THE OVER LOWLAND INVESTIGATIONS (IV)

Archaeological Evaluation in Hanson's Over / Needingworth Quarry

The 2012 Evaluation

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- The 2012 Evaluation -

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INTRODUCTION

This report outlines the results of an archaeological evaluation undertaken across a *c.* 83ha area located on the eastern side of the River Great Ouse at its junction with the fens at Earith/Haddenham (centred on TL 39900 73500). The investigation area constitutes the fourth mitigation phase of Hanson's Over/Needingworth Quarry and encompasses an area immediately to the east of the existing quarry, including the site of Willingham Mere; a former lake extending over some 37ha within the eastern half of proposed development zone (Figure 1). The work was carried out in September and October 2012.

The investigation revealed a buried landscape comprising a series of submerged gravel terraces around a shallow valley system, which probably drained to the east. Within this landscape, which pre-dates the formation of Willingham Mere proper, evidence of archaeological activity was largely confined to the gravel terraces. As a result, but also as a consequence of trench depth and a high watertable, trial trenching was concentrated in these higher zones, with investigations in the low-lying areas, up to this point, mainly comprising borehole survey (see Boreham, below).

Archaeological and Palaeoenvironmental Background

The current evaluation is part of a long-standing programme of archaeological investigations undertaken at Hanson's Over/Needingworth Quarry. The evaluation area corresponds to the planned Phase IV quarry extension immediately to the east of the existing quarry; an area intensively surveyed and excavated over the last five years (Evans *et al*. forthcoming).

Previous work at Over/Needingworth, as well as elsewhere in the Fens, has highlighted the integral link between the character, location and date of archaeological remains and the palaeo-environment, the investigation of which has always formed a major part of the CAU's investigations. In the area investigated to the west of the current evaluation – the *Over Narrows* – the prehistoric landscape is dominated by the River Great Ouse and numerous associated channels, which created a delta-like landscape of gravel 'islands' and terraces as well as a series of sand ridges that proved to have been a strong focus of prehistoric activity and occupation. The current evaluation area, however, being both lower lying and located further way from the river's influence appears to have been different. Here, the major influence on the prehistoric and historic landscape appears to have been a low-lying fen basin/mere, which in the Roman period became a significant lake known as Willingham Mere. Previous environmental investigations at the site of Willingham Mere (which occupies much of the eastern half of the evaluation area) by Waller (1994) and more recently by Boreham (Evans *et al.* 2011), have shown that prior to the formation of the mere in its final incarnation, the area was a low lying fen, characterised at various points by alder carr woodland and extensive reed beds during the Bronze Age/Iron Age and probably earlier. Identifying and characterising the mere/basin and its 'edges', and the relationship of any archaeological remains to it, has therefore, been a major objective of this investigation.

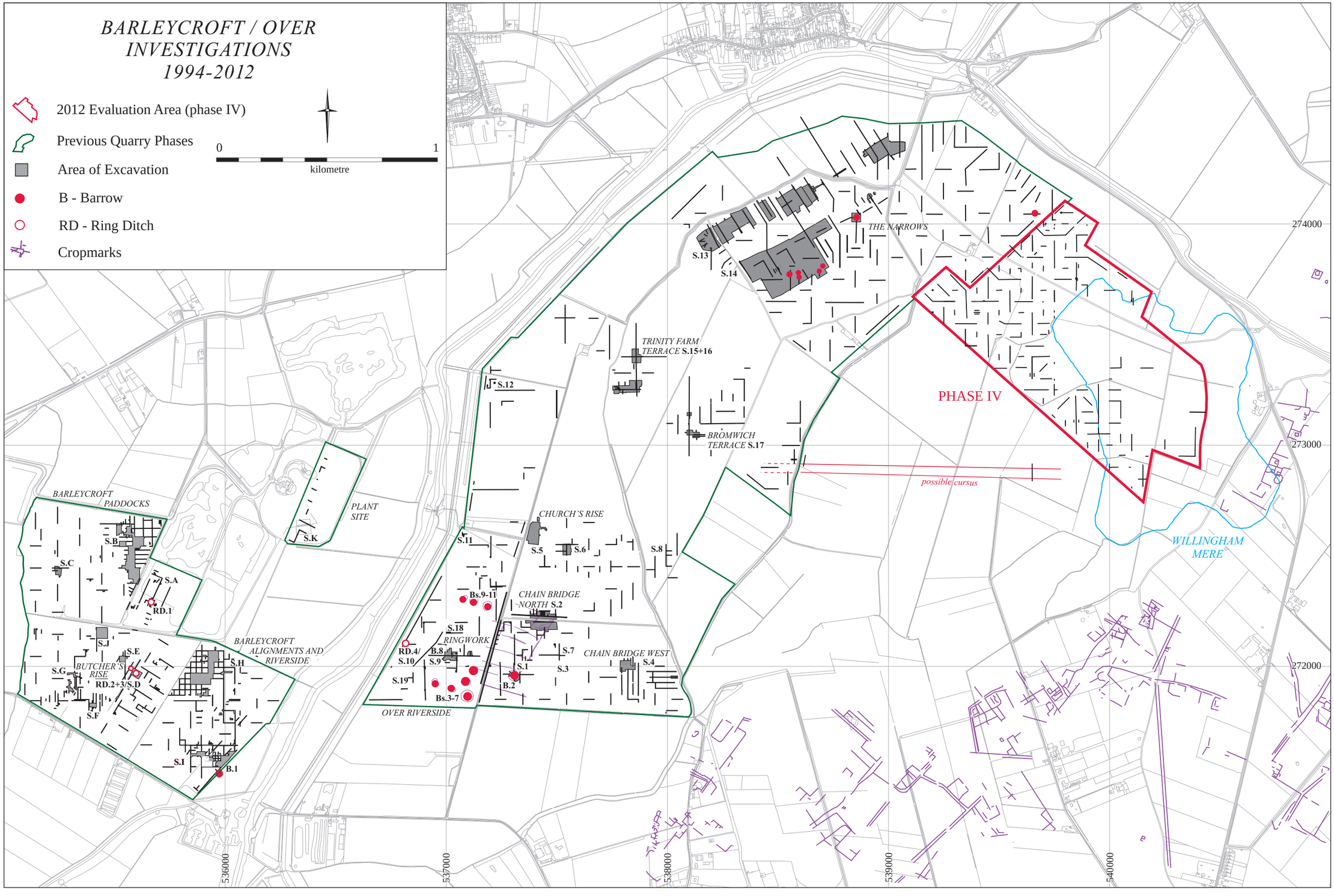


Figure 1. Location plan

In terms of recorded archaeological remains the Over/Needingworth landscape has proved to be a rich prehistoric landscape with archaeology dating from the early Mesolithic through to the Roman period recorded within the quarry. Indeed the archaeological remains recorded at the *Over Narrows* represent an almost continuous sequence between these periods. Excavation of the Godwin/Marlow Ridge, for example, recorded significant Mesolithic and Neolithic flint scatters, evidence of Early Bronze Age (Beaker and Collared Urn associated) occupation and later Bronze Age 'midden' deposits, as well as an Iron Age riverside ritual complex (Evans *et al.* forthcoming). To the south of the Godwin/Marlow Ridge, the O'Connell Ridge and Low Grounds' sites produced further evidence of Late Neolithic and Early Bronze Age occupation as well as Deverel Rimbury associated Middle Bronze Age settlement and fieldsystems, while a total of seven Early Bronze Age barrows have also been recorded in this area (*ibid.*). Of these (five round barrows and two pond barrows), one as yet unexcavated round barrow (Site III) is located less than 50m from the western boundary of the current evaluation area.

Little prior knowledge of the archaeological potential of the evaluation area itself exists although considerable documentary study of the history of Willingham Mere and the post-Medieval drainage of the area has been undertaken (Ravensdale 1974; Spufford 1974; Hinde 1977 and James in Evans *et al.* forthcoming). To the south and southeast of the evaluation area cropmarks on the slightly higher ground towards Willingham village itself are suggestive of extensive Roman and potentially earlier late prehistoric settlement and fieldsystems.

Methodology and Buried Soil Sampling

Following long-established evaluation methodologies used at Over/Needingworth Quarry, the current evaluation comprised a combination of archaeological trenching and geological survey. Regarding the latter, as with the previous 2007 evaluation (Vander Linden and Evans 2008) and resulting *Over Narrows* investigations, Dr. Steve Boreham (Dept. of Geography, University of Cambridge) was commissioned to undertake the survey. A sampling strategy was subsequently devised by Dr. Boreham focussing on the development of Willingham Mere and characterising the 'deep' areas of the evaluation area (see below).

Trial trenching also followed pre-established procedures used in previous evaluations. The original layout of the trial trenches was partially determined by quarry borehole data with areas of 'higher' ground and the 'edge' of Willingham Mere particularly targeted. Trenches were arranged on a 100m grid and the layout designed to provide a good general coverage of these areas as well as target specific landscape features – including those visible on LIDAR (see Figure 2) - and potential 'edges'. In the event, some flexibility and deviation from this original project design was required due to the (deeper than anticipated) trench depth, high watertable and resulting trench instability. Consequently, where trench depth exceeded 1.5m, trenches were generally abandoned for health and safety reasons (5x5m test stations used to evaluate deep areas in previous evaluations were also abandoned in favour of further borehole survey, for the same reason). In addition, the results of Dr. Boreham's borehole survey, received part way through the evaluation programme, also identified additional areas of archaeological potential (ie.'high' ground), which were trenched.

Figure 2. Lidar plot

As a result, a total of 143 trenches (7063m) were excavated and recorded (Figure 3, Appendix 1). Trenches were 2m wide and ranged from 2m to 150m in length and were excavated down to a clear archaeological horizon (where features became visible) or else to natural sands and gravels. Where a prehistoric buried soil was encountered, test points were sampled every 100m, as well as at the centre of every 100m square (a total of 87 test points). The buried soil sampling, once again followed well established procedures and comprised the hand sorting of 90 litre samples for finds retrieval. Where 'high' finds densities were encountered the sampling interval was reduced to 50m to allow better definition of high density zones.

Trial trenches were excavated using a tracked 360° excavator fitted with a toothless bucket and operating under direct archaeological supervision at all times. Trenches were located using an advanced Global Positioning System (GPS) with Ordnance Datum (OD) heights obtained. Potential archaeological features were planned at a scale of 1:50 and subsequently sample excavated with all archaeological finds retained. Environmental bulk samples were taken from selected features and deposits. A written record of archaeological features was created using the CAU recording system (a modification of the MoLAS system) and sections drawn at an appropriate scale.

PALAEOENVIRONMENTAL RESULTS

Lithology and Stratigraphy of Sediments (Steve Boreham)

In this study, four borehole transects (T3, T4, T5 & T6) and a range of 'checker' and 'additional' boreholes were investigated across the former site of Willingham Mere (Figure 4). Checker boreholes were sunk to corroborate the depth and stratigraphy of the boreholes sunk by Waller (1994). In general the stratigraphy of Waller's boreholes was proven, but the depth to basal gravel was not. For this reason, Waller's boreholes have not been used in this study. Additional boreholes were added between borehole transects when it became clear that the originally planned excavated boxes were not feasible due to exceptionally high water tables in autumn 2012.

In total 85 boreholes (see Appendix 2) were sunk at strategic locations to provide an in-depth understanding of the lithology and stratigraphy of the Holocene and earlier sediments in this area. Adding in the borehole transects (T1 & T2) from a previous survey (Boreham 2011) a total of 103 observations were available for constructing a 'deposit model' for the northern expanse of Willingham Mere. Survey boring was principally undertaken with a narrow gouge auger, although a Dutch auger and a Hiller corer were also used depending on the ground conditions encountered. All boreholes were stopped on sand and gravel.

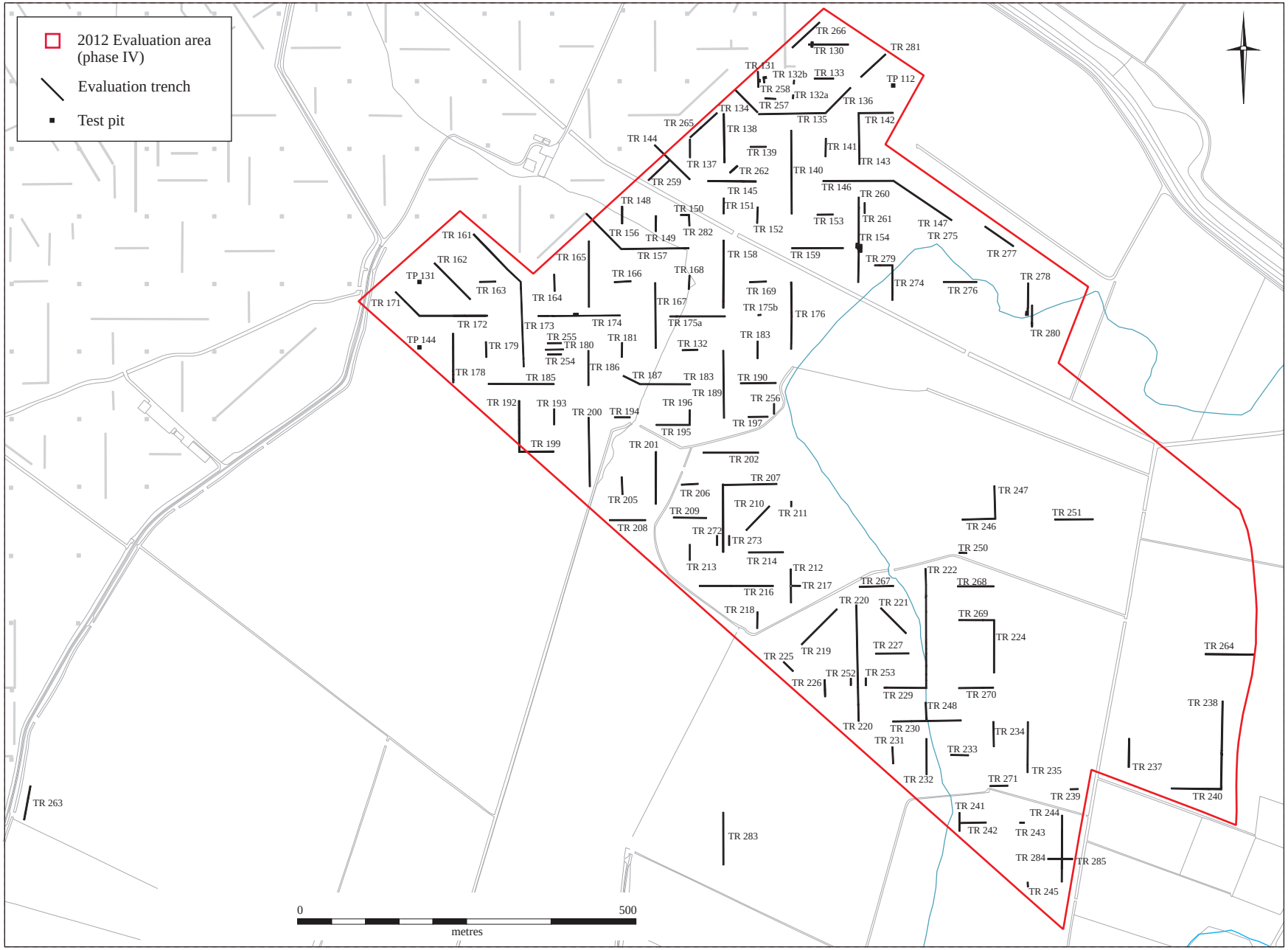


Figure 3. Plan of trenches and test pits

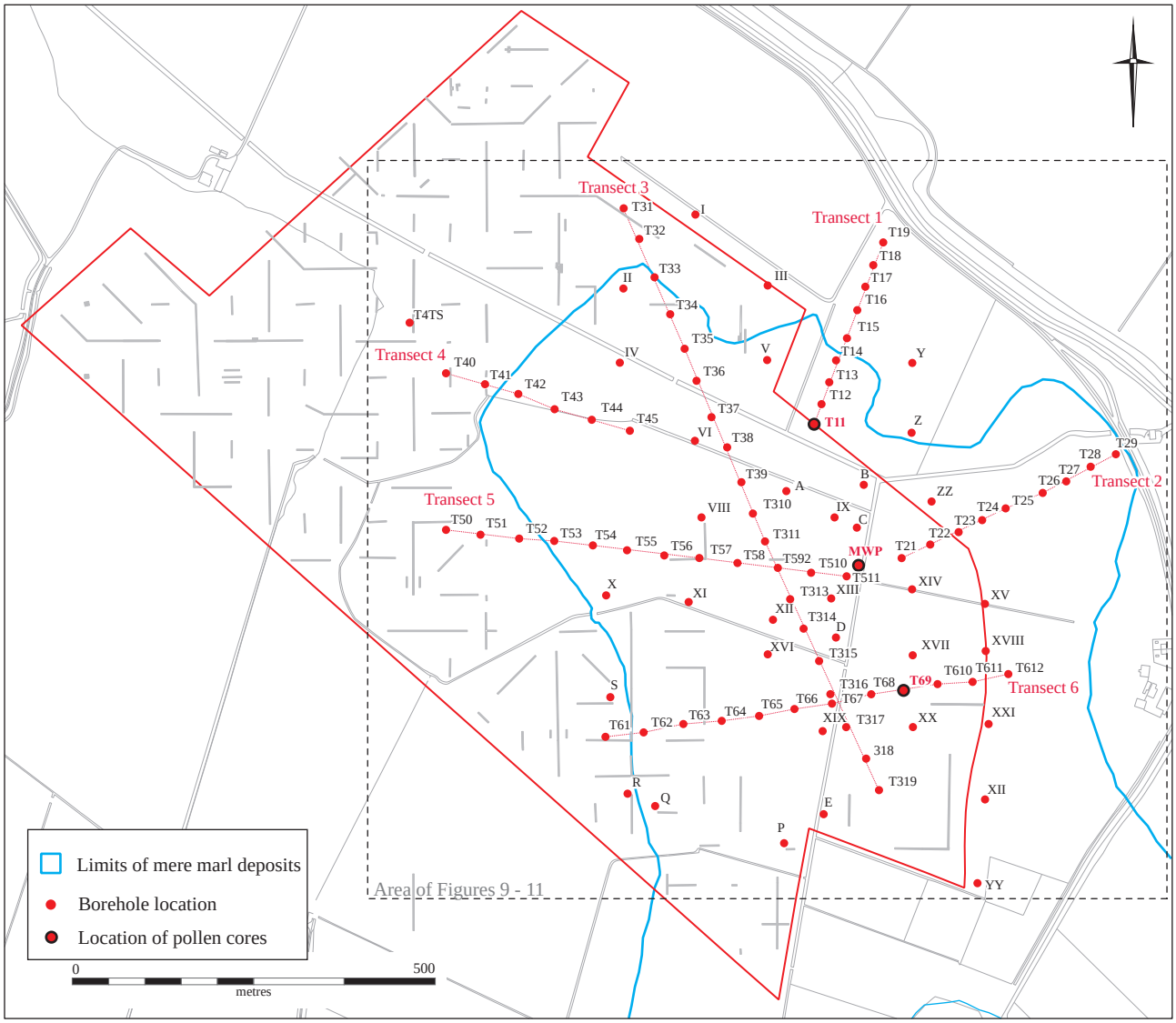


Figure 4. Location of borehole transects and BH9 transect 6 (T69), along with boreholes previously investigated for pollen

Lithology and Stratigraphy

Geological cross-sections along the borehole transects (T1-T6) are shown in Figures 5-8. Note that transect T3 was almost 1km in length and has been split into two (Figure 6). It is remarkable how consistent the lithology and stratigraphy of the deposits encountered were across relatively large distances. The boreholes everywhere ended on sand and gravel of river terrace deposits presumably belonging to the last Glacial period. In almost every borehole a basal sandy silt or silty sand was observed lying directly on the gravel surface. This unit was of somewhat variable thickness and lithology, sometimes containing abundant organic material. From radiocarbon dating (Boreham 2011) it is clear that the basal sandy silt unit is older than the Bronze Age, although it is not clear whether it has Mesolithic/Neolithic origins or is actually late Glacial.

