Crown Estate & Swiftbow & Wickham	P/145.2	17	TP1904	TP1904-01	0.00 - 0.30 m BGL (33.38 - 33.08 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	0.00
Bunting East & Crown Estate & Swiftbow & Wickham	P/145.2	17	TP1904	TP1904-02	0.30 - 0.40 m BGL (33.08 - 32.98 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Deposit is bedded. Clasts are 2% of unit, and 0 to 0.05m in size. Sub-angular to sub-rounded. Clasts are flint and sandstone. - - Abrupt and irregular transition - -	Fine-grained head deposit
Bunting East & Crown Estate & Swiftbow & Wickham	P/145.2	17	TP1904	TP1904-03	0.40 - 1.10 m BGL (32.98 - 32.28 m AOD)	Yes (100 l sifted)	Medium reddish brown clayey sandy gravel. Matrix supported. Deposit is bedded. Clasts are 40% of unit, and 0 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and quartz. - - Abrupt and irregular transition - -	Fluvial sand
Bunting East & Crown Estate & Swiftbow & Wickham	P/145.2	17	TP1904	TP1904-04	1.10 - 3.20 m BGL (32.28 - 30.18 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.25m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and sandstone. - - end of test pit - -	Till

Bunting East & Crown Estate & Swiftbow & Wickham	P/153.1	19	TP1934	TP1934-01	0.00 - 0.30 m BGL (30.34 - 30.04 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Bunting East & Crown Estate & Swiftbow & Wickham	P/153.1	19	TP1934	TP1934-02	0.30 - 0.60 m BGL (30.04 - 29.74 m AOD)	Yes (200 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 10% of unit, and 0.01 to 0.15m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk, quartzite and quartz. - - Abrupt and irregular transition - -	Fine-grained head deposit
Bunting East & Crown Estate & Swiftbow & Wickham	P/153.1	19	TP1934	TP1934-03	0.60 - 3.05 m BGL (29.74 - 27.29 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0.01 to 0.4m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and sandstone. - - end of test pit - -	Till
Bunting East & Crown Estate & Swiftbow & Wickham	P/153.1	20	TP1958	TP1958-01	0.00 - 0.45 m BGL (32.52 - 32.07 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Bunting East & Crown Estate & Swiftbow & Wickham	P/153.1	20	TP1958	TP1958-02	0.45 - 1.00 m BGL (32.07 - 31.52 m AOD)	Yes (300 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 10% of unit, and 0.1 to 0.25m in size. Sub-angular to sub-rounded. Clasts are flint and quartz. - - Abrupt and irregular transition - -	Fine-grained head deposit
Bunting East & Crown Estate & Swiftbow & Wickham	P/153.1	20	TP1958	TP1958-03	1.00 - 3.20 m BGL (31.52 - 29.32 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0.02 to 0.45m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and sandstone. - - end of test pit - -	Till
Bunting East & Crown Estate & Swiftbow & Wickham	P/153.1	20	TP1957	TP1957-01	0.00 - 0.30 m BGL (30.17 - 29.87 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Bunting East & Crown Estate & Swiftbow & Wickham	P/153.1	20	TP1957	TP1957-02	0.30 - 0.45 m BGL (29.87 - 29.72 m AOD)	Yes (300 l sifted)	Medium reddish brown sandy clayey gravel. Matrix supported. Deposit is structureless. Clasts are 60% of unit, and 0.01 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and quartz. - - Diffuse and irregular transition - -	Fluvial gravel
Bunting East & Crown Estate & Swiftbow & Wickham	P/153.1	20	TP1957	TP1957-03	0.45 - 3.00 m BGL (29.72 - 27.17 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0.01 to 0.4m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and sandstone. - - end of test pit - -	Till
Bunting East & Crown Estate & Swiftbow & Wickham	P/153.1	19	TP1937	TP1937-01	0.00 - 0.30 m BGL (28.59 - 28.29 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil

Bunting East & Crown Estate & Swiftbow & Wickham	P/153.1	19	TP1937	TP1937-02	0.30 - 1.05 m BGL (28.29 - 27.54 m AOD)	Yes (300 l sifted)	Medium orangish brown clayey medium sand coarse sand. Matrix supported. Deposit is fining upwards. Clasts are 2% of unit, and 0.01 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint and chalk. - - Sharp and involuted transition - -	Fine-grained head deposit
Bunting East & Crown Estate & Swiftbow & Wickham	P/153.1	19	TP1937	TP1937-03	1.05 - 2.10 m BGL (27.54 - 26.49 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0.02 to 0.3m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and sandstone. - - - - -	Till
Bunting East & Crown Estate & Swiftbow & Wickham	P/153.1	19	TP1937	TP1937-04	1.10 - 2.10 m BGL (27.49 - 26.49 m AOD)	Yes	Medium orangish brown silty clay. Matrix supported. Deposit is laminated (intermittent). Clasts are 10% of unit, and 0.01 to 0.05m in size. Sub-rounded to rounded. Clasts are flint and chalk. - - end of test pit - -	Fine-grained alluvium
Bunting East & Crown Estate & Swiftbow & Wickham	P/153.1	19	TP1920	TP1920-01	0.00 - 0.30 m BGL (30.36 - 30.06 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Bunting East & Crown Estate & Swiftbow & Wickham	P/153.1	19	TP1920	TP1920-02	0.30 - 1.50 m BGL (30.06 - 28.86 m AOD)	Yes (500 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is fining upwards. Clasts are 2% of unit, and 0.01 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint and chalk. - - Abrupt and wavy transition - -	Fine-grained head deposit
Bunting East & Crown Estate & Swiftbow & Wickham	P/153.1	19	TP1920	TP1920-03	1.50 - 3.20 m BGL (28.86 - 27.16 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0.01 to 0.3m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and sandstone. - - end of test pit - -	Till
Bunting East & Crown Estate & Swiftbow & Wickham	P/152.1	19	TP1977	TP1977-01	0.00 - 0.20 m BGL (28.05 - 27.85 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Bunting East & Crown Estate & Swiftbow & Wickham	P/152.1	19	TP1977	TP1977-02	0.20 - 0.55 m BGL (27.85 - 27.50 m AOD)	Yes (200 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 10% of unit, and 0.01 to 0.15m in size. Sub-angular to sub-rounded. Clasts are flint and chalk. - - Abrupt and wavy transition - -	Fine-grained head deposit
Bunting East & Crown Estate & Swiftbow & Wickham	P/152.1	19	TP1977	TP1977-03	0.55 - 3.10 m BGL (27.50 - 24.95 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 45% of unit, and 0.01 to 0.3m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and sandstone. - - end of test pit - -	Till
Sherwood West	P/152.1	20	TP2115	TP2115-01	0.00 - 0.35 m BGL (38.90 - 38.55 m AOD)	No	Dark brownish brown sandy silty clay. - - - - -	Topsoil

Sherwood West	P/152.1	20	TP2115	TP2115-02	0.35 - 2.10 m BGL (38.55 - 36.80 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 30% of unit, and 0 to 0.4m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, quartzite and quartz. - - Abrupt and irregular transition - -	Coarse-grained head deposit
Sherwood West	P/152.1	20	TP2115	TP2115-03	2.10 - 3.00 m BGL (36.80 - 35.90 m AOD)	No	Light greyish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 30% of unit, and 0.02 to 0.5m in size. Sub-angular to sub-rounded. Clasts are flint and chalk. - - end of test pit - -	Till
Sherwood West	P/152.1	20	TP2136	TP2136-01	0.00 - 0.35 m BGL (40.40 - 40.05 m AOD)	No	Dark brownish brown sandy silty clay. - - - - -	Topsoil
Sherwood West	P/152.1	20	TP2136	TP2136-02	0.35 - 0.90 m BGL (40.05 - 39.50 m AOD)	Yes (250 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 20% of unit, and 0.02 to 0.25m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, quartzite and quartz. - - Abrupt and irregular transition - -	Fine-grained head deposit
Sherwood West	P/152.1	20	TP2136	TP2136-03	0.90 - 2.70 m BGL (39.50 - 37.70 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 30% of unit, and 0.01 to 0.4m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and quartzite. - - end of test pit - -	Till
Sherwood West	P/152.1	20	TP2145	TP2145-01	0.00 - 0.30 m BGL (41.05 - 40.75 m AOD)	No	Dark brownish brown sandy silty clay. - - - - -	Topsoil
Sherwood West	P/152.1	20	TP2145	TP2145-02	0.30 - 1.25 m BGL (40.75 - 39.80 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 5% of unit, and 0.02 to 0.25m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and quartzite. - - Sharp and irregular transition - -	Fine-grained head deposit
Sherwood West	P/152.1	20	TP2145	TP2145-03	1.25 - 1.50 m BGL (39.80 - 39.55 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 30% of unit, and 0.02 to 0.2m in size. Sub-angular to sub-rounded. Clasts are flint, chalk, quartzite and tertiary flint. - - end of test pit - -	Till
Sherwood East	P/152.2	20	TP2190	TP2190-01	0.00 - 0.50 m BGL (41.24 - 40.74 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil

Sherwood East	P/152.2	20	TP2190	TP2190-02	0.50 - 1.50 m BGL (40.74 - 39.74 m AOD)	Yes (200 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 5% of unit, and 0.02 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and chalk. - - Abrupt and irregular transition - -	Fine-grained head deposit
Sherwood East	P/152.2	20	TP2190	TP2190-03	1.50 - 3.10 m BGL (39.74 - 38.14 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0.02 to 0.4m in size. Sub-angular to sub-rounded. Clasts are flint and chalk. - - end of test pit - -	Till
Sherwood East	P/152.2	20	TP2218	TP2218-01	0.00 - 0.50 m BGL (40.39 - 39.89 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Sherwood East	P/152.2	20	TP2218	TP2218-02	0.50 - 0.80 m BGL (39.89 - 39.59 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 5% of unit, and 0.02 to 0.15m in size. Sub-rounded to sub-rounded. Clasts are flint. - - Sharp and wavy transition - -	Fine-grained head deposit
Sherwood East	P/152.2	20	TP2218	TP2218-03	0.80 - 3.00 m BGL (39.59 - 37.39 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 30% of unit, and 0.02 to 0.2m in size. Sub-angular to sub-rounded. Clasts are flint and chalk. - - end of test pit - -	Till
Sherwood East	P/152.2	20	TP2226	TP2226-01	0.00 - 0.30 m BGL (40.96 - 40.66 m AOD)	No	Medium greyish brown sandy silty clay. - - - - -	Topsoil
Sherwood East	P/152.2	20	TP2226	TP2226-02	0.30 - 0.60 m BGL (40.66 - 40.36 m AOD)	Yes (200 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 5% of unit, and 0 to 0.8m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and chalk. - - Abrupt and irregular transition - -	Fine-grained head deposit
Sherwood East	P/152.2	20	TP2226	TP2226-03	0.60 - 3.00 m BGL (40.36 - 37.96 m AOD)	No	Light orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.6m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and sandstone. - - end of test pit - -	Till
Sherwood East	P/152.2	20	TP2240	TP2240-01	0.00 - 0.25 m BGL (39.72 - 39.47 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Sherwood East	P/152.2	20	TP2240	TP2240-02	0.25 - 0.70 m BGL (39.47 - 39.02 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported . Deposit is structureless. Clasts are 10% of unit, and 0.01 to 0.05m in size. Sub-angular to sub-rounded. Clasts are flint and chalk. - - Abrupt and irregular transition - -	Fine-grained head deposit

Sherwood East	P/152.2	20	TP2240	TP2240-03	7.00 - 3.20 m BGL (32.72 - 36.52 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0.01 to 0.3m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and quartzite. - - end of test pit - -	Till
Sherwood East	P/152.2	20	TP2257	TP2257-01	0.00 - 0.40 m BGL (36.10 - 35.70 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Sherwood East	P/152.2	20	TP2257	TP2257-02	0.40 - 0.90 m BGL (35.70 - 35.20 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 15% of unit, and 0.02 to 0.15m in size. Sub-angular to sub-rounded. Clasts are flint, quartzite and quartz. - - Abrupt and irregular transition - -	Fine-grained head deposit
Sherwood East	P/152.2	20	TP2257	TP2257-03	0.90 - 3.30 m BGL (35.20 - 32.80 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0.01 to 0.4m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and quartzite. - - end of test pit - -	Till
Sherwood East	P/152.3	20	TP2312	TP2312-01	0.00 - 0.30 m BGL (41.86 - 41.56 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Sherwood East	P/152.3	20	TP2312	TP2312-02	0.30 - 0.85 m BGL (41.56 - 41.01 m AOD)	Yes (200 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 5% of unit, and 0.01 to 0.1m in size. Sub-rounded to rounded. Clasts are flint, tertiary flint, quartzite and quartz. - - Abrupt and irregular transition - -	Fine-grained head deposit
Sherwood East	P/152.3	20	TP2312	TP2312-03	0.85 - 3.10 m BGL (41.01 - 38.76 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0.01 to 0.55m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and chalk. - - end of test pit - -	Till
Sherwood East	P/152.3	20	TP2340	TP2340-01	0.00 - 0.35 m BGL (36.83 - 36.48 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Sherwood East	P/152.3	20	TP2340	TP2340-02	0.35 - 1.40 m BGL (36.48 - 35.43 m AOD)	Yes (200 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 5% of unit, and 0.01 to 0.25m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk, quartzite, quartz and sandstone. - - Abrupt and irregular transition - -	Fine-grained head deposit
Sherwood East	P/152.3	20	TP2340	TP2340-03	1.40 - 3.00 m BGL (35.43 - 33.83 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0.01 to 0.4m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and sandstone. - - end of test pit - -	Till

Sherwood East	P/157	20	TP2346	TP2346-01	0.00 - 0.35 m BGL (36.22 - 35.87 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
Sherwood East	P/157	20	TP2346	TP2346-02	0.35 - 0.55 m BGL (35.87 - 35.67 m AOD)	Yes (300 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 5% of unit, and 0.01 to 0.15m in size. Sub-angular to sub-rounded. Clasts are flint, chalk, quartzite and quartz. - - Abrupt and wavy transition - -	Fine-grained head deposit
Sherwood East	P/157	20	TP2346	TP2346-03	0.55 - 3.00 m BGL (35.67 - 33.22 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0.01 to 0.4m in size. Sub-angular to sub-rounded. Clasts are flint and chalk. - - end of test pit - -	Till
Sherwood East	P/152.2	20	TP2680	TP2680-01	0.00 - 0.25 m BGL (40.01 - 39.76 m AOD)	No	Medium greyish brown sandy silty clay. - - - - -	Topsoil
Sherwood East	P/152.2	20	TP2680	TP2680-02	0.25 - 0.60 m BGL (39.76 - 39.41 m AOD)	Yes (200 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 10% of unit, and 0 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint and chert. - - Abrupt and irregular transition - -	Fine-grained head deposit
Sherwood East	P/152.2	20	TP2680	TP2680-03	0.06 - 2.90 m BGL (39.95 - 37.11 m AOD)	No	Light orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.25m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and sandstone. - - end of test pit - -	Till
Sherwood East	P/152.2	20	TP2198	TP2198-01	0.00 - 0.30 m BGL (39.36 - 39.06 m AOD)	No	Medium greyish brown sandy silty clay. - - - - -	Topsoil
Sherwood East	P/152.2	20	TP2198	TP2198-02	0.30 - 1.20 m BGL (39.06 - 38.16 m AOD)	Yes (300 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 10% of unit, and 0 to 0.15m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk and quartz. - - Abrupt and diffuse transition - -	Fine-grained head deposit
Sherwood East	P/152.2	20	TP2198	TP2198-03	1.20 - 3.00 m BGL (38.16 - 36.36 m AOD)	No	Light greyish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.3m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and sandstone. - - end of test pit - -	Till
West	P/159.1	20	TP2360	TP2360-01	0.00 - 0.30 m BGL (37.44 - 37.14 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
West	P/159.1	20	TP2360	TP2360-02	0.30 - 0.70 m BGL (37.14 - 36.74 m AOD)	Yes (200 l sifted)	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 10% of unit, and 0.01 to 0.2m in size. Sub-angular to sub-rounded. Clasts are flint. - - Abrupt and wavy transition - -	Fine-grained head deposit

West	P/159.1	20	TP2360	TP2360-03	0.70 - 3.30 m BGL (36.74 - 34.14 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 45% of unit, and 0.01 to 0.3m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and sandstone. - - end of test pit - -	Till
West	P/159.1	20	TP2378	TP2378-01	0.00 - 0.25 m BGL (38.46 - 38.21 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
West	P/159.1	20	TP2378	TP2378-02	0.25 - 0.50 m BGL (38.21 - 37.96 m AOD)	No	Medium orangish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 10% of unit, and 0.01 to 0.15m in size. Sub-angular to sub-rounded. Clasts are flint. - - Abrupt and wavy transition - -	Fine-grained head deposit
West	P/159.1	20	TP2378	TP2378-03	0.50 - 3.10 m BGL (37.96 - 35.36 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0.01 to 0.2m in size. Sub-angular to sub-rounded. Clasts are flint, chalk and sandstone. - - end of test pit - -	Till
West	P/159.1	20	TP2483	TP2483-01	0.00 - 0.30 m BGL (42.24 - 41.94 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
West	P/159.1	20	TP2483	TP2483-02	0.30 - 0.90 m BGL (41.94 - 41.34 m AOD)	No	Medium reddish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 5% of unit, and 0 to 0.05m in size. Sub-angular to sub-rounded. Clasts are flint and chalk. - - Abrupt and irregular transition - -	Fine-grained head deposit
West	P/159.1	20	TP2483	TP2483-03	0.90 - 3.00 m BGL (41.34 - 39.24 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is bedded. Clasts are 40% of unit, and 0 to 0.1m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk and sandstone. - - end of test pit - -	Till
West	P/159.1	20	TP2543	TP2543-01	0.00 - 0.35 m BGL (43.02 - 42.67 m AOD)	No	Dark greyish brown sandy silty clay. - - - - -	Topsoil
West	P/159.1	20	TP2543	TP2543-02	0.35 - 0.50 m BGL (42.67 - 42.52 m AOD)	No	Medium reddish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 2% of unit, and 0 to 0.03m in size. Sub-angular to sub-rounded. Clasts are flint and chalk. - - Abrupt and irregular transition - -	Fine-grained head deposit
West	P/159.1	20	TP2543	TP2543-03	0.50 - 2.90 m BGL (42.52 - 40.12 m AOD)	No	Light yellowish brown sandy silty clay. Matrix supported. Deposit is structureless. Clasts are 40% of unit, and 0 to 0.25m in size. Sub-angular to sub-rounded. Clasts are flint, tertiary flint, chalk, quartz and sandstone. - - end of test pit - -	Till

Table A2.2 Register of boreholes. Register of all completed boreholes including rig type and depth achieved.

