

# Earith Bulwark

# Investigations



ARCHAEOLOGY

HOUSE  
WASHLAND

Excavation Report No. 1



CAMBRIDGE  
ARCHAEOLOGICAL UNIT

# **OUSE WASHLAND ARCHAEOLOGY**

## **Earith Bulwark Investigations**

(Excavation Report No. 1)

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## PROJECT SUMMARY

Three trenches covering an area of 350.2sqm were opened in the environs of Earith's Civil War earthworks known as the Bulwark. Positioned upon a gravel terrace of the Wash, and set between the Old and New Bedford Levels that connect with the River Ouse, the surrounding landscape is archaeologically sensitive, with extensive prehistoric and Roman sites having been excavated to the north and south of the project area. Quarrying identified in two trenches immediately south of the Bulwark may hold some broad contemporary connection to Civil War activities, with 17<sup>th</sup> century pottery coming from one of these. A geophysical survey mapped a broad but discrete distribution of this quarried area. The trenches were opened across the distinct landfall of a terrace edge that was thought to have once framed a former channel of the River Ouse. A full sequence of sediment deposits was recorded from the later Holocene to the historic era. Items of Mesolithic to Middle Iron Age attribution dominated the finds recovered from these trenches, predominantly coming from sealed 'buried soil' contexts as well as a ditch dated to the latter of this time frame. These important findings are comparable to the Over/Needginworth and Colne Fen landscapes nearby, with the northward extension of the former's Mesolithic landscape being of particular significance. The potential for an early waterlogged organic sequence was clearly identified in one of the trenches in which the edge of a former course of the River Ouse was encountered. A third trench was positioned north of the Bulwark to investigate a raised linear anomaly thought to represent the course of the Roman Car Dyke. This was found to be a silt and alluvium filled roddon that passed through a deflated boggy environment, and although no sign of the dyke was forthcoming this may have been either removed or obscured by a later channel broadly following the West Wash flood deposits.

## ACKNOWLEDGEMENTS

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## 1. INTRODUCTION

As part of the Cambridge Archaeological Unit's project within the Ouse Washes Landscape Partnership scheme, 'Digging Environment and Ouse Washes Community Archaeology,' Earith's earthwork of a Civil War defended encampment - the Bulwark, designated as a scheduled heritage asset (SAM 1013282) - was the subject of surface and borehole survey followed by targeted excavation. Initiated in the autumn of 2014, the borehole survey was conducted across the Bulwark's scheduled area (SMC ref. S00091566) and was followed by geophysical (gradiometer) survey also within the Bulwark's scheduled interior (S42 ref.AA/40731/5) and over a 0.2 ha area to the southwest of the earthworks. The results of the surveys are appended here in Section 6. In August 2015, the initial surveys were followed up with the excavation of four trenches (A-D), all outside of the scheduled area (Figure 1). The principle objective of the evaluation process was to determine the presence or absence of archaeological remains and to establish their character (e.g. chronological range and quality of preservation) and the site's depositional history. Three trenches targeted an area of geophysical anomalies and an escarpment visible as a natural earthwork with a landfall of approximately 2.0m. A fourth trench was located c. 750m to the north of the Bulwark, its aim being to test the possibility that a linear earthwork represented a stretch of the Roman Car Dyke waterway.

At the project's core was the aim to provide a volunteer platform for experience in archaeological fieldwork, and the enhancement of local and regional awareness of the Washes' broader landscape history.

The project area was situated on land immediately east of Earith village and framed by the Old and New Bedford Rivers (TL 39255 75008), and the River Ouse. Trenches A, B and D were situated between the south arm of the Bulwark's defensive earthworks and a landfall or escarpment edge which Trenches A and B were specifically located to investigate. The Bulwark and the trenches rest upon a projection of solid geology within soft fenland deposits. The solid geology was predominantly clayey topsoil overlying thin silty clay alluvium (20-40cm thick) upon silty sand resting on sand and gravel. A gradual eastward fall in the gradient was evident at the top of the escarpment, from 4.23m OD in Trench A to 4.02m OD at Trench B. At the lower end of these trenches, on the base of the landfall, the present-day land surface was consistent at c. 2.9m OD, thereby registering a drop of c. 1.1-1.3m from the top of the escarpment to its base. Positioned c. 750m north of the Bulwark, and the northernmost of the trenches, the land surface at Trench C lay at 1.9-2.15m OD. The geology here also comprised clayey topsoil, but this overlay superficial deposits of saturated soft peaty silt and stiff alluvium that seal the Amphill Clay Formation of mudstone.

### *Methodology*

The work followed specifications previously outlined in a Project Design outlined by the CAU. The trenches were initially opened by a tracked 360 mechanical excavator

monitored by an experienced banksman to a level at which archaeological deposits were exposed. The length of the trenching totalled to 124.4m with widths of 2m and with additional 1m steps in trenches A and C. The trenches therefore covered an area of 350.2sqm.

All archaeological features and deposits were excavated by hand and recorded using the CAU modified version of the MoLAS recording system (Spence 1990). The spirit of the Ouse Washes Landscape Partnership is to provide experience for volunteer participants (Figure 5). Seventeen volunteers took part in the two-week fieldwork programme, collectively totalling 49 days on site; in the CAU's Cambridge office a number of other volunteers engaged in the washing and cataloguing of the finds collected from the excavations.

The trenches and features therein were digitally photographed in high resolution RAW and JPEG format and then planned at a scale of 1:50, with trench and feature sections planned at 1:10. All plans were correlated with fixed points on the OS grid using a Geographic Positioning (GPS). Environmental sampling of the archaeological deposits was strategically conducted as bulked (bagged) and profiled (tinned) samples.

Information detailing the character of the trenches was recorded on a data sheet that, along with the digital photographic record, has been catalogued together within an archive following the procedures outlined in MoRPHE (English Heritage 2006). These are being stored with the processed material finds record at the CAU offices, under the site code EBU15.

### *Archaeological and Historical Background*

Framing the landscape in which the project's trenches were positioned, the great artificial drains of the Old and New Bedford Levels traverse ground that has been subject to broad and detailed archaeological investigation. Much of this has been driven by the requirements of development control in advance of devouring quarrying. The results of the works are of notable significance to both regional and national understanding of prehistoric and Roman communities, and in particular their necessary and changing relationship to waterways. Of primacy to these investigations have been the Hanson quarry zones along the west side of the so-called West Water at Colne Fen, northwest of the study area, and to the southwest of the present course of the River Great Ouse within the Barleycroft Farm/Over quarries as well as the research-led investigations along the fen margins at Haddenham further to the southeast. The results of these findings are recounted and compared in a number of major monographs to which the reader is referred (Evans *et al.* 2013a, 2013b, Evans and Hodder 2006a, 2006b, Evans *et al.* forthcoming).

Revealed by these investigations are complexities of environmental transition, evidence for which was sealed by long-term peat and alluvial formation resulting from rising waters and increased saturation of once habitable terrain. The Godwin Ridge offers a portrait of this dynamic human-environment interplay from the Mesolithic onwards. This was a train of sand and gravel ridges moulded by flanking

palaeochannels as located within the northern Over Narrows portion of the Barleycroft Farm/Over quarry. These were raised only 1-3m above the surrounding river channel, but their occupation encompassed the Mesolithic to the Iron Age, upon which they were gradually abandoned owing to the engulfing fen. As well as facilitating transport, the watery context of this occupation provided abundant marine resources including bird life, fish and shellfish, and was the focus for ceremony and funerary customs as well as attracting various industrial-scale activities that involved the burning of readily available stone. Later inhabitants of Colne Fen displayed a similar degree of resourcefulness in tandem with rising and falling water levels. Drainage in the 1<sup>st</sup> and 2<sup>nd</sup> centuries AD provided opportunities for colonising new land and the establishment of multiple small farmsteads that grew in size over time, becoming more nucleated, planned and interconnected upon a variety of modes of production, including salt winning. Within at least one phase of occupation was a structure that may have served as a dock or a boathouse, implying a harbour and navigation of the waterways perhaps by shallow-drafted boats, and evidence for trading in pottery and meat was considerable.

At least since the early 18<sup>th</sup> century the Car Dyke has been central to understanding of the Roman Fenland. This was a canalised system traversing *c.* 122km across Cambridgeshire and Lincolnshire, between the Rivers Cam and Witham, and survives as cropmarks and a series of raised earthworks. The exact circumstances of its construction and use have remained a subject of speculation, having been variously interpreted as a catchwater, a drain and a political and symbolic boundary (see discussion in Evans *et al.* 2013b: 11-13). Its course is not uniform, but is formed of two main sections with causeways, linking natural waterways along its course. It has been argued that this course is traceable northeast of the Bulwark in a north by northwest direction (*ibid.*: 12), and testing of this statement was the aim with Trench C.

Perhaps owing to its proximity to the presumed course of the Car Dyke, the earthworks of the Bulwark (Figure 2) have also at times been presumed to have been constructed at a Roman date. It is now understood that these belong to a fort erected by the Parliamentarian forces during the English Civil War of the 1640s, thereby post-dating the cutting of the Old Bedford River (1630-1636), but established some time before the cutting of the New Bedford River (*c.* 1649-1652). The Bulwark covers an area of *c.* 0.73ha, and is formed of four arrow-shaped bastions joined by short flanks to four long ditched curtains with two hornworks projecting from the west and south curtains, perhaps to provide an extension of the firing line. Overall, the architecture appears to utilise an originally Dutch method of military engineering adopted by the Parliamentary forces only in the latter stages of the conflict but used throughout by the Royalist forces (Taylor 1999: 82). It is not clear just what function the fort provided during the war, although it held a strategic position near to an important bridge at Earith sluice linking Ely and Cambridge. Nonetheless, there is no record that it experienced direct conflict. Furthermore, the role of the Bulwark during the construction of the New Bedford River is uncertain, although its use as a deterrent to civil unrest against drainage and enclosure of the fenland is a

possibility. Two exploratory trenches opened across and within the Bulwark's earthworks in 1908 returned no dating material or evidence that could shed light on the exact nature of its use (Keynes and White 1908), although it was instructive as to the earthwork's construction materials and their potential for sealing contemporary soil horizons and potentially earlier features. The geophysical and borehole surveys further elaborated upon these findings (see Section 6). The former of these was also carried out over an area to the southwest of the Bulwark's earthworks along the scarp edge of a landfall towards the Ouse floodplain, and this highlighted areas presumed to have been for localised gravel extraction (Figure 3). The landfall highlights the Bulwark's landscape situation. It is positioned on the edge of a low promontory of gravel projecting southeast from Earith village (Figure 4), with the scarp edge following the south arm of the fort and brushing beneath its southeast bastion, northwards along its east arm and then back northwest towards the Old Bedford River. Annual floods of the lower-lying land to the north, south and east meet against this projection which probably represents several millennia of the migrating course of the Ouse River. The ancient course of the river, though not easily defined (e.g. Seale 1980), along with the potential for preserved environmental indicators that this might entail, was the target of Trenches A and B.

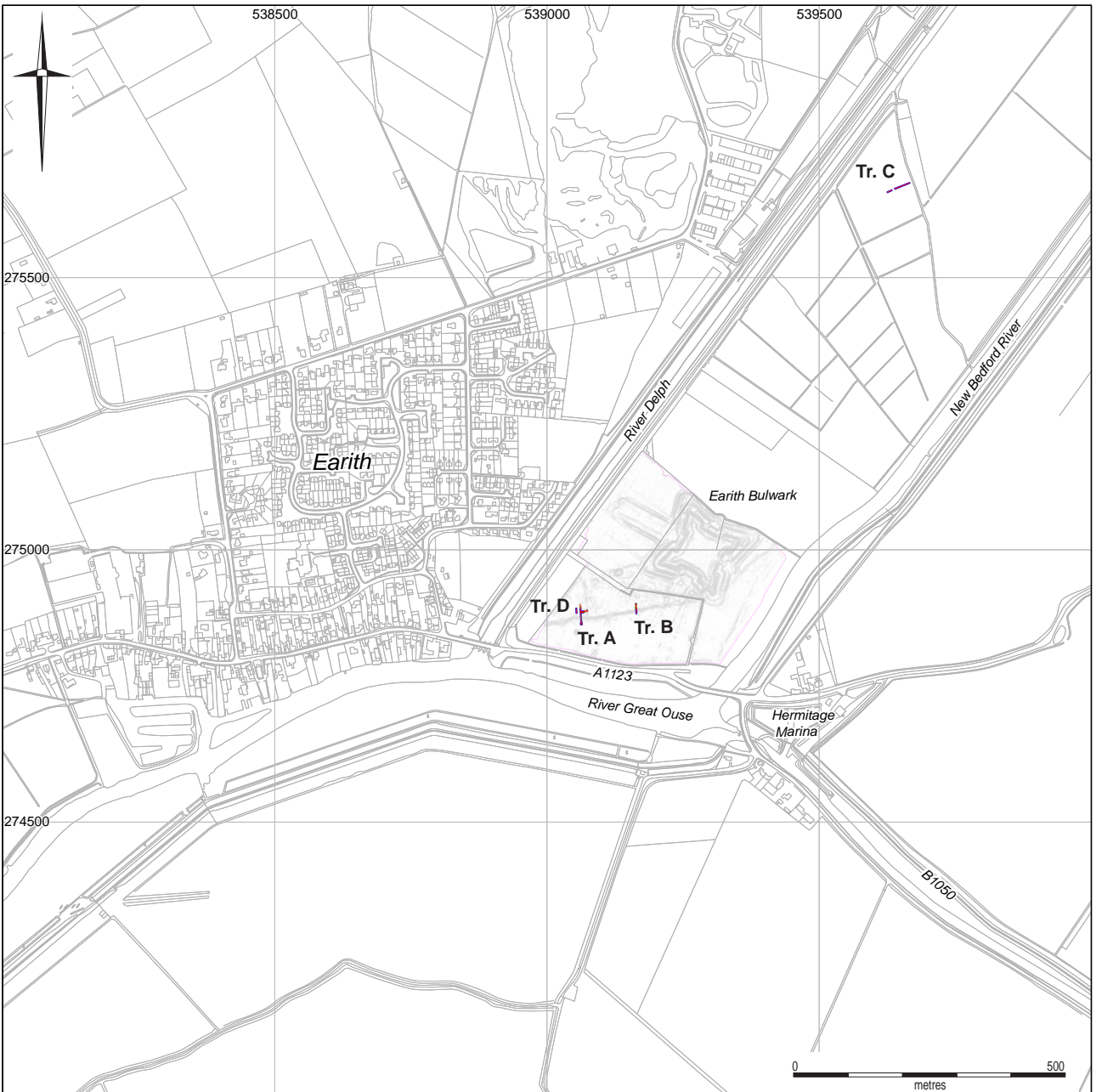
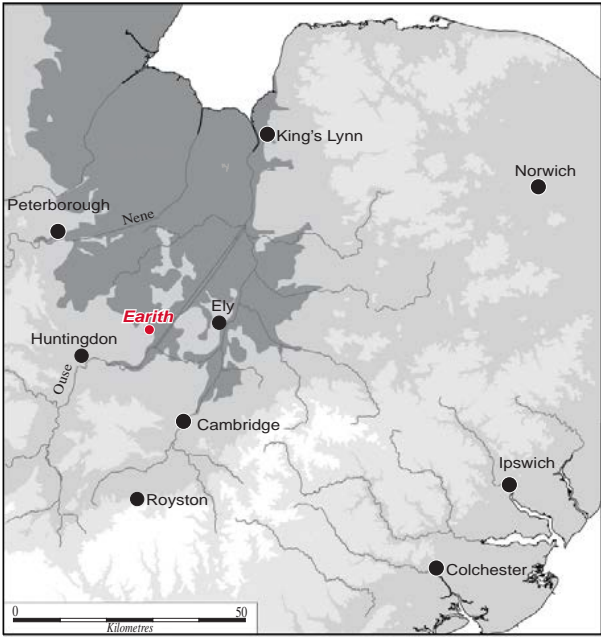