Overlying the basal sandy silt unit is an internally complex suite of sediments including silts, organic silts, organic detritus muds and thin marl layers deposited through the Bronze Age and Iron Age. These sediments are usually interpreted as representing flooding or low-energy fluvial input (silts), reedbeds (organic silts), open-water eutrophic fen (detritus mud) and deeper open water lake conditions (marl). Occasionally within these sediments are localised lenses of coarser sandy material (see T4-BH3) interpreted as 'edges' or 'beaches' subjected to wave energy. These sandy partings could also be related to crevasse-splay flooding events or river channels, although this seems less likely. In general however, this package or 'stack' of sediments comprises a tripartite arrangement with a basal organic layer (often organic silt or detritus mud), a middle silt layer and an upper organic layer. In some parts of the lake basin the sediments appear to be dominated by organic material, but elsewhere there is clearly more river silt. For the sake of convenience this package of sediments is referred to here as the 'organic silt' unit.

Overlying the organic silt unit in most boreholes is a clearly defined unit of lake marl apparently dating from the early Roman period, that sometimes had an erosional base. Occasionally the lower part of the marl unit is finely laminated and contains a little organic or silty material. This unit is interpreted as representing an extensive area of carbonate-rich water more than 2m deep that formed the Medieval Willingham Mere. It is worth remembering that a broad fringe of reedbeds would be expected at the margins of such a lake, and that organic silt and detrital mud would be deposited contemporaneously with the lake marl. Thus, any calculation of the extent of Willingham Mere must take into account this marginal zone and understand that these organic sediments may have been grouped into the underlying organic silt unit (see T3-BH3), although they are in fact partly syndepositional with the lake marl.

Overlying the lake marl unit in many places is a unit of alluvial silty clay of presumably Medieval age. In some marginal locations the underlying marl is thin or absent and the upper silty clay is particularly well-developed. Towards the centre of the lake basin the upper silty clay is often thin or absent. Whilst it is clear that this silty clay unit, interpreted as a flood deposit, was largely laid down after the lake marl, there is a suspicion that the lower parts may be syndepositional with the later parts of the lake marl in some marginal locations. In all boreholes there was an upper 20-35cm of ploughsoil that always contained a large proportion of silt. Where the ploughsoil developed directly on the lake marl unit it appeared that it almost entirely

comprises decalcified marl. Elsewhere the presence of alluvial silty clay made the ploughsoil heavier and often darker in colour.

Description of Transects T1-T6

Transects T1 & T2 have been described in detail in a previous report (Boreham 2011). Transect T1 (Figure 5) offers a N-S cross-section through the northern margin of Willingham Mere. It is clear that the basal sandy silt and the organic silt unit extend across the entire area, but that the lake marl present to the south rapidly thins at T1-BH5[1] and is overlain by the upper alluvial silty clay presumably associated with flooding from the Old West River. Borehole 1 from this transect presented a good sequence and was used for pollen analysis and radiocarbon dating (Boreham 2011). Transect T2 (Figure 5) provides a W-E cross-section through the eastern margin of Willingham Mere. In this case the underlying gravel and sand rise sharply at T2-BH9 to form a rampart that contains the Holocene sediments. The basal sandy silts and the organic silt unit are truncated by this gravel rise, and there is clearly the development of a beach (T2-BH8/9) associated with the edge of the reedswamp and the later lake. The lake marl appears to be cut at T2-BH5 by a channel filled with alluvial silty clay.

Transect T3 (Figure 6) provides a NW-SE cross-section through the centre of Willingham Mere. The gravel surface rises towards the NW and the Holocene sediments thin somewhat in this area. The edge of the lake marl is clearly seen at T3-BH4 and the underlying sediments at this lake margin are dominated by organic detritus mud. Towards the centre of the lake (Figure 5) the thicknesses of basal sandy silt, organic silt and lake marl are all quite similar. It is interesting to note the presence of a thin lake marl lens within the organic silt unit (T3-BH15) indicating the presence of deeper open water in the basin prior to the formation of the Roman Willingham Mere.

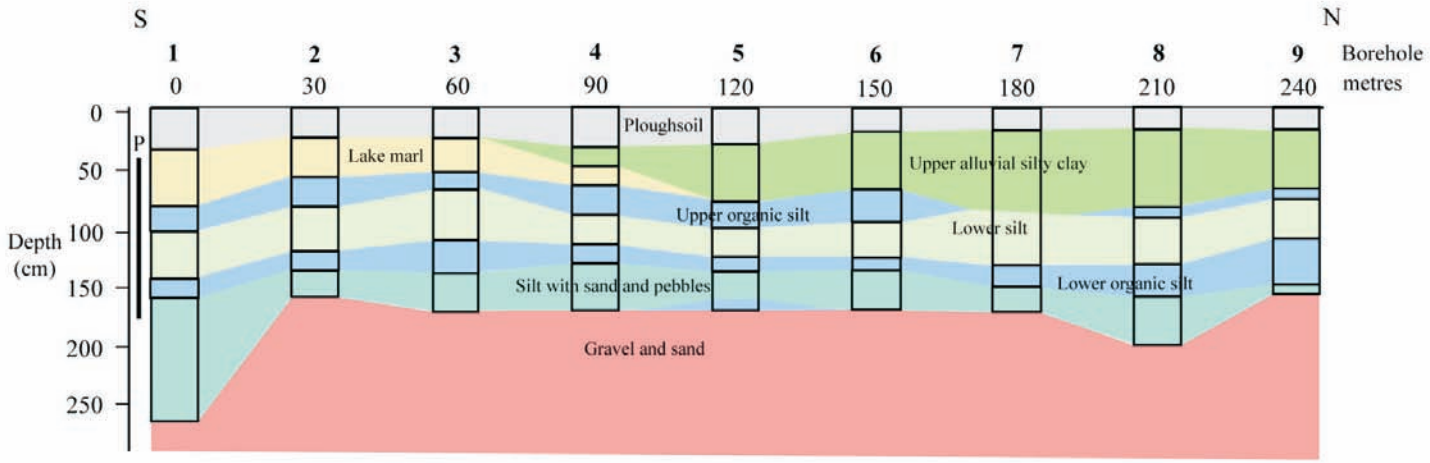
Transect T4 (Figure 7) provides a W-E cross-section through the western edge of Willingham Mere. The gravel surface rises towards the W and the Holocene sediments thin a little in this area. The edge of the lake marl is clearly seen at T4-TS. There is a curious sandy lens in the sediments at T4-BH3 that appears to have formed on a particularly thick sequence of silt. It is unclear whether this silt body represents a stream channel 'rodden' that formed an upstanding area, possibly a beach.

Transect T5 (Figure 7) provides a W-E cross-section through the western edge of Willingham Mere. In this location the edge of the lake marl was not detected, and the basal sandy silt and organic silt units appear to have a similar thickness throughout. It is possible that the body of silt present in T5-BH2 is a similar feature to that seen at T4-BH3.

Transect T6 (Figure 8) provides a W-E cross-section through the centre of Willingham Mere. In this location the western edge of the lake marl was not detected, although the gravel surface clearly rises to the E and the Holocene sediments thin in this area. The edge of the lake marl is clearly seen at T6-12. The upper alluvial silty clay unit appears to be particularly thick at T6-BH3, which may represent a channel entering the lake basin from the south.

[1]. Transect borehole numbers are preceded by the transect number, e.g. T-1 BH5 = T15, T2 on Figure 4.

Transect 1



Transect 2

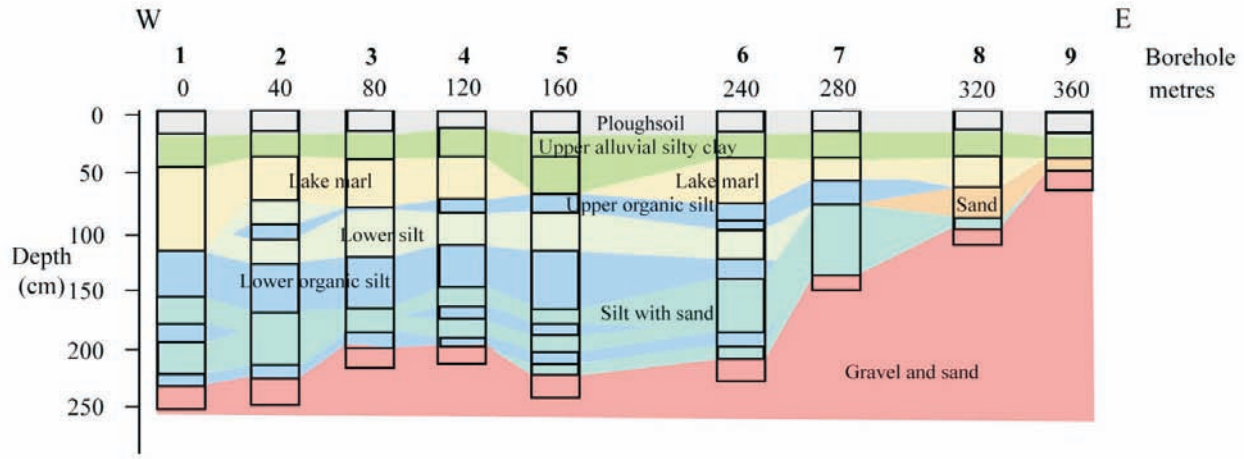
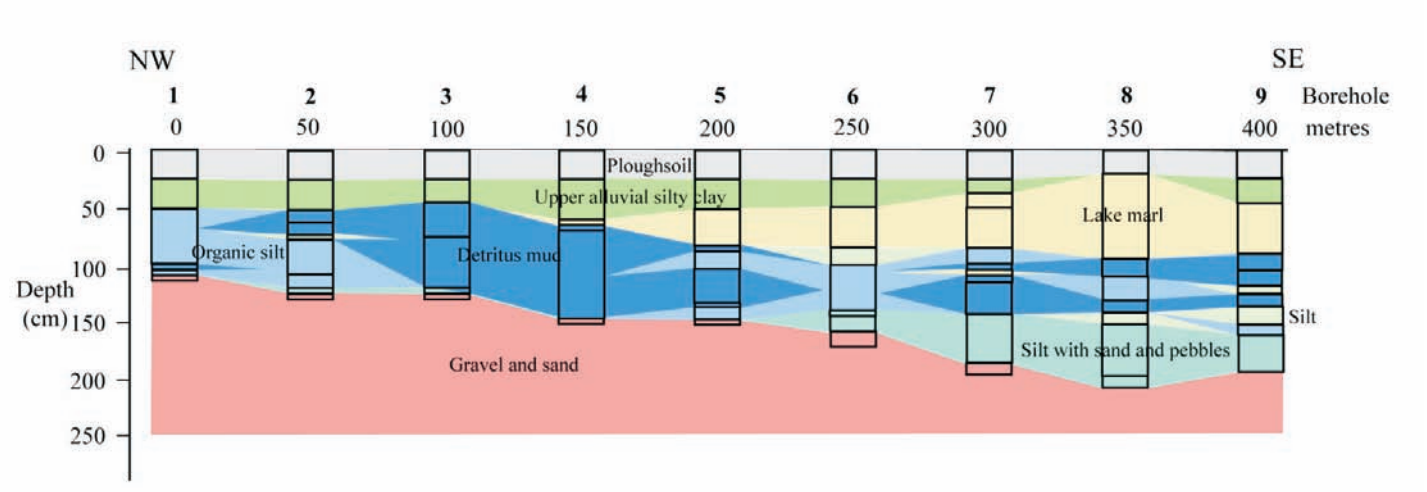


Figure 5. Willingham Mere transects 1 and 2

Transect 3



Transect 3 continued

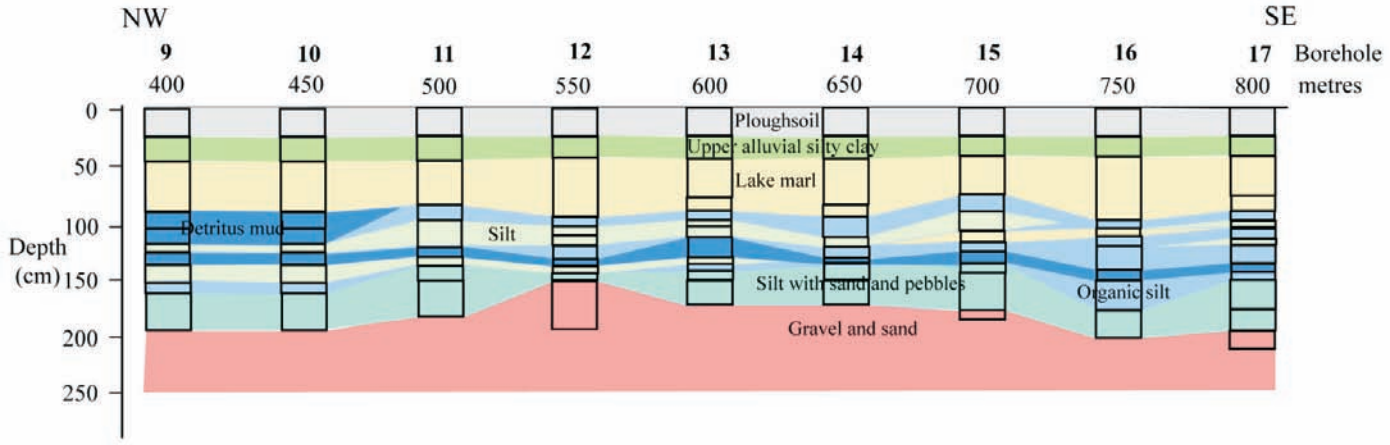
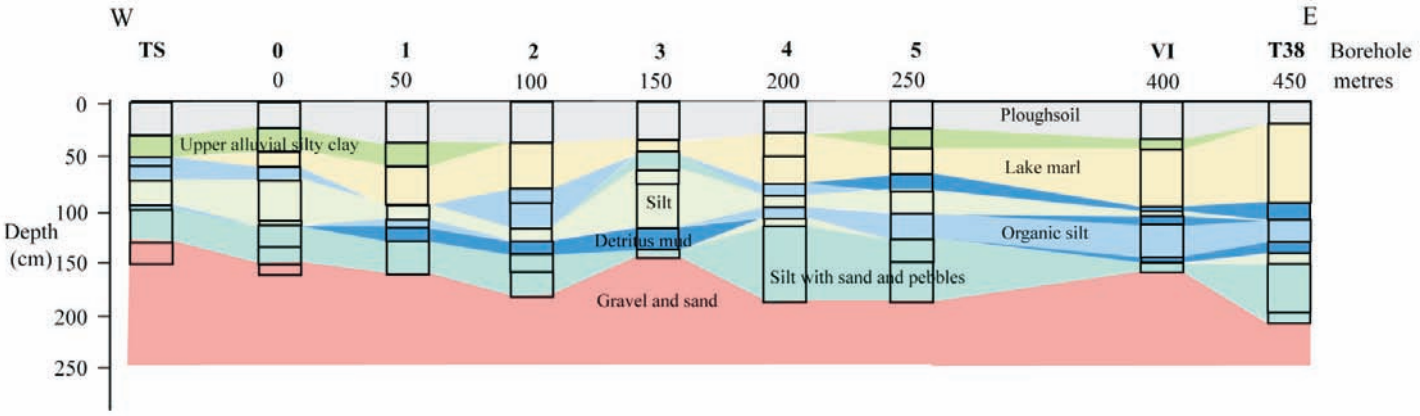