Borehole identifier	Rig type	Maximum depth (m BGL)
BECS01	CP	6.95
BECS02	CP	8.95
BECS04	CP	8.50
BNTN02	CP	6.00
BNTN03	CP	5.00
BNTN04	CP	6.50
BNTN07	CP	7.50
BNTW01	RC	9.50
BNTW02	RC	11.50
BNTW03	RC	10.00
BRQU01	RC	5.00
BRQU02	RC	5.50
BRQU03	RC	5.00
BRQU05	RC	10.00
BUNT01	CP	10.00
BUNT02	CP	10.00
BUNT03	CP	10.00
BUNT04	CP	10.00
BUNT05	CP	10.00
BUNT06	CP	10.00
BUNT17	CP	6.95
BUNT18	CP	6.00
BUNT19	CP	6.45
BUNT20	CP	2.95
HABH01(V1)	WS	4.00
HABH02(V1)	WS	3.00
HABH03(V1)	WS	3.00
HABH04(V1)	WS	4.00
HABH05(V1)	WS	4.00
HABH06(V2)	WS	4.00
HABH07(V2)	WS	3.00
HABH08(V2)	WS	3.00
HABH09(V2)	WS	6.00
HABH10(V2)	WS	3.00
HABH11(V3)	WS	2.50
HABH12(L2)	WS	6.00
HABH13(L2)	WS	4.00
HABH14(V3)	WS	4.00
HABH15(V3)	WS	4.00
HABH18(V4)	WS	6.00
HABH19(V4)	WS	3.00
HABH21(V4)	WS	4.00
HABH22(V4)	WS	5.00

HABH23(V4)	WS	4.00
HABH24(V5)	WS	2.00
HABH25(V5)	WS	3.00
HABH26(V5)	WS	3.00
HABH27(V5)	WS	3.00
HABH28(V5)	WS	2.00
HABH29(V6)	WS	4.00
HABH30(V6)	WS	4.00
HABH31(V6)	WS	4.00
HABH32(V6)	WS	3.00
HABH33(V6)	WS	4.00
HABH34(L2)	WS	8.00
HABH35(L2)	WS	8.00
HABH36(L2)	WS	3.00
HABH38(L2)	WS	4.00
HABH45(L1)	WS	8.00
HABH46(L1)	WS	4.00
HABH47(L1)	WS	2.00
HABH48(L1)	WS	5.00
HABH49(L1)	WS	3.00
HABH50(L1)	WS	3.00
RAYL07	CP	10.00
RAYL08	CP	9.30
RAYL09	CP	9.50
RAYL10	CP	10.00
SABB11	RC	9.80
SABB12	RC	6.70
SHRE09	CP	10.00
SHRE10	CP	6.00
SHRE11	CP	10.00
SHRW02	CP	10.00
SHRW03	CP	10.00
SHRW05	CP	3.20
SNJA01	RC	5.00
SNJA02	RC	3.00
SNJA03	RC	7.50
SNJA04	RC	4.00
SNJA05	RC	4.00
SNJA06	RC	5.50
SNJA07	RC	5.00
SNJA08	RC	3.00
SNJA09	RC	8.00
SNJA10	RC	8.00
SNJA11	RC	8.00
SNJA12	RC	4.00
SNJA13	RC	3.80

SNJA14	RC	3.40
SNJA15	RC	4.00
SSBE01	RC	12.00
SSBE02	RC	11.90
SSBE03	RC	9.60
SSBE04	RC	11.90
SSBE05	RC	10.65
SSBE06	RC	6.50
SSBE07	RC	6.50
SSBE08	RC	5.40
SSBE09	RC	17.50
SSBE10	RC	13.50
ULWK07	CP	7.50
ULWK08	CP	5.45
ULWK09	CP	5.55
VELL04	CP	7.05
VELL05	CP	8.30
VELL06	CP	7.55
VELL08	CP	3.00
VELL09	CP	2.45
VELL10	CP	4.55
WEST06	CP	10.05
WEST08	CP	10.05
WEST09	CP	10.00

A2.3 Results for priority boreholes. Results include data from cores (deposits with a number suffix) and from inspection pits and bulk samples (deposits with letter suffix). Rows with no data represent bulk samples yet to be logged. Description and interpretation are subject to review.

BOREHOLE	QLEA	PLOT	PQ AREA	DEPOSIT	DEPTH (m)	Description and/or transition	Interpretation
RAYL09	QLEA2	P/113.2	PQ28 (moderate)	RAYL09-A	0.00 - 0.30 m bgl (46.69 - 46.39 m AOD)	Light yellowish brown sandy silt. Firm consistency.	Topsoil
RAYL09	QLEA2	P/113.2	PQ28 (moderate)	RAYL09-B	0.30 - 1.20 m bgl (46.39 - 45.49 m AOD)	Medium yellowish brown sandy silt. Firm consistency.	Subsoil
RAYL09	QLEA2	P/113.2	PQ28 (moderate)	RAYL09-1	1.20 - 2.00 m bgl (45.49 - 44.69 m AOD)	Medium orangish brown slightly sandy silty clay. Hard consistency. Deposit is matrix supported. Clasts are 5mm-15mm moderately sorted sub-angular to sub-rounded flint.	Fine-grained head deposit
RAYL09	QLEA2	P/113.2	PQ28 (moderate)	RAYL09-2	2.00 - 8.33 m bgl (44.69 - 38.36 m AOD)	Medium yellowish grey slightly sandy silty clay. Hard consistency. Deposit is matrix supported. Clasts are 5mm-20mm unsorted sub-rounded to sub-angular chalk, flint and sandstone. Lower boundary transition is indistinct	Till
RAYL09	QLEA2	P/113.2	PQ28 (moderate)	RAYL09-3	8.33 - 8.45 m bgl (38.36 - 38.24 m AOD)	Medium yellowish grey clayey medium sand. Soft consistency. Deposit is matrix supported. Clasts are 5mm-20mm poorly sorted sub-angular to sub-rounded flint.	Fluvial sand
RAYL09	QLEA2	P/113.2	PQ28 (moderate)	RAYL09-4	8.45 - 9.30 m bgl (38.24 - 37.39 m AOD)	Medium whitish yellow fine sand. Loose consistency. Deposit is matrix supported. Lower boundary transition is abrupt	Fluvial sand
RAYL09	QLEA2	P/113.2	PQ28 (moderate)	RAYL09-5	9.30 - 9.50 m bgl (37.39 - 37.19 m AOD)	Medium yellowish grey clayey medium sand. Loose consistency. Deposit is matrix supported. Clasts are 5mm-40mm poorly sorted sub-angular to sub-rounded flint and quartz.	Fluvial sand
ULWK07	QLEA2	P/112	PQ27 (low)	ULWK07-A	0.00 - 0.35 m bgl (42.88 - 42.53 m AOD)	Medium greyish brown clayey silt. Firm consistency.	Topsoil
ULWK07	QLEA2	P/112	PQ27 (low)	ULWK07-B	0.35 - 1.20 m bgl (42.53 - 41.68 m AOD)	Medium orangish brown clayey silt. Soft consistency.	Subsoil
ULWK07	QLEA2	P/112	PQ27 (low)	NO DATA	1.20 - 1.50 m bgl (41.68 - 41.38 m AOD)	.	-
ULWK07	QLEA2	P/112	PQ27 (low)	ULWK07-1	1.50 - 2.84 m bgl (41.38 - 40.04 m AOD)	Medium orangish brown clayey sandy silt. Firm consistency. Deposit is matrix supported. Clasts are <5mm well sorted sub-angular flint. Lower boundary transition is diffuse	Fine-grained head deposit
ULWK07	QLEA2	P/112	PQ27 (low)	ULWK07-2	2.84 - 6.45 m bgl (40.04 - 36.43 m AOD)	Medium yellowish grey slightly sandy silty clay. Hard consistency. Deposit is matrix supported. Clasts are 5mm-40mm unsorted sub-rounded to rounded chalk.	Till

ULWK07	QLEA2	P/112	PQ27 (low)	ULWK07-C	6.95 - 7.95 m bgl (35.93 - 34.93 m AOD)	Medium yellow clayey fine sand. Loose consistency. Deposit is matrix supported. Clasts are 5mm-10mm moderately sorted sub-angular flint.	Fluvial sand
VELL04	QLEA2	P/51	PQ27 (low)	VELL04-1	0.00 - 0.40 m bgl (36.02 - 35.62 m AOD)	Medium greyish brown clayey silt. Firm consistency.	Topsoil
VELL04	QLEA2	P/51	PQ27 (low)	VELL04-2	0.40 - 0.90 m bgl (35.62 - 35.12 m AOD)	Medium orangish brown silt. Firm consistency.	Brickearth
VELL04	QLEA2	P/51	PQ27 (low)	VELL04-3	0.90 - 1.20 m bgl (35.12 - 34.82 m AOD)	Light greyish yellow clay. Firm consistency.	Fine-grained head deposit
VELL04	QLEA2	P/51	PQ27 (low)	VELL04-4	1.20 - 6.65 m bgl (34.82 - 29.37 m AOD)	Medium greyish brown silty clay. Firm consistency. Deposit is matrix supported. Clasts are 5mm-40mm unsorted sub-rounded to sub-angular chalk, flint and sandstone. Lower boundary transition is diffuse	Till
VELL04	QLEA2	P/51	PQ27 (low)	VELL04-5	6.65 - 6.95 m bgl (29.37 - 29.07 m AOD)	Medium brownish grey silty clay. Hard consistency. Deposit is matrix supported. Clasts are 5mm-30mm unsorted sub-rounded to sub-angular chalk, flint and sandstone.	Till
VELL04	QLEA2	P/51	PQ27 (low)	VELL04-6	6.95 - 7.05 m bgl (29.07 - 28.97 m AOD)	Medium grey silty clay. Firm consistency. Deposit is matrix supported. Clasts are 5mm-40mm unsorted sub-rounded to rounded chalk.	Till
BRQU02	QLEA3	P/57.1	PQ5 (high)	BRQU02-1	0.00 - 0.60 m bgl (17.11 - 16.51 m AOD)	Medium brownish grey sandy clay. Firm consistency. Lower boundary transition is sharp	Topsoil
BRQU02	QLEA3	P/57.1	PQ5 (high)	BRQU02-2	0.60 - 1.20 m bgl (16.51 - 15.91 m AOD)	Medium reddish yellow sandy clay. Firm consistency.	Fine-grained head deposit
BRQU02	QLEA3	P/57.1	PQ5 (high)	BHRQU02-1	1.20 - 1.35 m bgl (15.91 - 15.76 m AOD)	Medium orangish brown clayey medium sand. Loose consistency. Deposit is matrix supported. Clasts are 2mm-50mm poorly sorted sub-angular to sub-rounded flint and quartz. Lower boundary transition is abrupt	Fluvial sand
BRQU02	QLEA3	P/57.1	PQ5 (high)	BHRQU02-2	1.35 - 2.90 m bgl (15.76 - 14.21 m AOD)	Medium yellowish brown sandy clay. Soft consistency. Deposit is matrix supported. Clasts are 2mm-40mm poorly sorted sub-angular to sub-rounded flint and quartz. Lower boundary transition is abrupt	Fine-grained alluvium
BRQU02	QLEA3	P/57.1	PQ5 (high)	BHRQU02-3	2.90 - 3.75 m bgl (14.21 - 13.36 m AOD)	Medium orangish brown clayey coarse sand. Loose consistency. Deposit is matrix supported. Clasts are 2mm-50mm unsorted sub-angular to well rounded flint, tertiary flint, quartz and quartzite. Lower boundary transition is abrupt	Fluvial sand
BRQU02	QLEA3	P/57.1	PQ5 (high)	BHRQU02-4	3.75 - 4.05 m bgl (13.36 - 13.06 m AOD)	Medium brownish grey sandy clay. Firm consistency. Deposit is matrix supported. Clasts are 2mm-5mm well sorted sub-angular to sub-rounded flint and quartz. Lower boundary transition is abrupt	Fine-grained alluvium
BRQU02	QLEA3	P/57.1	PQ5 (high)	BHRQU02-5	4.05 - 4.25 m bgl (13.06 - 12.86 m AOD)	Medium brownish orange clayey coarse sand. Loose consistency. Deposit is matrix supported. Clasts are 2mm-5mm moderately sorted sub-angular to sub-rounded flint and quartz. Lower boundary transition is abrupt	Fluvial sand
BRQU02	QLEA3	P/57.1	PQ5 (high)	BHRQU02-6	4.25 - 4.50 m bgl (12.86 - 12.61 m AOD)	Medium brownish grey clay. Firm consistency. Deposit is matrix supported. Lower boundary transition is abrupt	Fine-grained alluvium

BRQU02	QLEA3	P/57.1	PQ5 (high)	BHRQU02-7	4.50 - 4.75 m bgl (12.61 - 12.36 m AOD)	Medium greyish brown clayey medium sand. Soft consistency. Deposit is matrix supported. Clasts are 2mm-4mm poorly sorted sub-angular to rounded flint and quartz. Lower boundary transition is abrupt	Fluvial sand
BRQU02	QLEA3	P/57.1	PQ5 (high)	BHRQU02-8	4.75 - 5.35 m bgl (12.36 - 11.76 m AOD)	Medium grey clay. Hard consistency. Deposit is matrix supported. Lower boundary transition is sharp	Lacustrine deposit
BRQU02	QLEA3	P/57.1	PQ5 (high)	BHRQU02-9	5.35 - 6.00 m bgl (11.76 - 11.11 m AOD)	Medium whitish grey sandy silty clay. Hard consistency. Deposit is matrix supported. Clasts are 2mm-4mm unsorted sub-angular to rounded chalk.	Till
BRQU05	QLEA3	P/57.2	PQ5 (high)	BRQU05-A	0.00 - 0.30 m bgl (18.79 - 18.49 m AOD)	Light yellowish grey sandy gravel. Firm consistency. Deposit is matrix supported.	Topsoil
BRQU05	QLEA3	P/57.2	PQ5 (high)	BRQU05-B	0.30 - 0.90 m bgl (18.49 - 17.89 m AOD)	Medium orangish brown coarse sand. Firm consistency.	Subsoil
BRQU05	QLEA3	P/57.2	PQ5 (high)	BRQU05-3	0.90 - 1.20 m bgl (17.89 - 17.59 m AOD)	Light greyish yellow coarse sand. Firm consistency.	fluvial sands
BRQU05	QLEA3	P/57.2	PQ5 (high)	BRQU05-1	1.20 - 1.74 m bgl (17.59 - 17.05 m AOD)	Medium greyish brown clayey silty medium sand. Firm consistency. Deposit is matrix supported. Clasts are 5mm-15mm moderately sorted sub-angular to sub-rounded flint.	Fine-grained head deposit
BRQU05	QLEA3	P/57.2	PQ5 (high)	BRQU05-2	1.74 - 10.00 m bgl (17.05 - 8.79 m AOD)	Medium brownish grey slightly sandy silty clay. Hard consistency. Deposit is matrix supported. Clasts are 5mm-60mm unsorted sub-rounded chalk.	Till
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-1	0.00 - 0.36 m bgl (21.19 - 20.83 m AOD)	Dark greyish brown sandy clay. Firm consistency.	Topsoil
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-2	0.36 - 1.00 m bgl (20.83 - 20.19 m AOD)	Medium brownish orange clayey sandy gravel. Firm consistency. Deposit is matrix supported. Clasts are 5mm-35mm poorly sorted sub-angular to sub-rounded flint.	Fluvial sand
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-3	1.00 - 1.20 m bgl (20.19 - 19.99 m AOD)	Medium orangish brown coarse sand. Firm consistency.	Fluvial gravel
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-4	1.20 - 3.00 m bgl (19.99 - 18.19 m AOD)	Medium reddish orange medium sand. Loose consistency. Deposit is matrix supported. Clasts are 5mm-30mm poorly sorted sub-angular to sub-rounded flint, quartz . Lower boundary transition is diffuse	Fluvial sand
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-5	3.00 - 3.57 m bgl (18.19 - 17.62 m AOD)	Medium brownish orange medium sand. Loose consistency. Deposit is matrix supported. Clasts are 5mm-30mm poorly sorted sub-angular to sub-rounded flint, quartz, chalk. Lower boundary transition is indistinct	Fluvial sand
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-6	3.57 - 4.27 m bgl (17.62 - 16.92 m AOD)	Medium yellowish orange fine sand. Loose consistency. Deposit is matrix supported. Clasts are 2mm-15mm well sorted sub-rounded quarts, flint. Lower boundary transition is distinct	Fluvial sand
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-7	4.27 - 4.29 m bgl (16.92 - 16.90 m AOD)	Medium orangish brown clayey fine sand. Loose consistency. Deposit is matrix supported. Clasts are 5mm-50mm moderately sorted sub-rounded to rounded flint, quartz, chalk.	Fluvial sand
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-8	4.29 - 4.40 m bgl (16.90 - 16.79 m AOD)	Medium reddish brown clayey medium sand. Loose consistency. Deposit is matrix supported. Clasts are well sorted sub-angular flint, quartz. Lower boundary transition is distinct	Fluvial sand

SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-9	4.40 - 4.47 m bgl (16.79 - 16.72 m AOD)	Medium orangish brown clayey fine sand. Loose consistency. Deposit is matrix supported. Clasts are 5mm-50mm moderately sorted sub-rounded to rounded flint, quartz, chalk.	Fluvial sand
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-10	4.47 - 4.50 m bgl (16.72 - 16.69 m AOD)	Medium reddish orange clayey medium sand. Loose consistency. Deposit is matrix supported. Clasts are 5mm-30mm poorly sorted sub-angular to sub-rounded flint, quartz. Lower boundary transition is distinct	Fluvial sand
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-11	4.50 - 4.91 m bgl (16.69 - 16.28 m AOD)	Medium orangish brown clayey fine sand. Loose consistency. Deposit is matrix supported. Clasts are 5mm-50mm moderately sorted sub-rounded to rounded flint, quartz, chalk.	Fluvial sand
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-12	4.91 - 4.98 m bgl (16.28 - 16.21 m AOD)	Medium reddish orange clayey medium sand. Loose consistency. Deposit is matrix supported. Clasts are 2mm-10mm well sorted sub-angular flint, . Lower boundary transition is indistinct	Fluvial sand
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-13	4.98 - 5.27 m bgl (16.21 - 15.92 m AOD)	Medium orangish brown clayey fine sand. Loose consistency. Deposit is matrix supported. Clasts are 5mm-50mm moderately sorted sub-rounded to rounded flint, quartz, chalk.	Fluvial sand
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-14	5.27 - 5.38 m bgl (15.92 - 15.81 m AOD)	Medium reddish orange clayey medium sand. Loose consistency. Deposit is matrix supported. Clasts are 2mm-10mm well sorted angular flint. Lower boundary transition is distinct	Fluvial sand
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-15	5.38 - 5.57 m bgl (15.81 - 15.62 m AOD)	Medium orangish brown clayey fine sand. Loose consistency. Deposit is matrix supported. Clasts are 5mm-50mm moderately sorted sub-rounded to rounded flint, quartz, chalk.	Fluvial sand
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-A	6.00 - 6.00 m bgl (15.19 - 15.19 m AOD)	Medium brownish orange coarse sand. Loose consistency.	Fluvial sand
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-B	7.50 - 7.50 m bgl (13.69 - 13.69 m AOD)	Medium greyish brown fine sand. Soft consistency. Deposit is matrix supported. Clasts are 5mm-10mm moderately sorted sub-rounded flint.	Fluvial sand
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-16	8.50 - 8.56 m bgl (12.69 - 12.63 m AOD)	Dark blueish grey sandy clayey silt. Soft consistency. Deposit is matrix supported. Lower boundary transition is distinct	Lacustrine deposit
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-17	8.56 - 8.86 m bgl (12.63 - 12.33 m AOD)	Medium blueish grey silty clay. Soft consistency. Deposit is matrix supported. Lower boundary transition is distinct	Lacustrine deposit
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-18	8.86 - 9.26 m bgl (12.33 - 11.93 m AOD)	Medium blueish grey silty sandy clay. Soft consistency. Deposit is matrix supported. Lower boundary transition is distinct	Lacustrine deposit
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-19	9.26 - 9.60 m bgl (11.93 - 11.59 m AOD)	Medium blueish grey silty sandy clay. Firm consistency. Deposit is matrix supported. Lower boundary transition is abrupt	Lacustrine deposit
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-20	9.60 - 10.13 m bgl (11.59 - 11.06 m AOD)	Medium blueish grey silty clay. Soft consistency. Deposit is matrix supported. Clasts are 5mm-10mm moderately sorted sub-rounded to sub-angular chalk. Lower boundary transition is sharp	Lacustrine deposit
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-21	10.13 - 11.10 m bgl (11.06 - 10.09 m AOD)	Medium yellowish grey clayey fine sand. Firm consistency. Deposit is matrix supported. Lower boundary transition is distinct	Lacustrine deposit
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-22	11.10 - 11.50 m bgl (10.09 - 9.69 m AOD)	Medium yellowish brown sandy clayey silt. Firm consistency. Deposit is matrix supported.	Lacustrine deposit

SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-23	12.29 - 12.53 m bgl (8.90 - 8.66 m AOD)	Medium brownish grey sandy clayey silt. Firm consistency. Deposit is matrix supported. Lower boundary transition is distinct	Lacustrine deposit
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-24	12.53 - 13.00 m bgl (8.66 - 8.19 m AOD)	Medium brownish grey clayey sandy silt. Firm consistency. Deposit is matrix supported.	Lacustrine deposit
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-25	13.18 - 13.73 m bgl (8.01 - 7.46 m AOD)	Medium brownish grey clayey silty fine sand. Firm consistency. Deposit is matrix supported. Lower boundary transition is sharp	Lacustrine deposit
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-26	13.73 - 14.46 m bgl (7.46 - 6.73 m AOD)	Medium brownish grey sandy clayey silt. Firm consistency. Deposit is matrix supported.	Lacustrine deposit
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-27	14.50 - 15.35 m bgl (6.69 - 5.84 m AOD)	Medium yellowish grey clayey sandy silt. Firm consistency. Deposit is matrix supported. Lower boundary transition is indistinct	Lacustrine deposit
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-28	15.35 - 15.45 m bgl (5.84 - 5.74 m AOD)	Medium yellowish grey sandy clayey silt. Firm consistency. Deposit is matrix supported.	Lacustrine deposit
SSBE09	QLEA3	P/57.5	PQ9 (high)	SSBE09-29	15.45 - 17.50 m bgl (5.74 - 3.69 m AOD)	Medium brownish grey sandy clayey silt. Firm consistency. Deposit is matrix supported.	Lacustrine deposit
SNJA10	QLEA3	P/23.2	PQ8 (low)	SNJA10-1	0.00 - 0.30 m bgl (23.37 - 23.07 m AOD)	Medium greyish brown sandy clayey silt. Firm consistency. Lower boundary transition is diffuse	Topsoil
SNJA10	QLEA3	P/23.2	PQ8 (low)	SNJA10-2	0.30 - 0.70 m bgl (23.07 - 22.67 m AOD)	Light yellowish brown clayey sandy silt. Firm consistency. Lower boundary transition is sharp	Fine-grained head deposit
SNJA10	QLEA3	P/23.2	PQ8 (low)	SNJA10-3	0.70 - 1.10 m bgl (22.67 - 22.27 m AOD)	Light yellowish brown sandy clay. Firm consistency. Lower boundary transition is sharp	Fine-grained head deposit
SNJA10	QLEA3	P/23.2	PQ8 (low)	SNJA10-4	1.10 - 1.20 m bgl (22.27 - 22.17 m AOD)	Light yellowish grey silty medium sand. Firm consistency.	Lacustrine deposit
SNJA10	QLEA3	P/23.2	PQ8 (low)	SNJA10-5	1.20 - 1.89 m bgl (22.17 - 21.48 m AOD)	Medium orangish brown sandy silty clay. Firm consistency. Deposit is matrix supported. Clasts are 5mm-15mm poorly sorted angular to sub-angular chalk, quartz, flint. Lower boundary transition is distinct	Lacustrine deposit
SNJA10	QLEA3	P/23.2	PQ8 (low)	SNJA10-6	1.89 - 4.95 m bgl (21.48 - 18.42 m AOD)	Light whitish grey silty clay. Soft consistency. Deposit is matrix supported. Lower boundary transition is indistinct	Lacustrine deposit
SNJA10	QLEA3	P/23.2	PQ8 (low)	SNJA10-7	4.95 - 5.10 m bgl (18.42 - 18.27 m AOD)	Light grey sandy silty clay. Soft consistency. Deposit is matrix supported. Clasts are 2mm-10mm moderately sorted sub-angular flint, chalk.. Lower boundary transition is indistinct	Lacustrine deposit
SNJA10	QLEA3	P/23.2	PQ8 (low)	SNJA10-8	5.10 - 5.20 m bgl (18.27 - 18.17 m AOD)	Medium brownish grey sandy silty clay. Soft consistency. Deposit is matrix supported. Clasts are well sorted sub-angular. Lower boundary transition is indistinct	Lacustrine deposit
SNJA10	QLEA3	P/23.2	PQ8 (low)	SNJA10-9	5.20 - 5.50 m bgl (18.17 - 17.87 m AOD)	Medium greyish brown silty sandy clay. Hard consistency. Deposit is matrix supported. Lower boundary transition is diffuse	Lacustrine deposit
SNJA10	QLEA3	P/23.2	PQ8 (low)	SNJA10-10	5.50 - 6.00 m bgl (17.87 - 17.37 m AOD)	Dark brownish grey clayey silt. Hard consistency. Deposit is matrix supported.	Lacustrine deposit
SNJA10	QLEA3	P/23.2	PQ8 (low)	SNJA10-11	6.00 - 6.94 m bgl (17.37 - 16.43 m AOD)	Medium brownish grey clayey silt. Firm consistency. Deposit is matrix supported. Lower boundary transition is distinct	Lacustrine deposit
SNJA10	QLEA3	P/23.2	PQ8 (low)	SNJA10-12	6.94 - 7.20 m bgl (16.43 - 16.17 m AOD)	Dark blueish grey clayey silt. Soft consistency. Deposit is matrix supported. Lower boundary transition is sharp	Lacustrine deposit

SNJA10	QLEA3	P/23.2	PQ8 (low)	SNJA10-13	7.20 - 7.21 m bgl (16.17 - 16.16 m AOD)	Dark blueish grey sandy silty clay. Soft consistency. Deposit is matrix supported. Lower boundary transition is sharp	Lacustrine deposit
SNJA10	QLEA3	P/23.2	PQ8 (low)	SNJA10-14	7.21 - 7.30 m bgl (16.16 - 16.07 m AOD)	Dark blueish grey clayey silt. Soft consistency. Deposit is matrix supported. Lower boundary transition is sharp	Lacustrine deposit
SNJA10	QLEA3	P/23.2	PQ8 (low)	SNJA10-15	7.30 - 8.00 m bgl (16.07 - 15.37 m AOD)	Medium blueish grey sandy silty clay. Firm consistency. Deposit is matrix supported. Clasts are 5mm-70mm unsorted sub-rounded to sub-angular chalk.	Till
SNJA11	QLEA3	P/23.2	PQ8 (low)	SNJA11-1	0.00 - 0.35 m bgl (25.05 - 24.70 m AOD)	Light yellowish brown clayey sandy silt. Firm consistency. Lower boundary transition is diffuse	Topsoil
SNJA11	QLEA3	P/23.2	PQ8 (low)	SNJA11-2	0.35 - 1.00 m bgl (24.70 - 24.05 m AOD)	Light brownish orange sandy clay. Firm consistency.	Fine-grained head deposit
SNJA11	QLEA3	P/23.2	PQ8 (low)	SNJA11-3	1.00 - 1.32 m bgl (24.05 - 23.73 m AOD)	Medium orangish brown sandy silty clay. Hard consistency. Deposit is matrix supported. Clasts are 5mm-20mm poorly sorted sub-angular to sub-rounded flint, chalk. Lower boundary transition is indistinct	Head
SNJA11	QLEA3	P/23.2	PQ8 (low)	SNJA11-4	1.32 - 1.57 m bgl (23.73 - 23.48 m AOD)	Medium greyish orange sandy silty clay. Hard consistency. Deposit is matrix supported. Clasts are 1mm-50mm poorly sorted sub-angular to rounded flint . Lower boundary transition is indistinct	Head
SNJA11	QLEA3	P/23.2	PQ8 (low)	SNJA11-5	1.57 - 1.76 m bgl (23.48 - 23.29 m AOD)	Light orangish grey sandy silty clay. Hard consistency. Deposit is matrix supported. Clasts are 5mm-15mm moderately sorted sub-angular to sub-rounded flint, chalk. Lower boundary transition is distinct	Head
SNJA11	QLEA3	P/23.2	PQ8 (low)	SNJA11-6	1.76 - 2.00 m bgl (23.29 - 23.05 m AOD)	Medium greyish orange sandy silty clay. Firm consistency. Deposit is matrix supported. Clasts are 1mm-5mm moderately sorted sub-angular to sub-rounded flint, chalk.	Head
SNJA11	QLEA3	P/23.2	PQ8 (low)	NO DATA	2.00 - 2.15 m bgl (23.05 - 22.90 m AOD)	.	-
SNJA11	QLEA3	P/23.2	PQ8 (low)	SNJA11-7	2.15 - 2.26 m bgl (22.90 - 22.79 m AOD)	Light orangish brown sandy silty clay. Soft consistency. Deposit is matrix supported. Lower boundary transition is indistinct	lacustrine deposit
SNJA11	QLEA3	P/23.2	PQ8 (low)	SNJA11-8	2.29 - 2.47 m bgl (22.76 - 22.58 m AOD)	Light yellowish grey sandy silty clay. Hard consistency. Deposit is matrix supported. Clasts are 5mm well sorted sub-angular flint.	Lacustrine deposit
SNJA11	QLEA3	P/23.2	PQ8 (low)	SNJA11-9	2.47 - 2.59 m bgl (22.58 - 22.46 m AOD)	Medium orangish brown sandy silty clay. Soft consistency. Deposit is matrix supported. Clasts are 1mm-2mm moderately sorted sub-angular to sub-rounded flint, (tertiary flint?). Lower boundary transition is distinct	Lacustrine deposit
SNJA11	QLEA3	P/23.2	PQ8 (low)	SNJA11-10	2.59 - 3.00 m bgl (22.46 - 22.05 m AOD)	Light yellowish grey sandy silty clay. Hard consistency. Deposit is matrix supported. Clasts are 5mm well sorted sub-angular flint.	Lacustrine deposit
SNJA11	QLEA3	P/23.2	PQ8 (low)	NO DATA	3.00 - 3.36 m bgl (22.05 - 21.69 m AOD)	.	-
SNJA11	QLEA3	P/23.2	PQ8 (low)	SNJA11-11	3.36 - 4.00 m bgl (21.69 - 21.05 m AOD)	Medium yellowish grey sandy clayey silt. Soft consistency. Deposit is matrix supported.	Lacustrine deposit
SNJA11	QLEA3	P/23.2	PQ8 (low)	NO DATA	4.00 - 4.40 m bgl (21.05 - 20.65 m AOD)	.	-

SNJA11	QLEA3	P/23.2	PQ8 (low)	SNJA11-12	4.40 - 5.00 m bgl (20.65 - 20.05 m AOD)	Medium yellowish grey sandy clayey silt. Soft consistency. Deposit is matrix supported.	Lacustrine deposit
SNJA11	QLEA3	P/23.2	PQ8 (low)	NO DATA	5.00 - 5.13 m bgl (20.05 - 19.92 m AOD)	.	-
SNJA11	QLEA3	P/23.2	PQ8 (low)	SNJA11-13	5.13 - 5.36 m bgl (19.92 - 19.69 m AOD)	Medium yellowish grey sandy clayey silt. Soft consistency. Deposit is matrix supported.	Lacustrine deposit
SNJA11	QLEA3	P/23.2	PQ8 (low)	SNJA11-14	5.36 - 5.69 m bgl (19.69 - 19.36 m AOD)	Light whitish orange clayey silt. Soft consistency. Deposit is matrix supported. Lower boundary transition is diffuse	Lacustrine deposit
SNJA11	QLEA3	P/23.2	PQ8 (low)	SNJA11-15	5.69 - 6.00 m bgl (19.36 - 19.05 m AOD)	Medium yellowish grey sandy clayey silt. Soft consistency. Deposit is matrix supported.	Lacustrine deposit
SNJA11	QLEA3	P/23.2	PQ8 (low)	NO DATA	6.00 - 6.39 m bgl (19.05 - 18.66 m AOD)	.	-
SNJA11	QLEA3	P/23.2	PQ8 (low)	SNJA11-16	6.39 - 6.61 m bgl (18.66 - 18.44 m AOD)	Medium brownish grey clayey silt. Soft consistency. Deposit is matrix supported. Lower boundary transition is abrupt	Lacustrine deposit
SNJA11	QLEA3	P/23.2	PQ8 (low)	SNJA11-17	6.61 - 6.93 m bgl (18.44 - 18.12 m AOD)	Medium brownish grey clayey silt. Firm consistency. Deposit is matrix supported. Lower boundary transition is indistinct	Lacustrine deposit
SNJA11	QLEA3	P/23.2	PQ8 (low)	SNJA11-18	6.93 - 7.00 m bgl (18.12 - 18.05 m AOD)	Dark brownish grey sandy clayey silt. Firm consistency. Deposit is matrix supported.	lacustrine deposit
SNJA11	QLEA3	P/23.2	PQ8 (low)	NO DATA	7.00 - 7.20 m bgl (18.05 - 17.85 m AOD)	.	-
SNJA11	QLEA3	P/23.2	PQ8 (low)	SNJA11-19	7.20 - 7.45 m bgl (17.85 - 17.60 m AOD)	Light blueish grey clayey silt. Firm consistency. Deposit is matrix supported. Lower boundary transition is diffuse	Lacustrine deposit
SNJA11	QLEA3	P/23.2	PQ8 (low)	SNJA11-20	7.45 - 7.84 m bgl (17.60 - 17.21 m AOD)	Medium blueish grey silty clay. Deposit is matrix supported. Lower boundary transition is distinct	Lacustrine deposit
SNJA11	QLEA3	P/23.2	PQ8 (low)	SNJA11-21	7.84 - 8.00 m bgl (17.21 - 17.05 m AOD)	Dark blueish grey sandy silty clay. Firm consistency. Deposit is matrix supported. Clasts are 5mm-15mm unsorted sub-rounded to sub-angular chalk, flint.	Till
SNJA13	QLEA3	P/88	PQ10 (moderate)	SNJA13-1	0.00 - 0.30 m bgl (27.54 - 27.24 m AOD)	Dark brownish grey clayey silt. Firm consistency. Lower boundary transition is sharp	Topsoil
SNJA13	QLEA3	P/88	PQ10 (moderate)	SNJA13-2	0.30 - 0.65 m bgl (27.24 - 26.89 m AOD)	Medium orangish brown sandy clay. Firm consistency. Lower boundary transition is sharp	Subsoil
SNJA13	QLEA3	P/88	PQ10 (moderate)	SNJA13-3	0.65 - 0.90 m bgl (26.89 - 26.64 m AOD)	Dark orangish brown sandy clay. Firm consistency. Lower boundary transition is diffuse	Fine-grained head deposit
SNJA13	QLEA3	P/88	PQ10 (moderate)	SNJA13-4	0.90 - 1.10 m bgl (26.64 - 26.44 m AOD)	Light yellowish grey clay. Firm consistency.	Fine-grained head deposit
SNJA13	QLEA3	P/88	PQ10 (moderate)	SNJA013-1	1.00 - 3.80 m bgl (26.54 - 23.74 m AOD)	Medium yellowish grey silty clay. Hard consistency. Deposit is matrix supported. Clasts are 5mm-30mm unsorted sub-rounded to sub-angular chalk, flint.	Till
SNJA15	QLEA3	P/88	PQ10 (moderate)	SNJA15-1	0.00 - 0.30 m bgl (29.44 - 29.14 m AOD)	Medium brownish grey sandy clay silt. Firm consistency.	Topsoil
SNJA15	QLEA3	P/88	PQ10 (moderate)	SNJA15-2	0.30 - 0.70 m bgl (29.14 - 28.74 m AOD)	Medium orangish brown sandy clay. Firm consistency.	Subsoil

SNJA15	QLEA3	P/88	PQ10 (moderate)	SNJA15-3	0.70 - 1.20 m bgl (28.74 - 28.24 m AOD)	Light greyish yellow clayey coarse sand. Firm consistency.	Head
SNJA15	QLEA3	P/88	PQ10 (moderate)	SNJA15-5	1.00 - 1.31 m bgl (28.44 - 28.13 m AOD)	Dark orangish brown clayey silty coarse sand. Loose consistency. Deposit is matrix supported. Clasts are 5mm-30mm unsorted sub-angular to sub-rounded flint, quartz. Lower boundary transition is distinct	Fluvial gravel
SNJA15	QLEA3	P/88	PQ10 (moderate)	SNJA15-6	1.31 - 1.90 m bgl (28.13 - 27.54 m AOD)	Medium brownish orange clayey silty medium sand. Loose consistency. Deposit is matrix supported. Clasts are 5mm-40mm unsorted sub-angular to sub-rounded flint, quartz. Lower boundary transition is distinct	Fluvial gravel
SNJA15	QLEA3	P/88	PQ10 (moderate)	SNJA15-7	1.90 - 2.93 m bgl (27.54 - 26.51 m AOD)	Medium brownish orange slightly silty medium sand. Loose consistency. Deposit is matrix supported. Clasts are 5mm-15mm moderately sorted sub-angular to sub-rounded flint. Lower boundary transition is distinct	Fluvial sand
SNJA15	QLEA3	P/88	PQ10 (moderate)	SNJA15-8	2.93 - 3.00 m bgl (26.51 - 26.44 m AOD)	Dark orangish brown silty clayey medium sand. Soft consistency. Deposit is matrix supported. Clasts are 5mm moderately sorted sub-angular to sub-rounded flint.	Fluvial sand
SNJA15	QLEA3	P/88	PQ10 (moderate)	SNJA15-9	3.00 - 3.25 m bgl (26.44 - 26.19 m AOD)	Dark brownish grey sandy silt. Soft consistency. Deposit is matrix supported. Clasts are 5mm-15mm moderately sorted sub-rounded to sub-angular flint, quartz. Lower boundary transition is indistinct	Fine-grained alluvium
SNJA15	QLEA3	P/88	PQ10 (moderate)	SNJA15-10	3.25 - 4.00 m bgl (26.19 - 25.44 m AOD)	Medium greyish yellow slightly sandy silty clay. Firm consistency. Deposit is matrix supported. Clasts are 5mm-15mm unsorted sub-rounded to sub-angular chalk, flint.	Till
BUNT01	QLEA4	P/118.4	PQ13b (moderate)	BUNT01-A	0.00 - 0.90 m bgl (27.57 - 26.67 m AOD)	Dark greyish brown silty clay. Firm consistency.	Topsoil
BUNT01	QLEA4	P/118.4	PQ13b (moderate)	BUNT01-B	0.90 - 1.50 m bgl (26.67 - 26.07 m AOD)	Medium orangish sandy gravel. Firm consistency.	Fluvial gravel
BUNT01	QLEA4	P/118.4	PQ13b (moderate)	BUNT01-C	1.50 - 2.00 m bgl (26.07 - 25.57 m AOD)	Medium yellowish brown sandy gravel. Loose consistency. Deposit is clast supported. Clasts are 2mm-60mm unsorted sub-rounded to sub-angular flint, quartz.	Fluvial gravel
BUNT01	QLEA4	P/118.4	PQ13b (moderate)	BUNT01-D	2.00 - 2.50 m bgl (25.57 - 25.07 m AOD)	Medium brownish grey sandy clayey silt. Soft consistency. Deposit is matrix supported. Clasts are <5mm-15mm poorly sorted sub-angular to sub-rounded flint, quartz.	Fine-grained alluvium
BUNT01	QLEA4	P/118.4	PQ13b (moderate)	BUNT01-E	2.50 - 3.00 m bgl (25.07 - 24.57 m AOD)	Medium greyish brown silty clay. Hard consistency. Deposit is matrix supported. Clasts are well sorted.	Fine-grained head deposit
BUNT01	QLEA4	P/118.4	PQ13b (moderate)	NO DATA	3.00 - 4.00 m bgl (24.57 - 23.57 m AOD)	.	-
BUNT01	QLEA4	P/118.4	PQ13b (moderate)	BUNT01-F	4.00 - 5.00 m bgl (23.57 - 22.57 m AOD)	Medium greyish brown silty clay. Hard consistency. Deposit is matrix supported.	Fine-grained head deposit
BUNT01	QLEA4	P/118.4	PQ13b (moderate)	BUNT01-G	5.00 - 6.00 m bgl (22.57 - 21.57 m AOD)	Dark greyish grey silty clay. Hard consistency. Deposit is matrix supported. Clasts are well sorted.	Till
BUNT01	QLEA4	P/118.4	PQ13b (moderate)	BUNT01-1	6.00 - 7.52 m bgl (21.57 - 20.05 m AOD)	Medium brown silty clay. Hard consistency. Deposit is matrix supported. Clasts are 20-40mm well sorted sub-rounded to angular chalk, flint.	Till
BUNT01	QLEA4	P/118.4	PQ13b (moderate)	BUNT01-2	7.52 - 10.00 m bgl (20.05 - 17.57 m AOD)	Medium grey silty clay. Deposit is matrix supported. Clasts are well sorted.	Till
SHRE09	QLEA5	P/152.3	PQ20 (low)	SHRE09-1	0.00 - 0.30 m bgl (33.45 - 33.15 m AOD)	Light brownish grey sandy clay. Firm consistency. Lower boundary transition is sharp	Topsoil