Figure 1. Location plan



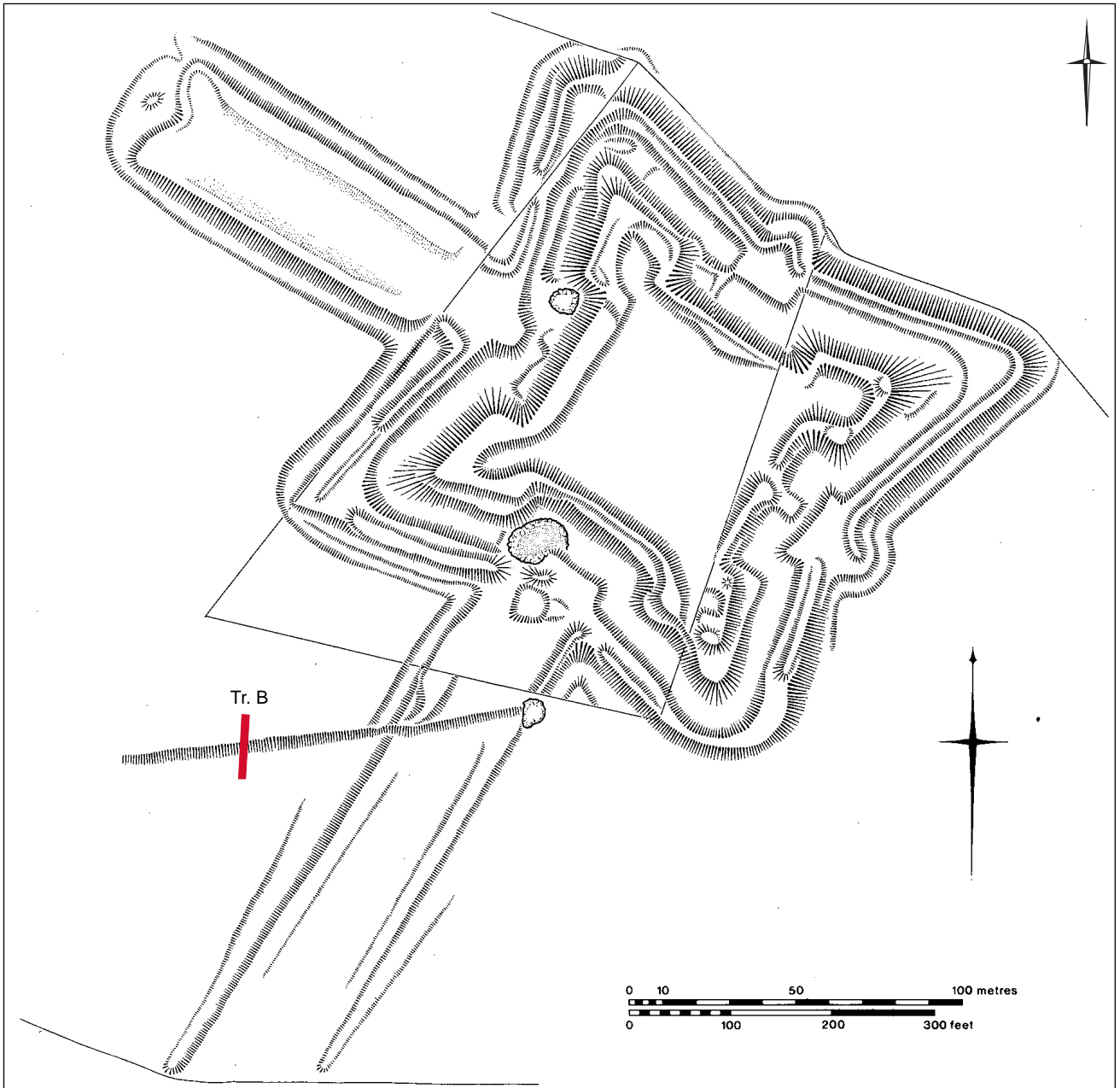


Figure 2. Taylor's 1999 plan of the Bulwark with location of Trench B

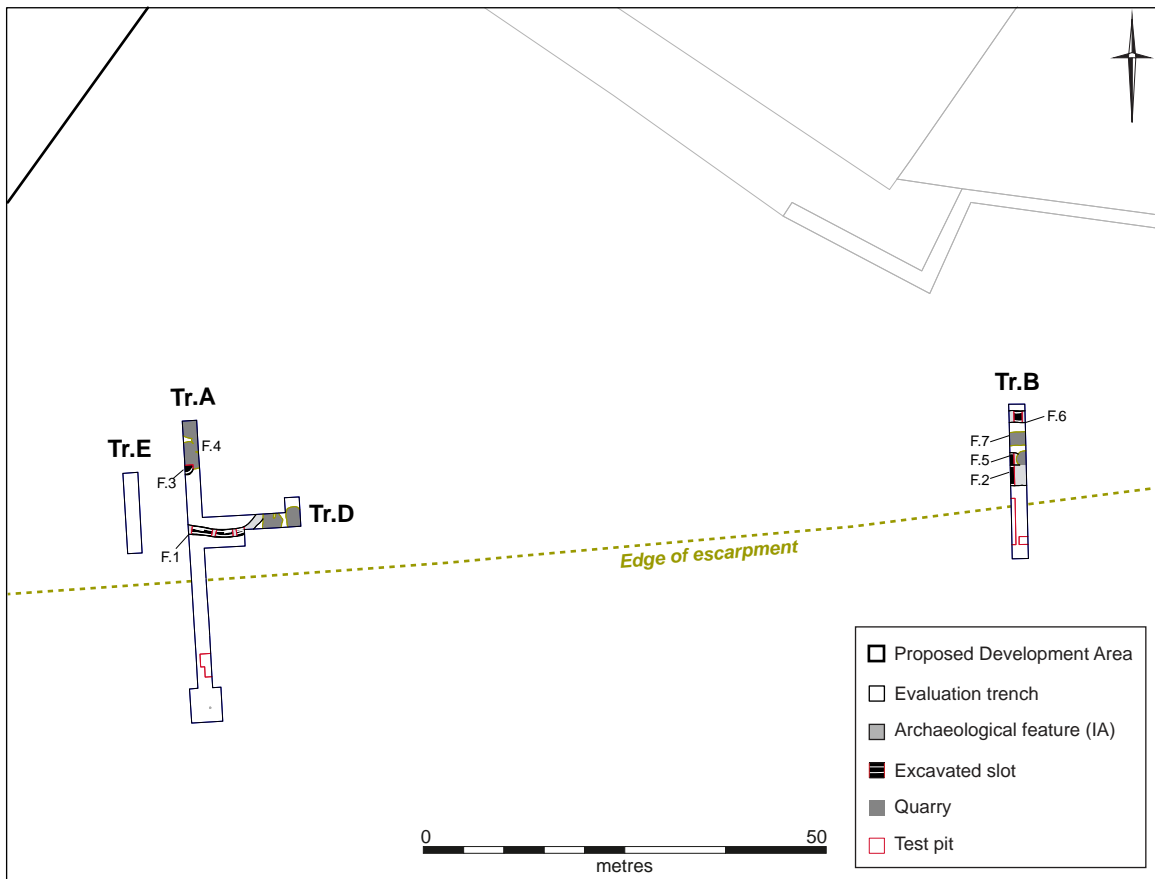


Figure 3. Trench plan in relation to geophysical anomalies

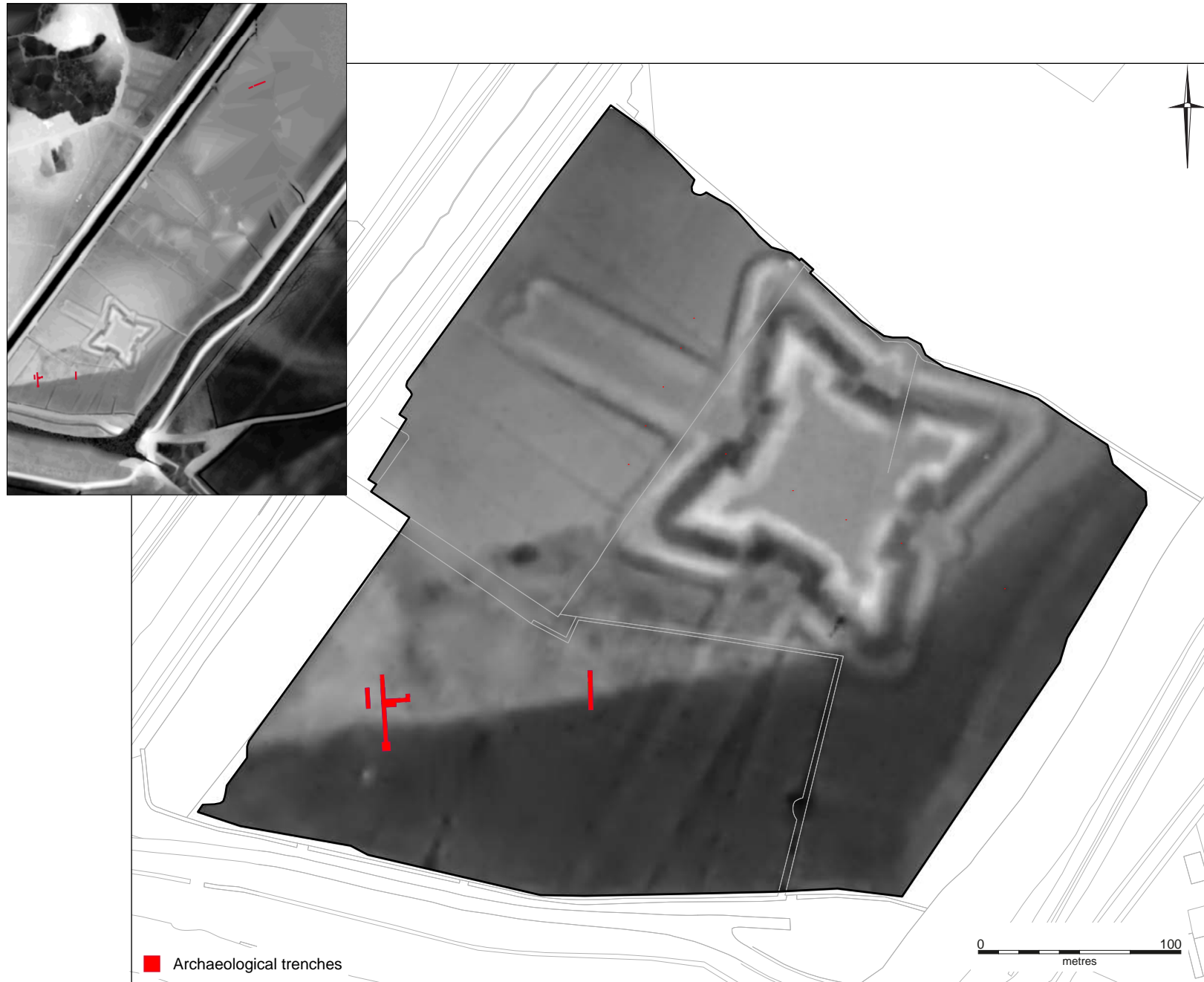


Figure 4. Lidar (inset), plan and trench locations, 1m surface terrain model





Figure 5. Some of the volunteers and C.A.U. team at the Earth Bulwark evaluation

## 2. RESULTS

Trench	Finds type by weight (g)									% of Total
	Burnt stone	Bone	Worked flint	Pottery	Metal	Burnt clay	Tobacco pipe	Brick or tile	Total	
A & D	6218	2100	1094	337	97	15	10	8	9879	83.3
B	21	73	48	-	5	-	-	-	147	1.2
C	-	1818	-	-	-	-	-	-	1818	15.3
E	-	-	3	-	-	-	-	-	3	0.02
Total	6239	3991	1145	337	112	15	10	8	11857	
% of Total	52.62	33.66	9.66	2.84	0.94	0.13	0.08	0.07	-	100

Table 1. Finds totals by trench and category

Seven archaeological features were identified, all in Trenches A and B (Figure 3), of which six were Medieval or post-Medieval quarrying pits, and a single ditch (in Trench A) was dated to the Middle Iron Age. Although no features were revealed in Trenches C and D, all trenches produced finds of various categories, totalling to 11,857g, within their deposit sequence (Table 1). Finds ranged from the Neolithic to modern periods, with the highest concentration of finds occurring in Trench A which mainly represented Neolithic and Iron Age activity.

### Trench Excavation

#### *Trench A & D*

Oriented north-south, Trench A (Table 2) was initially cut to a length of 37.8m and then extended south by another 5.0m where the trench was widened to 4.0m so to facilitate a 1.0m step as the trench deepened. A second extension of 7.0m length on the east side of the trench was initially labelled as Trench D, but is referred to here as a part of Trench A. The trench was positioned in order to investigate a fairly dramatic landfall on an escarpment edge with its solid landside plateau and riverside channel (Figures 6 and 7).

Period	Contexts	Description
Modern/Post-Medieval	F.3, F.4, 54, 55, 57	Quarry and overburden
Medieval	53	Alluvium
Roman	45	Alluvium
Iron Age	F.1, 2	Ditch and Peat (deflated)
Iron Age - Bronze Age	49, 50, 51	Channel/wetland deposits
	4, 9, 15, 46	Buried soil
	1, 11, 12, 16, 17, 44, 47, 52, 58	Washed sands
Bronze Age	5	Peat - woody
Bronze Age - Neolithic	10, 13, 14, 42, 43, 48	Buried soil and reed marsh

Table 2. Summary of Trench A deposit sequence

The northernmost 10m of the trench was almost completely covered with quarry strips (F.3, F.4), contained within one of which was a single pottery sherd dated to the 17<sup>th</sup>-18<sup>th</sup> century. These were no more than 0.4m in depth and each with a width

of c. 1.0m. Quarrying [57] also appeared to have occurred within the end of the east extension, although this appeared to be less structured than the strip quarries. High in the deposit profile overlying the strip quarries the topsoil and subsoil that overlay the remainder of the trench had been truncated and mixed by a layer [59] of mixed gravel, sand and clay made-ground which seems to have formed part of an east-west trackway of undoubtedly post-Medieval date.

Fill event	No. sherds
Upper	15
Middle	6
Lower	3

Table 3. Frequency of pottery in ditch F.1

The central and south half of the trench was well preserved by comparison to its north and east, with deposits containing prehistoric finds from the Neolithic to the Iron Age. A ditch (F.1) oriented east west crowned the escarpment landfall, turning to the northeast in Trench D where it is likely to have been truncated by later quarrying. Trench E was opened to the west in order to confirm the course of the ditch, but its absence suggests that it terminated somewhere between the two trenches. Ditch F.1 was extensively excavated with both perpendicular and longitudinal sections (Figure 8). It was shown to have a consistent width of 0.95-1.1m and a depth of 0.38-0.4m, and contained up to three visible fills: a lower basal silting, a middle core of fine grained light grey silty sand with occasional sub-angular stones, and a capping of similarly fine-grained mid greyish brown silty sand stained orange with vertical root casings. Twenty-four pottery sherds dated to the Middle Iron Age were encountered in all three fill events (Table 3).

An upcast bank [15] rung the crest of the escarpment south of ditch F.1 (Figure 7). This contained four flint flakes and two pot sherds, and may be interpreted as a headland or an agricultural bank formed on a plough turn, and a prehistoric date for this deposit is likely. Lying sealed beneath this was an intact buried soil [4] (see French in Section 3.2.1) with eight worked flints amongst its finds assemblage. This dissipated southward into a number of less distinct deposits (e.g. [9], [10], [13], [16], [17], [46], [48]), highlighting the downward action of the sediment owing to its proximity to an adjacent former deep watercourse. A second buried soil horizon [14] was preserved in the lower flank of the landfall. This may simply be a surviving remnant of the higher buried soil [4], but was sealed beneath alternating layers of indurated sandy gravel and fine mid grey sand ([11], [12], [44], [47]), from which a single sherd of Iron Age pottery was found amongst 506g of bone, 1193g of burnt stone and three worked flints. It is possible that these layers were deliberately laid to consolidate damp working ground, and would, therefore, point to an earlier and perhaps Neolithic date for the underlying buried soil horizon [14]. The base of the trench, identifiable as clean solid sandy gravel, was recorded at -0.02m OD at its deepest (south) end (defined by auger), with saturated deposits occurring at c. 1.3m OD indicating an early channel edge filled with light grey sandy silt [43] containing preserved reed casings. These channel deposits have been equated here with a broad Neolithic to Bronze Age range.



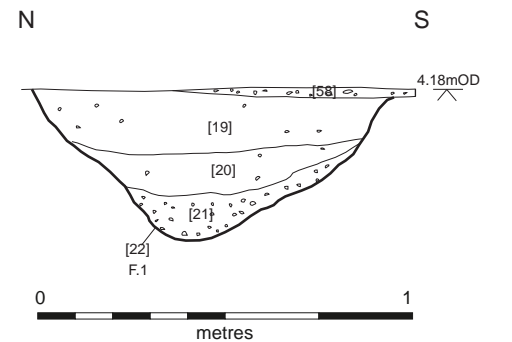
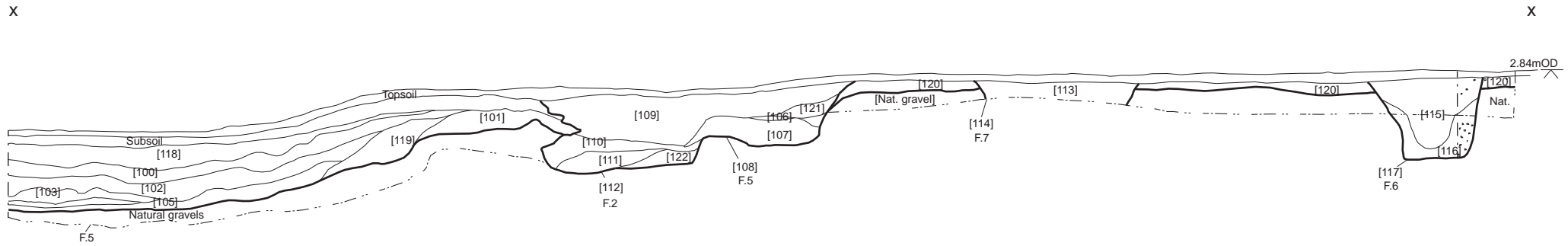
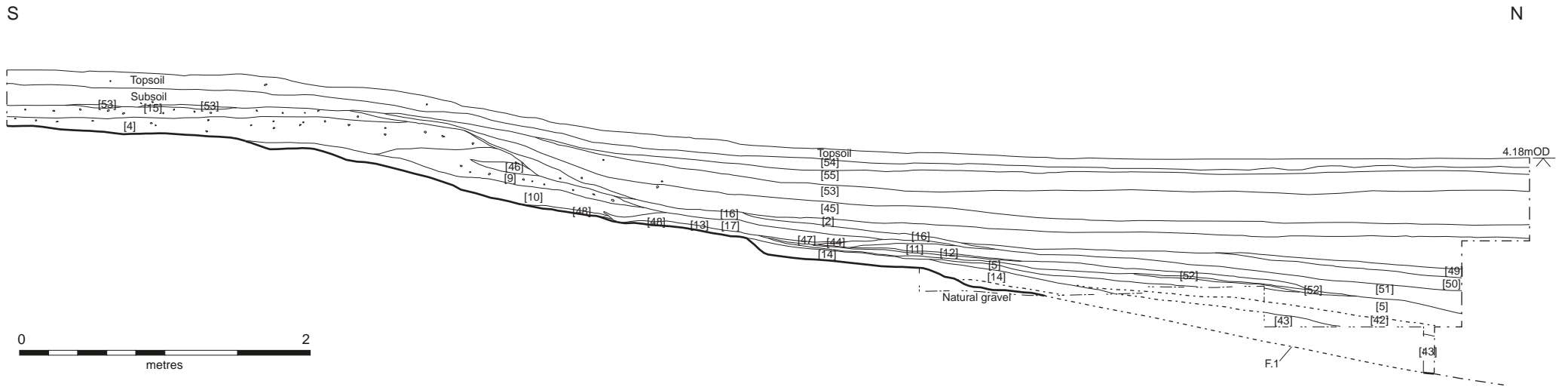