Figure 6. Willingham Mere Transect 3

Transect 4



Transect 5

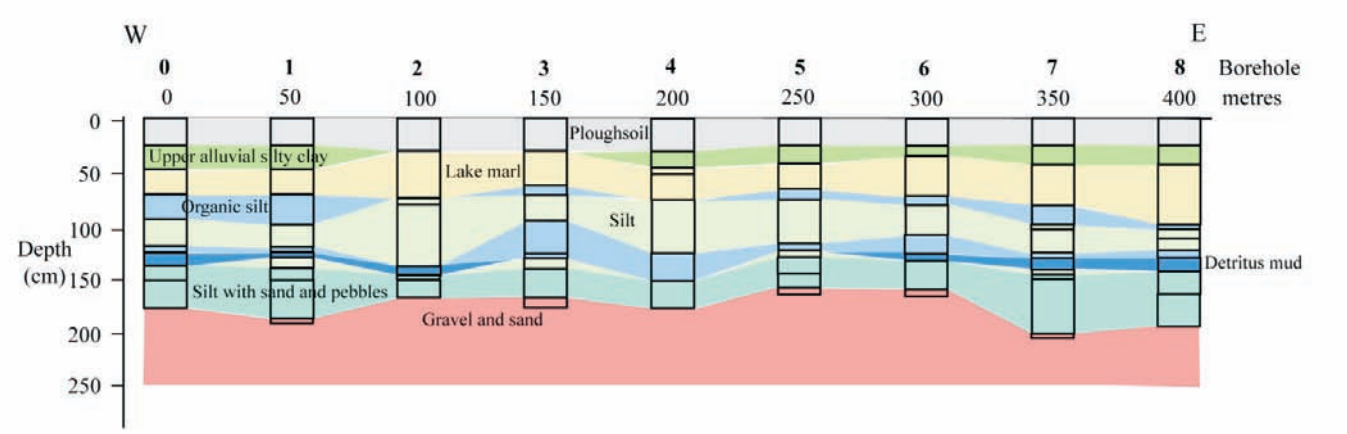


Figure 7. Willingham Mere Transects 4 and 5

Transect 6

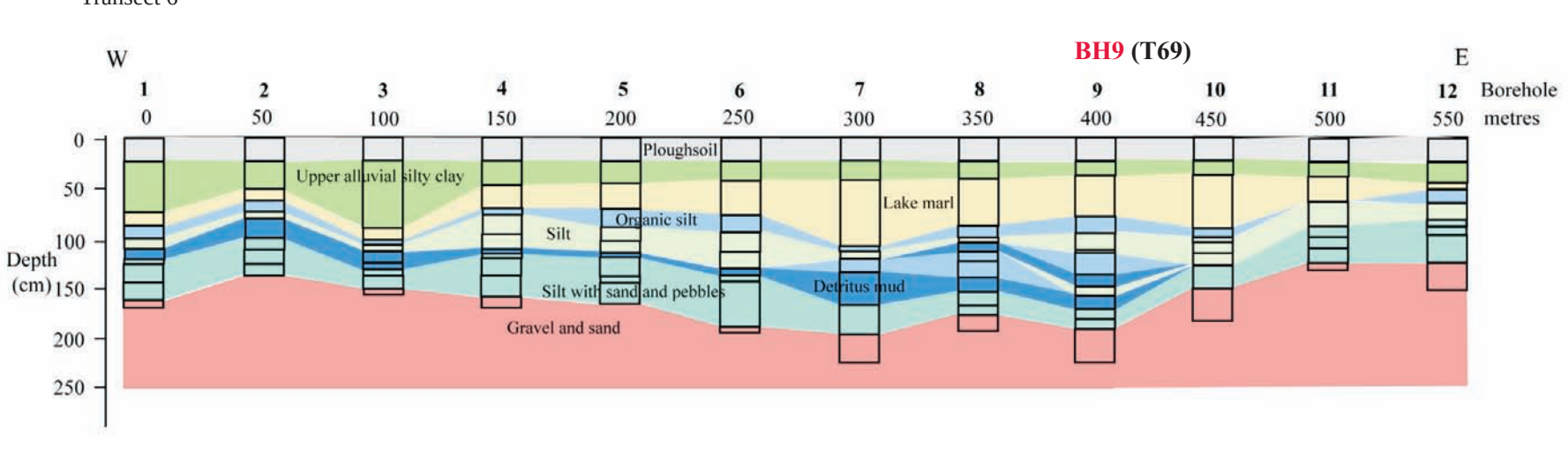


Figure 8. Willingham Mere Transect 6

Spatial Distribution of Sediments

Using all 103 borehole sequences, contour maps of sediment unit thickness and the depth of the gravel below surface have been constructed (Figures 9-11). It should be pointed out that the geological cross-sections (Figures 5-8) and the contour maps (Figures 9-11) do not take surface elevation into account. This does not present serious problems since the dry lake bed of Willingham Mere is of low relief. Since LiDAR and other survey data are available it should be possible to incorporate surface elevation into the final versions of these plots.

Figure 9 (top) shows the thickness of the upper alluvial silty clay unit across the study area. It is worth noting that this map includes the thickness of the ploughsoil, which is largely derived from the underlying silty clay. It is clear that there are two discrete sources for the thickest alluvium; one from the north (presumably the Old West River), and one from the southwest (presumably from a stream). The thinnest cover of upper silty clay appears to be in the centre of the lake basin.

Figure 9 (bottom) shows the thickness of lake marl across the study area. In many ways this isopach map is the inverse of the map of the upper silty clay thickness. The lake marl is observed to extend over a large area, although it is clearly thickest (>40cm thick) over a central region 800m x 500m in extent. The thickest marl sequence (>60cm) was around checker borehole D and T6-BH7.

Figure 10 (top) shows the thickness of the organic silt unit across the study area. Although this unit thins towards the southeast and southwest, it appears to extend to the south, north and west. The organic silt 'package' shows some internal variation but appears to be thickest (>100cm) towards the east of the basin near T2-BH4 & T6-BH9.

Figure 10 (bottom) shows the thickness of the basal sandy silt unit across the study area. From this isopach plot it is clear that the thickest basal sandy silt (>50cm) extends as a finger-like projection from SE to NW across the study area, with a secondary 'finger' projecting to the south. With reference to Figure 10 it is apparent that these deposits occupy the deepest parts of a small valley system developed in the surface of the underlying gravel terrace. It is worth noting that the sandy silt unit shows a lot of internal variation so that the thickest sequence might not always be the best for palaeoenvironmental reconstruction.

Figure 11 shows the depth below ground to the surface of the basal sand and gravel. There are landscape 'highs' to the north, east, southeast and southwest, and it seems that the buried landscape here is in the form of a small valley system exiting to the east, but with tributaries draining from the south, west and possibly north. It is in this buried valley system that the basal sandy silt unit and the organic silt unit are contained.

From these maps it is clear that both the basal sandy silt unit and to a lesser extent the organic silt unit are confined by the small eastward-draining valley system. The idea that the Roman Willingham Mere formed in a small valley system (Waller 1994) is only partially supported, since it is clear that by the Iron Age water levels and deposits had largely over-topped the highest undulations of the gravel terrace surface. The

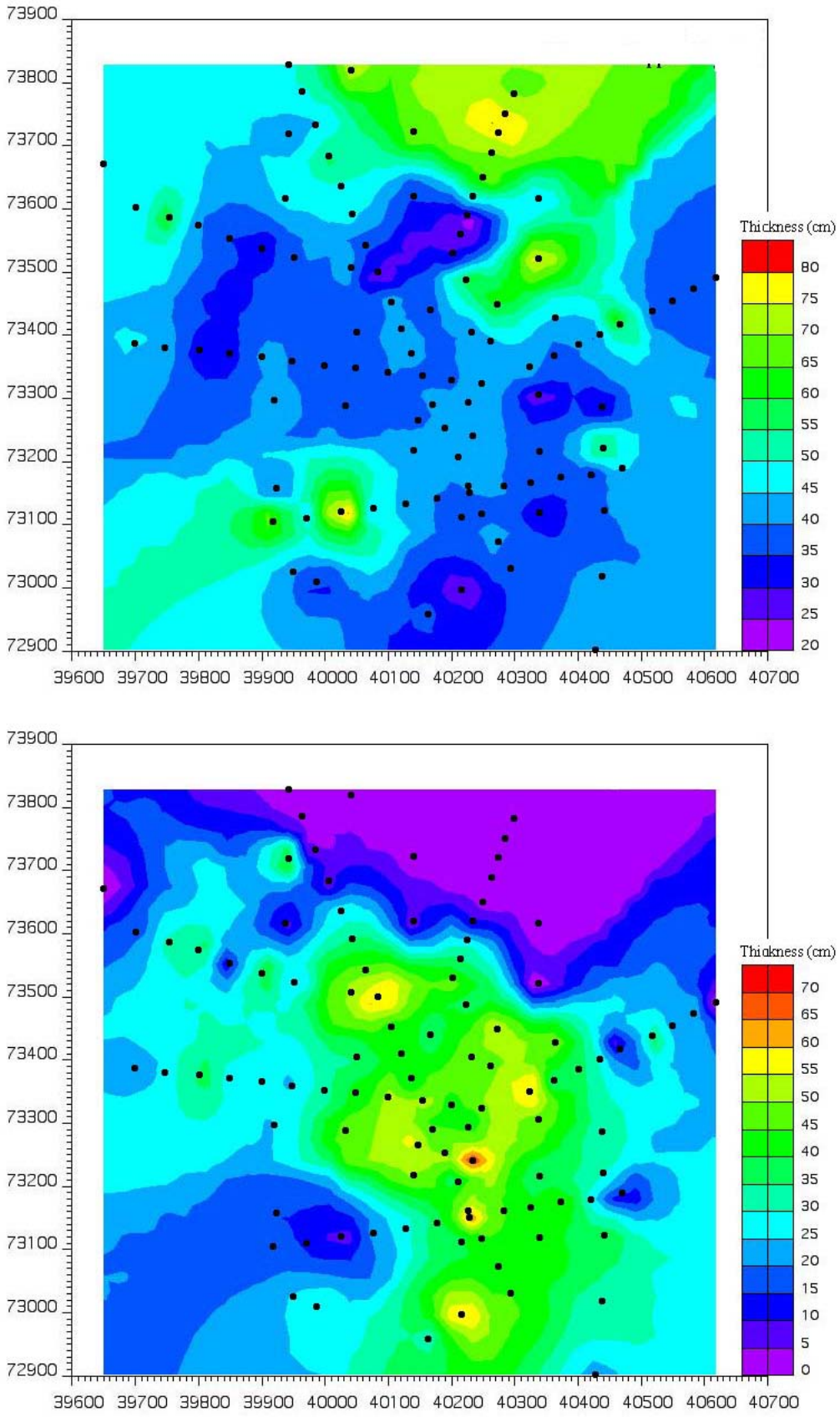


Figure 9. Thickness of upper silty clay (top). Thickness of marl (bottom)

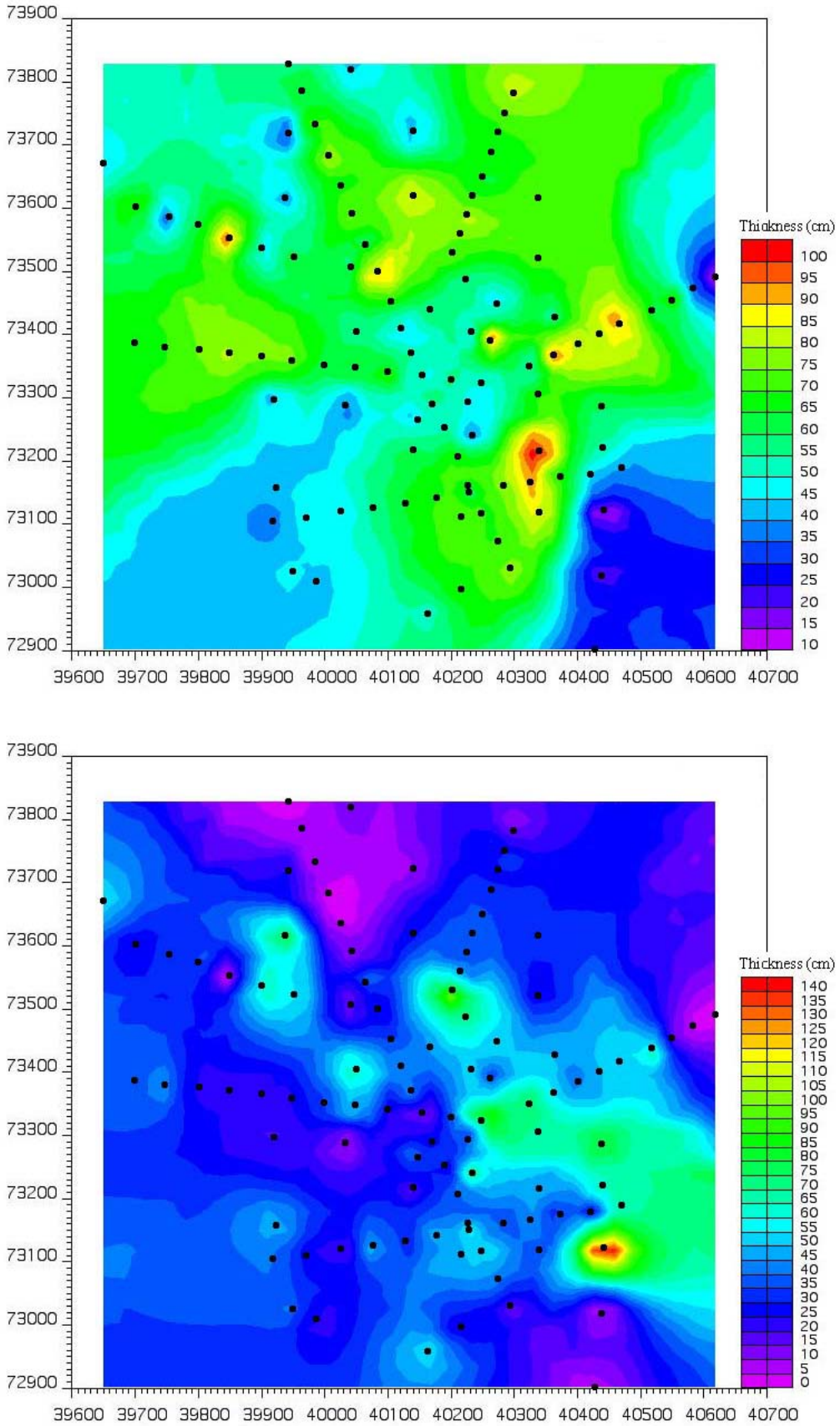


Figure 10. Thickness of organic silt (top). Thickness of basal sandy silt (bottom)

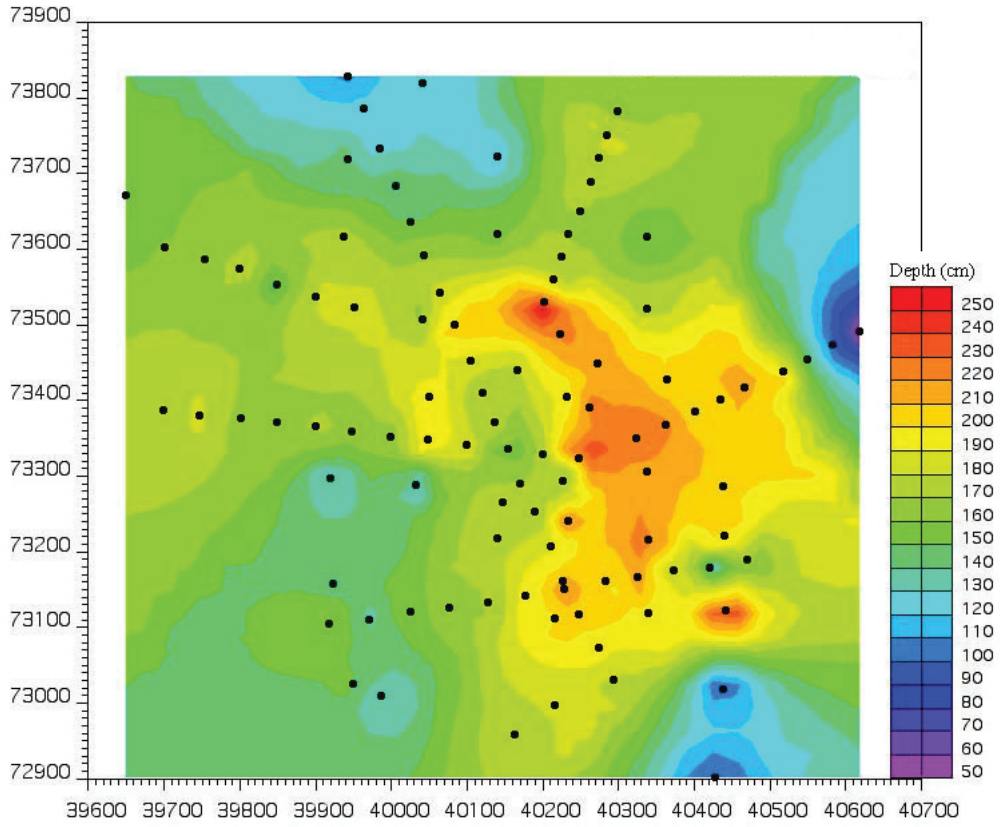


Figure 11. Depth to basal sand and gravel

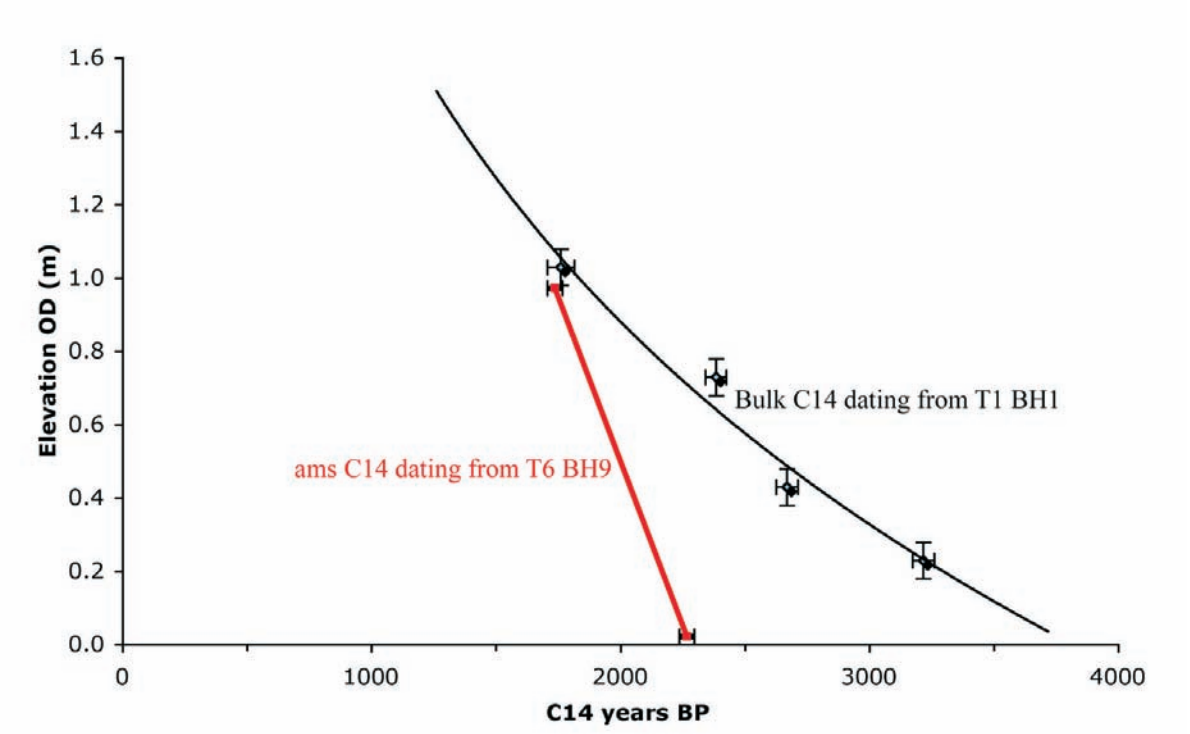


Figure 12. Age-elevation models for Willingham Mere sequence. The AMS C14 results for T6 BH9 are shown in red with a linear trend line. The elevation of the ground surface at T6 BH9 was 1.80m based on LiDAR data. For comparison, the four bulk C14 dates from T1 BH1 are shown with a fitted log trend line. The elevation of the ground surface at T1 BH1 was 1.88m OD

distribution of lake marl appears to be determined as much by the influx of alluvium as it is by the presence of historic landscape highs.