SHRE09	QLEA5	P/152.3	PQ20 (low)	SHRE09-2	0.30 - 0.60 m bgl (33.15 - 32.85 m AOD)	Light greyish yellow sandy clay. Firm consistency.	Subsoil
SHRE09	QLEA5	P/152.3	PQ20 (low)	SHRE09-3	0.60 - 1.20 m bgl (32.85 - 32.25 m AOD)	Light greyish brown sandy silt. Firm consistency.	Fine-grained head deposit
SHRE09	QLEA5	P/152.3	PQ20 (low)	SHRE09-4	1.20 - 4.16 m bgl (32.25 - 29.29 m AOD)	Medium yellowish grey silty clay. Hard consistency. Deposit is matrix supported. Clasts are 5-25mm unsorted sub-rounded chalk, sandstone. Lower boundary transition is diffuse	Till
SHRE09	QLEA5	P/152.3	PQ20 (low)	SHRE09-5	4.16 - 7.95 m bgl (29.29 - 25.50 m AOD)	Medium grey silty clay. Hard consistency. Deposit is matrix supported. Clasts are 5-60mm unsorted sub-rounded to sub-angular chalk, flint.	Till
WEST08	QLEA5	P/159.2	PQ20 (low)	WEST08-1	0.00 - 0.30 m bgl (40.73 - 40.43 m AOD)	Dark yellowish grey sandy clay. Firm consistency.	Topsoil
WEST08	QLEA5	P/159.2	PQ20 (low)	WEST08-2	0.30 - 0.70 m bgl (40.43 - 40.03 m AOD)	Medium greyish yellow sandy clay. Firm consistency.	Subsoil
WEST08	QLEA5	P/159.2	PQ20 (low)	WEST08-3	0.70 - 1.20 m bgl (40.03 - 39.53 m AOD)	Medium yellowish orange silty clay. Firm consistency.	Colluvium
WEST08	QLEA5	P/159.2	PQ20 (low)	WEST08-4	1.20 - 1.50 m bgl (39.53 - 39.23 m AOD)	Medium brownish grey slightly sandy silty clay. Firm consistency. Deposit is matrix supported. Clasts are <5mm well sorted sub-angular flint.	Fine-grained head deposit
WEST08	QLEA5	P/159.2	PQ20 (low)	WEST08-5	1.50 - 1.90 m bgl (39.23 - 38.83 m AOD)	Dark greyish brown silty clay. Firm consistency. Deposit is matrix supported. Clasts are 10 to 30mm poorly sorted sub-angular to sub-rounded flint, chalk (5%). Lower boundary transition is abrupt	Head
WEST08	QLEA5	P/159.2	PQ20 (low)	WEST08-6	1.90 - 5.80 m bgl (38.83 - 34.93 m AOD)	Medium greyish brown sandy silty clay. Hard consistency. Deposit is matrix supported. Clasts are 2 to 40mm unsorted sub-angular to well rounded flint, tertiary flint, chalk, quartz (35%). Lower boundary transition is diffuse	Till
WEST08	QLEA5	P/159.2	PQ20 (low)	WEST08-7	5.80 - 10.00 m bgl (34.93 - 30.73 m AOD)	Dark brownish grey sandy silty clay. Hard consistency. Deposit is matrix supported. Clasts are 1 to 70mm unsorted sub-angular to well rounded flint, tertiary flint, chalk, sandstone (40%).	Till

A2.4 Sample register. Samples collected from test pits (bulk samples) and borehole cores (spot samples) Further sampling of the cores is anticipated for the forthcoming Stage 2 Review.

SAMPLE NUMBER	TEST PIT / BOREHOLE	SAMPLE SIZE (l)	DEPOSIT NUMBER	DEPTH (m)	NOTES / PURPOSE
10001	TP2912	20	TP2912-02	1.6	Slope deposits. Contains molluscs and potentially small mammals
10002	TP2912	20	TP2912-02	2.0	Slope deposits. Contains molluscs and potentially small mammals
10003	TP2912	20	TP2912-03	3.0	Water laid, sands, silts and gravels. Contains molluscs and potentially small mammals.
10004	TP13	20	TP13-04	2.1	Suspected lake deposit.
10005	TP60	20	TP60-04	1.4	Potential lake deposits.
10006	TP60	20	TP60-04	1.9	Potential lake deposits.
10007	TP60	20	TP60-04	2.4	Potential lake deposits.
10008	TP60	20	TP60-04	2.9	Potential lake deposits.
10009	TP38	20	TP38-04	1.8	Taken for reference.
10010	TP38	20	TP38-05	2.9	Contains fresh water molluscs.
10011	TP48	20	TP48-04	2.0	Contains molluscs, blue grey clay.
10012	TP48	20	TP48-04	2.5	Contains molluscs, blue grey clay.
10013	TP48	20	TP48-04	3.0	Contains molluscs, blue grey clay.
10014	TP141	20	TP141-07	3.2	Lake deposits.
10015	TP1030	20	TP1030-01	1.2	contains snail shells and small mammals.
10016	TP1030	20	TP1030-03	1.4	Lake deposits
10017	TP1030	20	TP1030-03	1.9	Lake deposits
10018	TP1030	20	TP1030-03	2.4	Lake deposits
10019	TP1030	20	TP1030-03	2.9	Lake deposits
10020	TP1030	20	TP1030-03	3.1	Lake deposits
10021	TP1027	20	TP1027-03	0.8	Lake deposits
20001	SHRE10	<1	-	4.1	Wood
20002	SHRE10	<1	-	5.7	Wood
20003	SNJA10	<1	-	5.0	Pollen
20004	SNJA10	<1	-	5.2	Pollen
20005	SNJA10	<1	-	5.7	Pollen
20006	SNJA10	<1	-	6.2	Pollen
20007	SNJA10	<1	-	7.0	Pollen
20008	SNJA10	<1	-	6.6	Pollen
20009	SNJA10	<1	-	7.2	Pollen
20010	SNJA10	<1	-	7.3	Pollen
20011	SNJA10	<1	-	7.2	Ostracod
20012	SNJA10	<1	-	2.5	Ostracod
20013	SNJA10	<1	-	3.1	Ostracod
20014	SNJA10	<1	-	4.1	Ostracod
20015	SNJA10	<1	-	4.8	Ostracod
20016	SNJA10	<1	-	5.2	Ostracod
20017	SNJA10	<1	-	5.7	Ostracod
20018	SNJA10	<1	-	6.2	Ostracod
20019	SNJA10	<1	-	6.5	Ostracod
20020	SNJA10	<1	-	7.0	Ostracod

20021	SNJA10	<1	-	7.1	Ostracod
20022	SSBE09	<1	-	4.2	Pollen
20023	SSBE09	<1	-	8.7	Pollen
20024	SSBE09	<1	-	9.2	Pollen
20025	SSBE09	<1	-	9.7	Pollen
20026	SSBE09	<1	-	10.1	Pollen
20027	SSBE09	<1	-	10.6	Pollen
20028	SSBE09	<1	-	11.1	Pollen
20029	SSBE09	<1	-	12.6	Pollen
20030	SSBE09	<1	-	13.2	Pollen
20031	SSBE09	<1	-	13.6	Pollen
20032	SSBE09	<1	-	14.1	Pollen
20033	SSBE09	<1	-	8.7	Ostracod
20034	SSBE09	<1	-	9.2	Ostracod
20035	SSBE09	<1	-	9.7	Ostracod
20036	SSBE09	<1	-	10.2	Ostracod
20037	SSBE09	<1	-	10.6	Ostracod
20038	SSBE09	<1	-	11.1	Ostracod
20039	SSBE09	<1	-	12.7	Ostracod
20040	SSBE09	<1	-	13.2	Ostracod
20041	SSBE09	<1	-	13.6	Ostracod
20042	SSBE09	<1	-	14.2	Ostracod
20043	SSBE09	<1	-	15.0	Pollen
20044	SSBE09	<1	-	15.6	Pollen
20045	SSBE09	<1	-	16.3	Pollen
20046	SSBE09	<1	-	17.2	Pollen
20047	SSBE09	<1	-	14.9	Ostracod
20048	SSBE09	<1	-	15.7	Ostracod
20049	SSBE09	<1	-	16.3	Ostracod
20050	SSBE09	<1	-	17.2	Ostracod
20051	SNJA11	<1	-	6.5	Ostracod
20052	SNJA11	<1	-	6.8	Ostracod
20053	SNJA11	<1	-	6.6	Ostracod
20054	SNJA11	<1	-	7.4	Ostracod
20055	SNJA11	<1	-	7.7	Ostracod
20056	SSBE07	<1	-	5.3	Pollen
20057	SSBE07	<1	-	5.3	Ostracod
20058	SSBE07	<1	-	5.3	Organic Material

A2.5 Palaeoenvironmental assessments. Samples submitted for preliminary palaeoenvironmental assessment.

SAMPLE NUMBER	TEST PIT / BOREHOLE	SAMPLE DEPTH (m BGL)	SAMPLE WEIGHT (g)
10012	TP48	2.50	40
10005	TP60	1.40	40
10010	TP60	2.90	40
10014	TP141	3.20	40
10021	TP1027	0.80	40
10016	TP1030	1.40	40
10020	TP1030	3.10	40
20012	SNJA10	2.49	38
20013	SNJA10	3.06	35
20014	SNJA10	4.05	28
20015	SNJA10	4.81	38
20016	SNJA10	5.17	26
20017	SNJA10	5.68	38
20018	SNJA10	6.17	23
20019	SNJA10	6.51	36
20020	SNJA10	6.97	25
20021	SNJA10	7.13	40
20011	SNJA10	7.23	28
20051	SNJA11	6.47	35
20052	SNJA11	6.51	36
20053	SNJA11	6.58	34
20054	SNJA11	7.35	32
20055	SNJA11	7.71	35
20033	SSBE09	8.68	55
20034	SSBE09	9.19	50
20035	SSBE09	9.69	76
20036	SSBE09	10.21	40
20037	SSBE09	10.61	45
20038	SSBE09	11.11	45
20039	SSBE09	12.71	58
20040	SSBE09	13.21	42
20041	SSBE09	13.61	60
20042	SSBE09	14.21	48
20047	SSBE09	14.91	53
20048	SSBE09	15.71	78
20049	SSBE09	16.31	52
20050	SSBE09	17.21	65

A2.6 Test pit photograph register.

IMAGE ID	Area	TEST PIT	DESCRIPTION	FACING	DATE
100-0001	BUNTING 1&2	TP1548	Prior to work shot	E	21/06/2021
100-0002	BUNTING 1&2	TP1548	TP Section	S	21/06/2021
100-0003	BUNTING 1&2	TP1548	TP Section	W	21/06/2021
100-0004	BUNTING 1&2	TP1548	TP Section	N	21/06/2021
100-0005	BUNTING 1&2	TP1548	TP Section	E	21/06/2021
100-0006	BUNTING 1&2	TP1548	General view	NE	21/06/2021
100-0007	BUNTING 1&2	TP1544	General view	SE	21/06/2021
100-0008	BUNTING 1&2	TP1544	TP Section	N	21/06/2021
100-0009	BUNTING 1&2	TP1544	TP Section	W	21/06/2021
100-0010	BUNTING 1&2	TP1544	TP Section	S	21/06/2021
100-0011	BUNTING 1&2	TP1544	TP Section	E	21/06/2021
100-0012	BUNTING 1&2	TP1569	General view		22/06/2021
100-0013	BUNTING 1&2	TP1569	TP Section	NE	22/06/2021
100-0014	BUNTING 1&2	TP1569	TP Section	SW	22/06/2021
100-0015	BUNTING 1&2	TP1569	TP Section	NW	22/06/2021
100-0016	BUNTING 1&2	TP1569	TP Section	SE	22/06/2021
100-0017	BUNTING 1&2	TP1578	TP Section	E	22/06/2021
100-0018	BUNTING 1&2	TP1578	TP Section	W	22/06/2021
100-0019	BUNTING 1&2	TP1578	TP Section	N	22/06/2021
100-0020	BUNTING 1&2	TP1578	TP Section	S	22/06/2021
100-0021	BUNTING 1&2	TP1578	General view	SE	22/06/2021
100-0022	BUNTING 1&2	TP1572	General view	NE	22/06/2021
100-0023	BUNTING 1&2	TP1572	TP Section	N	23/06/2021
100-0024	BUNTING 1&2	TP1572	TP Section	S	23/06/2021
100-0025	BUNTING 1&2	TP1572	TP Section	W	23/06/2021
100-0026	BUNTING 1&2	TP1572	TP Section	E	23/06/2021
100-0027	SHERWOOD WEST	TP2145	TP Section S facing	N	30/06/2021
100-0028	SHERWOOD WEST	TP2145	TP Section N facing	S	30/06/2021
100-0029	SHERWOOD WEST	TP2145	TP Section E facing	W	30/06/2021
100-0030	SHERWOOD WEST	TP2145	TP Section W facing	E	30/06/2021
100-0031	SHERWOOD EAST	TP2115	TP Section SE facing	NW	01/07/2021
100-0032	SHERWOOD EAST	TP2115	TP Section NW facing	SE	01/07/2021
100-0033	SHERWOOD EAST	TP2115	TP Section SW facing	NE	01/07/2021
100-0034	SHERWOOD EAST	TP2115	TP Section NE facing	SW	01/07/2021
100-0035	SHERWOOD EAST	TP2090	TP Section	W	02/07/2021
100-0036	SHERWOOD EAST	TP2090	TP Section	NE	02/07/2021
100-0037	SHERWOOD EAST	TP2090	TP Section	N	02/07/2021
100-0038	SHERWOOD EAST	TP2090	TP Section	NE	02/07/2021
100-0039	SHERWOOD EAST	TP2090	General view	NE	02/07/2021
100-0040	SHERWOOD EAST	TP2218	TP Section	NE	02/07/2021
100-0041	SHERWOOD EAST	TP2218	TP Section	NW	02/07/2021
100-0042	SHERWOOD EAST	TP2218	TP Section	SW	02/07/2021
100-0043	SHERWOOD EAST	TP2218	General view	SW	02/07/2021
100-0044	SHERWOOD EAST	TP2240	TP Section	W	05/07/2021
100-0045	SHERWOOD EAST	TP2240	TP Section	S	05/07/2021
100-0046	SHERWOOD EAST	TP2240	TP Section	E	05/07/2021
100-0047	SHERWOOD EAST	TP2240	General view	SE	05/07/2021
100-0048	SHERWOOD EAST	TP2257	General view	NW	06/07/2021
100-0049	SHERWOOD EAST	TP2257	TP Section	W	06/07/2021
100-0050	SHERWOOD EAST	TP2257	TP Section	N	06/07/2021
100-0051	SHERWOOD EAST	TP2257	TP Section	E	06/07/2021
100-0052	SHERWOOD EAST	TP2340	TP Section	SE	07/07/2021
100-0053	SHERWOOD EAST	TP2340	TP Section	SW	07/07/2021
100-0054	SHERWOOD EAST	TP2340	TP Section	NW	07/07/2021
100-0055	SHERWOOD EAST	TP2340	General view	NW	07/07/2021

100-0056	SHERWOOD EAST	TP2346	TP Section	SW	08/07/2021
100-0057	SHERWOOD EAST	TP2346	TP Section	NW	08/07/2021
100-0058	SHERWOOD EAST	TP2346	TP Section	NE	08/07/2021
100-0059	SHERWOOD EAST	TP2346	General view	NE	08/07/2021
100-0060	SHERWOOD EAST	TP2312	TP Section	E	09/07/2021
100-0061	SHERWOOD EAST	TP2312	TP Section	S	09/07/2021
100-0062	SHERWOOD EAST	TP2312	TP Section	W	09/07/2021
100-0063	SHERWOOD EAST	TP2312	General view	W	09/07/2021
100-0064	SHERWOOD EAST	TP2136	TP Section S facing	N	12/07/2021
100-0065	SHERWOOD EAST	TP2136	TP Section W facing	E	12/07/2021
100-0066	SHERWOOD EAST	TP2136	TP Section N facing	S	12/07/2021
100-0067	SHERWOOD EAST	TP2136	General view	SE	12/07/2021
100-0068	LORD RAYLEIGH	TP2728	TP Section W facing	E	13/07/2021
100-0069	LORD RAYLEIGH	TP2728	TP Section N facing	S	13/07/2021
100-0070	LORD RAYLEIGH	TP2728	TP Section E facing	W	13/07/2021
100-0071	LORD RAYLEIGH	TP2764	TP Section E facing	W	14/07/2021
100-0072	LORD RAYLEIGH	TP2764	TP Section N facing	S	14/07/2021
100-0073	LORD RAYLEIGH	TP2764	TP Section W facing	E	14/07/2021
100-0074	LORD RAYLEIGH	TP2764	General view	SW	14/07/2021
100-0075	BUNTING 1&2	TP1546	TP Section NE facing	SW	15/07/2021
100-0076	BUNTING 1&2	TP1546	SE fac sec	NW	15/07/2021
100-0077	BUNTING 1&2	TP1546	SW fac sec	NE	15/07/2021
100-0078	BUNTING 1&2	TP1546	General view	NW	15/07/2021
100-0079	BUNTING 1&2	TP1564	TP Section	W	21/07/2021
100-0080	BUNTING 1&2	TP1564	TP Section	N	21/07/2021
100-0081	BUNTING 1&2	TP1564	TP Section	E	21/07/2021
100-0082	BUNTING 1&2	TP1564	General view	NE	21/07/2021
100-0083	BUNTING 1&2	TP1642	TP Section	W	22/07/2021
100-0084	BUNTING 1&2	TP1642	TP Section	N	22/07/2021
100-0085	BUNTING 1&2	TP1642	TP Section	E	22/07/2021
100-0086	BUNTING 1&2	TP1642	TP Section	NE	22/07/2021
100-0087	BUNTING 1&2	TP1642	TP Section	NE	22/07/2021
100-0088	BUNTING 1&2	TP1642	General view	W	22/07/2021
100-0089	BUNTING 1&2	TP1702	TP Section	S	22/07/2021
100-0090	BUNTING 1&2	TP1702	TP Section	S	22/07/2021
100-0091	BUNTING 1&2	TP1702	TP Section	W	22/07/2021
100-0092	BUNTING 1&2	TP1702	TP Section	N	22/07/2021
100-0093	BUNTING 1&2	TP1702	TP Section	N	22/07/2021
100-0094	BUNTING 1&2	TP1701	TP Section	SE	23/07/2021
100-0095	BUNTING 1&2	TP1701	TP Section	SE	23/07/2021
100-0096	BUNTING 1&2	TP1701	TP Section	SW	23/07/2021
100-0097	BUNTING 1&2	TP1701	TP Section	NW	23/07/2021
100-0098	BUNTING 1&2	TP1701	General view	SW	23/07/2021
100-0099	BUNTING 1&2	TP1701	TP Section	SE	23/07/2021
100-0100	CARTERS	TP1958	TP Section	E	26/07/2021
100-0101	CARTERS	TP1958	TP Section	S	26/07/2021
100-0102	CARTERS	TP1958	TP Section	W	26/07/2021
100-0103	CARTERS	TP1958	General view	NE	26/07/2021
100-0104	CARTERS	TP1920	TP Section	N	27/07/2021
100-0105	CARTERS	TP1920	TP Section	E	27/07/2021
100-0106	CARTERS	TP1920	TP Section	S	27/07/2021
100-0107	CARTERS	TP1920	General view	E	27/07/2021
100-0108	CARTERS	TP1937	TP Section	W	27/07/2021
100-0109	CARTERS	TP1937	TP Section	N	27/07/2021
100-0110	CARTERS	TP1937	TP Section	E	27/07/2021
100-0111	CARTERS	TP1937	General view	SE	27/07/2021
100-0112	CARTERS	TP1937	TP Section	E	27/07/2021
100-0113	CARTERS	TP1957	TP Section	SE	27/07/2021