Figure 6. Profiles of Trench A (top, east section) and Trench B (bottom, west section) with Iron Age ditch F.1



Figure 7. Trench A complete profile, looking North (above). Detail of Prehistoric "headland" soil and escarpment (below)



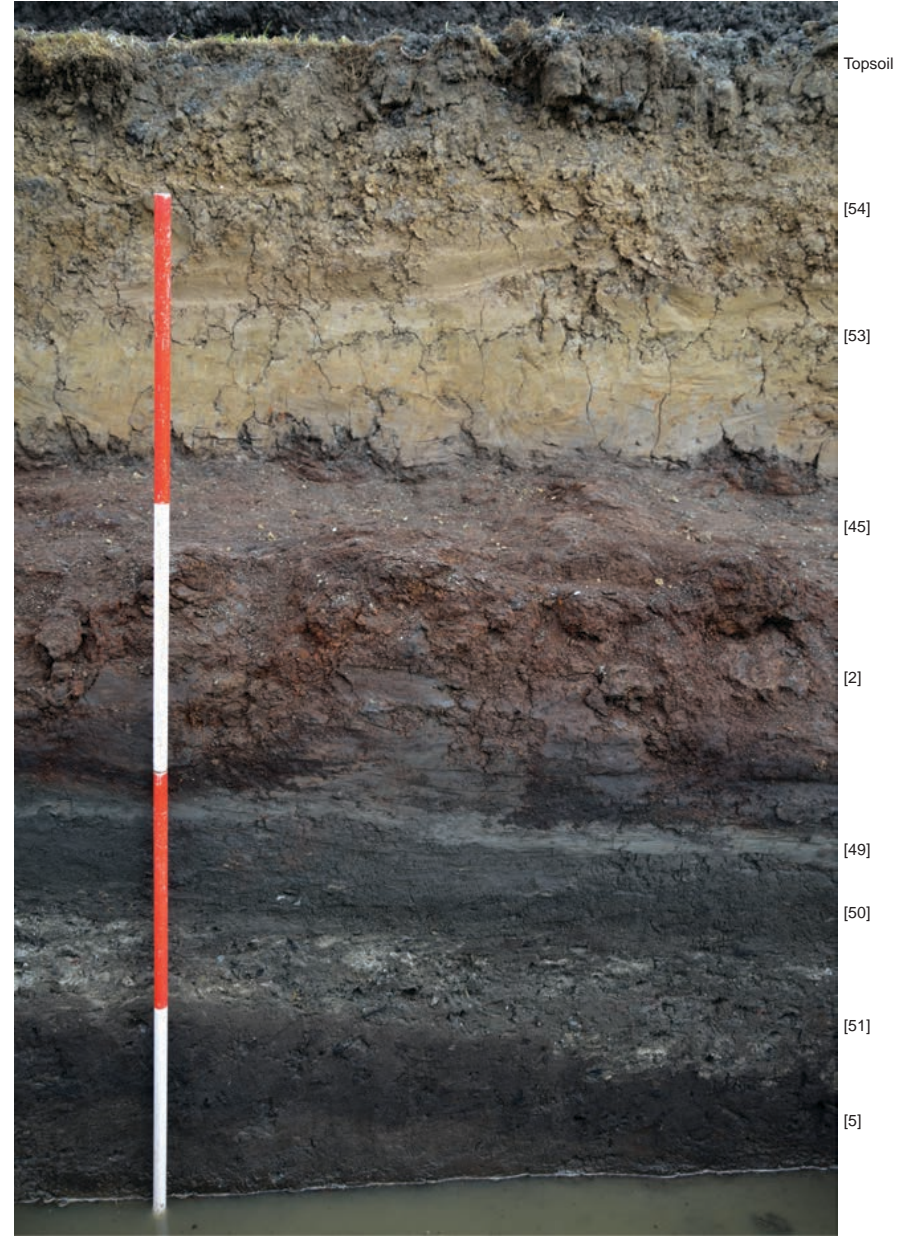


Figure 8. Photograph of Iron Age ditch F.1 and detail of Trench A channel profile

The proximity of a deep channel of the former course of the Ouse was evident in the southern end of the trench (Figure 8). The basal deposit at this lower depth consisted of organic sandy reed-silt [43] below peaty reed-silt [42] and above this a clayey woody peat [5] layer that also spread over the lower buried soil [14]. Other layers of alluvial clay [49], semi-formed peat [50] and washed gravelly sand [51] [52] were also observed above [5]. A Bronze Age to Iron Age date for these deposits is appropriate in the context of other nearby palaeochannel sequences. A column tin of the profile was retrieved and archived for the potential of future analysis. These layers were each sealed by a band of desiccated peat [2]. This falls within the broader south and east fenland sequence of later Iron Age peat formation, with familiar overlying alluvial deposits [45] [53] [55] formed during and following the Roman and Medieval eras. Each of these Iron Age and post-Iron Age layers rose upwards against the landfall of the escarpment, which is a characteristic of a sunken profile resultant of the deflation of the peat layer [2]. When fully formed this would have completely masked the escarpment edge, morphing the landfall into level ground.

### *Trench B*

The escarpment landfall was the target of Trench B which was cut to a length of 19.2m. The sequence was comparable to that observed in Trench A, except for a number of notable absences (Table 4, Figure 6). Strip quarrying was evident along the escarpment plateau with four confirmed but undated interventions: F.2 and F.5-7. Three residual worked flints comprised the finds assemblage from one of these (F.5 [107]). The buried soil present in Trench A was not replicated in Trench B, although the possible slumping of a relict soil horizon upon the downward slope of the edge was observed as [101] and [119]. A thin deposit of washed sand [105] covered the base of the trench at the foot of the escarpment at 1.8m OD was the only deposit equivalent with the Bronze Age to Iron Age channel edge deposits in Trench A. This produced a single worked flint and animal bone fragment. The subsequent layers included the deflated Iron Age peat [103] and Roman/post-Roman alluvial deposits [102], [100] and [118].

Period	Contexts	Description
Modern/Post-Medieval	F.2, F.5, F.6 F.7, 120	Quarry and overburden
Medieval	100, 118	Alluvium
Roman	102	Alluvium
Iron Age	103	Peat - deflated
Iron Age - Bronze Age	105	Washed sands
	101, 119	Buried soil

Table 4. Summary of Trench B deposit sequence

### *Trench C*

The possible course of the Roman Car Dyke was the target of Trench C, cut to a length of 45.7 at a width of 4.0m with a 1.0m (Figure 9). The course was visible as a linear anomaly in aerial photographs and as a slight (0.25m) raised earthwork on the ground at a maximum height of *c.* 2.15m OD, some 2.0m lower than Trenches A and



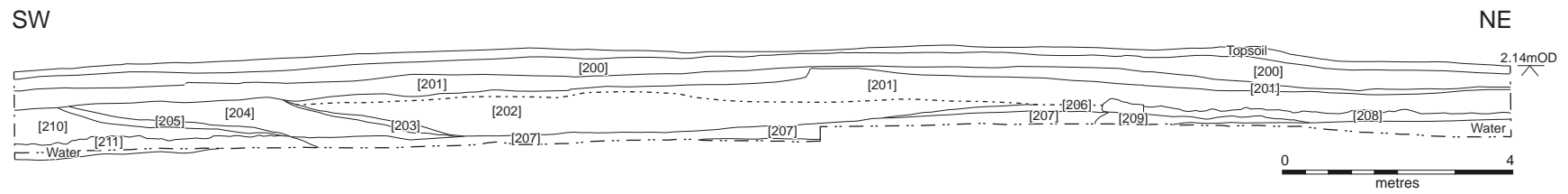


Figure 9. Photograph and section in Trench C, looking west.

B etc. There was no sign of any archaeological feature resultant of human work. Instead, the raised earthwork was evident in section as an alluviated rodde cutting through peaty mud reed bog. The bog itself was almost completely saturated, with the watertable resting high *c.* 0.4m from the ground surface; however, this abutted the stiff alluvial clays of the rodde within which the watertable was struck at 1.39m OD, or 0.75m from the ground surface. An assemblage of disarticulated animal bone, predominantly of mature cattle, was recovered from a band of orangey brown silty sand clay [201] high in the rodde's profile. This layer also contained bands of abundant shell.

### *Trench E*

Trench E was opened with the aim to establish the continuation of Ditch F.1 from Trench A to the east. It was 10m in length and revealed no archaeological features, with F.1 likely to have terminated between the two trenches (Figure 3). With no surviving relict land horizons, layers consisted only of topsoil (0.25m thick) and a sandy subsoil (*c.* 0.1m thick), and a single worked flint was retrieved from the trench's spoil heap.

## **Environment and Economic Data**

### *Soils and Geoarchaeology* – Charles French

Examination of the open Trench A section profiles revealed a probable buried soil surviving at the base of the sequence beneath the upcast bank [15]. As the land and bank contour begin to rise, there is a *c.* 25-30cm thick brown, gravel-free sandy loam [4] present at the base of the profile. The upper *c.* 10-15cm is browner and may indicate the base of a former organic A horizon surviving over a buried B horizon. Some 2-5m southwards, this soil becomes less well defined ([9], [10], [46], [48] etc.) as it was probably affected by mixing and erosion processes, presumably as a consequence of the increasing proximity to the former deep watercourse adjacent.

These two zones of the buried soil were sampled as Profiles 1 and 2, respectively, for micromorphological analysis (Courty *et al.* 1989). Trench B was not sampled as there was no apparent survival of any buried soil beneath the same linear bank structure.

### Potential

As the Profile 1 soil in particular is associated with Neolithic flintwork (Billington, Section 3.3.1), it may be directly comparable to similarly aged, early-mid-Holocene buried soils previously investigated in the near vicinity - at Haddenham long barrow to the northeast (French 2006) and the Godwin/O'Connell Ridges in Over Quarry to the south (French *in press*), and provide valuable comparative land-use data for this fen-edge area. Consequently, these two soil profiles should be examined in thin section.



## Environmental Data - Val Fryer

The excavations recorded features and deposits of prehistoric date. Samples for the retrieval of the plant macrofossil assemblages were taken from Trench A comprising a buried soil horizon [10] of probable Bronze Age to Iron Age date and a fill [31] within Middle Iron Age ditch F.1.

The samples were bulk floated by CAU and the flots were collected in a 300 micron mesh sieve. The dried flots were scanned under a binocular microscope at magnifications up to x16 and the plant macrofossils and other remains noted are listed below in Table 5. Nomenclature within the table follows Stace (2010). All plant remains were charred. Modern roots and seeds were also recorded.

### Results

Sample No.	5	8
Context No.	10	31
Feature No.	-	1
<b>Cereals</b>		
<i>Hordeum</i> sp. (grain)	x	-
<i>Triticum</i> sp. (grain)	x	-
(glume base)	x	-
Cereal indet. (grain)	x	-
<b>Herbs</b>		
<i>Bromus</i> sp.	-	x
<i>Fallopia convolvulus</i> (L.)A. Love	xcf	-
<i>Plantago lanceolata</i> L.	x	-
<i>Sherardia arvensis</i> L.	-	x
<b>Wetland plants</b>		
<i>Eleocharis</i> sp.	-	x
<b>Other plant macrofossils</b>		
Charcoal <2mm	x	x
Charcoal >2mm	x	-
Charcoal >5mm	x	-
Indet. seed	x	-
<b>Other remains</b>		
Black porous 'cokey' material	x	x
Small coal frag.	-	x
<b>Sample volume (litres)</b>	<b>14</b>	<b>19</b>
<b>Volume of flot (litres)</b>	<b>&lt;0.1</b>	<b>&lt;0.1</b>
<b>% flot sorted</b>	<b>100</b>	<b>100</b>

Table 5. Summary of charred plant macrofossils and other remains

Key to Table: x = 1 - 10 specimens cf = compare

Although both assemblages are extremely small (i.e. <0.1 litres in volume) and very limited in composition, cereal grains, chaff and seeds of common weeds are recorded, albeit as single specimens within each sample. Preservation is moderately good, although most of the cereals are puffed and distorted, probably as a result of combustion at very high temperatures.

Barley (*Hordeum* sp.) and wheat (*Triticum* sp.) grains are present along with a single wheat glume base. Seeds are scarce, but specimens of brome (*Bromus* sp.), black bindweed (*Fallopia convolvulus*), ribwort plantain (*Plantago lanceolata*) and field madder (*Sherardia arvensis*) are noted along with a single spike-rush (*Eleocharis* sp.) nutlet. Charcoal/charred wood fragments are also present along with small pieces of black porous material and an indeterminate seed. Shells of terrestrial and

marsh/freshwater slum molluscs are also noted, although the generally good condition of the remains may indicate that all are intrusive within the deposits from which the samples were taken.

In summary, the assemblage from buried soil horizon [10] may be derived from a very small quantity of cereal processing/storage detritus, although given the context, it is suggested that the remains may be indicative of scattered refuse rather than a deliberate deposit of material. The assemblage from ditch F.1 is too sparse for further interpretation, although it is again likely that the material is derived from scattered detritus which was accidentally incorporated within the ditch fill.

As neither assemblage contains sufficient material for quantification (i.e. 100+ specimens), no further analysis is recommended. However, a summary of this report should be included within any publication of data from the site.

#### *Animal Bone – Vida Rajkovača*

Of the assemblage with a raw count of 120 fragments and a total weight of 3991g, some 83 assessable specimens were recorded. Four species were identified based on 35 specimens (42% of the assemblage). Bone derived from layers of buried soil and washed sands in Trench A dated to between the Neolithic and Iron Age, with a ditch of Middle Iron Age date; in trench B bone was recovered from an Iron Age peat layer, and in Trench C a small assemblage was collected from roddon-associated contexts of probable post-Medieval date. The assessment aims to quantify the material, characterise the assemblage and assess its potential.

The zooarchaeological investigation followed the system implemented by Bournemouth University with all identifiable elements recorded (NISP: Number of Identifiable Specimens) and diagnostic zoning (amended from Dobney & Reilly 1988) used to calculate MNE (Minimum Number of Elements) from which MNI (Minimum Number of Individuals) was derived. Identification of the assemblage was undertaken with the aid of Schmid (1972), and reference material from the Cambridge Archaeological Unit.

Taphonomic criteria including indications of butchery, pathology, gnawing activity and surface modifications as a result of weathering were also recorded when evident.

Context Taxon	Neolithic- Bronze Age			Bronze Age	Bronze Age-Iron Age								Iron Age	Spoil Heap	Total NISP
	10	13	14	5	1	4	9	11	12	16	17	50	2	8	
Cow	-	2	-	2	-	-	1	-	3	-	-	1	1	1	11
Sheep/ goat	-	1	-	1	-	-	1	-	2	-	3	2	-	-	10
Pig	-	-	-	-	-	1	-	-	-	-	1	-	-	-	2
Horse	-	2	-	-	-	-	-	-	-	-	1	-	-	-	3
<i>Sub-total to species</i>	-	5	-	3	-	1	2	-	5	-	5	3	1	1	26
Cattle-sized	-	-	-	3	2	-	-	-	2	-	-	-	-	-	7
Sheep-sized	1	1	1	-	1	-	2	1	1	7	7	3	-	1	26
Mammal n.f.i.	4	-	-	-	3	-	-	-	-	-	-	-	-	-	7
<i>Total</i>	5	6	1	6	6	1	4	1	8	7	12	6	1	2	66

Table 6. Number of Identified Specimens for all species from trench A contexts; the abbreviation n.f.i. denotes that the specimen could not be further identified.

The majority of bone came from contexts excavated within Trench A (Tables 6 and 7). Cattle and ovicapra were found in similar numbers, followed by pig and horse. Bone was fragmentary and sometimes covered in iron-pan concretions.

Middle Iron Age ditch F.1 contained a small amount of animal bone (Table 7), with only three specimens identified as cow and sheep/ goat. One of the elements was calcined and a sheep/ goat astragalus was recorded as having been digested.

Context Taxon	F.1			Total NISP
	20	26	30	
Cow	-	2	-	2
Sheep/ goat	-		1	1
<i>Sub-total to species</i>	-	2	1	3
Cattle-sized	-	1	-	1
Mammal n.f.i.	1	3	-	4
<i>Total</i>	1	6	1	8

Table 7. Number of Identified Specimens for all species from Middle Iron Age ditch (F.1); the abbreviation n.f.i. denotes that the specimen could not be further identified.

Contexts excavated in Trenches B and C generated only a very small amount of animal bone (Table 8), of which seven specimens were identified as cow and horse. Cow metacarpus from [103] was chopped axially, probably to extract marrow. Trench C contained remains of horse front (right) and rear leg (left), all from the same animal, as well as cow tibia and metatarsus fragments.