Discussion and Conclusions

Investigations of palaeoenvironments at Willingham Mere by Waller (1994) focused on a borehole located close to T2-BH1. This sequence offered a good thickness of marl and organic silt. The palaeoenvironmental investigations by Boreham (2011) focused on a slightly thinner and more northerly sequence at T1-BH1. Neither study looked at the basal sandy silt unit.

In this study the sequence at T6-BH7 offers a more southerly example of a lake-centre core with a good thickness (>65cm) of marl. Close by, the sequence at T6-BH9 offers a good thickness of organic silt (>100cm), although there are also some other possible locations. In order to investigate the basal sandy silt unit a long sequence containing organic material would be ideal. Although the greatest thickness of sandy silt was at BH XXI on the eastern side of the mere (159cm), there appears to be little organic material within it. In contrast both T1-BH1 (the original sequence investigated by Boreham 2011) and T5-BH11 had thick (>100cm) sandy silt containing organic material.

It is clear that there is not a single borehole location that offers thick marl, organic silt and basal sandy silt in one package. However, since T1-BH1 has already been assessed for pollen and has been dated, it would make sense to investigate the organic sandy silt at this location to determine if the material is Mesolithic/Neolithic or simply late Glacial. This could be easily done with up to eight pollen samples and one or two radiocarbon (AMS) dates. If an investigation of the marl and organic silt is required from a more southerly lake-centre location, then a compromise borehole on T6 at either BH7 or BH9, or somewhere in between would appear to provide a solution. The assessment of such a sequence could be achieved with 16 pollen samples and at least two radiocarbon (AMS) dates.

This study has shown the high level of lithological and stratigraphic detail that can be achieved by covering an area to be investigated with carefully targeted boreholes. This gives rise to the possibility of more detailed interpretation of features that might be invisible to aerial photography, LiDAR or shallow trenching. The amount of fieldwork involved in this approach is far less than adopting a strict grid-based system and relies on the borehole positions being adaptive whilst adhering to an overall guiding scheme. This approach offers the possibility of constructing three-dimensional models of the study area, which can be added to at any time. The ‘deposit model’ has allowed the selection of the best sequences for further palaeoenvironmental assessment, and represents a database of different sediment types and thus palaeoenvironmental interpretations.

Pollen Analysis and Radiocarbon Dating of Sediments (Steve Boreham)

Following on from the borehole survey (see Boreham, above), in this study pollen analysis and radiocarbon dating was undertaken on a sequence of sediments from the south-central part of the Willingham Mere basin. Previous investigations of the Willingham Mere sequence (Waller 1994 (MWP) & Boreham 2011 (T1 BH1)) were from the northern part of the basin (see Figure 4). The sequence at T6 BH9 was chosen because it offered some of the thickest sediments (178cm) encountered during the current more extensive auger survey of the deposits at Willingham Mere (see Figure 4).

Stratigraphy and Lithology

The stratigraphy and lithology of sediments in Transect T6 is shown in Figure 8. In general, the sediment sequence comprised basal sand and gravel overlain by sandy silt with pebbles. Above this almost everywhere was a thin complex of lower detritus mud and organic silt, with peaty inclusions and wood. In most places this was overlain by a grey slightly marly and organic silt, which in turn was overlain by a thin upper organic silt with peaty inclusions. Overlying this was a unit of silty lake marl. Above this, and sometimes occupying a channel form cut through the lake marl, was a unit of alluvial silty clay. At all locations there was an upper *c.* 30cm of ploughsoil.

Pollen and Radiocarbon Dating from T6 BH9

It is generally considered that for dating and palaeoenvironmental reconstruction a long sediment sequence is preferred. The sequence at T6 BH9 was chosen for investigation since it presented some of the thickest sediment encountered, with a particularly well-developed lower organic silt and detritus mud complex. This study focuses on a 178 cm long sequence of lake marl, silt and organic mud, which was sampled for radiocarbon dating and pollen analysis.

In this study, a pollen assessment of fifteen samples from the sequence at BH9 has allowed the changing vegetation and landscape around Willingham Mere to be investigated. In addition, two AMS radiocarbon dates (by Beta Analytic Inc.) have been obtained from the sequence with the aim of understanding the age and deposition history of these sediments.

Radiocarbon Dating

An age-elevation model for the Willingham Mere T6 BH9 sequence appears in Figure 12. The basal AMS date (measured radiocarbon age) on wood (178cm) is 2270±30 BP (Beta-336270), which calibrates at 95% probability to 2340 – 2300 and 2270 - 2160 Cal BP. This mid-Iron Age date is from the very basal part of the lower sandy organic silt unit.

The upper AMS date (measured radiocarbon age) on organic material (83cm) is 1740±30 BP (Beta-336269), which calibrates at 95% probability to 1690-1680 and 1620-1550 Cal BP. This Roman date is from the upper part of the upper organic silt unit, which records a brief return to fen conditions before the onset of the lake marl deposition.

Two age-elevation models for the Willingham Mere sediments are shown in Figure 12. The linear trend line created from the two radiocarbon dates suggests that the sequence from T6 BH9 spans the mid-Iron Age to Roman period. However, this is at odds with the four bulk radiocarbon dating obtained from T1 BH1 where a mid-Bronze Age to Roman period was indicated.

Pollen Analyses

The 15 samples of sediment from the sequence at T6 BH9 were prepared using the standard hydrofluoric acid technique, and counted for pollen using a high-power stereo microscope at x400 magnification. The percentage pollen data from these samples is presented in Appendix 3 and is shown as percentage pollen diagrams in Figures 13 & 14.

Unfortunately, two pollen samples from the upper part of the sequence (60 & 70cm – iron-stained lake marl) and two pollen samples from the lower part of the sequence (190 & 200cm – sandy silt) proved to be barren. It should be noted that pollen analysis was also attempted from three samples (185, 195 & 205cm) of the basal sandy silt unit from the T1 BH1 sequence, but also without success.

The pollen concentrations of the T6 BH9 samples ranged between 65,439 and 19,532 grains per ml. Pollen counting was somewhat hampered by the presence of finely divided organic debris, and preservation of the fossil pollen grains (palynomorphs) was quite variable, especially in the upper part of the sequence (80 & 90cm) and in the basal sample (180cm). Assessment pollen counts were made from a single slide for these samples. The pollen sums achieved ranged between 52 and 125. None of these counts exceed the statistically desirable total of 300 pollen grains main sum. As a consequence caution must be employed during the interpretation of these results.

This sequence is rather similar throughout, although there are some changes in the pollen assemblage that reflect changing palaeoenvironments at the site. The basal samples (170 & 180cm) from the organic sandy silt unit appears to represent a reed swamp environment with a little willow and alder carr nearby. In contrast, the detritus mud and silt complex (136 – 170cm) appears to represent a period of deeper open water with water-milfoil (*Myriophyllum*) and yellow water-lily (*Nuphar*) pollen. There is also a signal from birch (*Betula*) and juniper (*Juniperus*) scrub and a background mixed-oak wood pollen spectrum with lime (*Tilia*) and elm (*Ulmus*). The organic silt unit (113 - 136cm) appears to represent a return to reed swamp conditions. The lower silt unit (92 - 113cm) signals a return to deeper water with yellow water-lily (*Nuphar*) pollen and *Sphagnum* spores. The upper organic silt (77 - 92cm) shows an increase in hazel (*Corylus*) pollen (hazel scrub) with some evidence of expanding emergent vegetation such as sedges (Cyperaceae) and bur-reed (*Sparganium*). At this

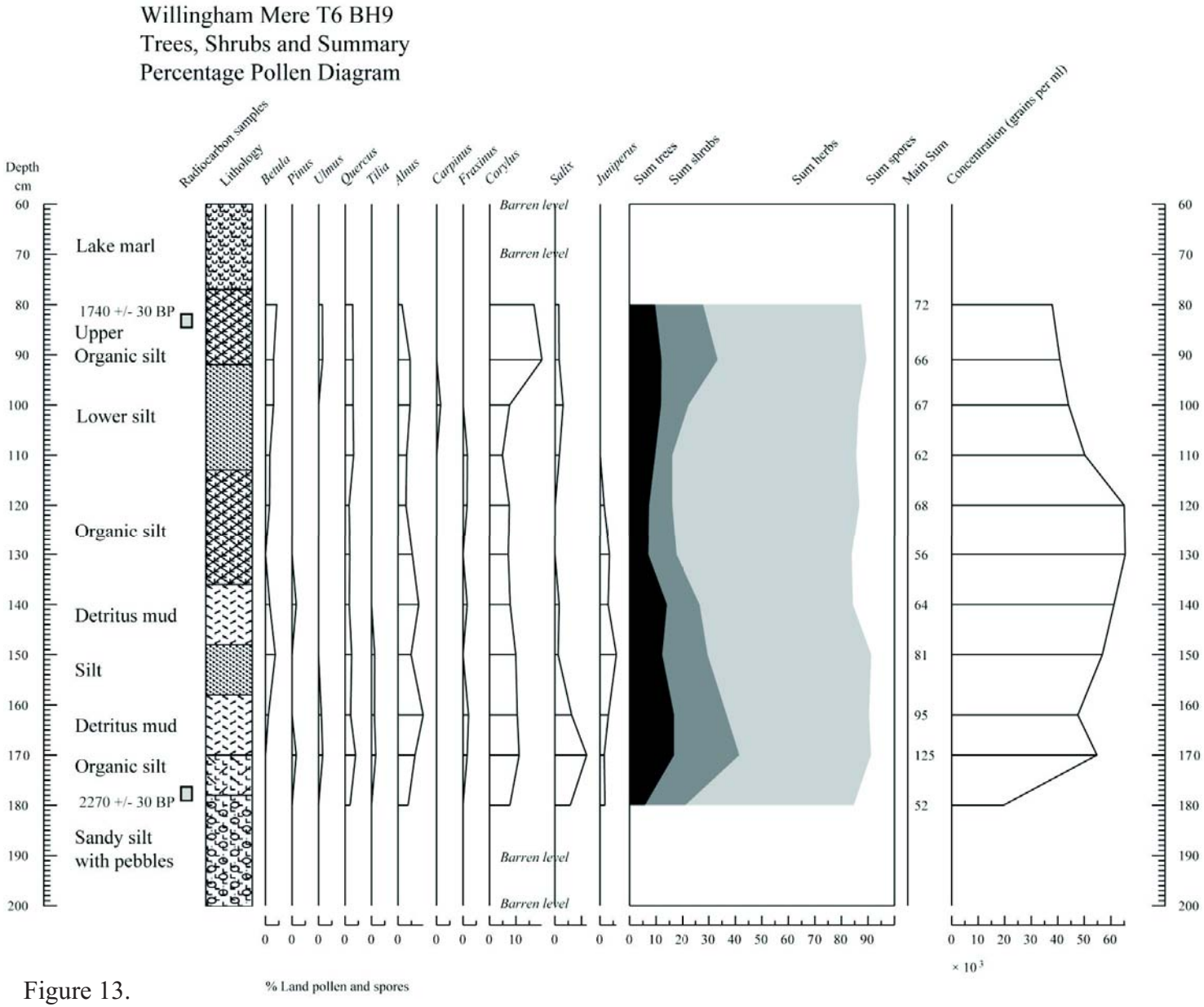

Willingham Mere T6 BH9
Trees, Shrubs and Summary
Percentage Pollen Diagram
Depth cm
Radiocarbon samples
Lithology
Betula
Pinus
Ulmus
Quercus
Tilia
Alnus
Carpinus
Fraxinus
Corylus
Salix
Juniperus
Sum trees
Sum shrubs
Sum herbs
Sum spores
Main Sum
Concentration (grains per ml)
Lake marl
1740 +/- 30 BP
Upper Organic silt
Lower silt
Organic silt
Detritus mud
Silt
Detritus mud
Organic silt
2270 +/- 30 BP
Sandy silt with pebbles
Barren level
Barren level
Barren level
Barren level
72
66
67
62
68
56
64
81
95
125
52
% Land pollen and spores
× 10 3

Figure 13.

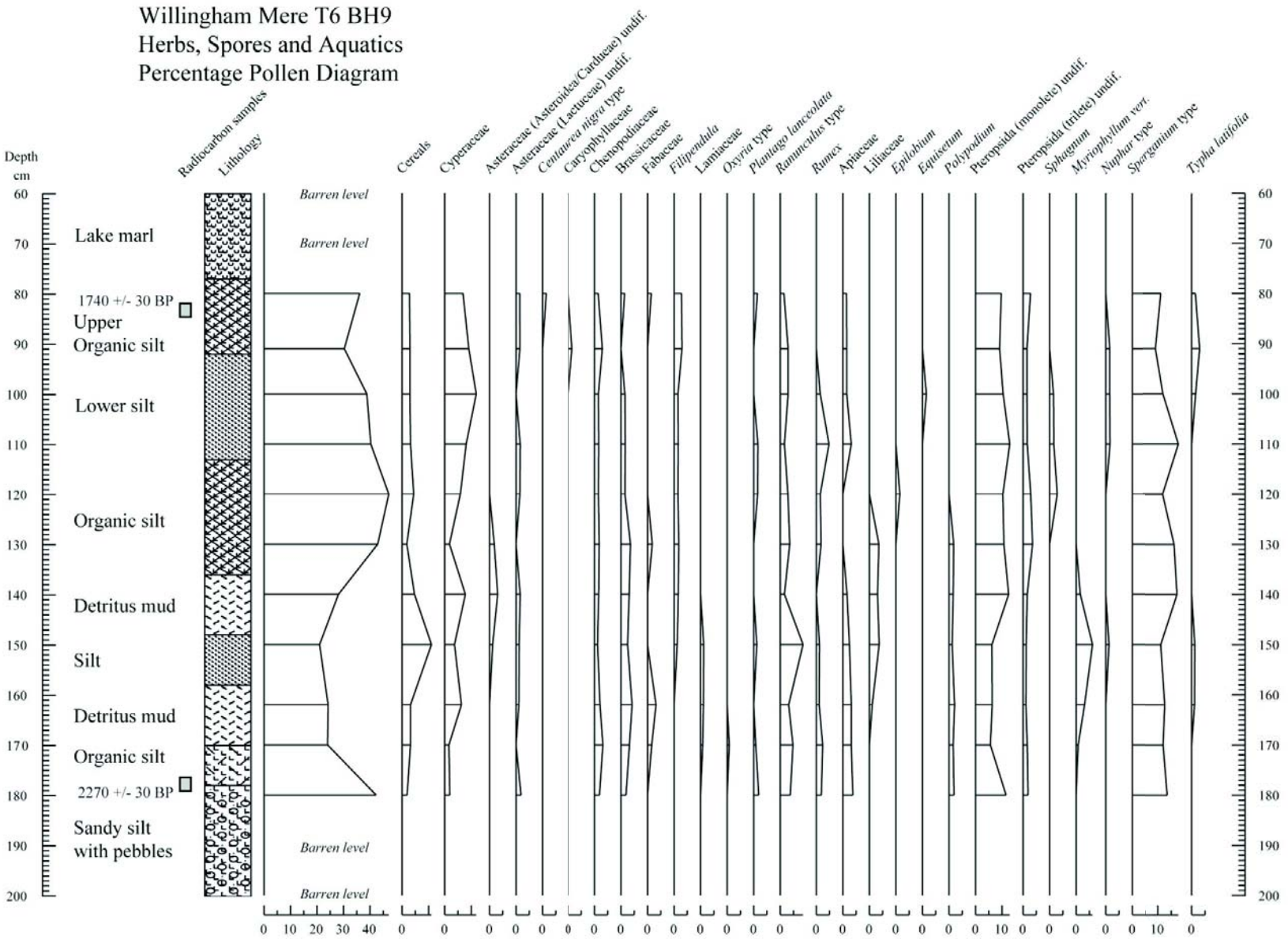

Willingham Mere T6 BH9
Herbs, Spores and Aquatics
Percentage Pollen Diagram
Depth cm
Radiocarbon samples
Lithology
Lake marl
1740 +/- 30 BP
Upper Organic silt
Lower silt
Organic silt
Detritus mud
Silt
Detritus mud
Organic silt
2270 +/- 30 BP
Sandy silt with pebbles
Barren level
Barren level
Barren level
Barren level
Cereals
Cyperaceae
Asteraceae (Asteroidea/Cardueae) undif.
Asteraceae (Lactuceae) undif.
Centaurea nigra type
Caryophyllaceae
Chenopodiaceae
Brassicaceae
Fabaceae
Filipendula
Lamiaceae
Oxyria type
Plantago lanceolata
Ranunculus type
Rumex
Apiaceae
Liliaceae
Epilobium
Equisetum
Polypodium
Pteropsida (monolete) undif.
Pteropsida (trilete) undif.
Sphagnum
Myriophyllum vert.
Nuphar type
Sparganium type
Typha latifolia
% Land pollen and spores

Figure 14

location the lake marl (37 - 77cm) did not produce a pollen assemblage. It is notable that cereal pollen and the disturbed ground indicator ribwort plantain (*Plantago lanceolata*) occur throughout the entire sequence.