100-0114	CARTERS	TP1957	TP Section	SW	27/07/2021
100-0115	CARTERS	TP1957	TP Section	NW	27/07/2021
100-0116	CARTERS	TP1957	General view	SE	27/07/2021
100-0117	CARTERS	TP1934	TP Section	S	28/07/2021
100-0118	CARTERS	TP1934	TP Section	W	28/07/2021
100-0119	CARTERS	TP1934	TP Section	N	28/07/2021
100-0120	CARTERS	TP1934	General view	SE	28/07/2021
100-0121	CARTERS	TP1977	TP Section	W	29/07/2021
100-0122	CARTERS	TP1977	TP Section	N	29/07/2021
100-0123	CARTERS	TP1977	TP Section	E	29/07/2021
100-0124	CARTERS	TP1977	General view	NE	29/07/2021
100-0125	WEST	TP2360	TP Section	E	29/07/2021
100-0126	WEST	TP2360	TP Section	N	29/07/2021
100-0127	WEST	TP2360	TP Section	W	29/07/2021
100-0128	WEST	TP2360	General view	N	29/07/2021
100-0129	WEST	TP2378	TP Section	E	30/07/2021
100-0130	WEST	TP2378	TP Section	S	30/07/2021
100-0131	WEST	TP2378	TP Section	W	30/07/2021
100-0132	WEST	TP2378	General view	SW	30/07/2021
100-0133	SAWDON, BUNTING & BELCHEM	TP1416	TP section	E	02/08/2021
100-0134	SAWDON, BUNTING & BELCHEM	TP1416	TP section	S	02/08/2021
100-0135	SAWDON, BUNTING & BELCHEM	TP1416	TP section	W	02/08/2021
100-0136	SAWDON, BUNTING & BELCHEM	TP1416	TP section detail	W	02/08/2021
100-0137	SAWDON, BUNTING & BELCHEM	TP1416	TP section detail	E	02/08/2021
100-0138	SAWDON, BUNTING & BELCHEM	TP1416	General view	SW	02/08/2021
100-0139	SAWDON, BUNTING & BELCHEM	TP2667	General view	SW	03/08/2021
100-0140	SAWDON, BUNTING & BELCHEM	TP2667	TP section	E	03/08/2021
100-0141	SAWDON, BUNTING & BELCHEM	TP2667	TP section	S	03/08/2021
100-0142	SAWDON, BUNTING & BELCHEM	TP2667	TP section	W	03/08/2021
100-0143	SAWDON, BUNTING & BELCHEM	TP2667	General view	NW	03/08/2021
100-0144	BUNTING NORTH	TP1812	TP Section	W	08/04/2021
100-0145	BUNTING NORTH	TP1812	TP Section	N	08/04/2021
100-0146	BUNTING NORTH	TP1812	General view	S	08/04/2021
100-0147	BUNTING NORTH	TP1817	Fencing set up	W	08/05/2021
100-0148	BUNTING NORTH	TP1817	Fencing set up	W	08/05/2021
100-0149	BUNTING NORTH	TP1817	TP Section	W	08/05/2021
100-0150	BUNTING NORTH	TP1817	TP Section	N	08/05/2021
100-0151	BUNTING NORTH	TP1817	TP Section	E	08/05/2021
100-0152	BUNTING NORTH	TP1817	General view	SW	08/05/2021
100-0153	BUNTING HEART	TP1408	TP Section	W	08/11/2021
100-0154	BUNTING HEART	TP1408	TP Section	N	08/11/2021
100-0155	BUNTING HEART	TP1408	TP Section	E	08/11/2021
100-0156	BUNTING HEART	TP1408	General view	E	08/11/2021
100-0157	BUNTING HEART	TP2942	TP Section	W	08/11/2021
100-0158	BUNTING HEART	TP2942	TP Section	S	08/11/2021
100-0159	BUNTING HEART	TP2942	TP Section	E	08/11/2021
100-0160	BUNTING HEART	TP2942	General view	E	08/11/2021
100-0161	BUNTING HEART	TP2970	TP Section	N	08/12/2021
100-0162	BUNTING HEART	TP2970	TP Section	E	08/12/2021
100-0163	BUNTING HEART	TP2970	TP Section	S	08/12/2021
100-0164	BUNTING HEART	TP2970	General view	N	08/12/2021
100-0165	BUNTING HEART	TP2967	TP Section	S	08/12/2021
100-0166	BUNTING HEART	TP2967	TP Section	W	08/12/2021
100-0167	BUNTING HEART	TP2967	TP Section	N	08/12/2021
100-0168	BUNTING HEART	TP2967	General view	S	08/12/2021
100-0169	BUNTING HEART	TP2981	TP Section	E	8/13/2021
100-0170	BUNTING HEART	TP2981	TP Section	S	8/13/2021
100-0171	BUNTING HEART	TP2981	TP Section	W	8/13/2021

100-0172	BUNTING HEART	TP2981	General view	E	8/13/2021
100-0173	SHERWOOD EAST	TP2198	TP Section	N	8/16/2021
100-0174	SHERWOOD EAST	TP2198	TP Section	E	8/16/2021
100-0175	SHERWOOD EAST	TP2198	TP Section	S	8/16/2021
100-0176	SHERWOOD EAST	TP2198	General view	S	8/16/2021
100-0177	SHERWOOD EAST	TP2680	TP Section	SE	8/16/2021
100-0178	SHERWOOD EAST	TP2680	TP Section	SW	8/16/2021
100-0179	SHERWOOD EAST	TP2680	TP Section	NW	8/16/2021
100-0180	SHERWOOD EAST	TP2680	General view	NW	8/16/2021
100-0181	SHERWOOD EAST	TP2226	TP Section	W	8/17/2021
100-0182	SHERWOOD EAST	TP2226	TP Section	N	8/17/2021
100-0183	SHERWOOD EAST	TP2226	TP Section	E	8/17/2021
100-0184	SHERWOOD EAST	TP2226	General view	E	8/17/2021
100-0185	LORD RAYLEIGH	TP2742	TP Section	E	8/18/2021
100-0186	LORD RAYLEIGH	TP2742	TP Section	S	8/18/2021
100-0187	LORD RAYLEIGH	TP2742	TP Section	W	8/18/2021
100-0188	LORD RAYLEIGH	TP2742	General view	W	8/18/2021
100-0189	LORD RAYLEIGH	TP2753	TP Section	NE	8/18/2021
100-0190	LORD RAYLEIGH	TP2753	TP Section	SE	8/18/2021
100-0191	LORD RAYLEIGH	TP2753	TP Section	SW	8/18/2021
100-0192	LORD RAYLEIGH	TP2753	General view	SW	8/18/2021
100-0193	LORD RAYLEIGH	TP510	TP Section	W	8/19/2021
100-0194	LORD RAYLEIGH	TP510	TP Section	N	8/19/2021
100-0195	LORD RAYLEIGH	TP510	TP Section	E	8/19/2021
100-0196	LORD RAYLEIGH	TP510	General view	E	8/19/2021
100-0197	LORD RAYLEIGH	TP477	TP Section	E	8/19/2021
100-0198	LORD RAYLEIGH	TP477	TP Section	N	8/19/2021
100-0199	LORD RAYLEIGH	TP477	TP Section	W	8/19/2021
100-0200	LORD RAYLEIGH	TP477	General view	E	8/19/2021
100-0201	RATCLIFFE	TP269	TP Section	E	8/20/2021
100-0202	RATCLIFFE	TP269	TP Section	S	8/20/2021
100-0203	RATCLIFFE	TP269	TP Section	W	8/20/2021
100-0204	RATCLIFFE	TP269	General shot	E	8/20/2021
100-0205	RATCLIFFE	TP258	TP Section	S	8/20/2021
100-0206	RATCLIFFE	TP258	TP Section	W	8/20/2021
100-0207	RATCLIFFE	TP258	TP Section	N	8/20/2021
100-0208	RATCLIFFE	TP258	General shot	S	8/20/2021
100-0209	ULTING	TP364	General shot	S	8/23/2021
100-0210	ULTING	TP364	TP Section	S	8/23/2021
100-0211	ULTING	TP364	TP Section	W	8/23/2021
100-0212	ULTING	TP364	TP Section	N	8/23/2021
100-0213	ULTING	TP355	TP Section	N	8/23/2021
100-0214	ULTING	TP355	TP Section	E	8/23/2021
100-0215	ULTING	TP355	TP Section	S	8/23/2021
100-0216	ULTING	TP355	General shot	S	8/23/2021
100-0217	ULTING	TP345	TP Section	N	8/23/2021
100-0218	ULTING	TP345	TP Section	E	8/23/2021
100-0219	ULTING	TP345	TP Section	S	8/23/2021
100-0220	ULTING	TP345	General shot	E	8/23/2021
100-0221	ULTING	TP340	TP Section	E	8/24/2021
100-0222	ULTING	TP340	TP Section	S	8/24/2021
100-0223	ULTING	TP340	TP Section	W	8/24/2021
100-0224	ULTING	TP340	General shot	W	8/24/2021
100-0225	ULTING	TP382	TP Section	W	8/24/2021
100-0226	ULTING	TP382	TP Section	N	8/24/2021
100-0227	ULTING	TP382	TP Section	E	8/24/2021
100-0228	ULTING	TP382	General shot	N	8/24/2021
100-0229	ULTING	TP397	TP Section	E	8/25/2021

100-0230	ULTING	TP397	TP Section	E	8/25/2021
100-0231	ULTING	TP397	TP Section	E	8/25/2021
100-0232	ULTING	TP397	TP Section	S	8/25/2021
100-0233	ULTING	TP397	TP Section	W	8/25/2021
100-0234	ULTING	TP397	TP Section	W	8/25/2021
100-0235	ULTING	TP397	General shot	S	8/25/2021
100-0236	WOODS LECCY	TP901	TP Section	N	8/25/2021
100-0237	WOODS LECCY	TP901	TP Section	N	8/25/2021
100-0238	WOODS LECCY	TP901	TP Section	E	8/25/2021
100-0239	WOODS LECCY	TP901	TP Section	S	8/25/2021
100-0240	WOODS LECCY	TP901	TP Section	S	8/25/2021
100-0241	WOODS LECCY	TP901	General shot	SE	8/25/2021
100-0242	WOODS LECCY	TP903	TP Section	N	8/31/2021
100-0243	WOODS LECCY	TP903	TP Section	E	8/31/2021
100-0244	WOODS LECCY	TP903	TP Section	S	8/31/2021
100-0245	WOODS LECCY	TP903	General shot	N	8/31/2021
100-0246	WOODS LECCY	TP918	TP Section	W	8/31/2021
100-0247	WOODS LECCY	TP918	TP Section	N	8/31/2021
100-0248	WOODS LECCY	TP918	TP Section	E	8/31/2021
100-0249	WOODS LECCY	TP918	TP Section	W	8/31/2021
100-0250	WOODS LECCY	TP918	General shot	E	8/31/2021
100-0251	WOODS LECCY	TP920	W facing section	W	09/01/2021
100-0252	WOODS LECCY	TP920	N facing section	N	09/01/2021
100-0253	WOODS LECCY	TP920	E facing section	E	09/01/2021
100-0254	WOODS LECCY	TP920	General shot	NE	09/01/2021
100-0255	WOODS LECCY	TP920	N section detail	N	09/01/2021
100-0256	WOODS LECCY	TP922	TP Section	W	09/01/2021
100-0257	WOODS LECCY	TP922	TP Section	N	09/01/2021
100-0258	WOODS LECCY	TP922	TP Section	E	09/01/2021
100-0259	WOODS LECCY	TP922	TP Section	E	09/01/2021
100-0260	WOODS LECCY	TP922	Location shot	NE	09/01/2021
100-0261	SAWDON	TP1381	TP Section	W	09/02/2021
100-0262	SAWDON	TP1381	TP Section	N	09/02/2021
100-0263	SAWDON	TP1381	TP Section	E	09/02/2021
100-0264	SAWDON	TP1381	General shot	E	09/02/2021
100-0265	BUNTING BITS	TP1420	Plan shot of tp	NW	09/03/2021
100-0266	BUNTING BITS	TP1420	TP Section	SE	09/03/2021
100-0267	BUNTING BITS	TP1420	TP Section	NW	09/03/2021
100-0268	BUNTING BITS	TP1420	TP Section	NE	09/03/2021
100-0269	BUNTING BITS	TP1420	General shot	SE	09/03/2021
100-0270	BUNTING BITS	TP1418	TP Section	NW	09/03/2021
100-0271	BUNTING BITS	TP1418	TP Section	NE	09/03/2021
100-0272	BUNTING BITS	TP1418	TP Section	SE	09/03/2021
100-0273	BUNTING BITS	TP1418	TP Section details	SE	09/03/2021
100-0274	BUNTING BITS	TP1418	General shot	SE	09/03/2021
100-0275	BOLTON SOUTH	TP2906	TP Section	N	09/06/2021
100-0276	BOLTON SOUTH	TP2906	TP Section	E	09/06/2021
100-0277	BOLTON SOUTH	TP2906	TP Section	S	09/06/2021
100-0278	BOLTON SOUTH	TP2906	General shot	SE	09/06/2021
100-0279	BOLTON SOUTH	TP2912	TP Section	N	09/06/2021
100-0280	BOLTON SOUTH	TP2912	TP Section	E	09/06/2021
100-0281	BOLTON SOUTH	TP2912	TP Section	S	09/06/2021
100-0282	BOLTON SOUTH	TP2912	General shot	NE	09/06/2021
100-0283	BOLTON SOUTH	TP13	TP Section	E	09/07/2021
100-0284	BOLTON SOUTH	TP13	TP Section	S	09/07/2021
100-0285	BOLTON SOUTH	TP13	TP Section	W	09/07/2021
100-0286	BOLTON SOUTH	TP13	Bottom of tp	S	09/07/2021
100-0287	BOLTON SOUTH	TP13	General shot	SE	09/07/2021

100-0288	BOLTON SOUTH	TP60	TP Section	S	09/08/2021
100-0289	BOLTON SOUTH	TP60	TP Section	W	09/08/2021
100-0290	BOLTON SOUTH	TP60	TP Section	N	09/08/2021
100-0291	BOLTON SOUTH	TP60	General shot	SW	09/08/2021
100-0292	BOLTON SOUTH	TP38	TP Section	E	09/08/2021
100-0293	BOLTON SOUTH	TP38	TP Section details	E	09/08/2021
100-0294	BOLTON SOUTH	TP38	TP Section	N	09/08/2021
100-0295	BOLTON SOUTH	TP38	TP Section	W	09/08/2021
100-0296	BOLTON SOUTH	TP38	General shot	N	09/08/2021
100-0297	BOLTON SOUTH	TP48	Plan shot of tp	NW	09/09/2021
100-0298	BOLTON SOUTH	TP48	TP Section	S	09/09/2021
100-0299	BOLTON SOUTH	TP48	TP Section	NW	09/09/2021
100-0300	BOLTON SOUTH	TP48	TP Section	NE	09/09/2021
100-0301	BOLTON SOUTH	TP48	TP Section details	NE	09/09/2021
100-0302	BOLTON SOUTH	TP48	General shot	SE	09/09/2021
100-0303	PAYNES LANE	TP130	TP Section	E	09/09/2021
100-0304	PAYNES LANE	TP130	TP Section	S	09/09/2021
100-0305	PAYNES LANE	TP130	TP Section	W	09/09/2021
100-0306	PAYNES LANE	TP130	TP Section	W	09/09/2021
100-0307	PAYNES LANE	TP130	TP Section	W	09/09/2021
100-0308	PAYNES LANE	TP130	General shot	W	09/09/2021
100-0309	PAYNES LANE	TP141	Plan shot of tp	SE	09/10/2021
100-0310	PAYNES LANE	TP141	Plan shot of tp	E	09/10/2021
100-0311	PAYNES LANE	TP141	Plan shot of tp	SE	09/10/2021
100-0312	PAYNES LANE	TP141	TP Section	NE	09/10/2021
100-0313	PAYNES LANE	TP141	TP Section	SE	09/10/2021
100-0314	PAYNES LANE	TP141	TP Section	SW	09/10/2021
100-0315	PAYNES LANE	TP141	TP Section details	SW	09/10/2021
100-0316	PAYNES LANE	TP141	General shot	N	09/10/2021
100-0317	PAYNES LANE	TP141	General shot	S	09/10/2021
100-0318	PAYNES LANE	TP121	TP Section	W	9/13/2021
100-0319	PAYNES LANE	TP121	TP Section	N	9/13/2021
100-0320	PAYNES LANE	TP121	TP Section	E	9/13/2021
100-0321	PAYNES LANE	TP121	General shot	W	9/13/2021
100-0322	PAYNES LANE	TP118	TP Section	E	9/13/2021
100-0323	PAYNES LANE	TP118	TP Section	S	9/13/2021
100-0324	PAYNES LANE	TP118	TP Section	W	9/13/2021
100-0325	PAYNES LANE	TP118	General shot	SE	9/13/2021
100-0326	PAYNES LANE	TP118	TP Section	W	9/13/2021
100-0327	BRICE WEST	TP1037	TP Section	E	9/14/2021
100-0328	BRICE WEST	TP1037	TP Section	N	9/14/2021
100-0329	BRICE WEST	TP1037	TP Section	W	9/14/2021
100-0330	BRICE WEST	TP1037	General shot	NW	9/14/2021
100-0331	BRICE WEST	TP1029	TP Section	N	9/14/2021
100-0332	BRICE WEST	TP1029	TP Section	W	9/14/2021
100-0333	BRICE WEST	TP1029	TP Section	S	9/14/2021
100-0334	BRICE WEST	TP1029	General shot	N	9/14/2021
100-0335	BRICE WEST	TP1029	Plan shot of tp	W	9/14/2021
100-0336	BRICE WEST	TP1030	TP Section	W	9/15/2021
100-0337	BRICE WEST	TP1030	Plan shot of tp	N	9/15/2021
100-0338	BRICE WEST	TP1030	TP Section	N	9/15/2021
100-0339	BRICE WEST	TP1030	TP Section	E	9/15/2021
100-0340	BRICE WEST	TP1030	General shot	SW	9/15/2021
100-0341	BRICE WEST	TP1027	TP Section	NW	9/15/2021
100-0342	BRICE WEST	TP1027	TP Section	NW	9/15/2021
100-0343	BRICE WEST	TP1027	TP Section	NE	9/15/2021
100-0344	BRICE WEST	TP1027	TP Section	NE	9/15/2021
100-0345	BRICE WEST	TP1027	TP Section	SE	9/15/2021