Context Taxon	Trench B		Trench C	Total NISP
	103	105	201	
Cow	1	-	2	3
Horse	-	-	4	4
<i>Sub-total to species</i>	1	-	6	7
Cattle-sized	-	1	1	2
<i>Total</i>	1	1	7	9

Table 8. Number of Identified Specimens for all species from trenches B and C

Excavations within the Earith landscape have in the past resulted in the most varied faunal signatures, often with a significant wild component. It is, thus, somewhat surprising to see the results from the excavations in the Bulwark environs as being dominated by domestic fauna. The small size of the assemblage limits its interpretative potential, although it is clear that additional investigations could yield significant assemblages.

## Material Culture

### *Worked Flint* – Lawrence Billington

A total of 92 worked flints and four pieces (304g) of unworked burnt flint were recovered from the excavations. The assemblage is quantified by type and context in Table 9. The vast majority of the worked flint, 88 pieces, was derived from Trench A, with a further four pieces deriving from Trench B. Precisely half of the worked assemblage was recovered from layers encountered during the excavations, comprising various buried soil layers, washed sands and peat/wetland/channel deposits. The remainder of the worked assemblage was derived from the fills of cut features (38 pieces), or were recovered as unstratified finds from spoil heaps (8 pieces). The assemblage is clearly chronologically mixed; technological traits suggest that the assemblage includes material dating from the Mesolithic into the Early Bronze Age, whilst the few diagnostic retouched forms are of Mesolithic and Later Neolithic date.

### Raw Materials

The assemblage is made up entirely of flint. The flint is generally fine grained of good knapping quality but is very varied in terms of colour and the character of surviving cortical surfaces. The character of the raw material is entirely typical of material recovered from previous phases of work at Over with a mixture of flint derived from (presumably local) gravel flint sources together with a substantial proportion of fine very dark grey/black flint, sometimes with surviving unweathered cortical surfaces, which is characteristic of material collected from sources closely associated with the parent chalk. This 'chalk' flint is particularly characteristic of Later Neolithic (Grooved Ware associated) assemblages from the local area (e.g. Pollard 1998; Billington 2010) whilst in both earlier (Mesolithic/earlier Neolithic) and later (Early Bronze Age) periods raw materials are overwhelmingly dominated by flint derived from more local gravel sources. The characteristics of the Earith assemblage are entirely typical of this pattern, and pieces probably deriving from chalk flint include several technologically distinctive Late Neolithic pieces struck from levallois-like cores (Ballin 2011). Particularly interesting in this respect is a large tested nodule/minimally worked core recovered from washed sands [12] in Trench A. This piece comprises a large thermally fractured sub rectangular block of flint weighing 230g from which a few removals have been made. The flint is a very high quality fine grained dark grey/black and surviving cortical surfaces include both relatively weathered cortex and heavily corticated surfaces. This piece gives some insight into the possible nature of raw material packages that were being introduced into the Over environs during the Late Neolithic and the most likely source for material of this kind is from deposits weathered directly from the parent chalk, the nearest flint bearing strata of which outcrops some 15 to 20 kilometres to the south east.

### Condition

The assemblage is generally in good, fresh, condition, reflecting its recovery from sealed deposits which have seen relatively little post depositional disturbance. Just under half of the worked flint is corticated ('patinated') to some extent, varying from a light blue clouding to a heavy white. Within other assemblages recovered from the Over environs cortication appears to have some general chronological significance, with a tendency for Mesolithic and some earlier Neolithic flintwork to be corticated and later material to be uncorticated, although this trend is by no means absolute and cannot be used as a reliable dating guide for individual pieces. The same trend is, however, clearly exhibited by the assemblage from Earith with almost all diagnostically 'early' (i.e. blade-based Mesolithic/earlier Neolithic material) displaying cortication and all diagnostically later (later Neolithic/Early Bronze Age) material being uncorticated (see Table 9).

## Composition and Dating

At the simplest level the assemblage can be separated into two technologically distinct groups, the first representing a blade based industry characteristic of the Mesolithic/earlier Neolithic and the second a flake based industry typical of the Later Neolithic/Early Bronze Age. To a large extent this division parallels the differences in cortication discussed above.

Trench	Feature	Context	Context description	Chip	Irregular waste	Flake	Blade like flake	Bladelet	Crested blade	Bladelet core	Tested nodule	Scraper	Truncated blade	Microlith	Total worked	Unworked burnt no.	Unworked burnt wt. (g)
A	-	4	Buried soil	-	-	5	-	-	-	-	-	-	1	-	6	-	-
A	-	9	Buried soil	-	1	10	2	4	-	-	-	-	-	-	17	3	65
A	-	10	Buried soil	-	-	1	1	1	-	-	-	-	-	-	3	-	-
A	-	14	Buried soil	1	-	1	-	2	-	-	-	-	-	1	5	-	-
A	-	15	Buried soil	-	-	4	-	-	-	-	-	-	-	-	4	-	-
A	-	1	Washed sand	-	-	2	-	-	-	-	-	-	-	-	2	-	-
A	-	12	Washed sand	-	-	-	-	-	-	-	1	-	-	-	1	-	-
A	-	16	Washed sand	-	-	2	-	-	-	-	-	-	-	-	2	-	-
A	-	17	Washed sand	-	-	-	-	1	-	-	-	-	-	-	1	-	-
A	-	2	Peat	-	-	-	1	-	-	-	-	-	-	-	1	-	-
A	-	5	Peat	-	-	1	-	1	-	-	-	-	-	-	2	-	-
A	-	50	Channel deposit	-	-	1	-	-	-	-	-	-	-	-	1	-	-
A	1	6	Ditch	-	-	-	-	1	-	-	-	-	-	-	1	-	-
A	1	19	Ditch	-	1	6	-	3	-	-	-	1	-	-	11	-	-
A	1	21	Ditch	-	-	2	1	2	-	-	-	-	-	-	5	-	-
A	1	26	Ditch	-	-	8	-	3	-	-	-	-	-	-	11	-	-
A	1	30	Ditch	1	-	1	-	1	-	-	-	-	-	-	3	-	-
A	1	32	Ditch	-	-	1	-	1	-	-	-	-	-	-	2	-	-
A	1	34	Ditch	-	-	-	-	1	-	-	-	-	-	-	1	-	-
A	4	39	Quarry	-	-	-	-	1	-	-	-	-	-	-	1	-	-
A	-	8	Spoil heap	-	1	3	-	1	1	1	-	-	-	-	7	1	239
A	-	56	Spoil heap	-	-	-	1	-	-	-	-	-	-	-	1	-	-
B	-	107	Quarry	-	-	2	-	1	-	-	-	-	-	-	3	-	-
B	-	105	Washed sand	-	1	-	-	-	-	-	-	-	-	-	1	-	-
<b>Totals</b>				<b>2</b>	<b>4</b>	<b>50</b>	<b>6</b>	<b>24</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>92</b>	<b>4</b>	<b>304</b>
Uncorticated total				-	3	38	2	3	-	-	1	1	-	-	48	-	-
Corticated total				2	1	12	4	21	1	1	-	-	1	1	44	-	-

Table 9. Basic quantification of the flint assemblage by type and context.

The first of these broad groups, made up of blade based material, includes 24 true blades and bladelets alongside a number of blade like pieces and flakes which display similar technological trends to the blades and bladelets, including regular dorsal scars, careful platform abrasion/trimming and evidence for soft hammer percussion. Also present is a fine (burnt) opposed platform bladelet core. This group of blade based material displays a degree of variability in the precise morphology and technological characteristics of individual pieces. Removals vary from very

narrow bladelets to fairly large blades and include examples struck from opposed platform cores and others from single platform cores. The high proportion of true blades, as opposed to blade like flakes, the use of opposed platform cores and the recovery of a blade with crested preparation all suggest that much of this material derives from the highly structured core reduction practices associated with Mesolithic flintworking and that Early Neolithic material, whilst probably present, is likely to form a minority part of the assemblage.

These observations are strengthened by the nature of the retouched tools which can be associated with the blade based material, which comprise a single microlith and a blade with a straight distal truncation – both of which are diagnostically Mesolithic. The microlith can be classed as a partially backed point/obliquely blunted point of Jacobi's (1978) *type 1ac* and Clark's (1934) *type A1*, it is however, missing its distal end due to a recent break and could have had basal retouch of some type. Despite its broken state the microlith is relatively large (43mm by 11mm) and is characteristic of forms recovered from Early Mesolithic Deepcar type assemblages (c. 8600 – 8000 cal. BC) and from 'Middle/Boreal' Mesolithic assemblages of Honey Hill/Horsham type (c. 8200 – 7000 cal. BC) (Reynier 2005, Barton and Roberts 2004). This general form of microlith was dominant in the very large Mesolithic assemblage derived from investigations of the Over Narrows which probably largely represents activity during the late ninth millennium cal. BC (Evans *et al.* forthcoming).

The second broad group of worked flint is characterised by flake based technologies. This material includes fairly expediently produced material, struck from simple flake cores using direct hard hammer percussion with little attention paid to platform preparation or core maintenance. Also present, however, are a substantial number of pieces which derive from more sophisticated practices of flint working, using levallois-like/discoidal cores. These pieces are characterised by fine, often multi-directional dorsal scar patterns, frequent platform faceting and regular morphologies. As noted above these technologies are almost exclusively associated with later Neolithic assemblages from across the country (Ballin 2011) and are particularly well represented in the later Neolithic assemblages from Over. The only core which can be associated with the later material is the tested nodule discussed above whilst only a single retouched tool was recovered and which is almost certainly of later Neolithic date: a fine convex end scraper with a finely faceted striking platform. Although the ratio of retouched pieces is rather low when compared to other broadly contemporary assemblages in the local area – which frequently have a retouched element of 10% or more of the total (see Evans *et al.* forthcoming) – it should be noted that many pieces display some degree of edge damage consistent with use as cutting or scraping tools. This contrast with the earlier blade-based material where there is less (macroscopically visible) evidence for the use of unretouched pieces. Although no diagnostically Early Bronze Age material was recovered it seems likely that a proportion of the flake based material reflects activity during this period, although the dominance of diagnostically later Neolithic material suggests this may have been relatively slight. There is no clear evidence for the presence of any post-Early Bronze flintwork.

In general terms the flint assemblage from Earith is entirely consistent with material recovered from analogous contexts elsewhere in the Over environs. In particular, the relatively high proportion of Mesolithic material invites direct comparisons with material recovered from the Over Narrows excavations, and contrasts with some other areas of the landscape somewhat further away from the main prehistoric river channels where there is an absence of Mesolithic flintwork, as in the most recently investigated area of the Over/Needingworth quarry to the southwest of the Narrows (Tabor and Evans 2013). It seems that Early Neolithic material may be relatively poorly represented and this is, again, consistent with the evidence from the Narrows where the post-Mesolithic flintwork was dominated by Later Neolithic and Early Bronze Age material. Although relatively small, this assemblage is valuable in indicating the continuation of the prehistoric activity registered so spectacularly on the Narrows, and highlights the potential for similar lithic scatters to be encountered in analogous locations in the Lower Ouse valley.



*Prehistoric Pottery* – Marcus Brittain with David Hall

The assemblage comprises 51 sherds of prehistoric pottery totalling 304.1g with an average mean sherd weight of 5.96g (Table 10). This was dominated by small sherds and by sand and shell tempered fabrics. All are of Early/Middle Iron Age date and were recovered exclusively from Trench A.

Cat. no.	Feature	Context	No. sherds	Weight (g)	Body	Rim	Base	Fabric	Notes
1	-	1	1	77	1	-	-	6	scored decoration
1	-	1	1	29	1	-	-	6	scored decoration
11	-	4	1	9	1	-	-	14	
19	1	6	1	3	1	-	-	4	
25	-	9	5	6.5	5	-	-	4	
25	-	9	1	6	1	-	-	4	
25	-	9	1	1.5	1	-	-	14	
25	-	9	1	10	1	-	-	16	
25	-	9	1	1	-	-	1	16	
25	-	9	1	1	-	-	1	16	
25	-	9	1	5	-	-	-	16	
31	-	10	1	4.5	1	-	-	4	
31	-	10	1	2	1	-	-	8	
42	-	14	1	5	1	-	-	4	
46	-	15	1	9	1	-	-	8	
46	-	15	1	4	1	-	-	16	band decoration
48	-	16	1	2	-	1	-	8	simple nipped rim
48	-	16	1	4	1	-	-	8	
48	-	16	1	3.5	1	-	-	8	
53	-	17	1	11.5	1	-	-	4	
53	-	17	1	7.5	1	-	-	4	
53	-	17	1	2	1	-	-	4	
53	-	17	1	6.5	1	-	-	8	band decoration
53	-	17	1	30	1	-	-	14	coarseware shouldered jar
57	1	19	7	6	1	-	-	4	
63	1	26	1	1.5	1	-	-	4	
63	1	26	1	1.5	1	-	-	8	
67	1	27	1	6.6	1	-	-	4	
67	1	27	1	4	1	-	-	4	
67	1	27	3	1.5	3	-	-	4	
67	1	27	1	3.5	-	-	1	16	
68	1	30	3	1.5	3	-	-	4	
68	1	30	2	2.5	2	-	-	4	
72	1	32	1	6	-	1	-	12	coarseware shouldered jar with fingertip rim top
72	1	32	1	3	1	-	-	16	band decoration
76	1	35	1	26	-	-	1	14	

Table 10. Summary of prehistoric pottery

Where possible, analysis utilised the fabric series devised for the Colne Fen later prehistoric ceramics by Brudenell (2013, 139). In the current assemblage six fabric types were identified from this series:

- Fabric 4 - Compact with common SAND
- Fabric 6 - Medium-hard with abundant small-medium SHELL
- Fabric 8 - Hard with common SAND and rare SHELL
- Fabric 12 - Medium-hard with frequent small-large FLINT
- Fabric 14 - Very hard with abundant SAND and moderate medium FLINT
- Fabric 16 - Medium-hard with common linear voids from burnt-out VEGETAL matter and rare SAND

Sandy fabrics were the most abundant fabric type at 58.8% (n=30), with types of both sand and shell, and vegetal matter and sand accounting for 13.7 % (n=7 each), sand and flint at 7.8 % (n=7), and shell (4%, n=2) and flint (2%, n=1) the least frequent of the fabric types. Compared with Colne Fen (Brudenell 2013, 223) this presents a notable lower shell value. Sand fabric possibly reflects material obtained from alluvial fenland clays perhaps in proximity to the find location.

A minimum of six vessels are represented by different rims and bases, all burnished. Three of these were from secure contexts in ditch F.1. In all cases the size of the sherds was too small to examine pot profiles with any confidence, but two rim sherds may belong to slack-shouldered vessels which are a form common to Middle Iron Age assemblages in eastern England. The assemblage comprised a mix of burnished and coarseware surfaces, with a prevalence of the latter. Two sherds <1> displayed scored decoration; these were larger, thicker and heavier than the other plain sherds, and were composed of a shelly fabric (Fabric 6), all of which is characteristic of this decorative form in this area (*ibid.* p.224). Three sherds <46> <53> <72> were decorated with thin bands that were lighter impressed and discrete by comparison to the scored method of decoration. Pinched finger decoration was found on the top of one rim sherd <72>.

#### *Medieval and Post-Medieval Pottery – David Hall with Marcus Brittain*

Four sherds of post-Medieval and one sherd of Medieval pottery were recovered, all from Trench A. Only one of these <77> was contained within a cut feature, a quarry pit F.3. Two of the sherds were from earlier contexts <25> and <11>, and had seemingly become displaced from a higher profile most likely through desiccation and peat shrinkage.

<8> [2] Trench A: Body sherd (weight 12g) of greyware, 15<sup>th</sup> century

<11> [4] Trench A: Rim (weight 1g) of blue and white ware, 19<sup>th</sup> century

<22> [8] Spoil heap, Trench A: Body sherd (weight 3g) of greyware, 15<sup>th</sup> century

<25> [9] Trench A: Two conjoining sherds (combined weight 3g) of greyware, 13<sup>th</sup> century

<77> F.3 [37], Trench A: Body sherd (weight 18.37g) of Staffordshire type slip ware, 17<sup>th</sup> – 18<sup>th</sup> century

## Burnt Stone – Simon Timberlake

All of the stone assemblage examined was burnt (6.408kg; Table 11) except for one flint nodule (<17>). Although the majority of this stone (4.35kg) came from generic Bronze Age to Iron Age contexts, the characteristics of this material is typical of the Early-Middle Bronze Age: small (generally <100mm diameter) pebbles and cobbles composed mostly of sandstone, quartzite and sometimes denser igneous rocks selectively collected from the flint gravels for the purposes of boiling water in pits (as evidence by the calcination and craze cracking of the pebble surfaces). Earlier-used material tends to have more burnt flint in it, whilst Iron Age burnt stone consists sometimes of larger cobbles with re-used quern and other pieces of broken-up worked stone amongst it.