Discussion & Conclusions

Taken together, the pollen sequence from T6 BH9 presents evidence for several fluctuations in local water level, with an early development of reed swamp followed by deeper water, shallowing and the expansion of reedswamp followed by a second phase of deeper water, expansion of marginal vegetation and then a third phase of deeper water that deposited the lake marl. The evidence that the lake marl dates from the Roman period seems fairly conclusive; however, the dating of the basal sediments at T6 BH9 is problematic. The radiocarbon dating of the basal part of the lower silt unit at both T1 BH1 (Boreham 2011) and MWP (Waller 1994) indicates an early-Iron Age date of about 2600 radiocarbon years BP, and the radiocarbon dating of the basal part of the lower organic silt at the bottom of the sequence at T1 BH1 gives a mid-Bronze Age date of 3220 ±44 years BP. In stark contrast, the radiocarbon date from the basal part of the sequence at T6 BH9 gives a much younger mid-Iron Age date of 2270±30 BP. It has previously been assumed that the remarkably consistent stratigraphy across the Willingham Mere basin indicates that each lithological unit was deposited in a particular time-envelope under broadly similar basin-wide environmental conditions. However, diachronous (time-transgressive) deposition is rather common in fluvial and lake environments, such that similar sediments are deposited in different places at different times but give the impression of well-ordered 'layer-cake' with stratigraphic and temporal integrity.

There are several possibilities to explain the apparently erroneous mid-iron Age date obtained from the base of this sequence. Firstly, we must consider the possibility that the wood present in the core at 178cm was contamination pushed into the sediment from higher up the sequence by the coring process. This seems unlikely because the Russian corer used encloses the sediment *in situ* and protects it from contamination during the extraction process. In addition, the sediment log for T6 BH9 indicates that apart from the immediately adjacent material, the overlying sediment did not contain obvious woody material. Contamination of this type is usually quite apparent during the process of core examination and sampling

The second possibility is that the woody material submitted for dating was in fact root material that had grown down through the basal sediment in the mid-Iron Age. Although initially plausible, this explanation would require that wet woodland (carr) had spread out to the middle of the lake basin at this time. The pollen analyses suggest that this is unlikely since there is no evidence of alder or willow carr close to the site at this time.

The third possibility is that the radiocarbon date is correct and that at this location, organic sedimentation did not start until the mid-Iron Age although material had been accumulating elsewhere since the mid-Bronze Age. This explanation might make sense if the sequence at T6 BH9 initially occupied a separate depositional sub-basin or if the base of the sequence was at a higher elevation than at T1 BH1. The deposit model produced for the Willingham Mere basin (Figure 11) clearly shows that there is

only one depositional basin that includes both T1 BH1 and T6 BH9. The elevation of the basal part of the sequence at T6 BH9 is close to 0m OD and therefore lower than the base of the sequence at T1 BH1. Thus without special pleading this option seems to be untenable. However, there are several features of the pollen diagram from T6 BH9 that support a younger date.

In the pollen diagrams from both T1 BH1 (Boreham 2011) (Figures 15 and 16) and MWP (Waller 1994) (Figure 17) and the basal part of the sequence (mid-Bronze Age to mid-Iron Age) is characterised by elevated proportions (>15%) of alder (*Alnus*) pollen accompanied by willow (*Salix*). This is interpreted as the presence of wet woodland (carr) at the site. This clear alder signal is conspicuously absent from the basal part of the pollen diagram from T6 BH9 (Figure 13) and may hint at a younger age for the sequence. Alternatively, one could argue that at the centre of the lake basin the presence of carr would be less likely than at the margins and that the presence of willow (Salix) pollen in the basal sediments is a roughly equivalent signal. The pollen diagram from T6 BH9 (Figure 14) has cereal pollen extending to the base of the sequence. However, the basal part of the pollen diagram from T1 BH1 shows a paucity of cereal pollen through the mid to late Bronze Age. The absence of this feature from the base of the T6 BH9 sequence again suggests that it might represent later sedimentation. Again, an alternative explanation can be given that the presence of cereal pollen is a local phenomenon suggesting that fields were not brought into arable cultivation until later to the north of Willingham Mere. The effect of local vegetation distributions is highlighted by the presence of elevated hazel (*Corylus*) pollen a the top of the T6 BH9 sequence, a feature not seen in the other pollen diagrams at that level. There are also a host of indications from minor pollen taxa that the T6 BH9 sequence could represent a post mid-Iron Age sequence. These include the abundances of yellow water-lily (*Nuphar*), water-milfoil (*Myriophyllum*), *Sphagnum*, sedges (Cyperaceae) and lily family (Liliaceae) which do not seem to match the older part of the T1 BH1 sequence.

Leaving aside the problematic dating of the base of the T6 BH9 sequence for a moment, another important question concerns evidence for the age of the basal sandy silt unit present across much of the Willingham Mere basin, and apparently in-filling a small eastward-draining valley system (see Boreham, above). Despite extensive sieving of material from the base of the T1 BH1 and T6 BH9 sequences, no suitable material for radiocarbon dating has been recovered. It appears that the preservation of organic material in these sediments is rather poor and where present is either unidentifiable debris (not discrete seeds or wood) or clearly comprises root fibres. The pollen analysis of samples from the basal sandy silt at both locations has also been unsuccessful, suggesting that either the material was deposited rapidly in an environment with little pollen-rain or that past oxidative processes have destroyed the pollen signal. Similar sediments from various locations at the Over excavations to the west have also proved barren. It has generally been concluded that these sandy silts and silty sands, often containing pebbles, date from the late-Glacial period. An alternative view that these sediments might in part represent Mesolithic or Neolithic sedimentation can be neither refuted or supported. Examination of the deposit model for the Willingham Mere basin (see Boreham, above) suggests that the best chance of obtaining material for radiocarbon dating comes from Transect T2 where organic material clearly underlies and is incorporated within the basal sandy silt unit.

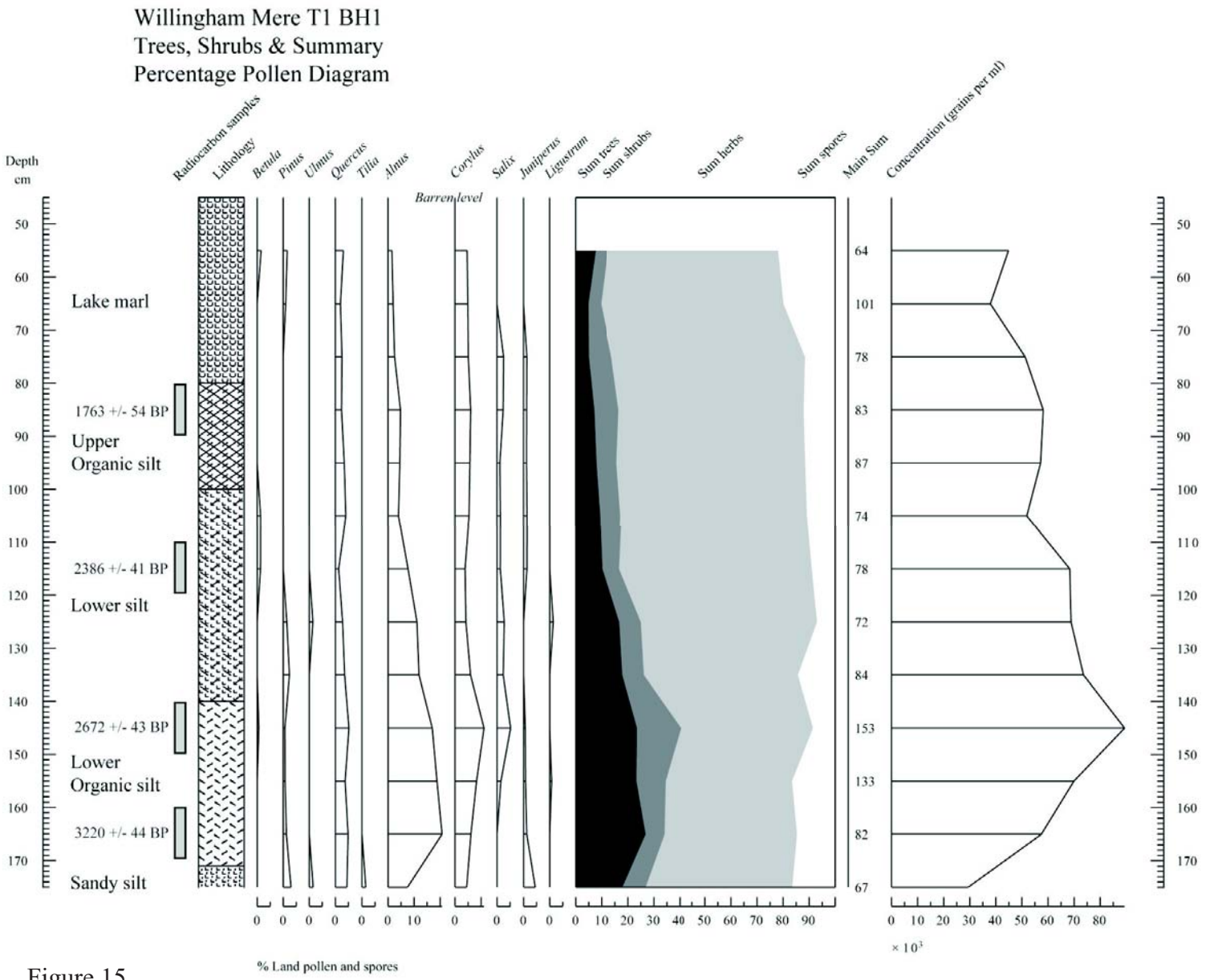

Willingham Mere T1 BH1
Trees, Shrubs & Summary
Percentage Pollen Diagram
Depth cm
Radiocarbon samples
Lithology
Betula
Pinus
Ulmus
Quercus
Tilia
Alnus
Barren level
Corylus
Salix
Juniperus
Ligustrum
Sum trees
Sum shrubs
Sum herbs
Sum spores
Main Sum
Concentration (grains per ml)
Lake marl
1763 +/- 54 BP
Upper Organic silt
2386 +/- 41 BP
Lower silt
2672 +/- 43 BP
Lower Organic silt
3220 +/- 44 BP
Sandy silt
% Land pollen and spores
× 10³

Figure 15.

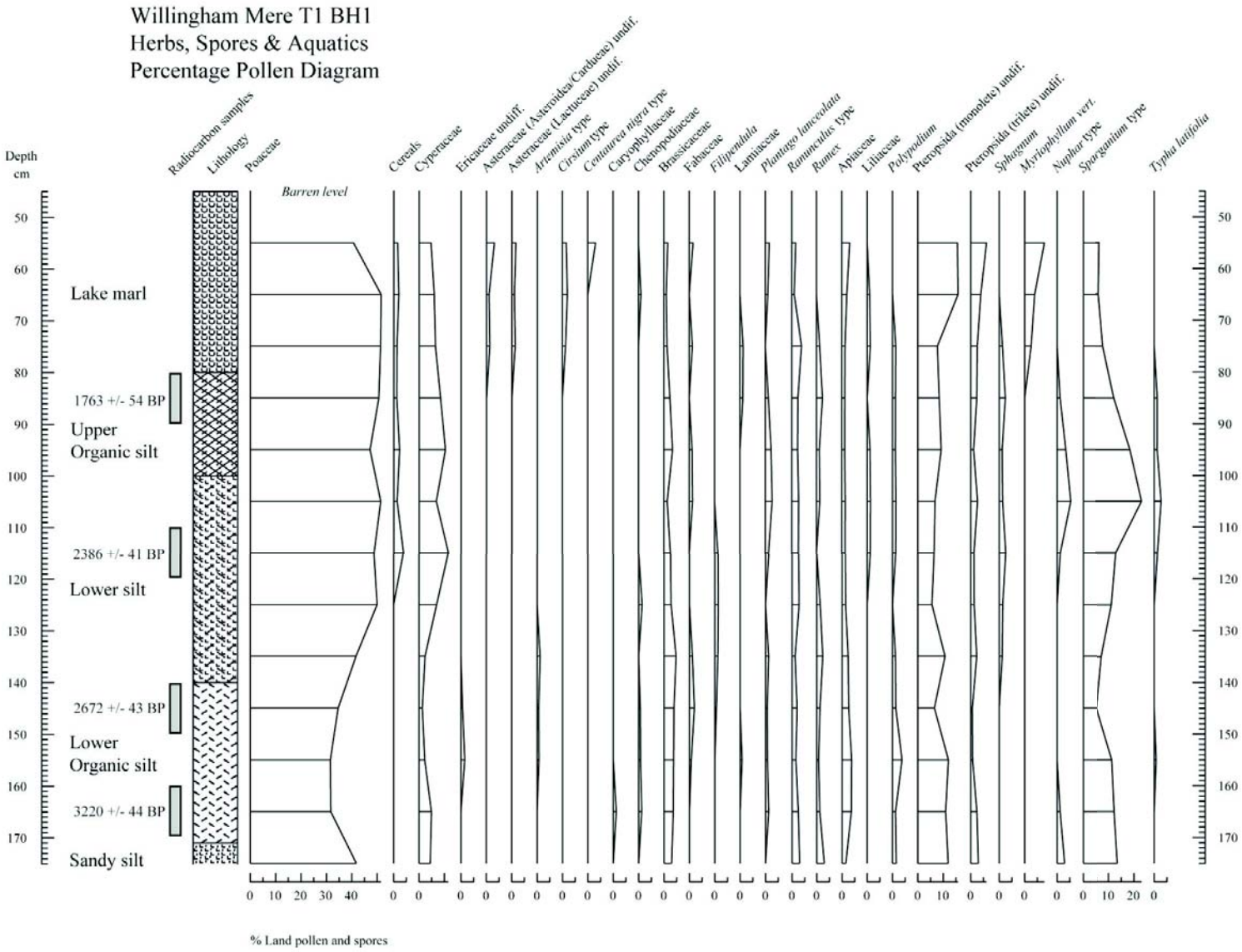

Willingham Mere T1 BH1
Herbs, Spores & Aquatics
Percentage Pollen Diagram
Depth cm
Radiocarbon samples
Lithology
Poaceae
Barren level
Cereals
Cyperaceae
Ericaceae undiff.
Asteraceae (Asteroidea (Carduceae) undif.
Asteraceae (Lactuceae) undif.
Artemisia type
Cirsium type
Centaurea nigra type
Caryophyllaceae
Chenopodiaceae
Brassicaceae
Fabaceae
Filipendula
Lamiaceae
Plantago lanceolata
Ranunculus type
Rumex
Apiaceae
Liliaceae
Polypodium
Pteropsida (monolete) undif.
Pteropsida (trilete) undif.
Sphagnum
Myriophyllum verr.
Nuphar type
Sparganium type
Typha latifolia
Lake marl
1763 +/- 54 BP
Upper Organic silt
2386 +/- 41 BP
Lower silt
2672 +/- 43 BP
Lower Organic silt
3220 +/- 44 BP
Sandy silt
% Land pollen and spores

Figure 16.

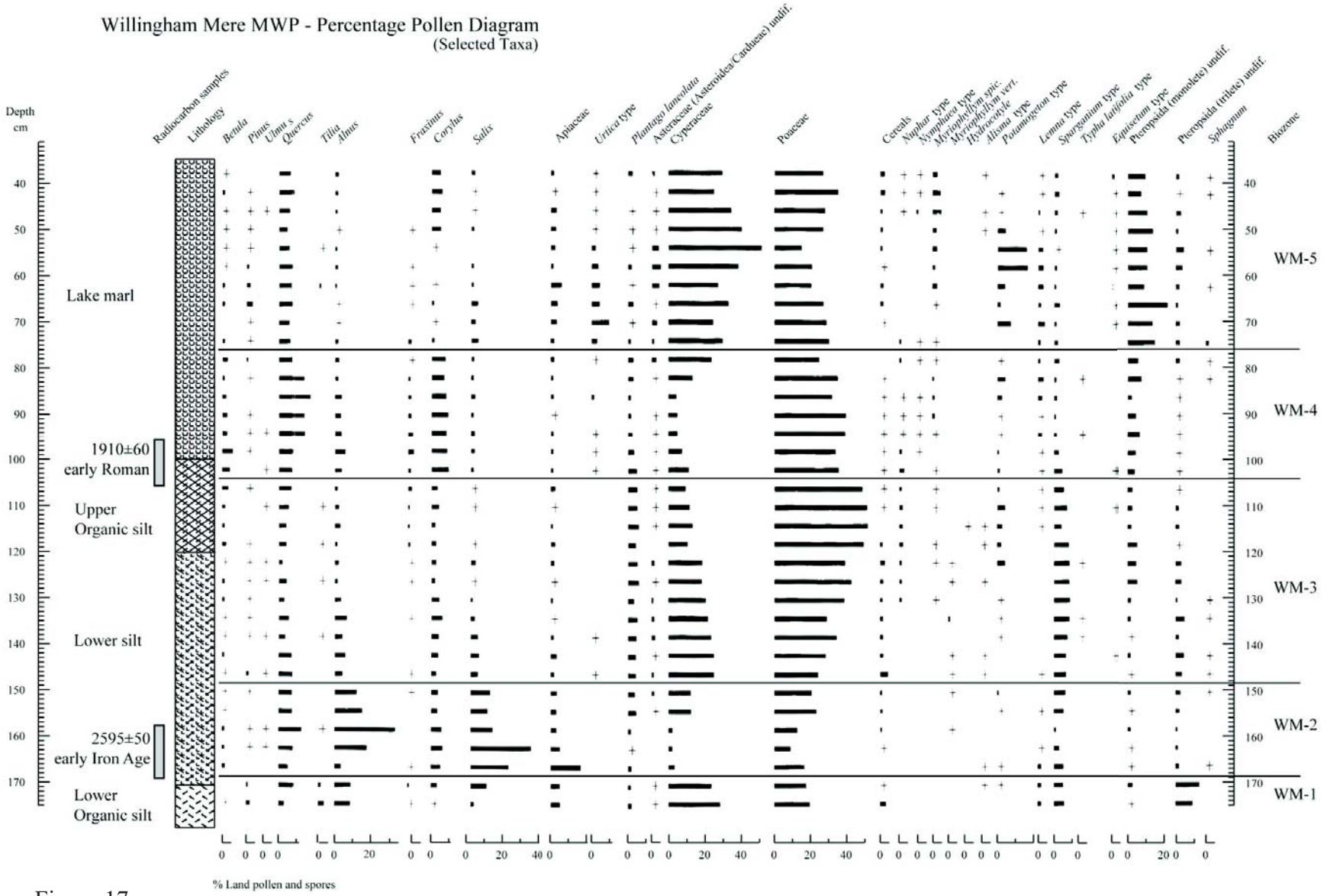

Willingham Mere MWP - Percentage Pollen Diagram
(Selected Taxa)
Depth cm
Radiocarbon samples
Lithology
Betula
Pinus
Ulmus
Quercus
Tilia
Alnus
Fraxinus
Corylus
Salix
Apiaceae
Urtica type
Plantago lanceolata
Asteraceae (Asteroidea Carduaceae) undif.
Cyperaceae
Poaceae
Cerealia
Nuphar type
Nymphaea type
Myriophyllum spic.
Myriophyllum verti.
Hydrocotyle
Alisma type
Potamogeton type
Lemna type
Sparganium type
Typha latifolia type
Equisetum type
Pteropsida (monolete) undif.
Pteropsida (trilete) undif.
Sphagnum
Biozone
Lake marl
1910±60
early Roman
Upper
Organic silt
Lower silt
2595±50
early Iron Age
Lower
Organic silt
WM-5
WM-4
WM-3
WM-2
WM-1
% Land pollen and spores

Figure 17.