100-0346	BRICE WEST	TP1027	TP Section	SE	9/15/2021
100-0347	BRICE WEST	TP1027	Working shot of tp	NE	9/15/2021
100-0348	BRICE WEST	TP1027	Working shot of tp	NE	9/15/2021
100-0349	BRICE WEST	TP1027	General shot	SW	9/15/2021
100-0350	BRICE WEST	TP1025	TP Section	N	9/16/2021
100-0351	BRICE WEST	TP1025	TP Section	W	9/16/2021
100-0352	BRICE WEST	TP1025	TP Section	E	9/16/2021
100-0353	BRICE WEST	TP1025	General shot	SE	9/16/2021
100-0354	BRICE WEST	TP1016	TP Section	E	9/16/2021
100-0355	BRICE WEST	TP1016	TP Section	S	9/16/2021
100-0356	BRICE WEST	TP1016	Shot of large stone at bottom of tp	S	9/16/2021
100-0357	BRICE WEST	TP1016	TP Section	W	9/16/2021
100-0358	BRICE WEST	TP1016	General shot	NE	9/16/2021
100-0359	BRICE WEST	TP1016	TP Section	W	9/16/2021
100-0360	BRICE WEST	TP1015	General shot	SE	9/17/2021
100-0361	BRICE WEST	TP1015	TP Section	N	9/17/2021
100-0362	BRICE WEST	TP1015	TP Section	W	9/17/2021
100-0363	BRICE WEST	TP1015	TP Section	S	9/17/2021
100-0364	BRICE WEST	TP1019	TP Section	S	9/17/2021
100-0365	BRICE WEST	TP1019	TP Section	E	9/17/2021
100-0366	BRICE WEST	TP1019	TP Section	N	9/17/2021
100-0367	BRICE WEST	TP1019	General shot	N	9/17/2021
100-0368	BRICE WEST	TP1018	TP Section	W	9/17/2021
100-0369	BRICE WEST	TP1018	TP Section	N	9/17/2021
100-0370	BRICE WEST	TP1018	TP Section	E	9/17/2021
100-0371	BRICE WEST	TP1018	General shot	W	9/17/2021
100-0372	BRICE WEST	TP1022	General shot	NE	9/17/2021
100-0373	BRICE WEST	TP1022	TP Section	N	9/17/2021
100-0374	BRICE WEST	TP1022	TP Section	E	9/17/2021
100-0375	BRICE WEST	TP1022	TP Section	W	9/17/2021
100-0376	WEST	TP2543	General shot	W	9/20/2021
100-0377	WEST	TP2543	TP Section	W	9/20/2021
100-0378	WEST	TP2543	TP Section	N	9/20/2021
100-0379	WEST	TP2543	TP Section	E	9/20/2021
100-0380	WEST	TP2483	TP Section	W	9/21/2021
100-0381	WEST	TP2483	TP Section	N	9/21/2021
100-0382	WEST	TP2483	TP Section	E	9/21/2021
100-0383	WEST	TP2483	TP Section details	E	9/21/2021
100-0384	WEST	TP2483	General shot	W	9/21/2021
100-0385	VELLACOTT	TP629	TP Section	E	9/21/2021
100-0386	VELLACOTT	TP629	TP Section	S	9/21/2021
100-0387	VELLACOTT	TP629	TP Section	W	9/21/2021
100-0388	VELLACOTT	TP629	TP Section	W	9/21/2021
100-0389	VELLACOTT	TP629	General shot	NE	9/21/2021
100-0390	VELLACOTT	TP629	General shot	NE	9/21/2021
100-0391	VELLACOTT	TP597	TP Section	S	9/22/2021
100-0392	VELLACOTT	TP597	TP Section	W	9/22/2021
100-0393	VELLACOTT	TP597	TP Section	N	9/22/2021
100-0394	VELLACOTT	TP597	General shot	E	9/22/2021
100-0395	CROWN ESTATE	TP1904	TP Section	NE	9/22/2021
100-0396	CROWN ESTATE	TP1904	TP Section details	NE	9/22/2021
100-0397	CROWN ESTATE	TP1904	TP Section	SE	9/22/2021
100-0398	CROWN ESTATE	TP1904	TP Section	SW	9/22/2021
100-0399	CROWN ESTATE	TP1904	TP Section details	SW	9/22/2021
100-0400	CROWN ESTATE	TP1904	TP Section	SW	9/22/2021
100-0401	CROWN ESTATE	TP1904	General shot	N	9/22/2021
100-0402	CROWN ESTATE	TP1904	General shot	S	9/22/2021
100-0403	CROWN ESTATE	TP1878	TP Section	SE	9/23/2021

100-0404	CROWN ESTATE	TP1878	TP Section	SE	9/23/2021
100-0405	CROWN ESTATE	TP1878	TP Section	NE	9/23/2021
100-0406	CROWN ESTATE	TP1878	TP Section	NW	9/23/2021
100-0407	CROWN ESTATE	TP1878	TP Section details	NW	9/23/2021
100-0408	CROWN ESTATE	TP1878	General shot	S	9/23/2021

APPENDIX 3 THEORETICAL BACKGROUND TO SELECTED GEOPHYSICAL TECHNIQUES

Electrical Resistivity Imaging Technique

Theory

For any single measurement of ground resistance, an alternating electric current is injected into the subsurface via two metal stakes (electrodes) planted into the ground. One electrode behaves as the current source, whilst the current is returned to the surface to complete the electrical circuit through a second electrode. The current passing through the ground sets up a distribution of potential in the subsurface which is sampled by two additional electrodes (potential electrodes) across which a voltage is measured. The ratio of voltage to current is the resistance, R, of the ground through which the current has passed.

The basic principle of the Dipole-Dipole array resistivity imaging method is shown in Appendix A - B. A cable containing x electrode connections is positioned in a straight line and the electrodes are deployed along this line with an equal inter-electrode spacing, a. For each measurement, the two current electrodes (C1 & C2) are located adjacent to each other on the left end of the electrode set up, and the two potential electrodes (P1 & P2) are located adjacent to each other on the right end of the electrode set up. Once a measurement of ground resistance has been determined for one set of four electrodes, the next set of four electrodes is automatically selected and second measurement made. The process is repeated until the end of the line is reached. The line is then resurveyed with the spacing between the two centre electrode increasing to 2a, 3a, 4a, etc., up to a maximum central electrode spacing of 70a. The measured resistance values are converted to values of what is termed as apparent resistivity (ρa) using the equation

$$\rho a = \pi n(n+1)(n+2)aR$$

The values measured are intimately related to the geometry of the electrodes used to obtain them and hence are termed apparent, not true, resistivities.

The results may be displayed as a pseudosection, which is made up of individual apparent resistivity values plotted at the mid-point of the four electrodes used to acquire them and at a depth of approximately half the inter-electrode spacing. The depth at which the apparent resistivity values are plotted reflects the depth of investigation of the measurement. Although the pseudosection can be viewed as an approximate image of the subsurface and indeed contains information on the subsurface geology, it is also influenced by the electrode geometry. In order to separate geometrical effects and produce an image of true resistivities of the ground and true depths to features within the ground, the data set is put through a sophisticated processing stage called inversion. The result of this is a final image of the distribution of resistivity with depth, along the line of the survey.

Electrical resistivity imaging requires the formation of an electrical pathway, or 'galvanic circuit', through the subsurface. The passage of electrical current through the subsurface occurs predominantly through pore-space and interstitial moisture, although saturation is not necessary. As such a detectable contrast between the electrical properties of the different subsurface materials may exist. A variation in materials across a paleolake and surrounding undisturbed ground may be expected and should manifest as a contrast in resistivity values.

CMD

In electromagnetic surveying the electrical properties of the ground are measured as a function of depth and/or horizontal distance. Different rocks (and buried structures/objects) exhibit different values of electrical conductivity. Mapping variations in electrical conductivity can identify anomalous areas worthy of further geophysical or intrusive investigation. See Appendix 3 for background information on this technique.

Theory

The electromagnetic method is based on the induction of electric currents in the ground by the magnetic component of electromagnetic waves generated at the surface. An alternating current, of variable frequency, is passed through a coil of wire (a transmitter coil, T_X). This process generates an alternating primary magnetic field which, in turn, induces very small eddy currents in the earth, the magnitude of which is directly proportional to the ground conductivity in the vicinity of the coil. These eddy currents then generate a secondary magnetic field, a part of which is intercepted by a receiver coil (R_X). The interaction between the primary and secondary magnetic flux and the receiver coil generates a voltage that is linearly related to the electrical conductivity of the subsurface.

Two types of measurements may be recorded in electromagnetic surveying; the quadrature component and the in-phase response. The quadrature response measures the bulk electrical properties of the ground. The electrical properties are expressed as an apparent electrical conductivity in millisiemens per metre (mS/m). The in-phase response is essentially metal detector mode and is expressed in units of parts per thousand (ppt) of the primary transmitted field.

In electromagnetic mapping, individual measurements are recorded across a site at a suitable density and plotted as a contoured map. Measurements may also be recorded at different depths according to the orientation (either vertical or horizontal) of the transmitter and receiver coils.

EM techniques are very successful in identifying areas of contrasting conductive properties of the ground. In theory a historic glacial lake and associated infill deposits with different infill material content and moisture content (whether manmade or natural) will manifest as an area of contrasting conductivity compared to surrounding (undisturbed) ground. Manmade features are expected to produce more regular/geometric shaped features.

A summary of the EM processing methods is shown below in Table A3.1.

Table A3.1. Summary of EM processing methods

Method	Justification
Instrument nulling	An area of the site free of metallic objects is identified and the instrument is nulled. The location is marked and returned to prior to commencement of survey works in the survey area. Each area contained its own null station.
Data download	Following completion of each survey area the data was downloaded to a laptop, to allow completion of quality control check.
Coordinate transform	Positional data was transformed from Geographic projection to OSGB (1936), British National Grid projection, for mapping and presentation.
Data filtering	Spurious data points were filtered from the datasets.
Data inversion	Smooth spatially constrained inversion.
Gridding & plotting	Data is gridded and plotted as depth slices at 1m intervals along with ordnance datum extracts at various elevations.

APPENDIX 4 SELECTED PHOTOGRAPHS OF TEST PIT SECTIONS

1. Section of TP13 facing E

2. Section of TP2912 facing N

3. Section of TP2906 facing N

4. Section of TP48 facing S

5. Detailed view of section of TP48

6. Section of TP38 facing E

7. Section of TP60 facing S

8. Section of TP118 facing W

9. Section of TP121 facing E

10. Section of TP141 facing SW

11. Section of TP130 facing W

12. Section of TP269 facing W

13. Section of TP258 facing S

14. Section of TP2728 facing W

15. Section of TP2742 facing W

16. Section of TP2753 facing SW

17. Section of TP2764 facing W

18. Section of TP477 facing W

19. Section of TP510 facing E

20. Section of TP340 facing E

21. Section of TP345 facing N

22. Section of TP355 facing S

23. Section of TP364 facing S

24. Section of TP382 facing E

25. Section of TP397 facing E

26. Section of TP597 facing S

27. Section of TP629 facing W

28. Section of TP901 facing N

29. Section of TP903 facing S

30. Section of TP918 facing E

31. Section of TP920 facing E

32. Section of TP922 facing W

33. Section of TP1022 facing N

34. Section of TP1018 facing E

35. Section of TP1019 facing N

36. Section of TP1015 facing N

37. Section of TP1016 facing W

38. Section of TP1037 facing E

39. Section of TP1029 facing N

40. Section of TP1030 facing W

41. Section of TP1027 facing NW

42. Section of TP1025 facing E

43. Section of TP1381 facing W

44. Section of TP1418 facing SE

45. Section of TP1420 facing SE

46. Section of TP1408 facing E

47. Section of TP2942 facing E

48. Section of TP2970 facing N

49. Section of TP1416 facing E

50. Section of TP2667 facing SW

51. Section of TP2967 facing S

52. Section of TP2981 facing E

53. Section of TP1578 facing W

54. Section of TP1569 facing NE

55. Section of TP1544 facing N

56. Section of TP1548 facing N

57. Section of TP1572 facing N

58. Section of TP1564 facing E

59. Section of TP1546 facing NE

60. Section of TP1702 facing N

61. Section of TP1701 facing SE

62. Detailed view of section of TP1701

63. Section of TP1642 facing E

64. Section of TP1812 facing N

65. Section of TP1817 facing W

66. Section of TP1878 facing NW

67. Section of TP1904 facing SW

68. Section of TP1934 facing S

69. Section of TP1958 facing E

70. Section of TP1957 facing SE

71. Section of TP1937 facing E

72. Section of TP1920 facing N

73. Section of TP1977 facing W

74. Section of TP2115 facing NW

75. Section of TP2136 facing N

76. Section of TP2145 facing S

77. Section of TP2190 facing W

78. Section of TP2218 facing SW

79. Section of TP2226 facing E

80. Section of TP2240 facing W

81. Section of TP2257 facing E

82. Section of TP2312 facing E

83. Section of TP2340 facing SE

84. Section of TP2346 facing SW

85. Section of TP2680 facing NW

86. Section of TP2198 facing N

87. Section of TP2360 facing W

88. Section of TP2378 facing W

89. Section of TP2483 facing E

90. Section of TP2543 facing W

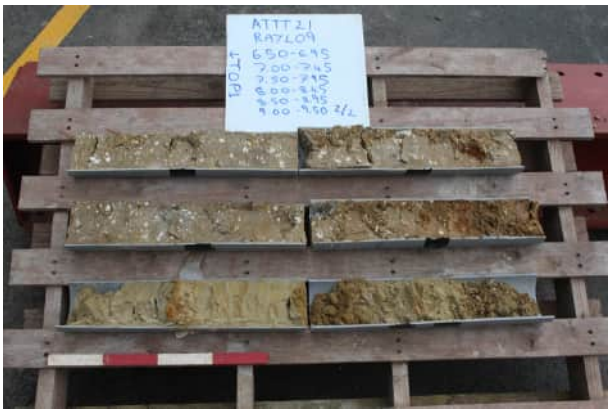
APPENDIX 5 SELECTED PHOTOGRAPHS OF PRIORITY BOREHOLE SEQUENCES

BRQU02 1.20 to 5.00m

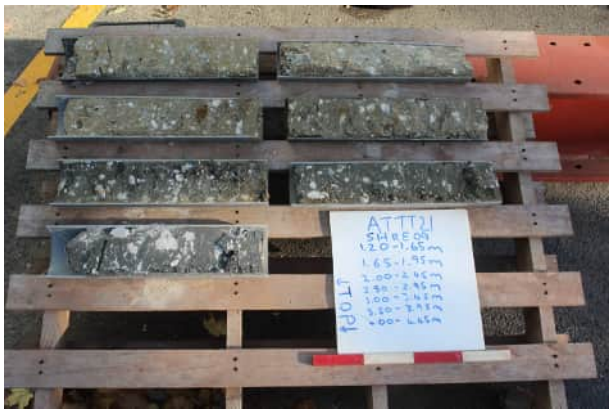
BRQU05 5.00 to 10.00m

BUNT01 6.00 to 10.00m

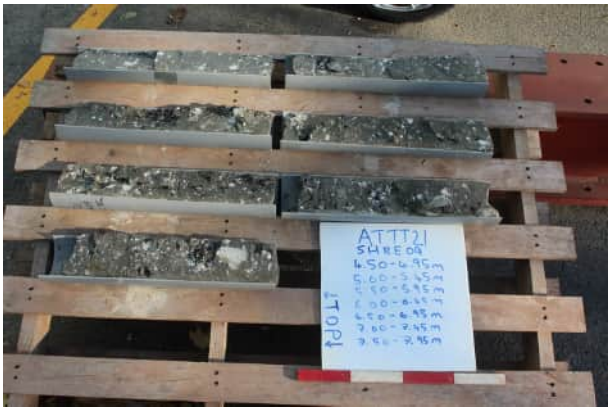
RAYL09 1.20 to 5.45m



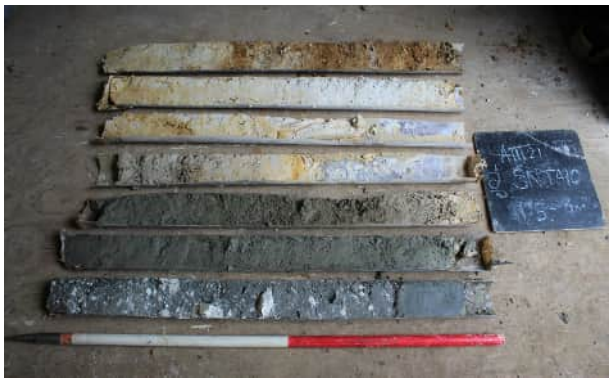
RAYL09 6.50 to 9.50m



SHRE09 1.20 to 4.45m



SHRE09 4.50 to 7.95m



SNJA10 1.20 to 8.00m

SNJA11 1.00 to 8.00m

SNJA13 1.00 to 3.80m

SNJA15 1.00 to 4.00m

SSBE09 1.20 to 5.00m

SSBE09 8.50 to 11.50m

SSBE09 10.00 to 17.50m

ULWK07 1.50 to 4.45m

ULWK07 4.50 to 6.95m

VELL04 2.00 to 5.95m (2.45-5.00m excluded)

VELL04 2.45 to 6.95m

WEST08 1.50 to 5.45m

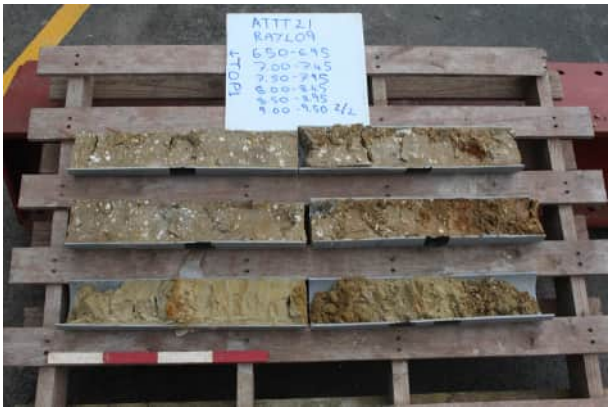
WEST08 5.50 to 10.00m

BRQU02 1.20 to 5.00m

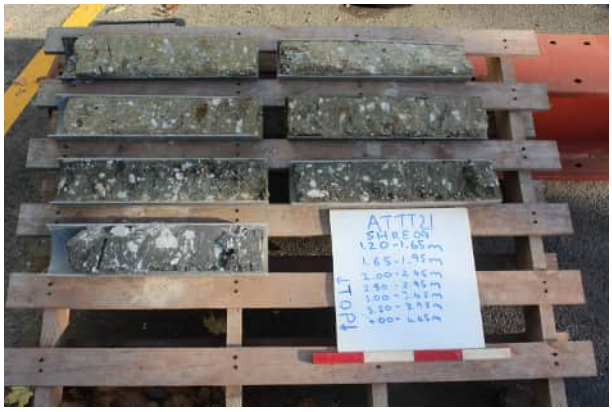
BRQU05 5.00 to 10.00m

BUNT01 6.00 to 10.00m

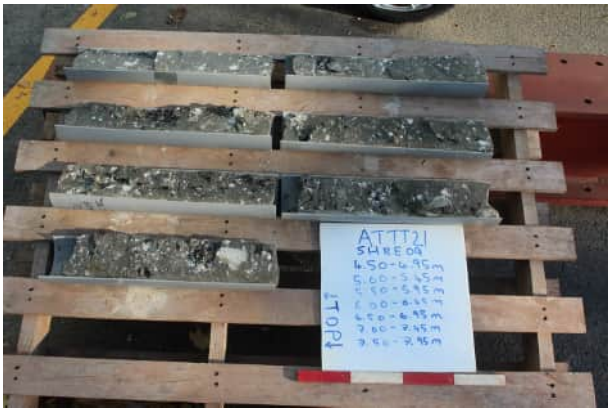
RAYL09 1.20 to 5.45m



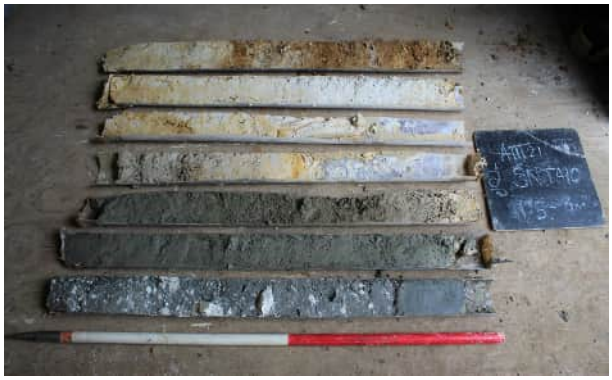
RAYL09 6.50 to 9.50m



SHRE09 1.20 to 4.45m



SHRE09 4.50 to 7.95m



SNJA10 1.20 to 8.00m

SNJA11 1.00 to 8.00m

SNJA13 1.00 to 3.80m

SNJA15 1.00 to 4.00m

SSBE09 1.20 to 5.00m

SSBE09 8.50 to 11.50m

SSBE09 10.00 to 17.50m

ULWK07 1.50 to 4.45m

ULWK07 4.50 to 6.95m

VELL04 2.00 to 5.95m (2.45-5.00m excluded)