Cat. No.	Trench	Feature	Context	Nos. frags	Size (mm)	Weight (kg) NB largest cobble weight shown in ( )	Geology	Notes	Period
07	A	-	1	1	95	0.124	trachyandesite (see <18>)	fragment	BA-IA
04	A	-	1	2	30-75	0.098 (0.064)	micac sstn + qtz sstn	-	BA-IA
14	A	-	4	1	70	0.240	sstn	-	BA?
18	A	-	5	3	60-110	0.538 (0.322)	trachyandesite + metaquartzite + sstn	fragments	BA-IA
21	A	1	6	2	35-65	0.168 (0.132)	sstn + quartzite	fragments	MIA
27	D	-	8	1	85	0.274	micac qtz sstn	fragment	-
30	A	-	9	2	80-90	0.810 (0.456)	Est Ser sstn pl foss + sstn	cobble fragments	BA-IA
34	A	-	10	4	20-65	0.224 (0.134)	chert + micac sstn + sstn(2)	-	Neo-BA
39	A	-	12	8	30-95	1.202 (0.308)	micac stn (3) + lithic sstn + orthoquartz sstn + quartz	cobble + fragments	BA-IA
41	A	-	13	5	10-80	0.332 (0.166)	diorite/dolerite(3) + quartzite sstn + sstn	fragments	Neo-BA
45	A	-	14	4	30-55	0.394 (0.28)	basalt/andesite + sstn + BF	fragments	Neo-BA
51	A	-	16	6	15-30	0.046	sstn	fragments	BA-IA
56	A	-	17	18	32-85 (45)	1.346 (0.27)	metaquartzite + volc tuff + micac sstn + sstn (14)	fragments	BA-IA
66	A	1	26	1	35	0.004	quartzite	fragment	MIA
71	A	1	30	1	80	0.272	sandstone	fractured cobble	MIA
75	A	1	34	1	60	0.128	micaceous coarse sstn (greensand)	fractured cobble	MIA
82	A	-	50	1	55	0.184	sstn	pebble	BA-IA
88	B	2	109	1	30	0.024	sandstone	-	PM

Table 11. Summary of the burnt stone catalogue

### *Fired Clay* – Simon Timberlake

Fired clay totalling 22.4g was recovered from three contexts, all in Trench A. The assemblage appears to equate with Middle Iron Age occupation of the plateau, with ditch F.1 containing 4.6g of fired clay <59>. Fired clay in a post-Medieval quarry pit F.3 <78> is likely to be residual, and that <29> from the prehistoric buried soil [9] was water-worn and clearly also derived from another source, but also contained the only example of a wattle rod impression. All specimens were composed of the same fabric: fine clay bonded by vegetal matter dissolved into open voids.

### *Metalwork* – Marcus Brittain

The assemblage consists of two catalogue numbers comprising three items of metalwork all of post-Medieval date. One, <91>, is assigned to two fragments of iron horse shoe (118g) from the topsoil of Trench A, and <92> is a hand-made iron nail (3.5g) with square profile towards the tip and rectangular profile towards the head. This was recovered from a test pit in Trench B in a layer [103] low in the soil profile. It must be assumed that this had originated from the upper layers but was displaced during the drying and cracking of the upper sediment.

## **3. DISCUSSION**

The outcome of these modest investigations has undoubtedly been successful; the results' emphases on prehistoric activities rather than either Roman or historic-era evidence was unexpected, but is no less significant.

In Trenches A and B the intensity of plateau-side quarrying has clearly disrupted visibility of earlier horizons, and though probably spanning several hundred years either side of the Bulwark's construction, some limited frame of connection to activities therein may nonetheless be inferred. The strategic importance of the Bulwark's landscape position in relation to waterways and dry routeway crossings is additionally visible as a raised gravel terrace in the broad view LiDAR model of Figure 4, also in which the scale of quarrying is further outlined as an oval shadow south of the Bulwark's earthworks (see also the results of the geophysical survey in Appendix 6.3, Figure 16). The terrace projects eastwards into a sinuous fen environment of possible smaller banks and waterlogged creeks, the nature of which is illustrated by Trench C to the north where organic bog deposits were cut by the silt and alluvium filled channel roddon. The Bulwark's south and east earthworks appear to have been constructed on the very edge of this raised promontory. Borehams borehole survey of the sediment sequence immediately east of the Bulwark (in BH10) encountered organic river silts of *c.* 5m thickness, and subsidence of the southeast defensive bastion again illustrates the tight placement of the earthwork against the crest of the raised gravels' landfall. This subsidence also highlights a change in the local ground level where shrinkage of the prehistoric and later peat layers that part filled the ancient channel sequence have enhanced the declination of the escarpment landfall, in effect returning it close to its earlier

prehistoric form. The hornwork projecting southward from the south defensive curtain may have therefore traversed ground raised from today's ground surface and subsequently sunk in profile. The effect of this on the nature and scale of its preservation remains unknown. The construction of the Bulwark's southeast bastion part-way over this landfall also suggests that the subsequent cutting of the New Bedford River and additional fen drainage methods substantially dewatered the landscape here for much of the year, with recharge today only following significant and sustained rainfall.

No sign of the Roman Car Dyke was encountered in Trench C, although this need not diminish the argument that the roddon – evident as a raised soil mark – represents its possible course. The flow of the West Water 'channel' might conceivably have passed through and removed any primary trace of an earlier course with its wash deposits sealing basal horizons. Irrespective, there was no sign of a formally cut and managed watercourse.

The sediment sequence recorded in Trenches A and B provide an important insight to the changes in the physical character of the terrace landscape around the Bulwark. In many respects this mirrors a familiar sequence that culminated with the formation of peat during the Iron Age subsequently overlain by multiple deposits of alluvium incurred by the breaking of the River Ouse banks to the south. The peat itself was heavily deflated, resulting in the overlying layers of alluvium falling from their original height of deposition, and turning upwards against the slope of the escarpment landfall. The sediment sequence underlying the peat – particularly in Trench A – tells of a different story, one still congruent with the local context of prehistoric activity but, importantly, within an area for which this was previously unrecognised. Moreover, the quality of these sediment deposits – a combination of disturbed and *in situ* buried land surfaces with organic preservation – is the project's main highlight.

The sub-peat layers appear to relate to a number of phases of waterside activity, the earliest of these, as represented by its microlithic worked flint industries, being of the (predominantly Late) Mesolithic. This comprised nearly half of the entire assemblage of 92 worked flints, 24 of which were blades, and had been sourced as a raw material predominantly from local gravels. Late Neolithic forms made up the second half of the assemblage, mainly comprising flake based technologies and with a greater mix of raw material sources that included high quality dark flint imported from chalk-derived seams. As Billington describes in his report on the worked flint, the assemblage may be closely paralleled with that from the Over/Needingworth quarries south of the River Ouse and the project area. This too was composed of Late Mesolithic and Late Neolithic technologies with few forms representative of intermediary – Early Neolithic – activity. The lithic material was recovered from the *in situ* buried soils and the overlying mixed washed sands derived from water action on the channel banks. Taking into account that one half of the trench had been truncated by post-medieval quarrying, and that the lower third of the trench mostly housed channel deposits, the assemblage was delivered by an area of only *c.* 38m<sup>2</sup>, which equates to 2.4 worked flints per square metre. Although slightly less than the more extensively investigated landscape of Over's Godwin Ridge to the south

(equating to 4/5 microliths per square metre), and coming from only a keyhole view into the Wash's landscape, this is an important finding that illustrates a northward extension of the early prehistoric riverside activity identified at the Over Narrows, which has itself been considered to be one of the most significant Mesolithic landscapes to have been investigated in Cambridgeshire (Evans *et al.* forthcoming).

The potential of the waterlogged palaeoenvironmental data that could be held within the sediment sequence in Trench A is noteworthy. Partially overlain by washed sands containing Middle Iron Age ceramics, this is likely to relate to an environment spanning at least the Neolithic and Bronze Age, if not earlier. Unfortunately the available resources could not meet the costs that analysis of this would entail, although three column samples were collected for cold storage in case a later opportunity for its analysis arises. Equivalent deposits were not present in Trench B. This may partly be due to the shorter length of the trench, its southern end not reaching into the deeper saturated deposits. There was, however, indication that a lesser degree of preservation was sealed by the later deposit sequence in Trench B; this may have resulted from higher energy water action towards the interface of the West Wash and an old course of the River Ouse. Moreover, with only two worked flints coming from this trench the foci of early activity was evidently further to its west.

The only cut feature of prehistoric date was a ditch (F.1) situated a few metres from the escarpment edge upon the plateau of Trench A. This appeared to terminate beyond the west of the trench (not continuing into Trench E) and curved northwards at its west projection and into an area destroyed by later quarrying. This was of modest proportions, 1.1m wide and 0.38m deep, and contained a small assemblage of residual earlier worked flint, with 66g of Middle Iron Age pottery comparable with sherds found in the washed sands at the base of the landfall. This does not easily correspond with any of the geophysical anomalies, but lies at a contour comparable with the 1.7 to 3.0m OD activity at Colne Fen, at which two sub-square ditched compounds were located. Similarly, a small partially ditched compound was positioned along the Over's Godwin Ridge - an 'island' within the course of the River Ouse - with three main areas of artefact deposition. The Iron Age activity seen here to the south of the Bulwark may cover much of the terrace promontory and be in part overlain by the Bulwark's earthworks. It is possible, furthermore, that the extent and broader character of the Iron Age occupation may be defined through geophysical survey in areas relatively unaffected by later quarrying. The relationship of the ditch to the upcast bank [15] on the landfall's edge remains open to question, and any number of the site's phases may account for the latter's development, but it is most likely to have accumulated during early agricultural practices. The environmental data retrieved from the Bronze-Iron Age buried soils [10] serves to reinforce this view with a small assemblage of cereals being present. By contrast, ditch F.1 contained no cereal evidence, and the presence of sedge implies that by the Middle Iron Age the land edge had increased in saturation. A sequence may, therefore, be suggested of a shift from localised crop husbandry during the Bronze Age to enclosed pasture by the Middle Iron Age, thereby also reflecting changes of 'ideal' economies in reference to environmental circumstances.

The landscape of the project area is dominated by three primary features: the Bulwark's Civil War earthworks, the terrace-edge landfall, and the River Ouse. In three trenches the project has enriched understanding of the relation between each of these features. Importantly, this investigation has highlighted the dynamic and changing character of this landscape, and in particular an underlying and often very well preserved prehistoric landscape. What is apparent is that the terrace promontory embodied a number of specific qualities that favoured the specific priorities - resources, settlement, strategic position - expressed by differing ages of inhabitant communities.

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## 5. APPENDICES

### Context Summary

Context No.	Trench	Category	Feature	Basic Feature Description	Context Description	Above	Below
1	A	Layer			Same as [17]		
2	A	Layer		Iron Age peat	Deflated peat - thinning out on up-slope boundary and desiccated overall. Romano-British pottery.	[16] [49] [50]	[45]
3	A	Layer			Same as [12]		
4	A	Layer		BA-IA buried soil	Leached buried soil - B/C horizon. Moderately firm mid orangey brown sandy silt, mottled with lighter and darker patches. Occasional charcoal flecks and lumps. Possible up-cast with down-slope erosion.	[15]	[9] [10]
5	A	Layer		BA peat?	Woody clayey peat sealing in situ B/C horizon [14] and overlain by Iron Age washed deposits. Possible Bronze Age formation.	[14] [42] [43]	[12] [51] [52]
6	A	Fill	1	E-W Ditch - MIA	Fill of [7]. Firm and compact light grey sandy silt with vertical orange lenses (root casings) and occasional small sub-angular stones.		
7	A	Cut	1	E-W Ditch - MIA	Sharp concave sides and near flat base, with slight concave deepening on north side. Width 1.1m, Depth 0.38m		
8	A & D	Layer			Spoil heap		
9	A	Layer		BA-IA buried soil	Buried soil B/C horizon, possibly displaced through erosion. Moderately firm mid grey sandy silt with moderate iron panned patches and occasional small sub-angular and rounded stones.	[10]	[4]
10	A	Layer		Neolithic - Bronze Age buried soil and reed marsh	Buried soil B/C horizon, in situ on upslope and slightly weathered on lower downslope (slumping over or under cut by [17]). Loose to firm mid grey sandy silt with occasional small sub-angular and rounded stones and very rare charcoal flecks.	[17] [48]	[9]
11	A	Layer			Compact and indurated dark orange sandy gravel with iron panning. Possibly a laid deposit. 30mm thick.	[12]	[44]

Context No.	Trench	Category	Feature	Basic Feature Description	Context Description	Above	Below
12	A	Layer		BA-IA washed sands	Semi-formed A/Ab horizon. Dark grey fine grained and friable silty sand with moderate small to medium subangular stones and very occasional larger rounded stones. Woody lumps in lower basin with Iron Age pottery	[5]	[11]
13	A	Layer		Neolithic - Bronze Age buried soil and reed marsh	Compact and indurated dark orange sandy gravel with iron panning. Possibly a laid deposit. 30mm thick.	[48]	[17]
14	A	Layer		Neolithic - Bronze Age buried soil and reed marsh	Buried soil B/C horizon, in situ in swail. Friable mottled light grey and mid orange sandy silt, becoming lighter and more orangey towards base - possible thin secondary horizon.	Nat	[5] [48]
15	A	Layer		BA-IA buried soil	Semi-formed A/Ab horizon. Iron Age or later. Mid greyish brown loose to firm sandy clayey silt with moderate small to medium subangular stones.	[4]	[53]
16	A	Layer		BA-IA washed sands	Mid brownish grey loose to firm clayey sandy silt with occasional iron pan and rooting.	[17]	[45]
17	A	Layer		BA-IA washed sands	A water-borne wash deposit. Light brownish grey fine grained friable medium sand with occasional small sub-angular stones and rare saturated wood lumps.	[13] [44] [47] [48]	[10] [16]
18	A	Layer			Same as [12]		
19	A	Fill	1	E-W Ditch - MIA	Fill of [22]. Fine grained moderately soft mid greyish brown silty sand with occasional vertical orange staining (rooting).		
20	A	Fill	1	E-W Ditch - MIA	Fill of [22]. Light grey fine grained medium silty sand with occasional medium and small sub-angular stones and occasional vertical orange staining (rooting)		
21	A	Fill	1	E-W Ditch - MIA	Fill of [22]. Coarse mid orangey brown sand, slightly mottled with darker orange silty sand and with moderate medium sub-angular stones.		
22	A	Cut	1	E-W Ditch - MIA	Sharp concave sides and near flat base, with slight concave deepening on north side.		
23	A	Layer			Same as [14]		
24	A	Layer			Same as [13]		
25	A	Layer			Same as [13]		
26	A	Fill	1	E-W Ditch - MIA	Fine grained moderately soft mid greyish brown silty sand with occasional vertical orange staining (rooting).		

Context No.	Trench	Category	Feature	Basic Feature Description	Context Description	Above	Below
27	A	Fill	1	E-W Ditch - MIA	Light grey fine grained medium silty sand with occasional medium and small sub-angular stones and occasional vertical orange staining (rooting)		
28	A	Fill	1	E-W Ditch - MIA	Coarse mid orangey brown sand, slightly mottled with darker orange silty sand and with moderate medium sub-angular stones.		
29	A	Cut	1	E-W Ditch - MIA	Sharp concave sides and near flat base, with slight concave deepening on north side.		
30	A	Fill	1	E-W Ditch - MIA	Fine grained moderately soft mid greyish brown silty sand with occasional vertical orange staining (rooting).		
31	A	Fill	1	E-W Ditch - MIA	Light grey fine grained medium silty sand with occasional medium and small sub-angular stones and occasional vertical orange staining (rooting)		
32	A	Fill	1	E-W Ditch - MIA	Coarse mid orangey brown sand, slightly mottled with darker orange silty sand and with moderate medium sub-angular stones.		
33	A	Cut	1	E-W Ditch - MIA	Sharp concave sides and near flat base, with slight concave deepening on north side.		
34	A	Fill	1	E-W Ditch - MIA	Fine grained moderately soft mid greyish brown silty sand with occasional vertical orange staining (rooting).		
35	A	Fill	1	E-W Ditch - MIA	Light grey fine grained medium silty sand with occasional medium and small sub-angular stones and occasional vertical orange staining (rooting)		
36	A	Cut	1	E-W Ditch - MIA	Sharp concave sides and near flat base, with slight concave deepening on north side.		
37	A	Fill	3	Post-Med E-W Quarry	Fill of [38]. Strongly cemented mid greyish brown clayey silt with occasional small rounded stones and moderate iron panning with rare off-white clay lumps		
38	A	Cut	3	Post-Med E-W Quarry	Straight near vertical sides to flat base. Rectilinear in plan. Width 0.95m, Depth 0.4m		
39	A	Fill	4	Post-Med E-W Quarry	Firm light greyish brown fine grained medium sand		
40	A	Fill	4	Post-Med E-W Quarry	Slumping natural sandy gravel		
41	A	Cut	4	Post-Med E-W Quarry			

Context No.	Trench	Category	Feature	Basic Feature Description	Context Description	Above	Below
42	A	Layer		Neolithic - Bronze Age buried soil and reed marsh	Soft mid greyish brown peaty reed silt. 20cm max thickness	[43]	[5]
43	A	Layer		Neolithic - Bronze Age buried soil and reed marsh	Soft mid to light grey sandy reed silt with rare small sub-angular stones. Basal deposit overlying natural gravel. 50cm max thickness	Nat	[42]
44	A	Layer		BA-IA washed sands	Soft and loose fine yellow silty sand	[1]	[16]
45	A	Layer		Roman alluvium	Firm dark grey silty clay alluvium	[2], [4], [15], [16]	[53]
46	A	Layer		BA-IA buried soil	Mid yellow coarse and loose gravelly sand within [9]		[15]
47	A	Layer		BA-IA washed sands	Indurated mid to dark orange sandy gravel	[11], [12], [44]	[17]
48	A	Layer		Neolithic - Bronze Age buried soil and reed marsh	Friable dark grey sandy silt	Nat, [13]	[10], [17]
49	A	Layer		BA-IA channel/ wetland deposits	Firm light yellowish grey silty clay band	[50]	[2]
50	A	Layer		BA-IA channel/ wetland deposits	Firm dark grey peaty reed silt	[1], [51]	[2], [49]
51	A	Layer		BA-IA channel/ wetland deposits	Mixed band of light blueish grey gravelly silt and dark greyish brown peaty silt. Blended amalgamation of [1] and [12]	[5], [52]	[50]
52	A	Layer		BA-IA washed sands	Light orangey yellow loose pebbly coarse sand	[5]	[51]
53	A	Layer		Medieval alluvium	Very firm Mid yellowish brown silty clay alluvium. Post-Roman.	[15], [45]	[55]
54	A	Layer		Post-Med subsoil	Mid to light brown clayey silt subsoil		
55	A	Layer		Med to post-Med alluvium	Mid to light grey silty clay alluvium. Medieval?	[53]	[54]
56	E	Layer			Spoil heap		
57	A/D	Layer		Post-Med E-W Quarry	Quarrying in section of Trench D		
58	A	Layer		BA-IA washed sands	Change in buried soil [4] - possibly a later truncation or wash phase that has removed [4]. Dark grey friable and moderately loose gravelly silty sand.	F.1 [22]	