In summary and returning to the issue of the age of the T6 BH9 sequence, it is clear that only by additional radiocarbon dating of the sediments can the conundrum be resolved. Given the potential problems with dating discrete pieces of wood, it would be preferable to attempt dating of sediment slices, either as bulk dates or AMS samples. The T6 BH9 sequence has a complex of lower organic silts and detritus muds that are ideal for two or three more C14 dates if required. Although AMS dating is seen as the modern methodology of choice, the small sample size makes it vulnerable to contamination by tiny amounts of both modern and ancient carbon. In contrast, the larger sample size required by bulk dating makes it more robust and resilient, if a little less stratigraphically precise.

The benefits of further dating attempts are manifold. If the T6 BH9 sequence is proved to be mid-Iron Age and younger, the spectre of diachronous sedimentation in the Willingham Mere basin must be confronted and an explanation found for the late onset of deposition despite the low elevation of the sequence base. If a mid-Bronze Age date is obtained for the basal sediments then the diachronous nature of the pollen spectrum must be explained by reference to significant local variations in lake depth, marginal vegetation type and arable activity. In either case, important palaeoenvironmental information will be obtained from the data and a more accurate reconstruction of the Willingham Mere basin and its surrounding area will result.

Buried Soils (Charles French)

Inspection of the open assessment trenches in the immediate surroundings of Willingham Mere was undertaken on September 19th 2012. This revealed rather poorly developed sandy/silt loam buried soils on the margins of the mere buried by up to *c*. 1.25m of freshwater peats, organic muds and alluvial silty clays. These soils varied from being fully to partly oxidised/gleyed depending on the groundwater regime, and were generally of less than 30cm in thickness, and often mono-horizonal. In many cases the former organic A horizon of the buried soil is not recognisable as it has effectively become incorporated into and replaced by a freshwater, silty clay organic mud deposit with much rooting which is suggestive of the influence of freshwater flood deposits around the margins of the mere. This may reflect seasonally present, shallow and vegetated standing water conditions, either as flood meadow and/or reed swamp. In many trenches, as the river sands/gravels substrate shallowly dips lower, only this grey organic silty mud is present, situated directly on the drift geology substrate. This indicates that long-term saturation pertained and that there was almost no Holocene soil development taking place. It is expected that Dr Steve Boreham's stratigraphic survey and associated pollen/diatom analyses should corroborate or modify these suggestions.

It was noted in several trenches that the upper surface of the lower peat was often undulating, and apparently had suffered surface disturbance in the past. This feature was also observed in trenches in the same area in the author's 1987 assessment for Tarmac's initial application to extract sand and gravel at this location. This is indicative of surface drying and disturbance in the past, possibly at some point in the mid-2nd millennium BC (dating to be confirmed).

Potential and Sampling

At this early stage and until more areas of concentrated archaeological material is identified, sampling of the buried soil should be at the minimum. Buried soil block samples were, however, taken by site staff at two locations where the soil is associated with a Bronze Age ditch/bank systems and possible Neolithic settlement features.

Buried Land Surface Topography

As described by Boreham above, the buried topography revealed by the investigations comprised a low-lying valley system (-0.7m AOD at its lowest point) with areas of high ground to the west, southwest and southeast (Figure 18). Trial trenching has shown that these gravel terraces - the *Shelfords Terrace*, *Long Holmes Terrace* and *Bridge Farm Terrace* - are associated with areas of archaeological activity and in the case of the *Long Holmes Terrace* good buried soil survival.

Shelfords Terrace - Located in the northeast of the evaluation area, the Shelfords Terrace is comparatively low lying reaching a maximum height of only 0.6m AOD. Probably as a result of its depth, the terrace is largely sealed by a thin layer of alluvial silt with no surviving buried soil horizon present. The contour plot of the underlying basal sands and gravels (Figure 18) suggests that Shelfords Terrace may not be as well defined as previously thought (on-site and following Boreham's initial deposit models) and it may well be the low-lying northern extent of the Long Holmes Terrace.

Long Holmes Terrace - A terrace comprising gravel apparently overlain by colluvial/'hill wash'on its lower slopes, the Long Holmes Terrace extends along the southern edge of the evaluation area and beyond to the south and southwest. The terrace is defined to the west by a palaeochannel separating it from the Low Grounds/O'Connell Terrace and to the north and northeast by the Y-shaped valley system described by Boreham above. The terrace reaches a maximum height of 1m AOD and whilst buried soil is survival good on the higher ground in the west it becomes more alluviated and eventually absent as depth increases to the north and east.

Bridge Farm Terrace - Located in the southeast of the evaluation area and largely lying beyond the proposed quarry boundary to the east, Bridge Farm Terrace reaches a maximum height of 0.8m AOD. Within the relatively limited area in which the terrace was identified buried soil was present although it appeared to be poorly preserved and alluviated. Of the three terraces identified the Bridge Farm Terrace appears to be the only one with a clear 'edge', which on its western side is defined by a relatively deep palaeochannel.

It is worth noting that the 'edges' of the terraces were almost certainly not constant and as a result it is largely impossible to define definitive 'edges' as such. This is reflected in the imperceptible change in the terrace-edge deposits from colluvial to alluvial derived material in many areas. While there were clearly 'wet' as opposed to 'dry' areas, much of the evaluation area probably represents an intermediary zone,

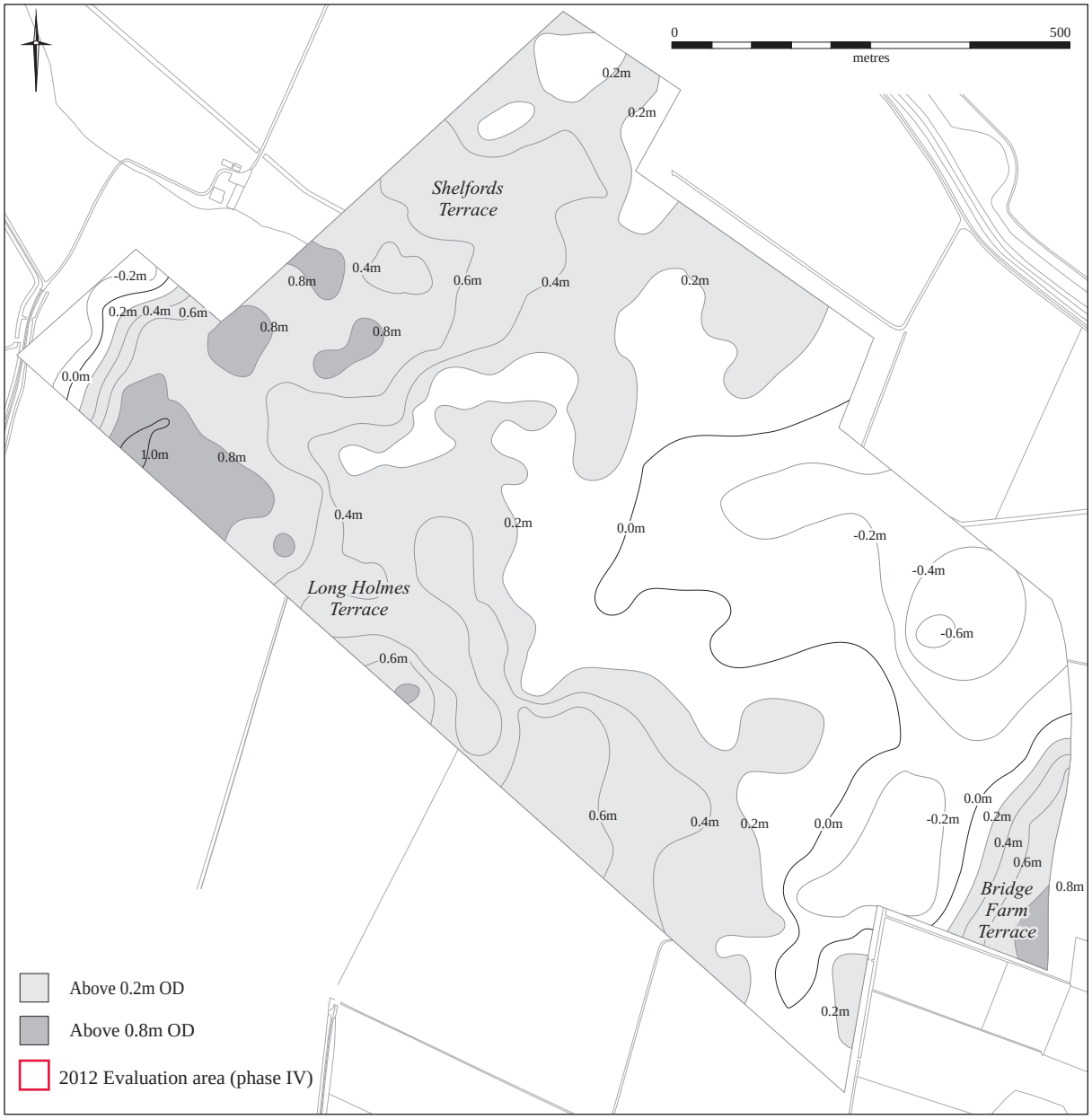


Figure 18. Contour map of basal sands and gravels

which would have been periodically, perhaps seasonally, exploited/utilised during prehistory, albeit not permanently and probably not 'settled'. This constant state of flux appears to have persisted to varying degrees until the formation of Willingham Mere proper during the Roman period. The presence of potential 'colluvial' matieral on the terrace edges also means that although the contour plot of the basal sands and gravels shown in Figure 18 is a good indicator of the prehistoric landscape/ground surface it does not necessarily reflect it exactly.

In addition to the work by Boreham and French a site visit was undertaken by Dr. Mike Allen who it is proposed will have a co-ordinating role in future investigations into the character and geoarchaeology of this prehistoric landscape. Dr. Allen's notes on the site visit are included in Appendix 4.

ARCHAEOLOGICAL RESULTS

Trenching and buried soil sampling has identified three broad areas of archaeological activity, located on the *Shelfords Terrace* in the north of the evaluation area, the *Long Holmes Terrace* in the south and the *Bridge Farm Terrace* in the east. Within these areas of activity seven Archaeological Zones have been defined based on the distribution of archaeological features and buried soil finds (Figure 19).

Buried soil finds densities (see Appendix 5) were generally much lower than encountered during evaluation of the Godwin/Marlow Ridge and the O'Connell Ridge to the west (see Vander Linden and Evans 2008). However, rather than representing a lack of archaeological activity it is clear that these statistics reflect a different kind of occupation with a more limited time span in this part of the landscape, away from the densely occupied ridges. Evidently, lower densities, which in the context of the ridges were deemed insignificant, should here be seen as a good indication of archaeological activity in an area where 'background' levels of finds are low or non-existent and buried soil preservation is poor. Consequently, a threshold of three or more finds per test point has been used to define the archaeological zones. A buried soil finds density 'contour plot' is shown in Figure 20.

A total of 37 archaeological features were recorded during the evaluation with a further 24 features interpreted as tree throws/natural in origin (see Appendix 6).

Zone IX

Archaeological Zone IX was located on the *Long Holmes Terrace* and bounded to the west by a palaeochannel identified during the 2007 investigations. Trenches in this area more closely defined the extent of the channel as well as producing evidence of Late Neolithic activity alongside a series of prehistoric ditches (Figure 21). Buried soil survival in Zone IX was generally good, although in some areas eroded by episodes of overbank flooding and partially replaced by washed sand deposits. A total of eight archaeological features, all sealed by the organic silts and therefore almost certainly dating to the Bronze Age or earlier, were recorded within Zone IX (see Table 1).

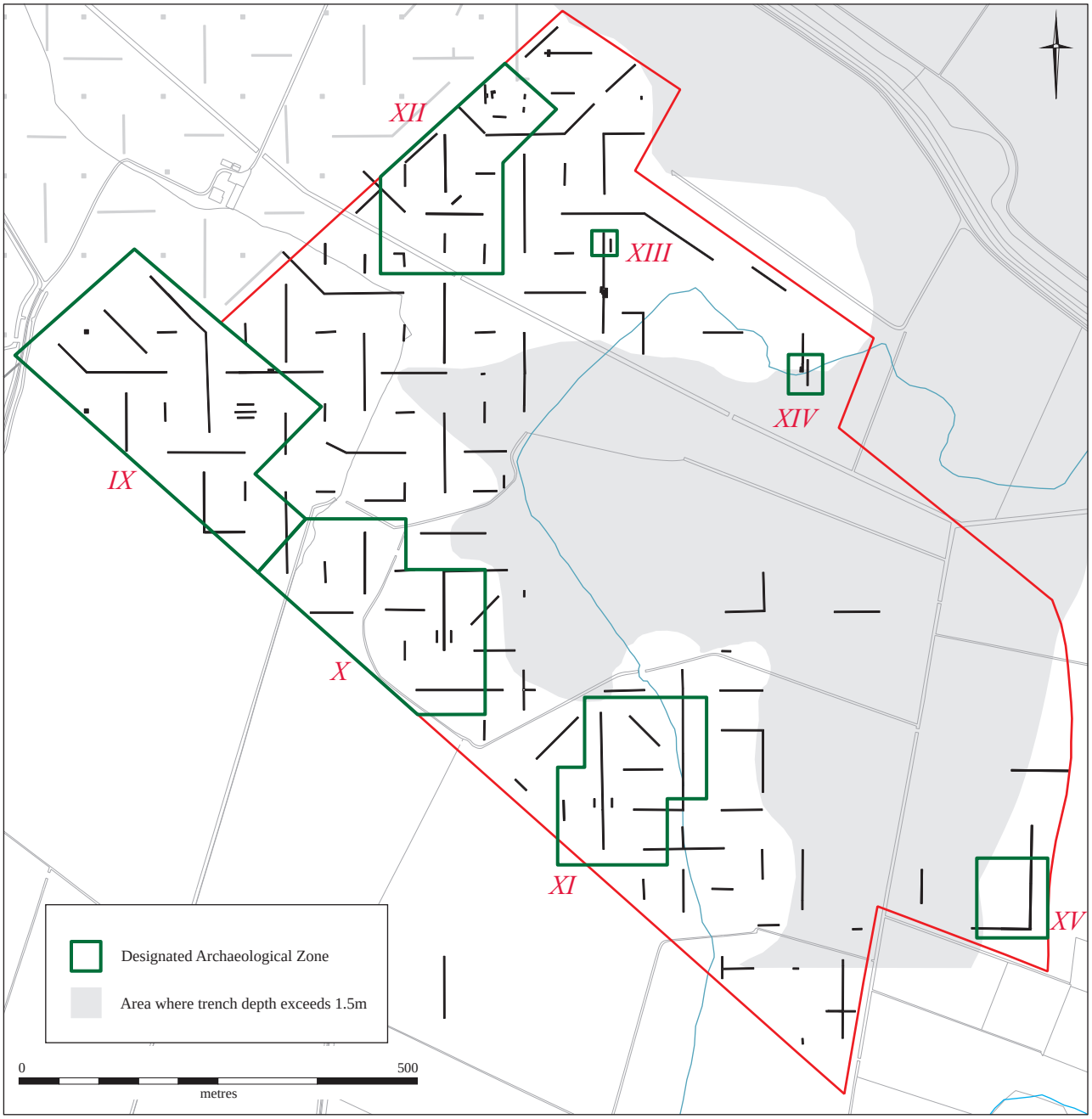


Figure 19. Designated archaeological zones and areas where trench depth exceeded 1.5m