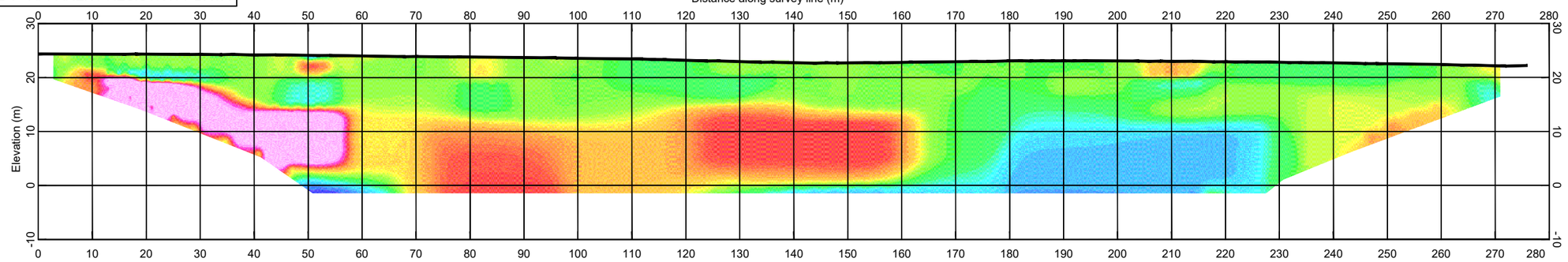
VELL04 2.45 to 6.95m

WEST08 1.50 to 5.45m

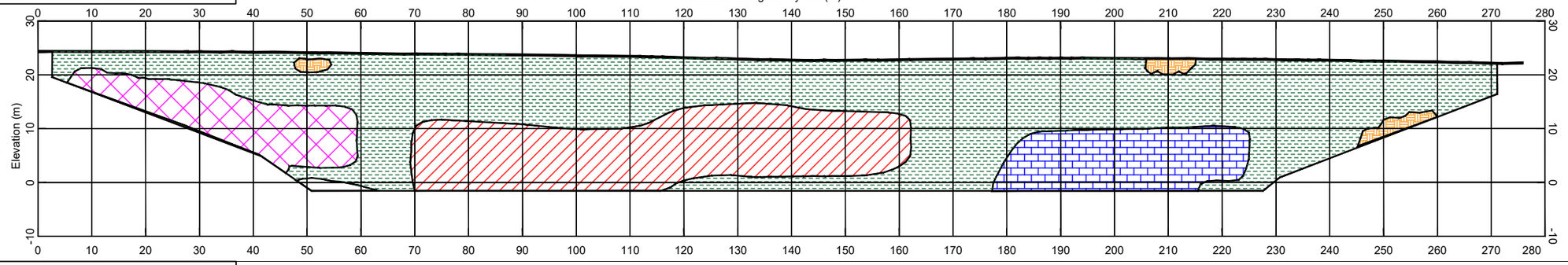
WEST08 5.50 to 10.00m

APPENDIX 6 GEOPHYSICS RESULTS

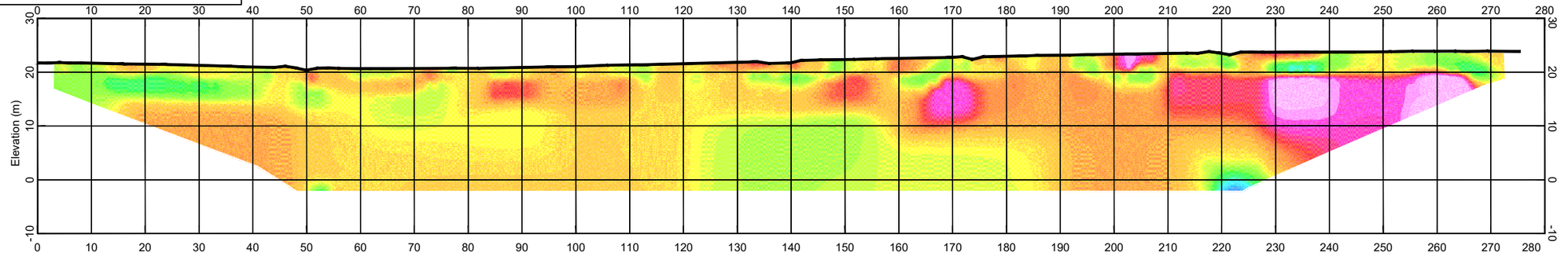
A. LINE 1 - APPARENT RESISTIVITY DATA



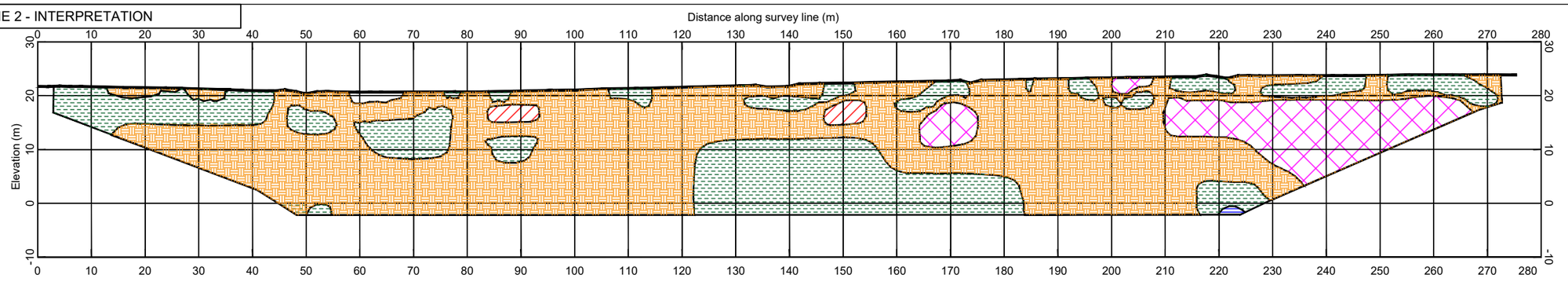
B. LINE 1 - INTERPRETATION



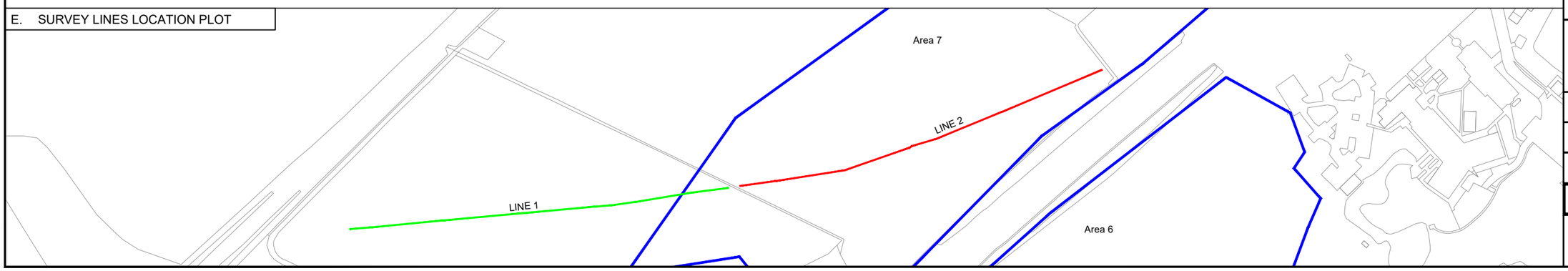
C. LINE 2 - APPARENT RESISTIVITY DATA



D. LINE 2 - INTERPRETATION



E. SURVEY LINES LOCATION PLOT

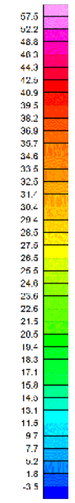


NOTES

The specific risks associated with the content of this drawing are considered to be:–

(1) The topographical baseplan has been supplied by the client and has not been checked for accuracy.
(2) Apparent resistivity data collected using Syscal Pro 72 with electores spaced approximately 2m apart. Position data acquired using a Leica GPS.
(3) Data inverted using Res2dInv and apparent resistivity data points plotted using Oasis Montaj

KEY



APPARENT RESITIVITY (Ωm)

SURVEY LINE 1
SURVEY LINE 2
VERY HIGH APPARENT RESISTIVITY ANOMALY
HIGH APPARENT RESISTIVITY ANOMALY
ELEVATED APPARENT RESISTIVITY
MODERATE APPARENT RESISTIVITY
LOW APPARENT RESISTIVITY ANOMALY

Rev.	Date	Amendment	Drawn	Chkd.	Appd.

HEADLAND ARCHAEOLOGY

Client
COSTAIN

Project Title
A12 CHELMSFORD TO A120 JUNCTIONS 19 TO 25

Drawing Title
RESULTS OF THE ERT SURVEY

Drawn	Date	Checked	Date	Approved	Date
VV	02/09/21	MJS	02/09/21	SH	02/09/21

Scale	Orig Size	Dimensions
1:2000	A3	

Project No.	Drawing File
2190784	2190784 Figure 1

Drawing No.	Rev.
2190784 Figure 1 Sheet 1 of 1	

Scale
0 20 40 60 80 100m

NOTES

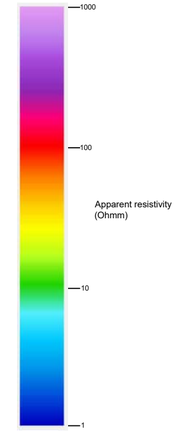
The specific risks associated with the content of this drawing are considered to be:-

(1) The topographical baseplan has been supplied by the client and has not been checked for accuracy.

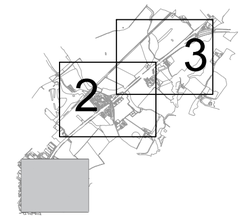
(2) Apparent conductivity data collected using CMD Explorer along bi-directional lines spaced approximately 10m apart. Position data acquired using a dGPS attached to the CMD Explorer console.

(3) Data inverted using Aarhus Workbench and apparent resistivity data points plotted with 5m buffer radius.

KEY



SHEET. LAYOUT



Rev.	Date	Amendment	Drawn	Chkd.	Appd.

HEADLAND ARCHAEOLOGY

Client

COSTAIN

Project Title

A12 CHELMSFORD TO A120
JUNCTIONS 19 TO 25

Drawing Title

AREA 2-3
APPARENT RESISTIVITY
DEPTH 0-1M

Drawn	Date	Checked	Date	Approved	Date
MJS	10/11/21	TG	10/11/21	MW	10/11/21

Scale	Orig Size	Dimensions
1:2000	A2	

Project No.	Drawing File
2190784	2190784-Figure 3

Drawing No.	Rev.
2190784-Figure 3 Sheet 1 of 3	

Scale
0 20 40 60 80 100m

NOTES

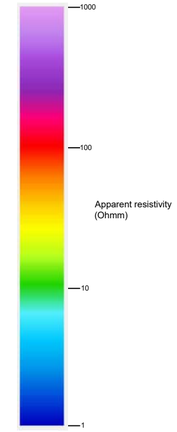
The specific risks associated with the content of this drawing are considered to be:-

(1) The topographical baseplan has been supplied by the client and has not been checked for accuracy.

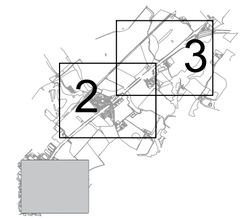
(2) Apparent conductivity data collected using CMD Explorer along bi-directional lines spaced approximately 10m apart. Position data acquired using a dGPS attached to the CMD Explorer console.

(3) Data inverted using Aarhus Workbench and apparent resistivity data points plotted with 5m buffer radius.

KEY



SHEET. LAYOUT



Rev.	Date	Amendment	Drawn	Chkd.	Appd.

HEADLAND ARCHAEOLOGY

Client: COSTAIN

Project Title: A12 CHELMSFORD TO A120 JUNCTIONS 19 TO 25

Drawing Title: AREA 2-3 APPARENT RESISTIVITY DEPTH 2-3M

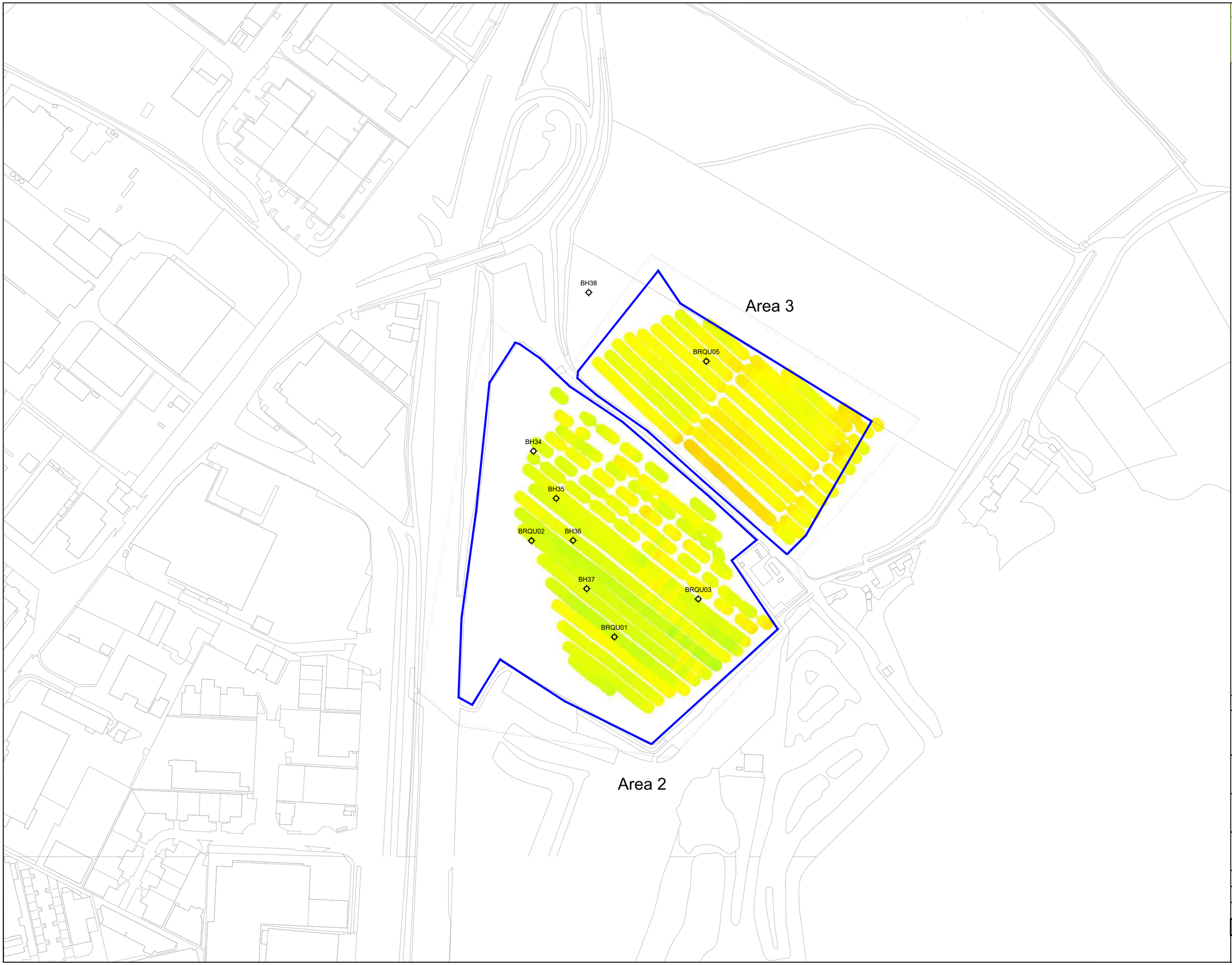
Drawn	Date	Checked	Date	Approved	Date
MJS	10/11/21	TG	10/11/21	MW	10/11/21

Scale	Orig Size	Dimensions
1:2000	A2	

Project No.	Drawing File
2190784	2190784-Figure 4

Drawing No.: 2190784-Figure 4 Sheet 1 of 3 — Rev.:

Scale: 0 20 40 60 80 100m



NOTES

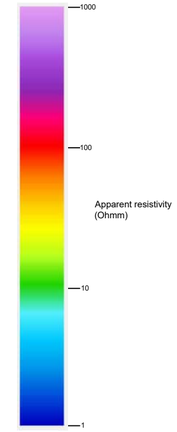
The specific risks associated with the content of this drawing are considered to be:-

(1) The topographical baseplan has been supplied by the client and has not been checked for accuracy.

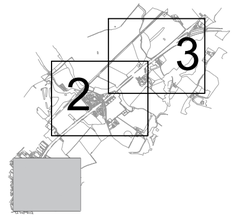
(2) Apparent conductivity data collected using CMD Explorer along bi-directional lines spaced approximately 10m apart. Position data acquired using a dGPS attached to the CMD Explorer console.

(3) Data inverted using Aarhus Workbench and apparent resistivity data points plotted with 5m buffer radius.

KEY



SHEET. LAYOUT



Rev.	Date	Amendment	Drawn	Chkd.	Appd.