Context No.	Trench	Category	Feature	Basic Feature Description	Context Description	Above	Below
59	A	Layer			Post-Medieval made-ground in north of Trench A. Possibly quarry debris or trackway. Mixed mid yellow and orange gravel, sand and silty clay.	F.4	
100	B	Layer		Medieval alluvium	Very firm Mid yellowish brown silty clay alluvium. Post-Roman.	[101], [102]. [119]	[118]
101	B	Layer		BA-IA buried soil	Compact and friable mid orangey brown silty sand with occasional small rounded stones. Possible slumping B horizon. Also slumping into quarry F.2.		[100], [119], [120]
102	B	Layer		Roman alluvium	Firm dark grey silty clay alluvium	[103], [105], [119]	[100]
103	B	Layer		Iron Age peat	Deflated peat - thinning out on up-slope boundary and desiccated overall.	[104], [105]	[102]
104	B	Layer			Prob lower boundary of [103] with clearer lumps of desiccated wood and peat.	[105]	[103]
105	B	Layer		BA-IA washed sands	A water-borne wash deposit. Mid to light brownish grey fine grained friable medium sand with occasional small sub-angular stones and rare desiccated wood lumps.	[119]	[102], [103], [104]
106	B	Fill	5	Post-Med E-W Quarry	Fill of [108]. Moderately compact and friable light greyish brown gravelly silt with fair small rounded and sub-angular stones		
107	B	Fill	5	Post-Med E-W Quarry	Fill of [108]. Moderately compact light yellowish brown gravelly silt with occasional small sub-angular stones		
108	B	Cut	5	Post-Med E-W Quarry	Flat based quarry with probable straight sides, partially infilled with [106] and [107], partially slumping into F.2. Width 2.6m, Depth 0.4m		
109	B	Fill	2 & 5	Post-Med E-W Quarry	Fill of [112]. Moderately compact mid to dark greyish brown clayey silt with occasional small sub-angular stones. Main fill of hollow over F.2 and F.5		
110	B	Fill	2	Post-Med E-W Quarry	Fill of [112]. Moderately compact and friable light greyish brown sandy silt with rare small sub-angular stones		
111	B	Fill	2	Post-Med E-W Quarry	Fill of [112]. Similar to [109]		

Context No.	Trench	Category	Feature	Basic Feature Description	Context Description	Above	Below
112	B	Cut	2	Post-Med E-W Quarry	Fill of [112]. Flat based quarry with probable straight sides, partially infilled with [110] and [111] before slumping of sides into open hollow. Width 3.3m, depth 1m		
113	B	Fill	7	Post-Med E-W Quarry	Fill of [114]. Moderately compact mid to dark greyish brown clayey silt with occasional small sub-angular stones.		
114	B	Cut	7	Post-Med E-W Quarry	Unexcavated quarry. Width 2m		
115	B	Fill	6	Post-Med E-W Quarry	Fill of [117]. Firm dark greyish brown silty clay with occasional rounded and angular stones		
116	B	Fill	6	Post-Med E-W Quarry	Fill of [117]. Mixed orange sand and dark brown clayey silt with mid grey clay		
117	B	Cut	6	Post-Med E-W Quarry	Straight near vertical sides to flat base. Rectilinear in plan. Width 1.6m, Depth 0.8m		
118	B	Layer		Medieval alluvium	Firm mid to light grey silty clay alluvium	[100]	[120]
119	B	Layer		BA-IA buried soil	Compact mid greyish brown sandy silt with moderate small sub-angular stones. Possible slumped A horizon	[101]	[100], [102], [105]
120	B	Layer			Mid to light brown clayey silt subsoil	[118]	Topsoil
121	B	Fill	2	Post-Med E-W Quarry			
122	B	Fill	2	Post-Med E-W Quarry	Mixed loose mid orange sandy gravel and moderately compact light yellowish brown gravelly silt with rare small sub-angular stones		
200	C	Layer		Rodden	Channel layer. Firm dark grey silty clay alluvium	[201]	Topsoil
201	C	Layer		Rodden	Channel layer. Firm mid yellowish brown/orange silty (sand) clay with bands of small freshwater shells spread across the whole deposit. Finds of cow/sheep bone.	[202]	[200]
202	C	Layer		Rodden	Channel layer. Mottled stiff silty clay with occasional mid grey/orangey red friable silty sand pockets.	[203] [206] [208]	[201]
203	C	Layer		Rodden	Channel layer. Soft light silvery grey bands of silty clay	[204]	[202]
204	C	Layer		Rodden	Channel layer. Mottled stiff silty clay with occasional mid grey/orangey red friable silty sand pockets.	[205]	[203]
205	C	Layer		Rodden	Channel layer. Soft light silvery grey bands of silty clay	[210]	[204]
206	C	Layer		Rodden	Channel layer.	[207]	[202]

Context No.	Trench	Category	Feature	Basic Feature Description	Context Description	Above	Below
207	C	Layer		Rodden	Channel layer. Soft and saturated mid dark grey organic clay with slight wood, reed and shell. Slight greenish mottling in patches.		[202] [206]
208	C	Layer			Reed Bog. Mottled stiff and soft dark grey and dark orangey brown silty clay with moderate charcoal flecks.	[209]	[201]
209	C	Layer			Reed Bog. Mottled soft mid grey/dark orangey brown silty clay with rare charcoal flecks. Slightly organic layer with woody peat patches		[208]
210	C	Layer			Alluvium. Mottled stiff silty clay with occasional mid grey/orangey red friable silty sand pockets. Mixed with [211] - poor basal boundary.	[211]	[205]
211	C	Layer			Alluvium. Very similar to [208] but more peaty/organic mud and includes mussel shells.		[210]
212	C	Layer			Reed Bog. Firm and very fibrous dark greyish brown peaty mud with fine laminated silt with reed and weed rooting. Small freshwater molusca.		[210]/[211]



## Lithology and Stratigraphy of Sediments - Bulwark Borehole Survey - Steve Boreham

This study focuses on the lithology and stratigraphy of sediments obtained from a series of ten boreholes (BH1-10) sunk by hand auger across the site of Earith Bulwark, Cambridgeshire. The boreholes were arranged in two transects (see Figure 10). Transect T1 (BH1-5) was aligned N-S across the western part of the earthwork traversing two ditches (BH2 & BH4). Transect T2 (BH6-10) was aligned W-E across the central part of the earthwork. Boreholes BH6 & BH9 were located in major ditches, and BH10 was positioned on lower ground to the east of the main earthwork. The borehole descriptions appear in the Appendix and are illustrated in Figures 12-14.

In general the stratigraphy of most boreholes comprised clayey topsoil overlying thin (up to c. 40cm) silty clay alluvium, and a unit of silty sand or sandy silt (up to c. 80cm) resting on sand and gravel. Notable exceptions to this pattern were observed in BH6 where gravel was encountered just below the topsoil (see Figure 11) and at BH10 where a long sequence of organic river silts extended more than 5m below the surface.



Figure 10. Aerial photograph of Earith Bulwark, showing the location of boreholes BH1-10 arranged in two transects T1 (N-S BH1-5) & T2 (W-E BH6-10).





Figure 11. Field photograph of gravel obtained from BH6 at 25 – 50cm below the surface.

#### Transect T1 (BH1 – 5)

This c. 80m long borehole transect was aligned N-S across the western part of the earthwork. Figure 12 shows the location of boreholes relative to changes in topography (ditches and banks). The stratigraphy of topsoil overlying silty clay alluvium upon sandy silt/silty sand to gravel was common to all the boreholes. Contrary to initial expectations, the ditches did not contain well-developed fill-sequences, and in fact boreholes BH2 & BH4 produced thinner sequences than elsewhere. Only BH2 produced clear evidence of human activity with a layer of silty clay with pea grit and brick fragments at 80-90cm depth.

#### Transect T2 (BH6 - 10)

This c. 180m long borehole transect was aligned W-E across the central part of the earthwork. Figures 13 & 14 show the location of boreholes relative to changes in topography (ditches and banks). The lack of sediments in the western ditch was evident in BH6 where gravel was encountered at 25cm below the surface. In the centre of the earthwork BH7 recorded a horizon of silt with pea grit and occasional rootlets at 70-90cm within the layer of sandy silt/silty sand. In contrast, BH8 exhibited no silty clay alluvium at all and BH9 in the eastern ditch showed the more common stratigraphy as described in Transect T1. Borehole BH10 located on lower ground to the east of the earthwork produced a fine sequence of organic river silt and marl overlying Amphill Clay bedrock extended down to 509cm below the surface.

It appears that Earith Bulwark was constructed on the surface of a low gravel terrace adjacent to a Holocene course of the River Great Ouse. There is remarkably

consistent stratigraphy across the site and the upper alluvial silty clay and topsoil may relate to the repeated flooding of the Ouse Wash over the past *c.* 350 years. It may be that BH8 represents a high point where these flood waters seldom reached. The relative absence of sediment in the ditches suggests that they were not necessarily intended to hold water or to act as a defensive moat. Presumably a palisade along the embankments provided the defensive advantage. Evidence of human activity was sparse in the sediments apart from an interesting fill with brick fragments in the northern ditch (BH2). The long sequence of river silt from BH10 certainly suggests a rapid drop-off and sharp edge to the gravel terrace. Although the Old Bedford River (1630-1936), which confined the River Great Ouse, was constructed about a decade before Earith Bulwark (*c.* 1643) it was not until the New Bedford River (1650) created the Ouse Wash, that alluvium began to be deposited across the site. The upper alluvial silty clay from BH10 is presumably to some extent contemporaneous with this alluvium.

*Appendix – Lithology & Stratigraphy of boreholes from Earith Bulwark*

BH1	TL3921575084
0 – 30cm	Topsoil – grey brown silty clay with rootlets and occasional pea grit
30 – 40cm	Stiff grey brown silty clay with occasional rootlets
40 – 65cm	Orange grey mottled silty clay with occasional rootlets
65 – 89cm	Grey buff sandy silt with pea grit and occasional rootlets
89 – 135cm	Orange clayey sand with pea grit and gravel
135 – 145cm	Grey brown clayey coarse sand with pea grit
145cm	Borehole stopped on gravel and sand
BH2	TL392075069
0 – 30cm	Topsoil – grey brown silty clay with rootlets and occasional pea grit
30 – 46cm	Stiff grey brown silty clay with occasional rootlets
46 – 70cm	Orange grey silty sand with pea grit and occasional rootlets
70 – 80cm	Orange coarse sand with pea grit
80 – 90cm	Grey brown silty clay with pea grit and brick fragments
90 – 95cm	Orange coarse sand with pea grit
95cm	Borehole stopped on gravel and sand
BH3	TL3919975048
0 – 28cm	Topsoil – grey brown silty clay with rootlets and occasional pebbles
28 – 65cm	Stiff grey brown silty clay with occasional rootlets
65 – 80cm	Orange grey silty sand with pea grit
80 – 111cm	Buff orange silty sand with pea grit
111 – 150cm	Orange coarse sand with pea grit and gravel
150cm	Borehole stopped on gravel and sand
BH4	TL3918975029
0 – 15cm	Topsoil – grey brown silty clay with rootlets
15 – 35cm	Grey silty clay (alluvium) with occasional rootlets
35 – 48cm	Stiff orange grey brown mottled silty clay
48 – 60cm	Orange sandy clay with shell fragments and chalk fragments
60 – 75cm	Orange buff sand with pea grit
75cm	Borehole stopped on gravel and sand
BH5	TL3918075010

0 - 30cm	Topsoil - grey brown silty clay with rootlets and occasional pebbles
30 - 60cm	Stiff grey brown silty clay with occasional rootlets and a little sand
60 - 100cm	Orange brown silty sand with pea grit
100 - 130cm	Orange coarse sand with pea grit
130cm	Borehole stopped on gravel and sand
BH6	TL3923075010
0 - 20cm	Topsoil - grey brown silty clay with rootlets and occasional pea grit
20 - 25cm	Grey brown silty clay with rootlets and gravel
25 - 50cm	Buff coarse sand and gravel
50cm	Borehole stopped on gravel and sand
BH7	TL3926274997
0 - 30cm	Topsoil - grey brown silty clay with rootlets and occasional pea grit
30 - 55cm	Stiff grey brown silty clay with occasional rootlets
55 - 70cm	Orange grey mottled sandy silt
70 - 90cm	Grey brown mottled silt with pea grit and occasional rootlets
90 - 95cm	Orange brown silty sand with pea grit
95 - 125cm	Orange coarse sand with pea grit and gravel
125cm	Borehole stopped on gravel and sand
BH8	TL3929174982
0 - 20cm	Topsoil - grey brown silty clay with rootlets and occasional pea grit
20 - 80cm	Grey brown sandy silty clay with occasional rootlets and pea grit
80 - 125cm	Orange coarse sand with pea grit and gravel
125cm	Borehole stopped on gravel and sand
BH9	TL3931774972
0 - 20cm	Topsoil - grey brown silty clay with rootlets and occasional pea grit
20 - 42cm	Orange brown mottled silty clay with occasional rootlets and pea grit
42 - 65cm	Grey brown sandy silt with pea grit
65 - 79cm	Orange brown silty sand with gravel
79 - 105cm	Orange yellow coarse sand with pea grit and gravel
105cm	Borehole stopped on gravel and sand
BH10	TL3936874949
0 - 15cm	Topsoil - grey brown silty clay with rootlets and occasional pea grit
15 - 50cm	Grey brown silty clay with occasional rootlets and shells
50 - 120cm	Soft grey silty clay with occasional rootlets and shells
120 - 145cm	Black organic detrital mud
145 - 165cm	Grey brown silty organic mud
165 - 285cm	Blue grey organic silt with reeds and shells
285 - 300cm	Grey silt with shells
300 - 315cm	Dark grey organic mud with shells
315 - 334cm	Grey brown buff silty marl with shells
334 - 350cm	Blue grey organic silt with organic, charcoal and shells
350 - 388cm	Blue grey silt with rootlets, reed stems and charcoal
388 - 400cm	Brown grey organic silt with shells
400 - 442cm	Blue grey silt with wood fragments
442 - 450cm	Grey brown silt with shells
450 - 462cm	Light grey laminated silt
462 - 473cm	Light grey silt with wood fragments and pebbles
473 - 500cm	Blue grey silt with organic fragments
500 - 509cm	Blue grey silt with wood fragments
509 - 540cm	Very stiff light blue grey clay
540cm	Borehole stopped on very stiff clay (bedrock Amphill Clay)

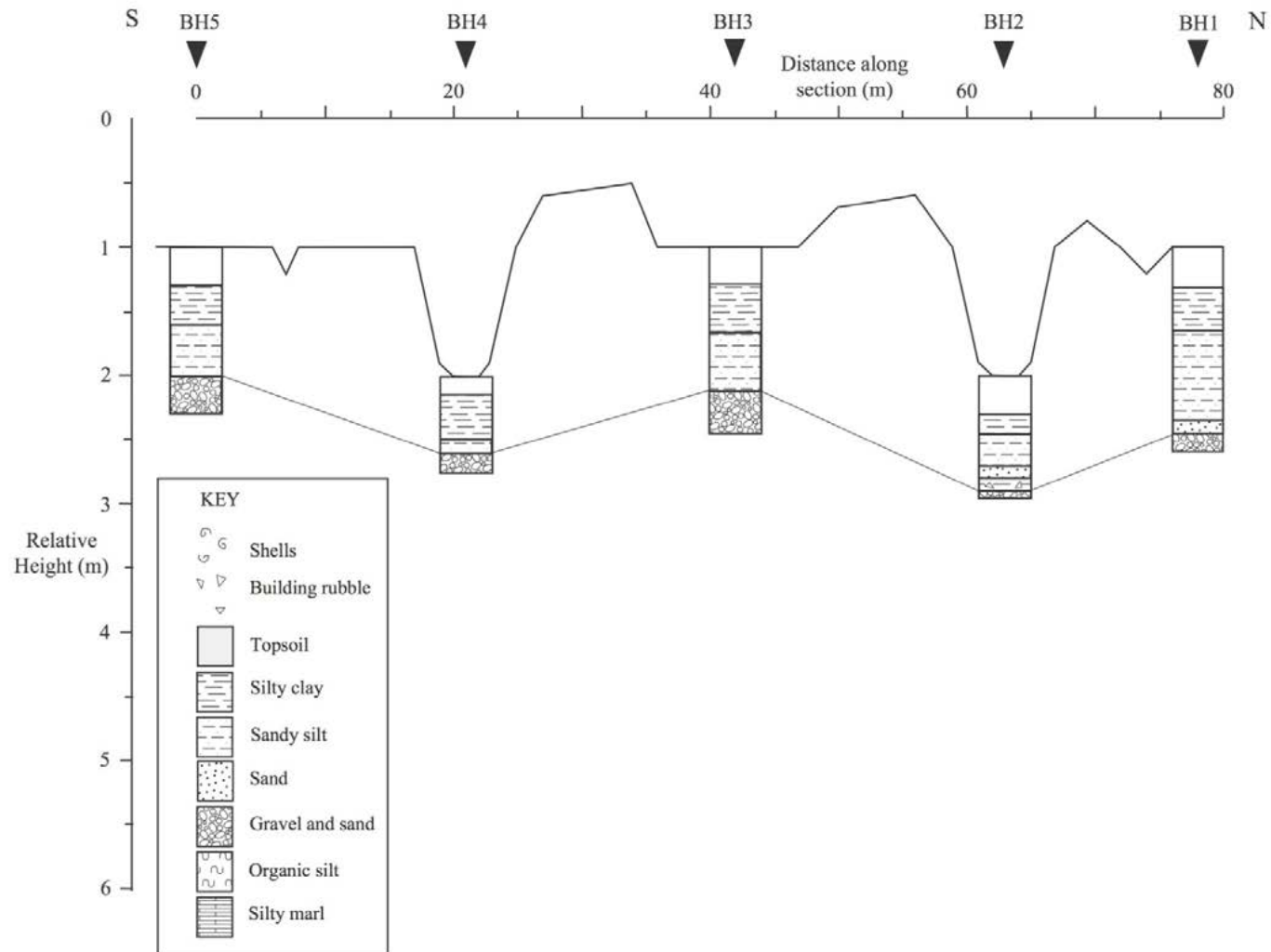


Figure 12. Borehole transect T1 showing the lithology and stratigraphy of sediments recovered in boreholes BH1 - 5