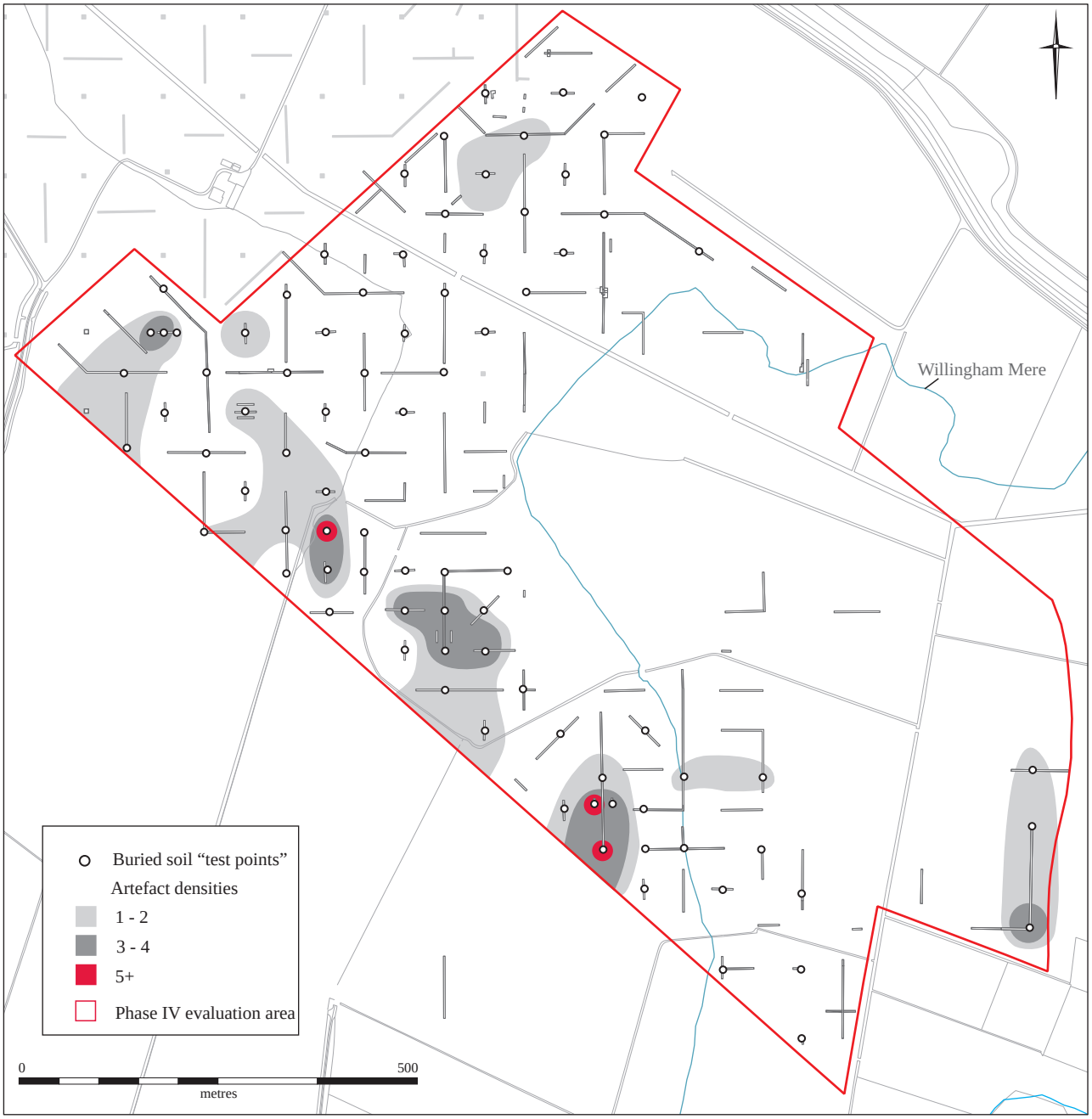


Figure 20. Buried soil finds ‘contour plot’

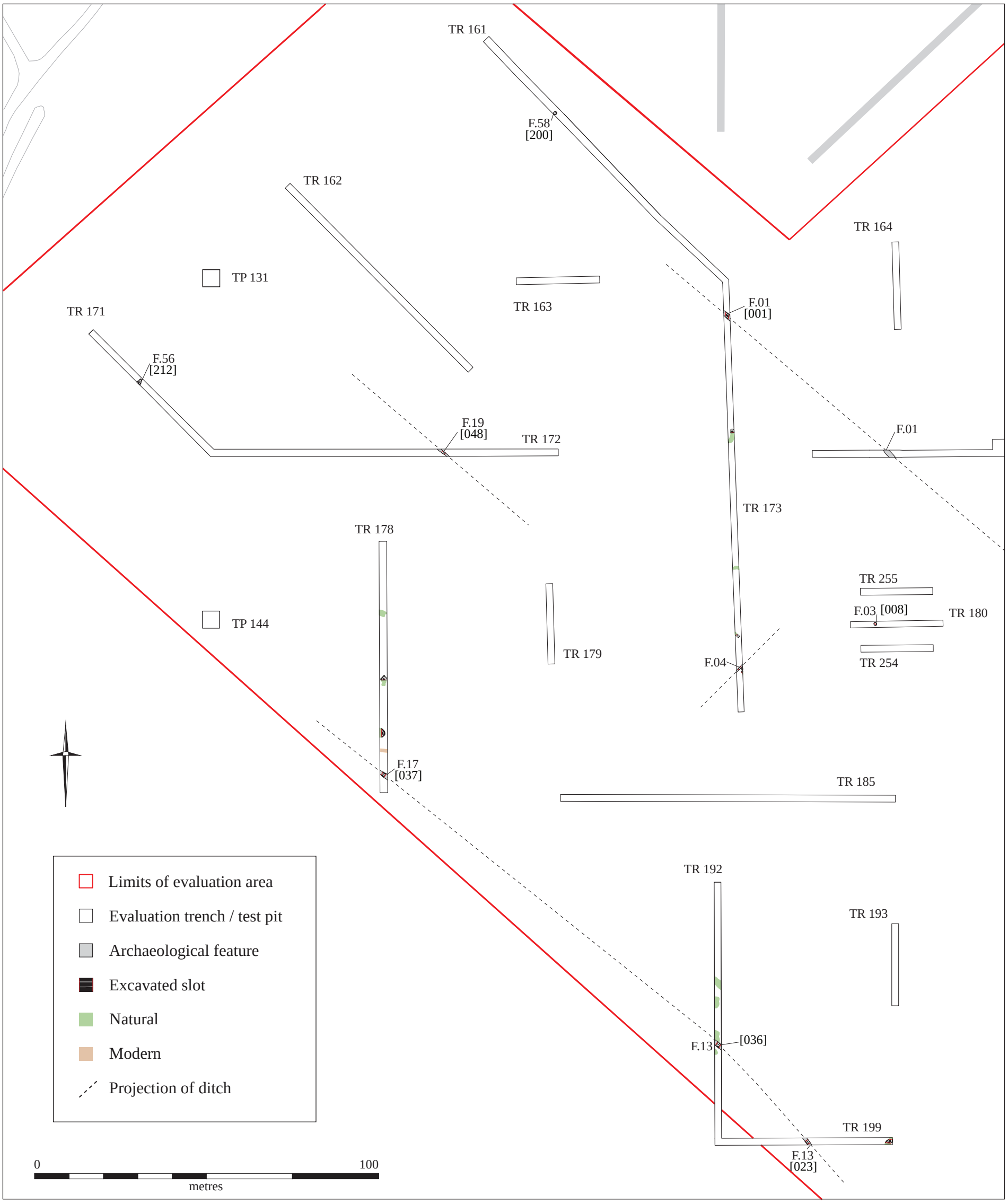


Figure 21. Archaeological Zone IX

Feature	Trench	Description
F.01	173,174	Middle Bronze Age (?) ditch
F.03	180	Late Neolithic pit
F.04	173	Middle Bronze Age (?) ditch
F.13/17	178, 192, 199	Middle Bronze Age (?) ditch
F.19	172	Middle Bronze Age (?) ditch
F.56	172	Buried soil-filled hollow with burnt stone
F.57	172	Undated pit/posthole
F.58	161	Late Neolithic pit

Table 1: Archaeological features in Zone IX

Two Late Neolithic pits (**F.03** and **F.58**) located some 175m apart were excavated in the north of Zone IX and produced finds assemblages including Grooved Ware pottery, worked flint and animal bone as well as fragments of burnt clay and burnt stone and flint (see Table 2, below). It is presently unclear whether the pits are isolated single features or potentially part of pit clusters as recorded on the O'Connell Ridge to the west (Evans and Tabor 2009). Judgemental trenches excavated either side of F.03 (Trenches 254 and 255) did not however, expose any further features.

	Pottery	Flint	Bone	Burnt Clay	Burnt Flint/Stone
F.03	23 (217g)	2 (31g)	3 (7g)		8 (819g)
F.58	6 (5g)	10 (80g)	1 (311g)	6 (10g)	11 (750g)

Table 2: Assemblage breakdown for Late Neolithic pits in Zone IX

Evidence of a fieldsystem extending across Zone IX- and indeed much of the *Long Holmes Terrace* – comprised a series of ditches on a northwest/southeast by southwest/northeast alignment. Four ditches were identified and recorded in six trenches, of which three were aligned northwest/southeast (**F.01**, **F.13/17** and **F.19**) and one southwest/northeast (**F.04**). All of the ditches contained sterile fills and none produced any finds or dating evidence (save for occasional residual flint); however, the ditches seem likely to have formed part of the wider network of fields/fieldsystems previously identified on the O'Connell Ridge to the west, which has been dated to the Middle Bronze Age (Evans and Tabor 2009). Furthermore, the fact that the uppermost fill of ditch F.01 was effectively comprised of the 'lower organic silt' – a blanket deposit recorded across much of the wider area and which potentially date to no later than the Late Bronze Age (see Boreham, above) – would appear to support a Middle Bronze Age attribution. Clearly by the Late Bronze Age the ditches had long silted up and the fieldsystem was no longer in use.

One further pit/posthole (**F.57**) and a buried soil-filled hollow (**F.56**) containing a concentration of burnt stone were also excavated in Zone IX. Neither yielded any dating evidence, although they seem likely to be contemporary with either the Late Neolithic or Middle Bronze Age activity in this zone.

In addition to the archaeological features frequent tree throws were identified across Zone IX and the wider *Long Holmes Terrace*. A selection were sample excavated although non produced any finds or significant quantities of charcoal.

Buried Soil Finds

Buried soil test points produced finds totals ranging from 0 to 4 with the highest concentrations around Trench 163. The overall Zone IX assemblage comprised nine flints and five fragments of burnt stone. None of the flint was closely chronologically diagnostic, but the assemblage is typical of Late Neolithic/Early Bronze Age technologies and ties in well with the feature-based evidence.

Zone X

To the southeast of Zone IX and also situated on the *Long Holmes Terrace*, an area of Neolithic and Bronze Age activity has been defined as Zone X. A total of four features (detailed in Table 3) were recorded while a relatively good buried soil survived over much of the area (Figure 22).

Feature	Trench	Description
F.49	216	Middle Bronze Age (?) ditch
F.50	201	Pit/hollow containing rough-out flint cores and Neolithic polished flint axe
F.51	210	Early Bronze Age hearth
F.52	210	Early Bronze Age pit

Table 3: Archaeological features in Zone X

Evidence of Neolithic activity in Zone X included a polished flint axe found together with a 'cache' of six roughed out flint cores in Trench 201 (**F.50**; see Figure 23). The group of flints appear to have been deposited in a shallow pit or hollow – although no clear evidence of this was recorded – and probably represent a 'cache' of raw material stored for future flint working (see Billington, below). It is also likely that the flint axe itself was effectively being recycled and was intended as raw material for future working, although a 'ritual' element to its deposition cannot be ruled out.

A cluster of features was also recorded in Trench 210 and the adjacent judgemental Trench 272. Here, a pit (**F.52**) containing three worked flints, which have been dated broadly to the Late Neolithic/Early Bronze Age, was recorded together with the remains of a potentially contemporary 'hearth' (**F.51**). This feature comprised the remains of two burnt timbers/logs situated within a slight hollow within the surface of the buried soil and overlain by a thin deposit of scorched earth (Figure 24). Finds recovered from the hearth were limited to a single fragment of burnt flint. In addition, a possible pit, which was not recorded in detail, was exposed *c.* 7m to the west of F.51 in Trench 272 and suggests further remains in the vicinity.

Finally, a single ditch, which once again seems likely to form part of a wider fieldsystem, probably dating to the Middle Bronze Age, was recorded in Trench 216. The ditch (**F.49**) was aligned northwest to southeast and contained a sterile fill with no dating evidence or finds.

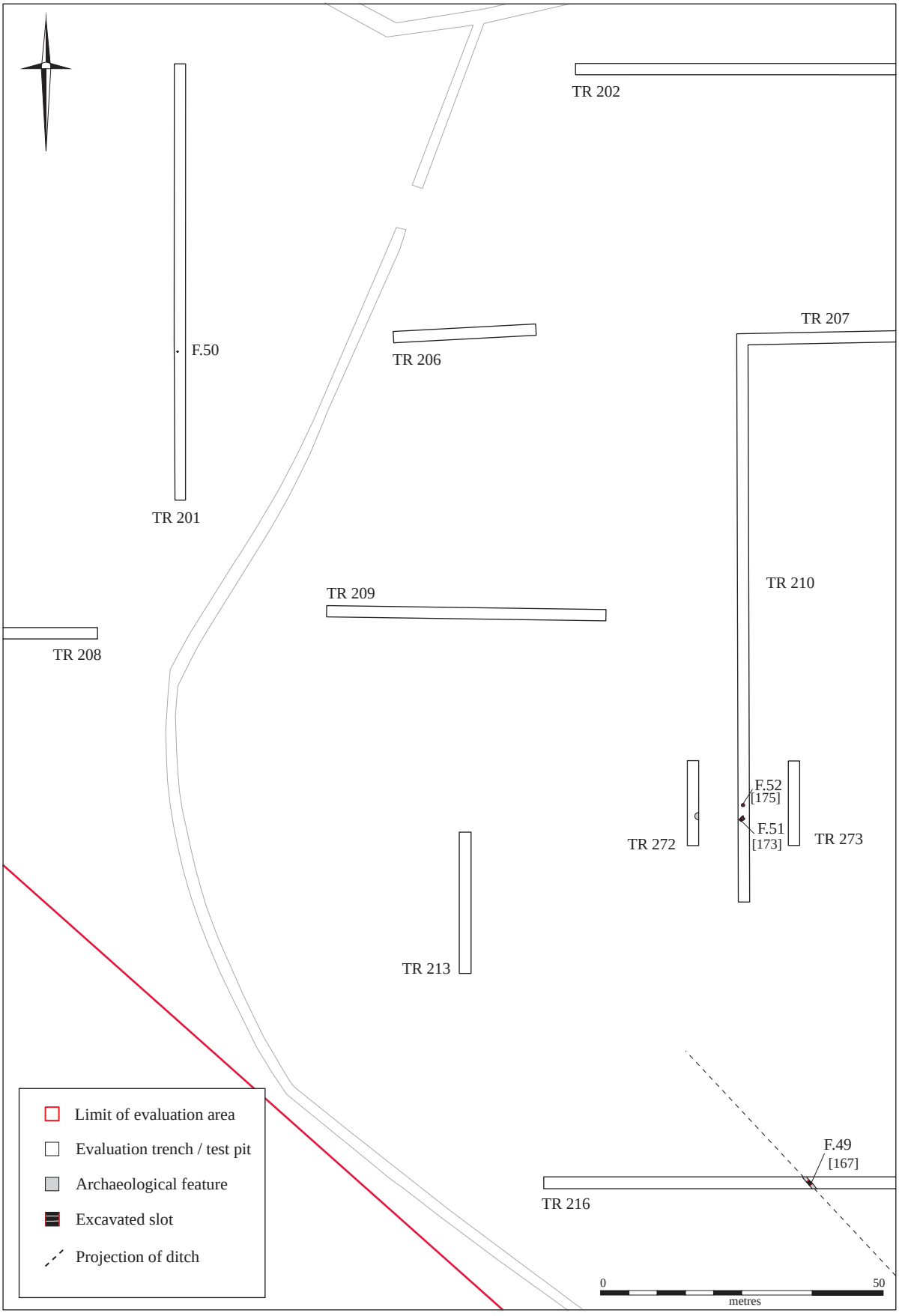


Figure 22. Archaeological Zone X

Figure 23. Photographs of F.50, the flint ‘cache’.

Figure 24. Photograph of hearth F.51 in Zone X (above) and ditch and bank F.34 in Zone XI (below)

Buried Soil Finds

Buried soil test points in Zone X produced comparatively high values in the vicinity both to the west of F.50 and in the vicinity of F.51 and F.52 providing further evidence of activity in this area. Of the assemblage (flint x13, pottery x3, animal bone x3 and burnt stone x5), whilst the flintwork was once again generally typical of Late Neolithic/Early Bronze Age technologies, Early Neolithic elements – pottery sherds and a serrated flint blade – were also present and attest to earlier activity.

Zone XI

A concentration of pits/postholes together with a further ditch(es) evidently related to the wider fieldsystem marked a third archaeological zone on the *Long Holmes Terrace* (see Table 4, Figure 25).

Feature	Trench	Description
F.07	226	Middle Bronze Age (?) ditch
F.18, 20-25	220	Cluster of possible postholes
F.28	220	Neolithic (Peterborough Ware) pit
F.34	221, 222	Middle Bronze Age (?) ditch

Table 4: Archaeological features in Zone XI

A cluster of pits/postholes together with a single clearly defined pit were recorded in Trench 220 and potentially represent a relatively discrete Neolithic occupation site. While only one of the seven pits/postholes (**F.18** and **Fs. 20-25**) produced a single worked flint, the pit (**F.28**) yielded 11 sherds (44g) of Peterborough Ware pottery, as well as a single worked flint and a fragment of burnt stone. Judgemental trenches (Trenches 252 and 253) excavated immediately adjacent to Trench 220, to the west and east respectively exposed further features, although with the exception of one possible pit (unexcavated), all were considered likely to be natural/tree throw-related.

Evidence of the (presumed) Middle Bronze Age fieldsystem in this area of site comprised a ditch and associated up-cast bank, which was recorded in Trenches 221 and 222 **(F.34**, see Figure 24) and Trench 226 (**F.07**). Interestingly, the ditch, which was aligned southwest to northeast, was not recorded in Trench 220 (which intersected its projected line) suggesting either the presence of an entrance or that the boundary was discontinuous. Once again, none of the excavated ditch sections yielded any dating evidence, although a small number of fragments of burnt flint and stone as well as a single worked flint were recovered; all are considered likely to be residual.

A number of tree throws, which were abundant in Zone XI, were sample excavated due to their charcoal rich fills – potentially a result of the evident prehistoric occupation in this area of site – none, however, produced any evidence of utilisation and artefacts recovered were limited to a single struck flint.