HEADLAND ARCHAEOLOGY

Client: COSTAIN

Project Title: A12 CHELMSFORD TO A120 JUNCTIONS 19 TO 25

Drawing Title: AREA 2-3 APPARENT RESISTIVITY DEPTH 4-5M

Drawn	Date	Checked	Date	Approved	Date
MJS	10/11/21	TG	10/11/21	MW	10/11/21

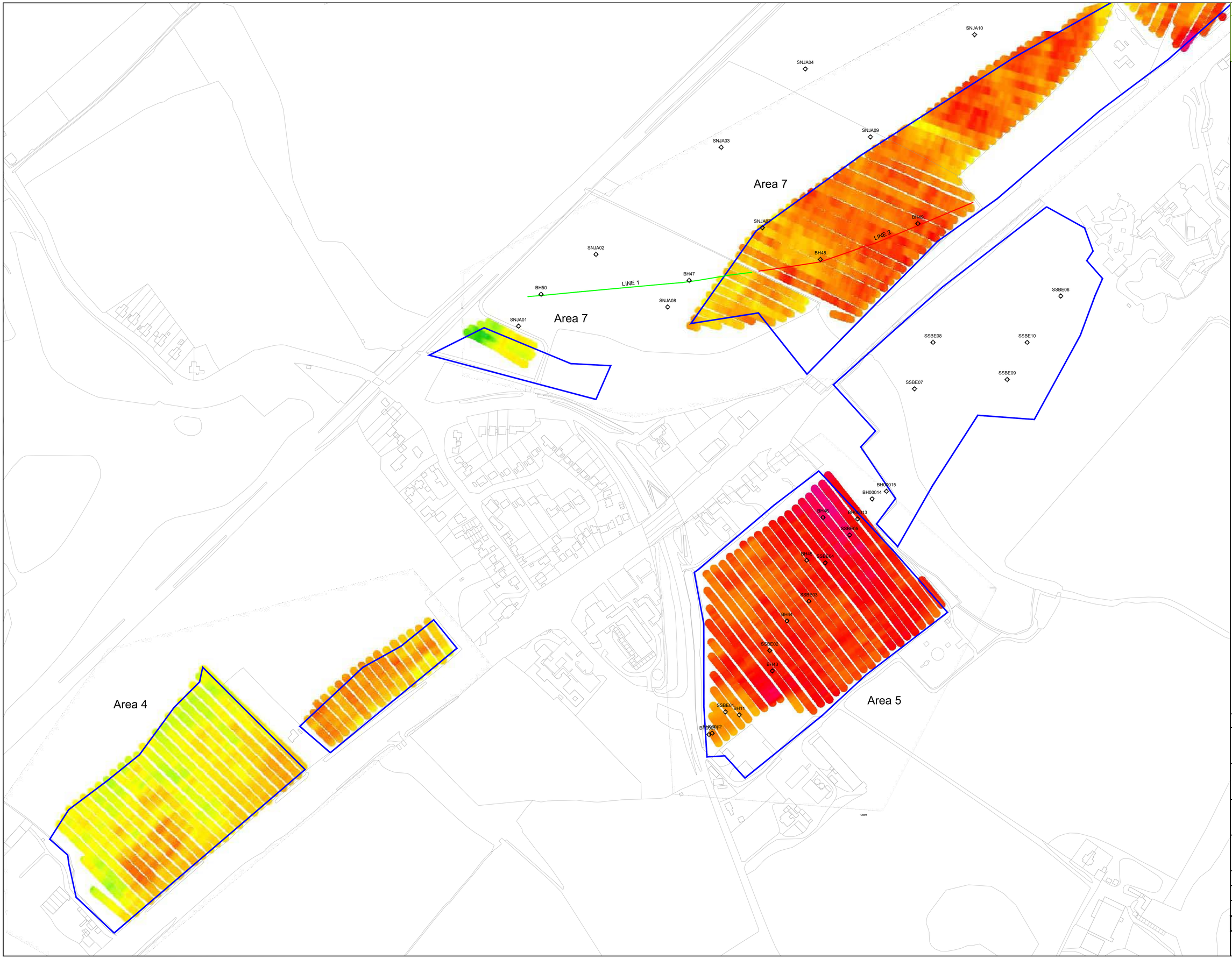
Scale	Orig Size	Dimensions
1:2000	A2	

Project No.	Drawing File
2190784	2190784-Figure 5

Drawing No.	Rev.
2190784-Figure 5 Sheet 1 of 3	

Scale

0 20 40 60 80 100m



NOTES

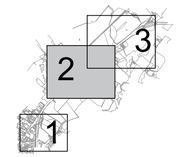
The specific risks associated with the content of this drawing are considered to be:-

(1) The topographical baseplan has been supplied by the client and has not been checked for accuracy.
(2) Apparent conductivity data collected using CMD Explorer along bi-directional lines spaced approximately 10m apart. Position data acquired using a dGPS attached to the CMD Explorer console.
(3) Data inverted using Aarhus Workbench and apparent resistivity data points plotted with 5m buffer radius.

KEY

1000
100
10
1
Apparent resistivity (Ohmm)

SHEET. LAYOUT



N
NORTH
INDICATIVE

Rev.	Date	Amendment	Drawn	Chkd.	Appd.

HEADLAND ARCHAEOLOGY

Client: COSTAIN

Project Title: A12 CHELMSFORD TO A120 JUNCTIONS 19 TO 25

Drawing Title: APPARENT RESISTIVITY DEPTH 0-1M

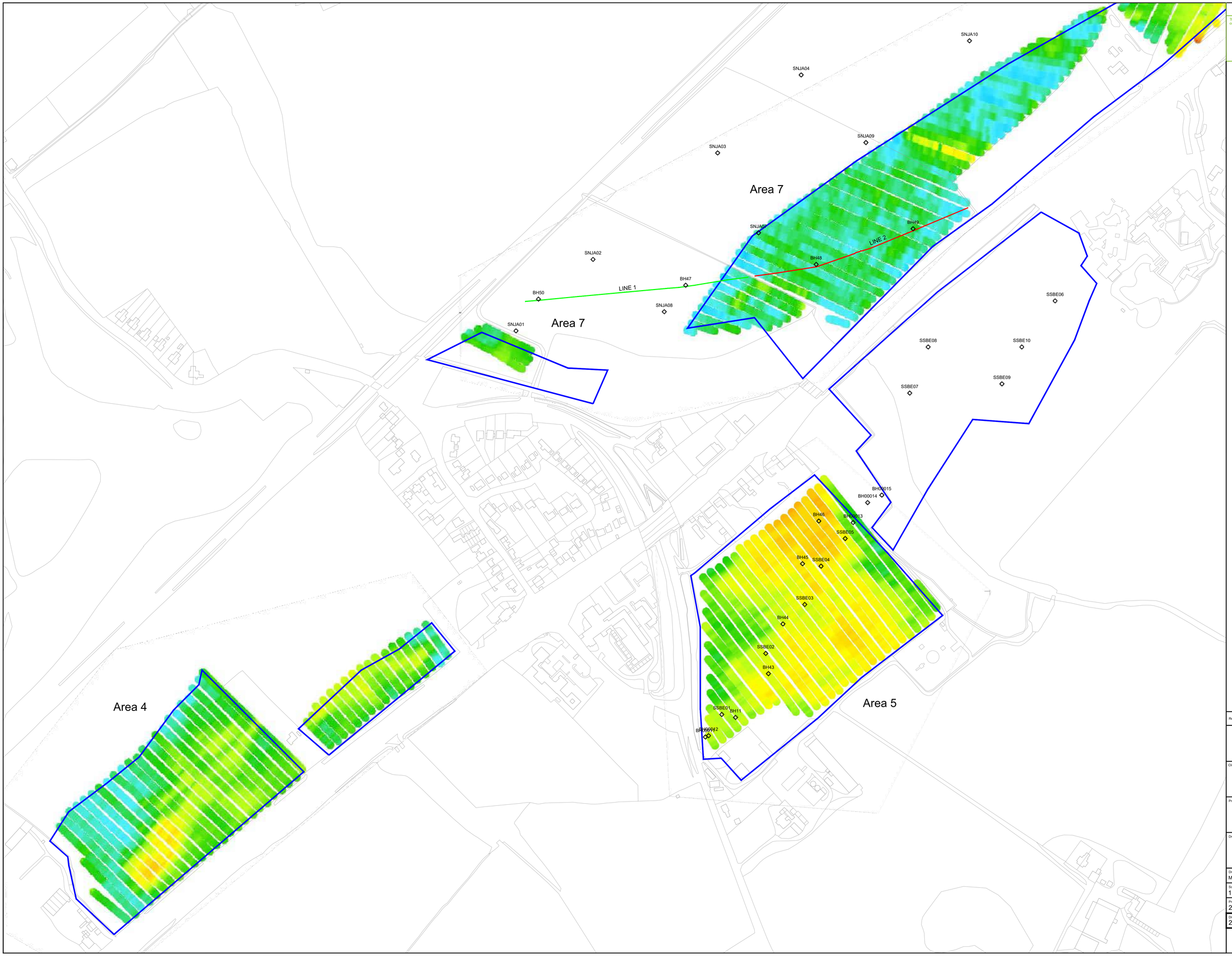
Drawn	Date	Checked	Date	Approved	Date
MJS	10/11/21	TG	10/11/21	MW	10/11/21

Scale	Orig Size	Dimensions
1:2000	A1	

Project No	Drawing File
2190784	2190784-Figure 3

Drawing No: 2190784-Figure 3 Sheet 2 of 3 — Rev.

Scale
0 20 40 60 80 100m



NOTES

The specific risks associated with the content of this drawing are considered to be:-

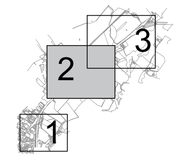
(1) The topographical baseplan has been supplied by the client and has not been checked for accuracy.
(2) Apparent conductivity data collected using CMD Explorer along bi-directional lines spaced approximately 10m apart. Position data acquired using a dGPS attached to the CMD Explorer console.
(3) Data inverted using Aarhus Workbench and apparent resistivity data points plotted with 5m buffer radius.

KEY

1000
100
10
1

Apparent resistivity (Ohmm)

SHEET LAYOUT



Rev.	Date	Amendment	Drawn	Chkd.	Appd.

HEADLAND ARCHAEOLOGY

Client: COSTAIN

Project Title: A12 CHELMSFORD TO A120 JUNCTIONS 19 TO 25

Drawing Title: APPARENT RESISTIVITY DEPTH 2-3M

Drawn	Date	Checked	Date	Approved	Date
MJS	10/11/21	TG	10/11/21	MW	10/11/21

Scale	Orig Size	Dimensions
1:2000	A1	

Project No	Drawing File
2190784	2190784-Figure 4

Drawing No: 2190784-Figure 4 Sheet 2 of 3 — Rev.

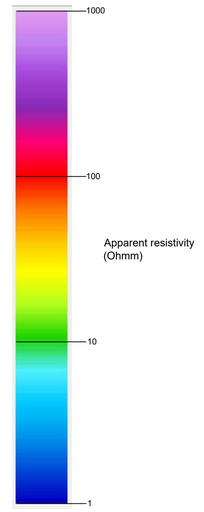
Scale: 0 20 40 60 80 100m

NOTES

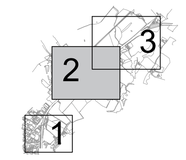
The specific risks associated with the content of this drawing are considered to be:-

(1) The topographical baseplan has been supplied by the client and has not been checked for accuracy.
(2) Apparent conductivity data collected using CMD Explorer along bi-directional lines spaced approximately 10m apart. Position data acquired using a dGPS attached to the CMD Explorer console.
(3) Data inverted using Aarhus Workbench and apparent resistivity data points plotted with 5m buffer radius.

KEY



SHEET LAYOUT



Rev.	Date	Amendment	Drawn	Chkd	Appd

HEADLAND ARCHAEOLOGY

Client: COSTAIN

Project Title: A12 CHELMSFORD TO A120 JUNCTIONS 19 TO 25

Drawing Title: APPARENT RESISTIVITY DEPTH 4-5M

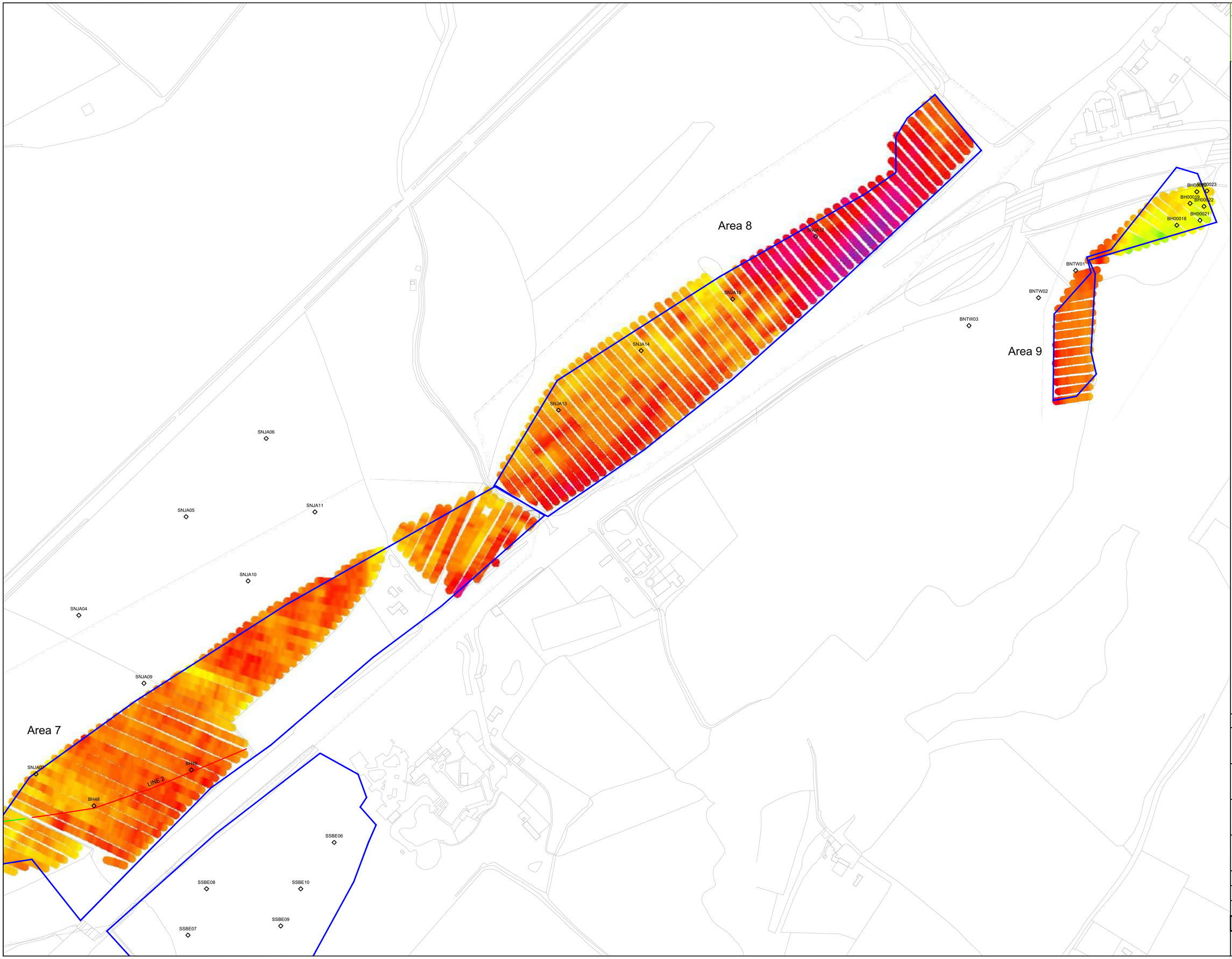
Drawn	Date	Checked	Date	Approved	Date
MJS	10/11/21	TG	10/11/21	MW	10/11/21

Scale	Orig Size	Dimensions
1:2000	A1	

Project No.	Drawing File
2190784	2190784-Figure 5

Drawing No.: 2190784-Figure 5 Sheet 2 of 3 | Rev.:

Scale: 0 20 40 60 80 100m



NOTES

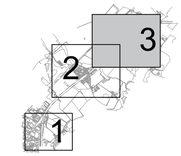
The specific risks associated with the content of this drawing are considered to be:-

(1) The topographical baseplan has been supplied by the client and has not been checked for accuracy.
(2) Apparent conductivity data collected using CMD Explorer along bi-directional lines spaced approximately 10m apart. Position data acquired using a dGPS attached to the CMD Explorer console.
(3) Data inverted using Aarhus Workbench and apparent resistivity data points plotted with 5m buffer radius.

KEY

1000
100
10
1
Apparent resistivity (Ohmm)

SHEET. LAYOUT



N
NORTH
INDICATIVE

Rev.	Date	Amendment	Drawn	Chkd.	Appd.

HEADLAND ARCHAEOLOGY

Client
COSTAIN

Project Title
A12 CHELMSFORD TO A120
JUNCTIONS 19 TO 25

Drawing Title
APPARENT RESISTIVITY
DEPTH 0-1M

Drawn	Date	Checked	Date	Approved	Date
MJS	10/11/21	TG	10/11/21	MW	10/11/21

Scale	Orig Size	Dimensions
1:2000	A1	

Project No.	Drawing File
2190784	2190784-Figure 3

Drawing No.	Rev.
2190784-Figure 3 Sheet 3 of 3	

Scale
0 20 40 60 80 100m

Area 8

Area 9

Area 7

SNJA06
SNJA05
SNJA11
SNJA10
SNJA04
SNJA09
SNJA08
SNJA07
SNJA12
SNJA15
SNJA14
SNJA13
BNTW01
BNTW02
BNTW03
BH00023
BH00019
BH00022
BH00021
BH00018
BH49
BH48
LINE 2
SSBE06
SSBE08
SSBE10
SSBE09
SSBE07

NOTES

The specific risks associated with the content of this drawing are considered to be:-

(1) The topographical baseplan has been supplied by the client and has not been checked for accuracy.
(2) Apparent conductivity data collected using CMD Explorer along bi-directional lines spaced approximately 10m apart. Position data acquired using a dGPS attached to the CMD Explorer console.
(3) Data inverted using Aarhus Workbench and apparent resistivity data points plotted with 5m buffer radius.

KEY

1000
100
10
1
Apparent resistivity (Ohmm)

SHEET LAYOUT

1
2
3

N
NORTH
INDICATIVE

Rev.	Date	Amendment	Drawn	Chkd.	Appd.

HEADLAND ARCHAEOLOGY

Client
COSTAIN

Project Title
A12 CHELMSFORD TO A120 JUNCTIONS 19 TO 25

Drawing Title
APPARENT RESISTIVITY DEPTH 2-3M

Drawn	Date	Checked	Date	Approved	Date
MJS	10/11/21	TG	10/11/21	MW	10/11/21

Scale	Orig Size	Dimensions
1:2000	A1	

Project No.	Drawing File
2190784	2190784-Figure 4

Drawing No.	Rev.
2190784-Figure 4 Sheet 3 of 3	

Scale
0 20 40 60 80 100m

Area 8

Area 9

Area 7

SNJA06
SNJA11
SNJA05
SNJA10
SNJA04
SNJA09
SNJA07
SNJA12
SNJA15
SNJA14
SNJA13
BNTW01
BNTW02
BNTW03
BH00023
BH00019
BH00022
BH00021
BH00018
BH49
BH48
LINE 2
SSBE06
SSBE08
SSBE10
SSBE09
SSBE07

NOTES

The specific risks associated with the content of this drawing are considered to be:-

(1) The topographical baseplan has been supplied by the client and has not been checked for accuracy.
(2) Apparent conductivity data collected using CMD Explorer along bi-directional lines spaced approximately 10m apart. Position data acquired using a dGPS attached to the CMD Explorer console.
(3) Data inverted using Aarhus Workbench and apparent resistivity data points plotted with 5m buffer radius.

KEY

1000
100
10
1
Apparent resistivity (Ohmm)

SHEET LAYOUT

1
2
3

N
NORTH
INDICATIVE

Rev.	Date	Amendment	Drawn	Chkd	Appd.

HEADLAND ARCHAEOLOGY

Client: COSTAIN

Project Title: A12 CHELMSFORD TO A120 JUNCTIONS 19 TO 25

Drawing Title: APPARENT RESISTIVITY DEPTH 4-5M

Drawn	Date	Checked	Date	Approved	Date
MJS	10/11/21	TG	10/11/21	MW	10/11/21

Scale	Orig Size	Dimensions
1:2000	A1	

Project No	Drawing File
2190784	2190784-Figure 5

Drawing No: 2190784-Figure 5 Sheet 3 of 3 Rev.

Scale
0 20 40 60 80 100m