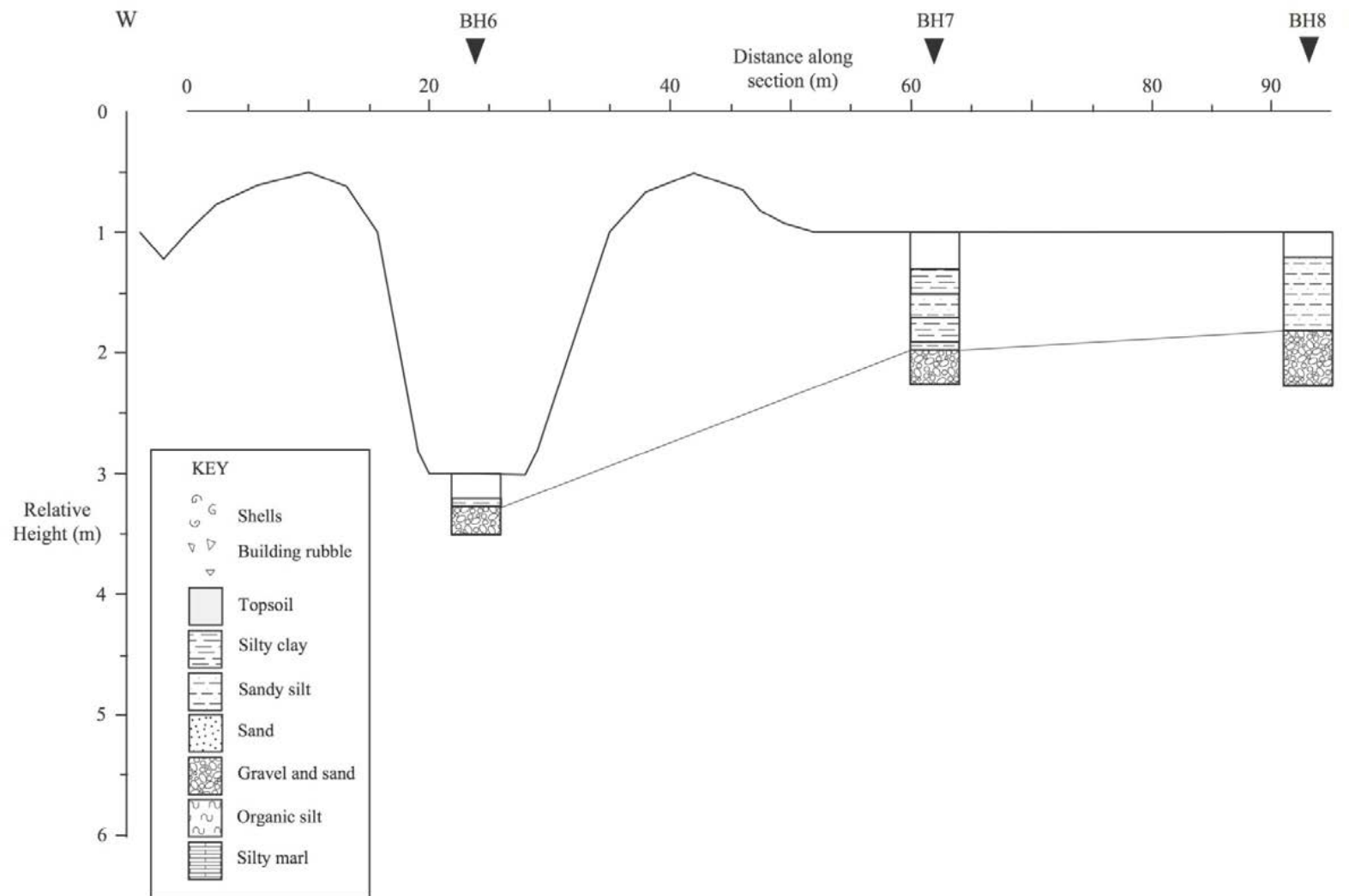


Figure 13. Borehole transect T2 (west) showing the lithology and stratigraphy of sediments recovered in boreholes BH6 - 8

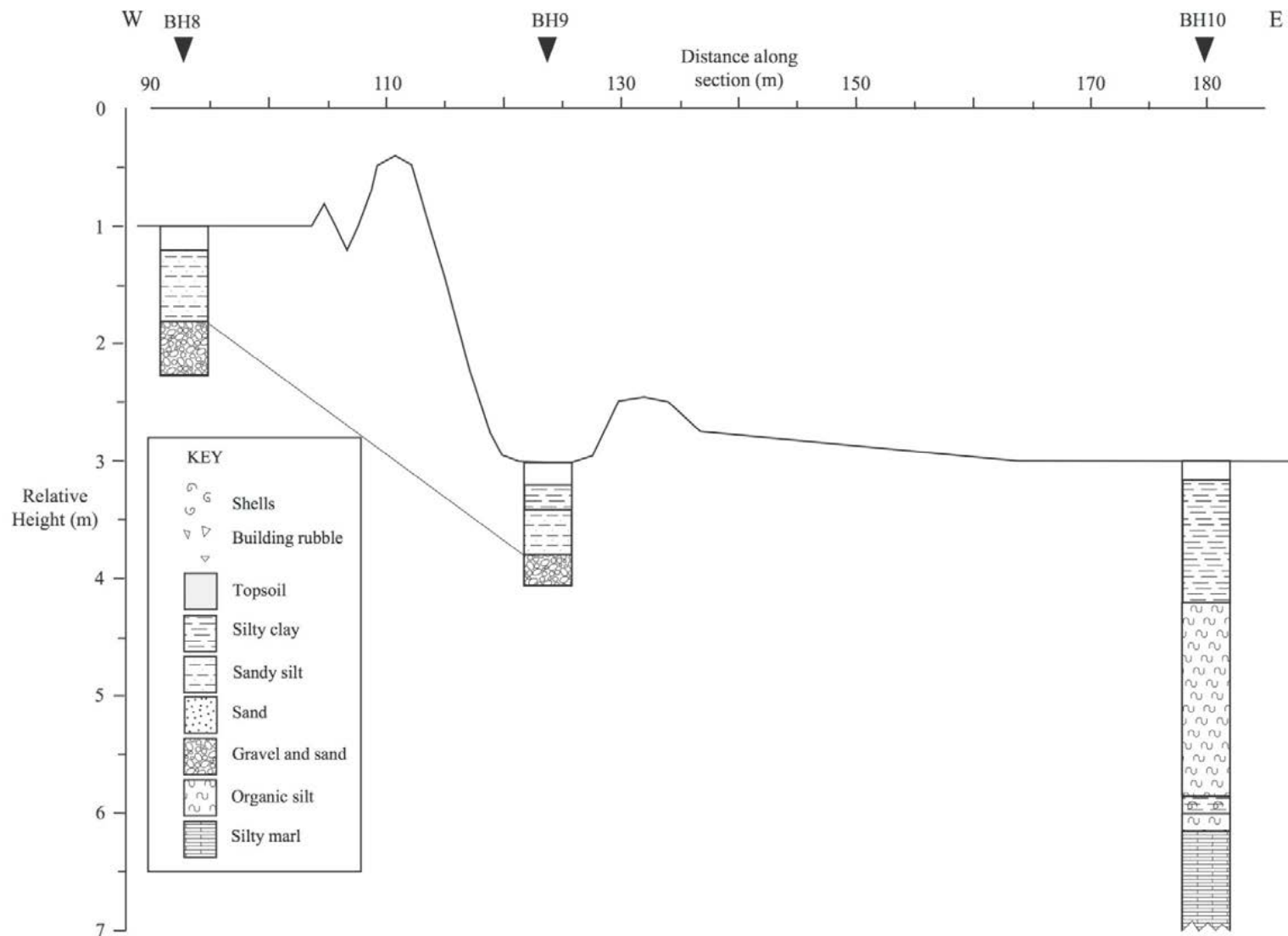


Figure 14. Borehole transect T2 (east) showing the lithology and stratigraphy of sediments recovered in boreholes BH8 - 10



## Geophysical Survey – Oxford Archaeotechnics

### Summary

A geophysical evaluation programme comprising magnetometer (gradiometer) survey was carried out at The Bulwark, an English Civil War fortification situated just east of the village of Earith, Cambridgeshire. Earith Bulwark is a Scheduled Monument (English Heritage List No: 1013282; centred on NGR 539255 275008).

Survey was conducted (under Licence from English Heritage) both within the interior of the earthworks (sconce) and in an adjacent field to the southwest. The edges of the projecting bastions were defined by subtle weak linears which may be indicative of former revetments. There was some magnetic evidence for pitting/hollows within the bastions, which may be associated with their use as artillery emplacements. A single ditch identified within the southeast part of the earthwork possibly represents part of an earlier enclosure.

Survey to the southwest, beyond the earthworks, revealed a substantial area (0.2ha) of structured highly magnetically susceptible deposits which appear to relate to what may be industrial activity, together with a second area containing a number of pits seemingly grouped together within, perhaps, organised orthogonal elements.

Both survey areas were littered with considerable amounts of ferrous material.

### Introduction

A geophysical evaluation programme comprising gradiometer survey was commissioned by Cambridge Archaeological Unit both within and in close proximity to The Bulwark, an English Civil War fortification and World War II gun emplacement 150m north of Earith Bridge, just east of the village of Earith, in Cambridgeshire, situated on the Hundred Foot Washes between the Old and New Bedford Rivers. The fieldwork was carried out in September 2014.

Earith Bulwark survives as a well preserved earthwork comprising an inner ‘sconce’ protected by outworks with lozenge-shaped artillery bastions at each of the four corners, with further perimeter earthworks to the west and south. The fortification was constructed to command the river crossing of the River Great Ouse at its confluence with the Old Bedford River, thereby controlling access to the Isle of Ely at the western end of the fen causeway. The Bulwark is a Scheduled Monument (English Heritage List No: 1013282; centred on NGR 539255 275008). Survey was conducted (under Licence from English Heritage) both within the interior of the monument (Area A) and also within an adjacent field c. 100m to the southwest, extending southwards as far as the scarp edge which seemingly represents the edge of a former river bank (Area B). The survey location is shown on Figure 15.

Both survey areas were rough pasture with some light scrub.

The geophysical work followed guidelines set out by both the English Heritage Ancient Monuments Laboratory and Institute of Field Archaeologists (David *et al.* 2008).



Survey control was established using a Geodimeter 600S EDM Total Station, and accurately tied in with the National Grid, using OS digital mapping. Following the English Heritage Ancient Monuments Laboratory 2008 guidelines, the geophysical grid is internally accurate to  $\pm 10\text{cm}$ , and the grid locatable on the OS 1:2500 map to the nearest metre.

Detailed gradiometer survey was carried out using a Bartington Instruments 601 dual array fluxgate gradiometer, sampling four readings per metre at one metre traverse intervals). This method was used to define the extent and geometry of any underlying cut features with potential archaeological significance. The survey grids were orientated within the existing field boundaries.

Anomalies are reported in nanotesla (nT), the standard unit of magnetic flux (expressed as the current density), which indicates positive and negative deviations from the Earth's normal geomagnetic field.

An explanation of the techniques used, and the rationale behind their selection, is included in an Appendix to the present report.

## Survey Results

An overview of results is shown on Figure 16.

### Area A (Figures 17, 19 & 20)

The magnetic response within the sconce was generally weak, with the majority of subtle anomalies in the +1-2 and sub-nanotesla range. A few stronger anomalies were also recorded.

Within the enclosure, the principal magnetic anomaly is an east-west ditch which was traced for a distance of some 30m within the southeastern angle; it is possible that this feature curves southward, where it is lost within the contours of the earthworks. The anomaly generated by this linear suggests a ditch up to 2m in width. It may possibly be associated with a pit which lies *c.* 10 m to the south.

Two further pits were identified within the earthworks: one at the junction of the northern projecting bastion, and the other west of the centre of the earthwork.

No magnetic evidence was found for internal structures, although the projecting bastions are bounded by extremely weak but precise linear negative anomalies which indicate well-defined boundaries, possibly former revetments.

There is a general impression of disturbed ground within the bastions on the north and west sides; the northernmost shows the greatest disturbance and is also associated with one of the larger pits noted above. The disturbance may be associated with their use as artillery platforms.

The interior is extensively littered with ferrous material, far more than would usually be anticipated in a pastoral context, which is probably associated with activity contemporary with the earthwork. There is also a substantial concentration of ferrous material in and around the area of the former pond on the south side of the earthwork. The significant anomaly close to the southeastern edge of the survey area has been generated by the steel dome of the World War II gun emplacement. It is conceivable that much of the larger ferrous debris recorded between this gun turret and the pond is of wartime origin.

### Area B (Figures 18 & 19)

This survey area is dominated by two substantial spreads of highly magnetically susceptible deposits which are clearly structured and contained within clear-cut boundaries, extending over an area of *c.* 0.2 ha. The westerly spread is roughly semi-circular in shape, covering an area measuring *c.* 40m x 40m, separated by a well-defined boundary (some 3m in width) from a second rectangular spread of similar deposits measuring not less than 50m (north-south) x 35m (east-west), which clearly extend

northwards beyond the survey area. This area has a curious appearance of cell-like, almost 'herringbone' patterning, with a distance of some 5 m between the 'rays'.

Nothing was observed on the ground surface to indicate the nature of the buried deposits which are responsible for generating these anomalies. However, the patterning is not dissimilar to spreads of industrial material likely to contain burnt or fired deposits.

To the west of these areas of high magnetic susceptibility lies a zone of extremely weak anomalies containing a number of what appear to be substantial pits or hollows, up to 5m in diameter. These are clustered close to the west side of the survey area and appear to define an area of activity defined within orthogonal elements covering an area some 30m x 40m, and extending westwards beyond the survey area.

Isolated pits were also identified within the northwest and extreme west sides of the survey area.

Within the southern part of the survey area, the scarp edge is seen as a broad amorphous area of positive and negative sinuous anomalies on a general east-west alignment

A considerable concentration of ferrous material was recorded, with some clustering towards the western edge of the survey area. Although ferrous material is also no doubt present within the two highly magnetic spreads, it is not possible to distinguish against the locally enhanced magnetic background.

Within the interior of the earthwork, the magnetic response was generally characterised by extremely subtle anomalies which, though weak, are well defined along the edges of the projecting bastions; they probably represent traces of former revetments. Magnetic disturbance and pits within the bastions may be associated with contemporary activity. There was no further magnetic evidence for internal structures associated with the earthworks. A linear identified within the southeast angle of the earthwork appears to be an earlier enclosure ditch.

The survey area southwest of The Bulwark produced a substantial and enigmatic spread of highly magnetic material which is tentatively interpreted as being industrial in origin. There is a slight possibility that there may be a second organised area of activity, much weaker in magnetic strength, to the west of this focus containing a clearly defined area of pits and hollows.

The substantial litter of ferrous material identified within the earthwork may be contemporary, although similar material in equal density was also identified within the adjacent field to the southwest.



Figure 15. Location of geophysical survey

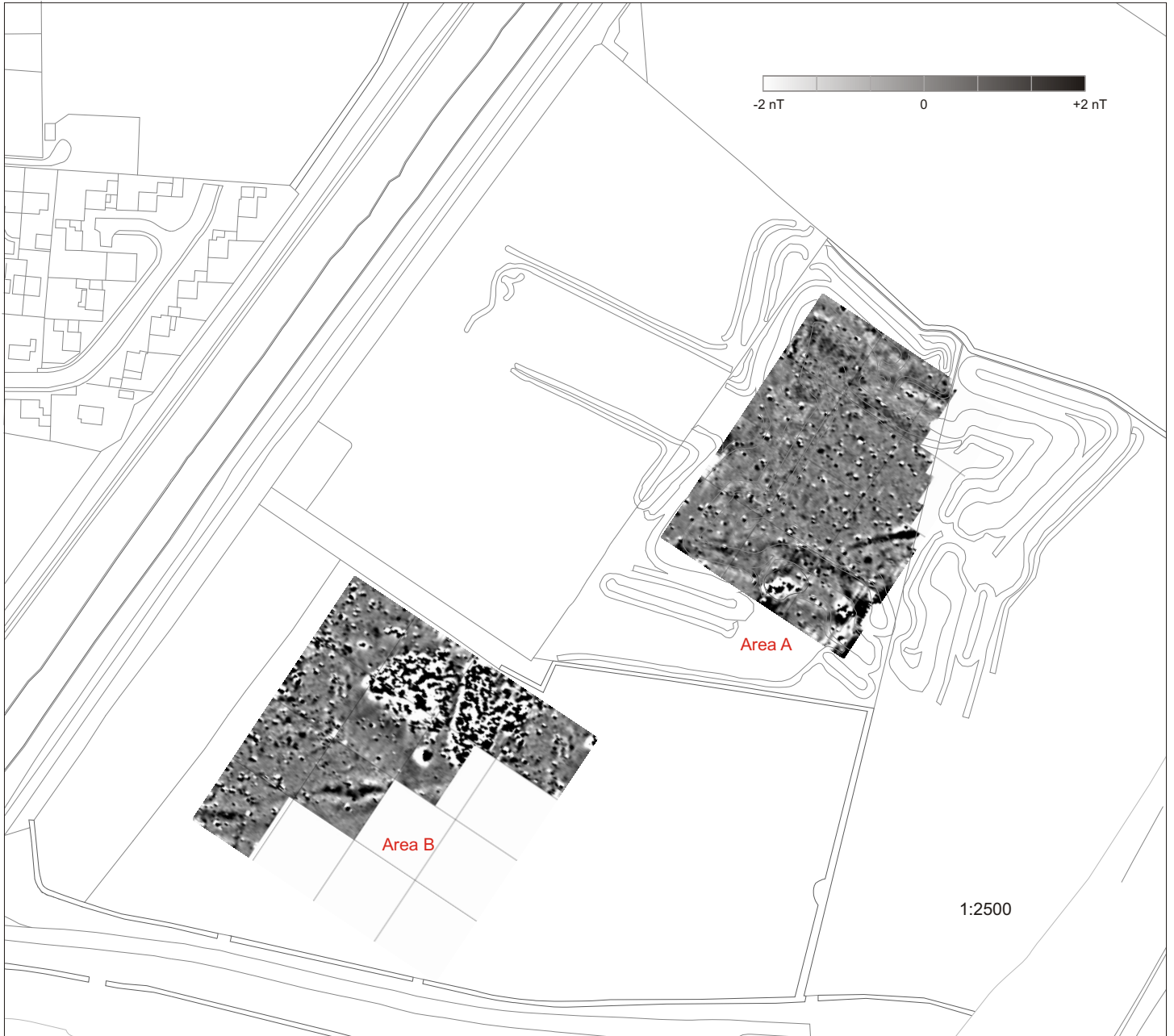
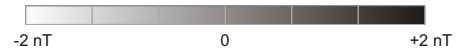
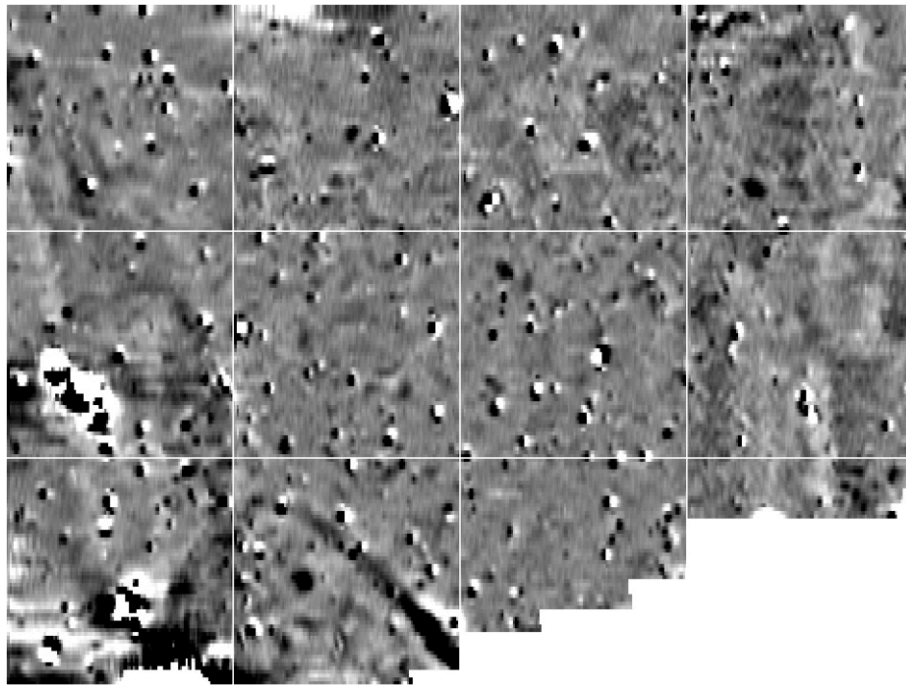
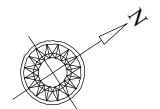
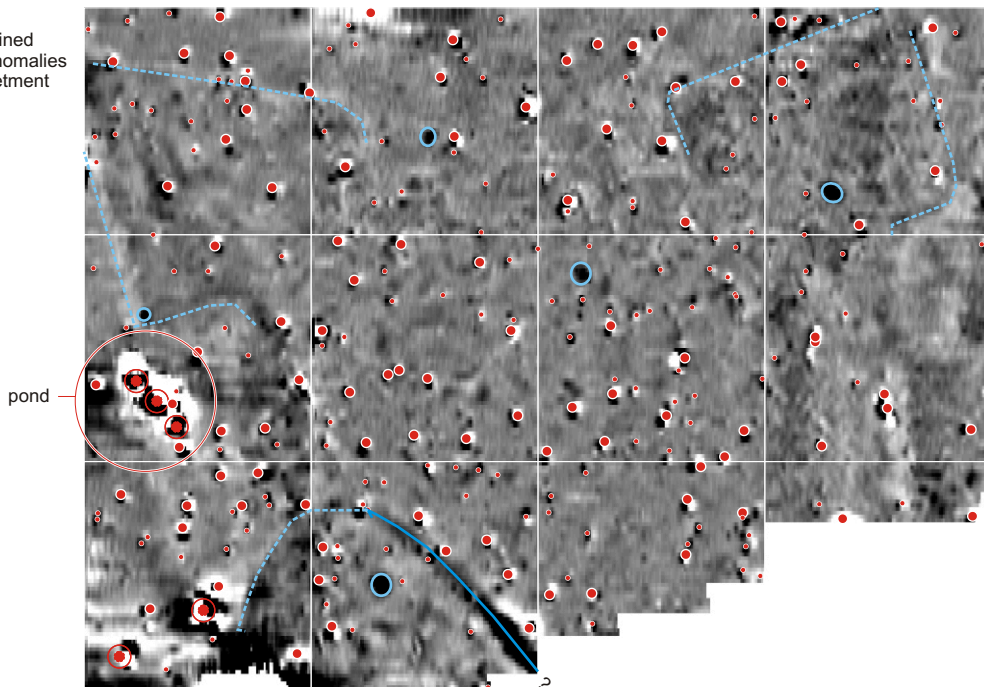


Figure 16. Geophysical survey results overview



weak but well defined  
negative linear anomalies  
may suggest revetment



1:1000

- Linear & curvilinear features
- - - - - Weak linear & curvilinear features
- Pits & pit-like features
- Substantial ferrous anomalies
- Ferrous anomalies

Figure 17. Geophysical survey interpretation - Area A



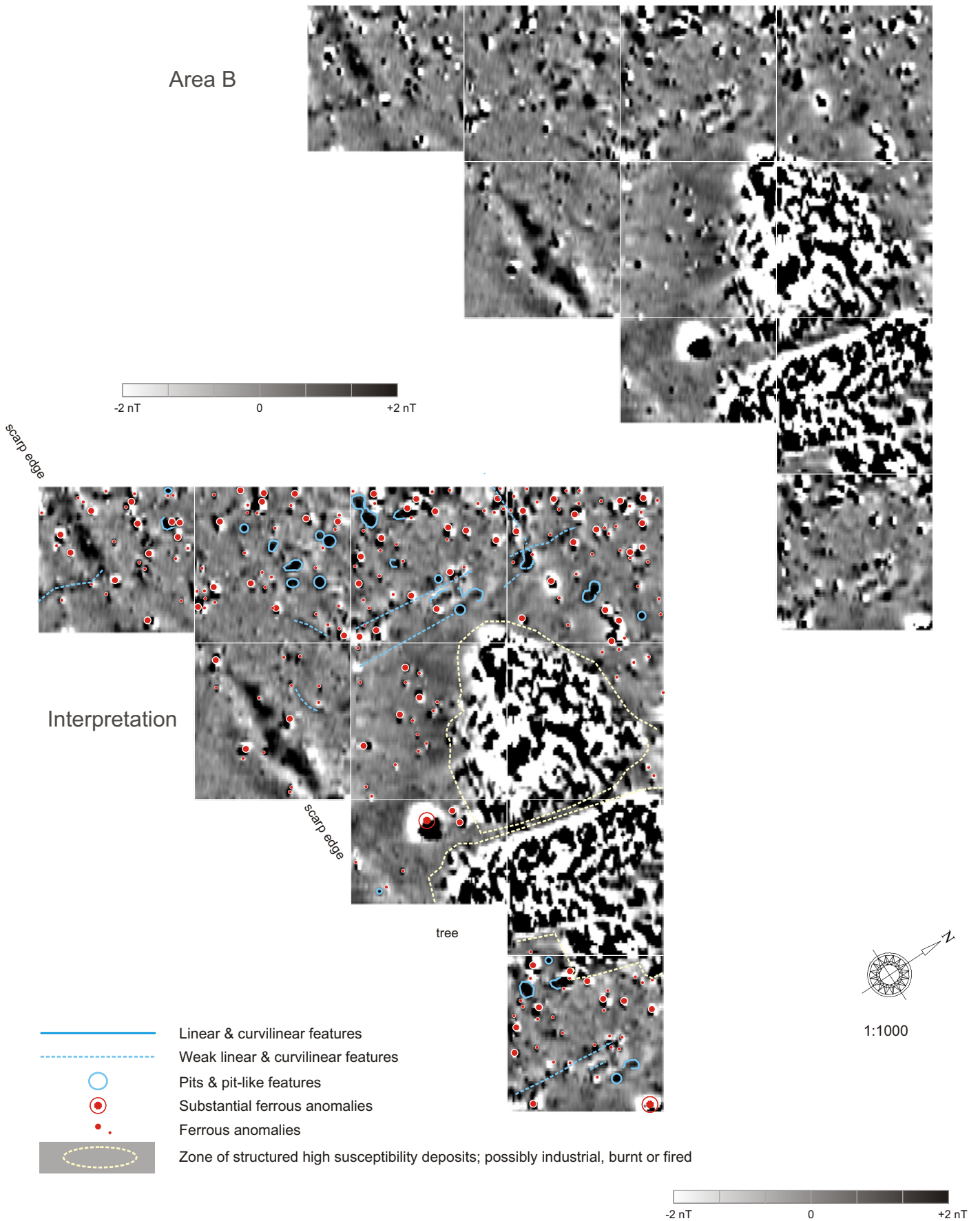


Figure 18. Geophysical survey interpretation - Area B

Stacked Trace Plots (Raw Data)

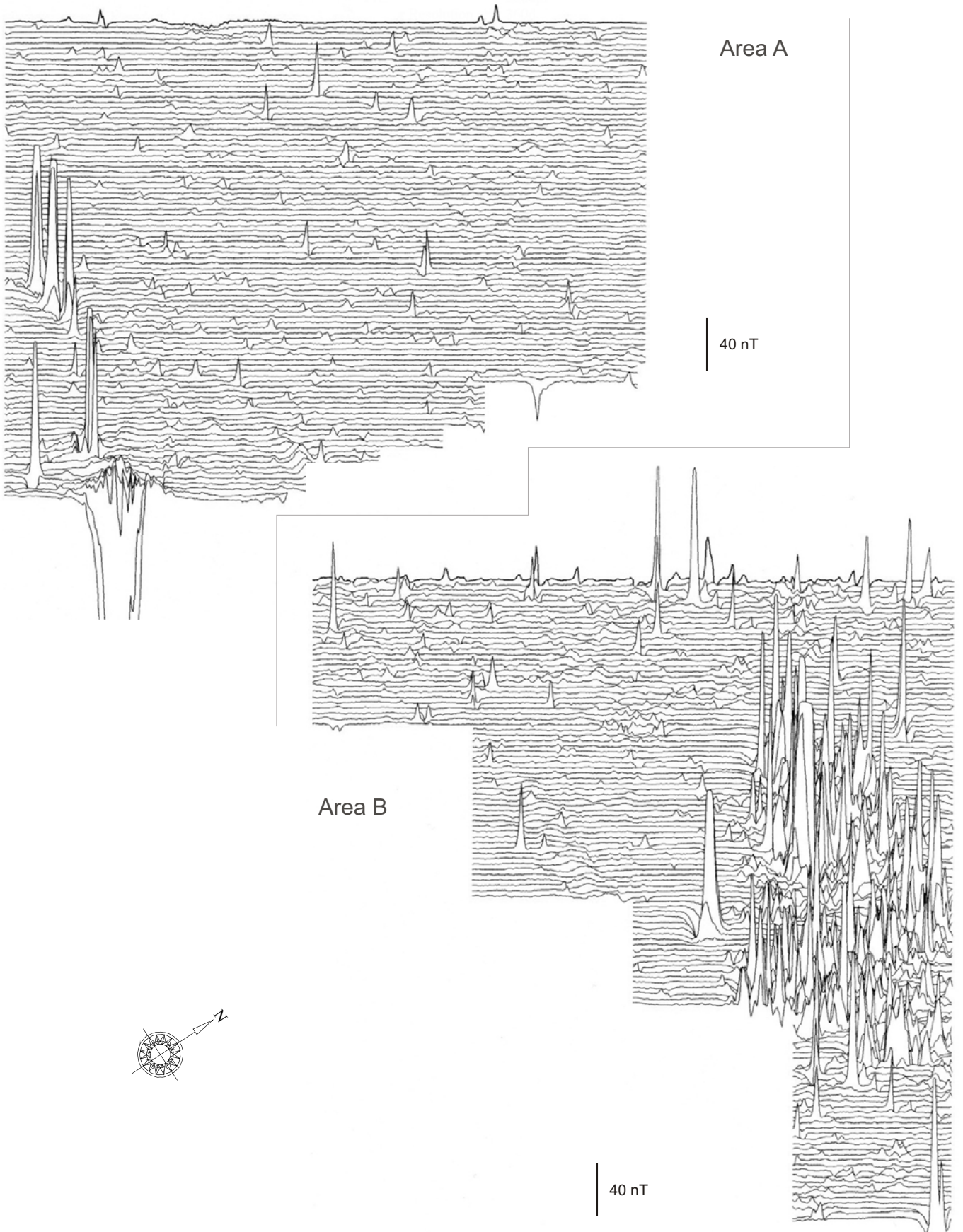


Figure 19. Geophysical survey trace plot data



Figure 20. Area A magnetic anomalies in respect of earthwork contours



## Oasis Form

OASIS ID: cambridg3-247033

### Project Summary

Project dates	10-08-2015 to 28-08-2015
Project reference codes	EBU15 - Sitecode ECB4701 - HER event no.
Type of project	Field evaluation
Site status	Scheduled Monument (SM)
Current Land use	Grassland Heathland 2 - Undisturbed Grassland
Methods & techniques	"Augering", "Geophysical Survey", "Targeted Trenches", "Topographic Survey"
Prompt	Research
Solid geology	OXFORD CLAY AND KELLAWAYS BEDS
Drift geology	GLACIAL SAND AND GRAVEL
Techniques	Magnetometry
Project location	England, Cambridgeshire, Huntingdonshire, Earith Bulwark
Postcode	PE28 3RH
Study area	350.2 Square metres
Site coordinates	TL3925575008 52.35501735585 0.044984060427 52 21 18 N 000 02 41 E
Height OD / Depth	Point Min: 1.9m Max: 4.23m

### Project creators

Name of Organisation	Cambridge Archaeological Unit
Project brief originator	Self (i.e. landowner, developer, etc.)
Project design/ manager	Christopher Evans
Project supervisor	Marcus Brittain
Sponsor/funding body	Heritage Lottery Fund

### Project archives

Archive recipient & ID	Cambridge Archaeological Unit (EBU15)
Physical Contents	"Ceramics", "Environmental", "Metal", "Worked stone/lithics", "other", "Animal Bones"
Digital Contents	"Animal Bones", "Ceramics", "Environmental", "Metal", "Stratigraphic", "Survey", "Worked stone/lithics", "other"
Digital Media available	"Geophysics", "Images raster/ digital photography", "Spreadsheets", "Survey", "Text"
Paper Contents	"Stratigraphic"
Paper Media available	"Context sheet", "Correspondence", "Map", "Notebook - Excavation', 'Research', 'General Notes", "Photograph", "Plan", "Report", "Section", "Survey "

### Project bibliography

Publication type	Unpublished 'Grey' literature
Title	Earith Bulwark Investigations
Author(s)/Editor(s)	Brittain, M
Other bibliographic details	Ouse Washland Archaeology Excavation Report no.1; CAU Report no.1331
Date	2016
Issuer or publisher	Cambridge Archaeological Unit
Description	57pp; 20 colour figures
Entered by	Marcus Brittain (mb654@cam.ac.uk) on 31 March 2016