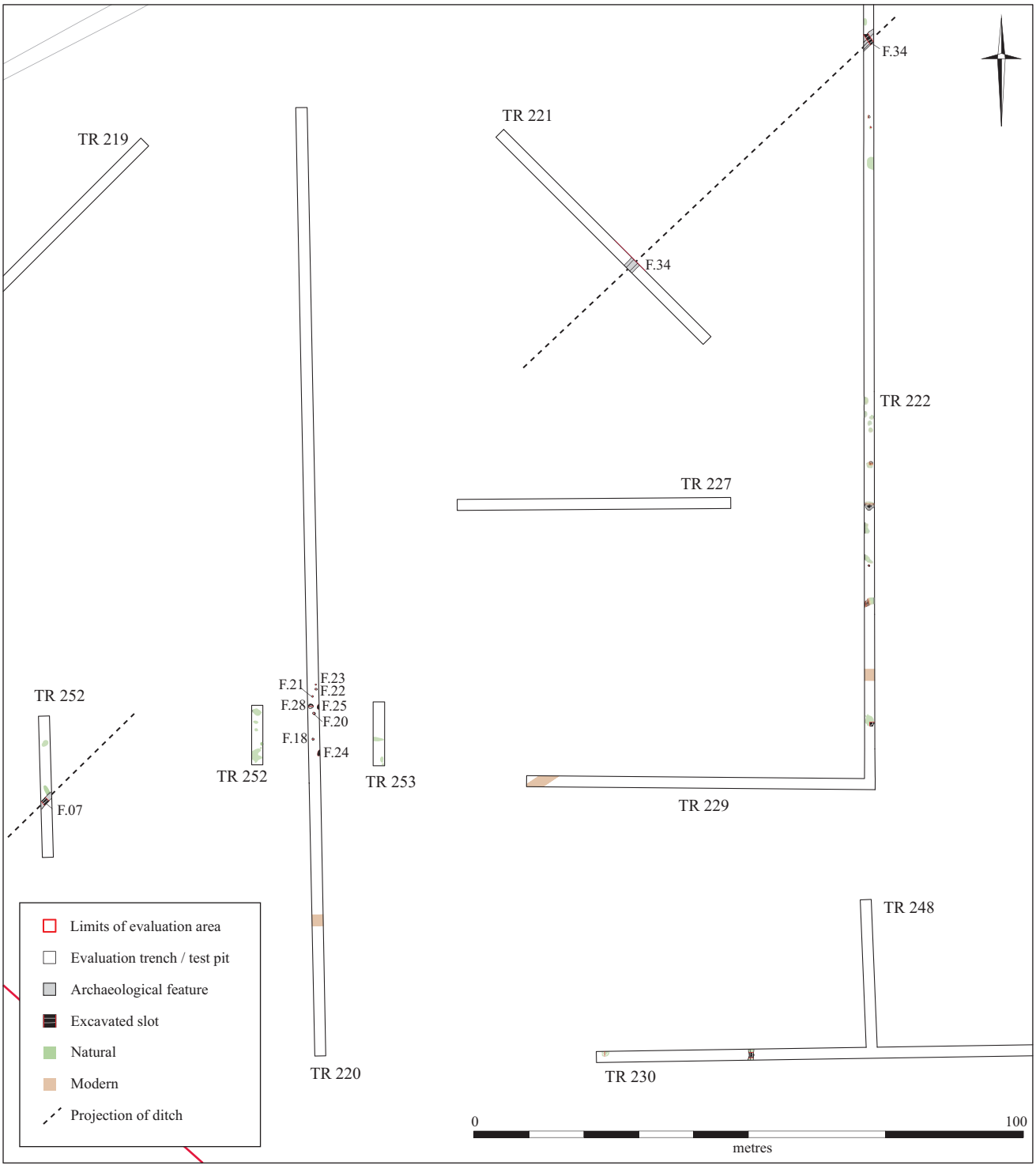


Figure 25. Archaeological zone XI

Buried Soil Finds

A number of buried soil test points in Zone XI located around the Neolithic features in Trench 220 produced comparatively high numbers of finds with up to six per sample. The Zone XI assemblage comprises 11 struck flints, four sherds of pottery and four fragments of burnt stone. Much of the flintwork, including a chisel arrowhead, appears to reflect the same Peterborough Ware associated Neolithic activity as the features in Trench 220, although, as with Zone X, the flint and pottery assemblage also has an earlier Neolithic component.

Zone XII

Located in the northwest of the evaluated area on the *Shelfords Terrace*, Zone XII differs slightly in character from Zones VIII-X on the *Long Holmes Terrace* and has been defined based largely on the presence of Early and Middle Bronze Age features (see Table 5, Figure 26).

Feature	Trench	Description
F.08, 09, 10	150	Early Bronze Age (?) pits (unexcavated)
F.39	134, 138, 145, 262	Middle Bronze Age (?) ditch
F.42/43	131, 258	Metalled surface with bronze palstave
F.44	258	Wooden stake

Table 5: Archaeological features in Zone XII

In the south of Zone XII on the southern edge of the *Shelfords Terrace*, a cluster of Early Bronze Age pits was identified in Trench 150. Up to three pits (**Fs. 08**, **09** and **10**) were recorded; however, none could be excavated due to the depth of the trench and high water levels, which due to its location immediately adjacent to a major dyke/drain, quickly flooded the trench. Nevertheless, a single sherd of Collared Urn pottery was recovered from the surface of F.08 providing an Early Bronze Age date for the features.

To the north, a second concentration of features was located in close proximity to the as yet unexcavated Site III barrow to the west (see Vander Linden and Evans 2008). In Trenches 131 and 258 a 'metalled' surface comprising a thin layer of gravel and pebbles was recorded (**F.42/43**). The surface was approximately linear in form measuring *c.* 3.25m wide by at least 4m in length and appeared to be situated on a low bank, although no clear deposit of made ground/bank material could be distinguished from the surrounding sandy silt deposit. Careful cleaning and removal of the organic silt layer, which sealed the metalling revealed a Middle-Late Bronze Age palstave sitting on its surface along the southern edge/face (see Figure 27). In addition, judgemental Trench 258 exposed a single wooden stake (**F.42**) driven into the underlying sandy silts and gravel immediately to the south of the metalled surface (see Figure 28).

Finally, a northwest to southeast aligned ditch (**F.39**) with associated up-cast bank was exposed in Trenches 134, 138, 145, and 262. Once again, although devoid of finds or dating evidence it seems most likely that this boundary belongs to the wider network of Middle Bronze Age fields/fieldsystems.

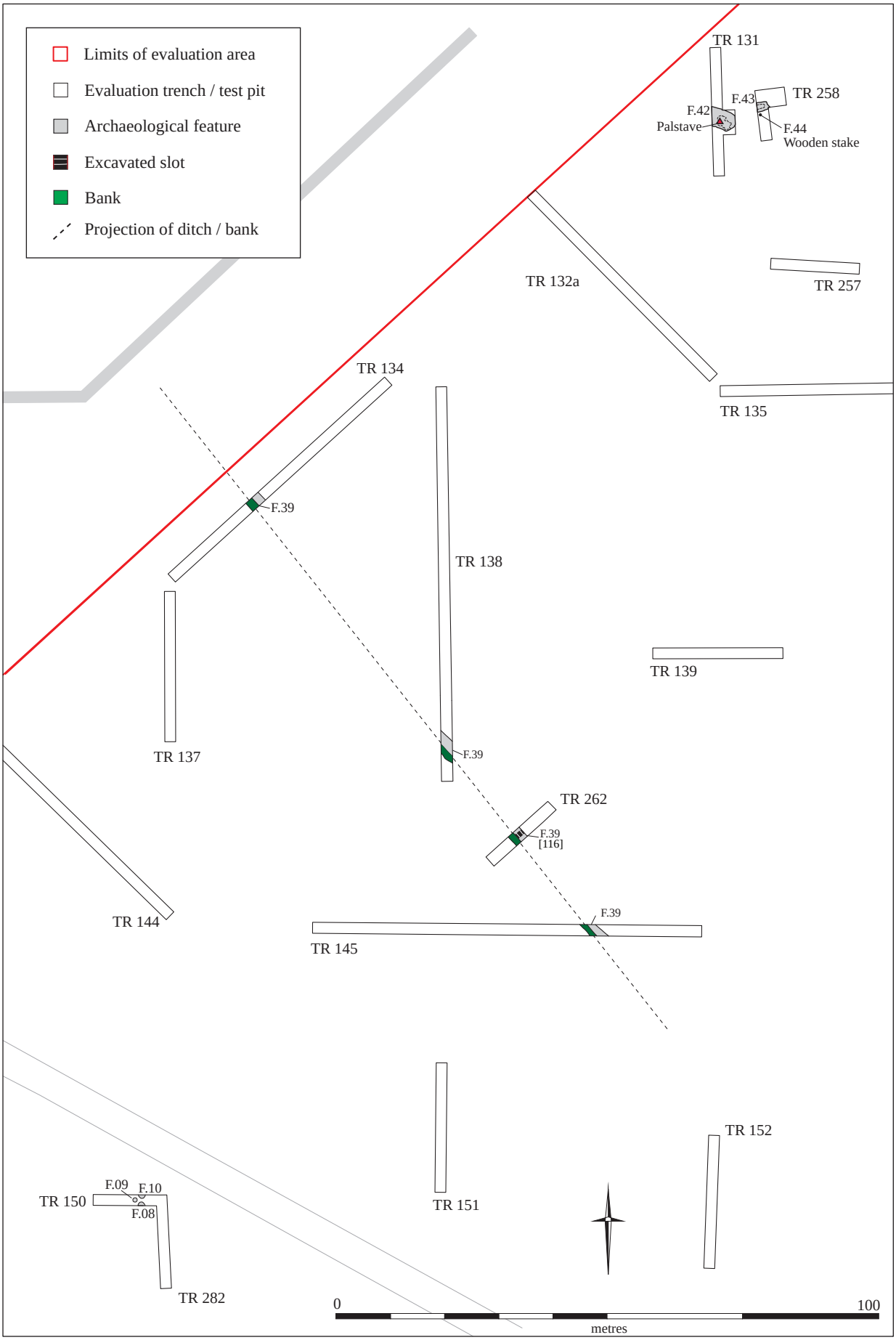


Figure 26. Archaeological Zone XII

Figure 27. Photographs of metalled surface F.42 (above) and bronze palstave (below).

Figure 28. Photograph and plan of Wooden stake F.44

Buried Soil Finds

No clearly defined buried soil horizon was present in Zone XII and deposits appeared to be highly 'alluviated'/saturated. Test point sampling produced just two worked flints from the entire area.

Zone XIII

This archaeological zone has been defined on the basis of just one isolated pit (**F.61**), located on the southern edge of *Shelfords Terrace* in Trench 154 (Figure 29). The pit measured *c.* 3m in diameter and extended beyond the edge of the trench to the east. Due to the depth of the deposits in this area of site the pit could not be excavated and therefore remains undated. However, the pit appeared to be sealed by the lower organic silt and is likely therefore to predate the Late Bronze Age.

No buried soil horizon was recorded in Zone XIII and, therefore, test point sampling was not undertaken.

Zone XIV

Located on the eastern end of the *Shelfords Terrace*, features in Zone XIV comprised a burnt stone spread adjacent to a potentially associated pit recorded in Trenches 280 and 278 respectively (Figure 29).

Feature	Trench	Description
F.59	280	Burnt stone spread
F.60	278	Pit (unexcavated)

Table 6: Archaeological features in Zone XIV

The burnt stone spread (**F.59**) was a maximum of 0.05m thick and measured 6.5m north-south, extending beyond the trench to the west and east. The deposit was situated directly on the sandy silt 'alluvial' deposit, sealed by the organic silt unit and appeared to be almost entirely comprised of burnt stone (rather than burnt flint) within a charcoal rich silty matrix. Occasional small fragments of burnt clay were also noted within the deposit. Associated artefacts were limited to a fragment of animal bone, which could not be recovered due to its poor preservation. To the west, pit **F.59** (4.5m x 2.25m) was not excavated due to the saturated state of the sands and gravels in this part of site. It was, however, clearly sealed by the lower organic silt and therefore prehistoric in date, and seems likely to be associated with the burnt spread.

No buried soil horizon was recorded in Zone XIV and, therefore, test point sampling was not undertaken.

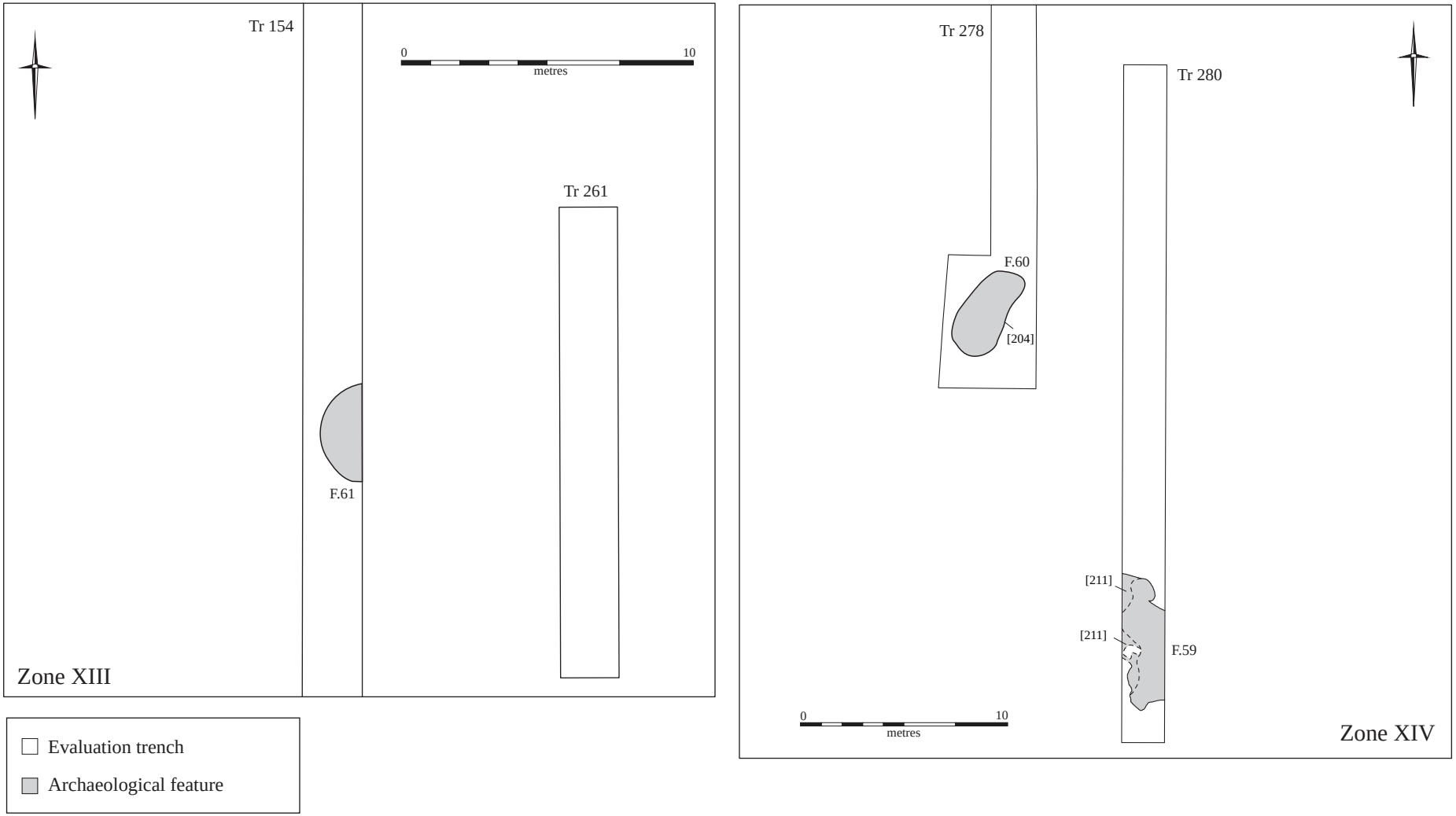


Figure 29. Archaeological Zones XIII and XIV

Zone XV

The final archaeological zone identified was located on *Bridge Farm Terrace* in the east of the evaluated area. A total of four features, once again including elements of a possible Bronze Age fieldsystem were recorded (see Table 7, Figure 30).

Feature	Trench	Description
F.53	240	Middle Bronze Age (?) ditch
F.54	238	Pit (undated)
F.55	238	Middle Bronze Age (?) ditch
F.62	240	Trace of metalled (?) surface

Table 7: Archaeological features in Zone XV

Two parallel northwest to southeast aligned ditches, **F. 53** and **F.55,** were located in Trenches 240 and 238 respectively. Finds recovered were limited to a single fragment of animal bone from F.53 and neither ditch can be confidently dated. While a trace of the lower organic silt was recorded in the upper profile of both ditches and suggests a pre-Late Bronze Age date is most likely, their proximity to a series of cropmarks, which are characteristic of Iron Age and Roman occupation suggest a later date is also possible.

Two further features recorded in Zone XV comprise a trace of a possible metalled surface (**F.62**) recorded immediately to the west of ditch F.53 and a small pit to the north of ditch F.55 (**F.54**). Surface F.62 was recorded over 7m east-west and extended beyond the trench to the north and south. It comprised a layer of gravel/pebbles situated directly on the underlying sand and sealed by buried soil suggesting the surface may have originally been laid to consolidate an area of soil erosion before being sealed by a later buried soil. Alternatively, it is not impossible that the layer has effectively been 'moved down' through the soil profile by bioturbation. A single worked flint was recovered from the surface, although it seems likely that the flint materially formed part of the surface rather than representing activity associated with it.

Finally, pit F.54, to the north of ditch F.55, was cut through the lowest layers of the organic silt unit, which 'dipped' into the upper profile of ditch F.55 and this together with the presence of preserved waterlogged wood fragments in its base suggest that it was dug in a wet landscape and in terms of the chronology of the evaluated area is a comparatively 'late' feature. Amongst the wood fragments was a length of dowel made from a quarter split log (see Taylor, below) No firm dating evidence was recovered, but it seems likely to be later prehistoric.

Buried Soil Finds

A thin and rather patchy buried soil was recorded in Zone XIV. Three test points yielded five finds, with a 'high' of three finds per test point, at the southern end of Trench 238. The small assemblage comprised burnt stone/flint together with one worked flint and, although providing further evidence of activity on the Bridge Farm Terrace, gives no indication of its date.

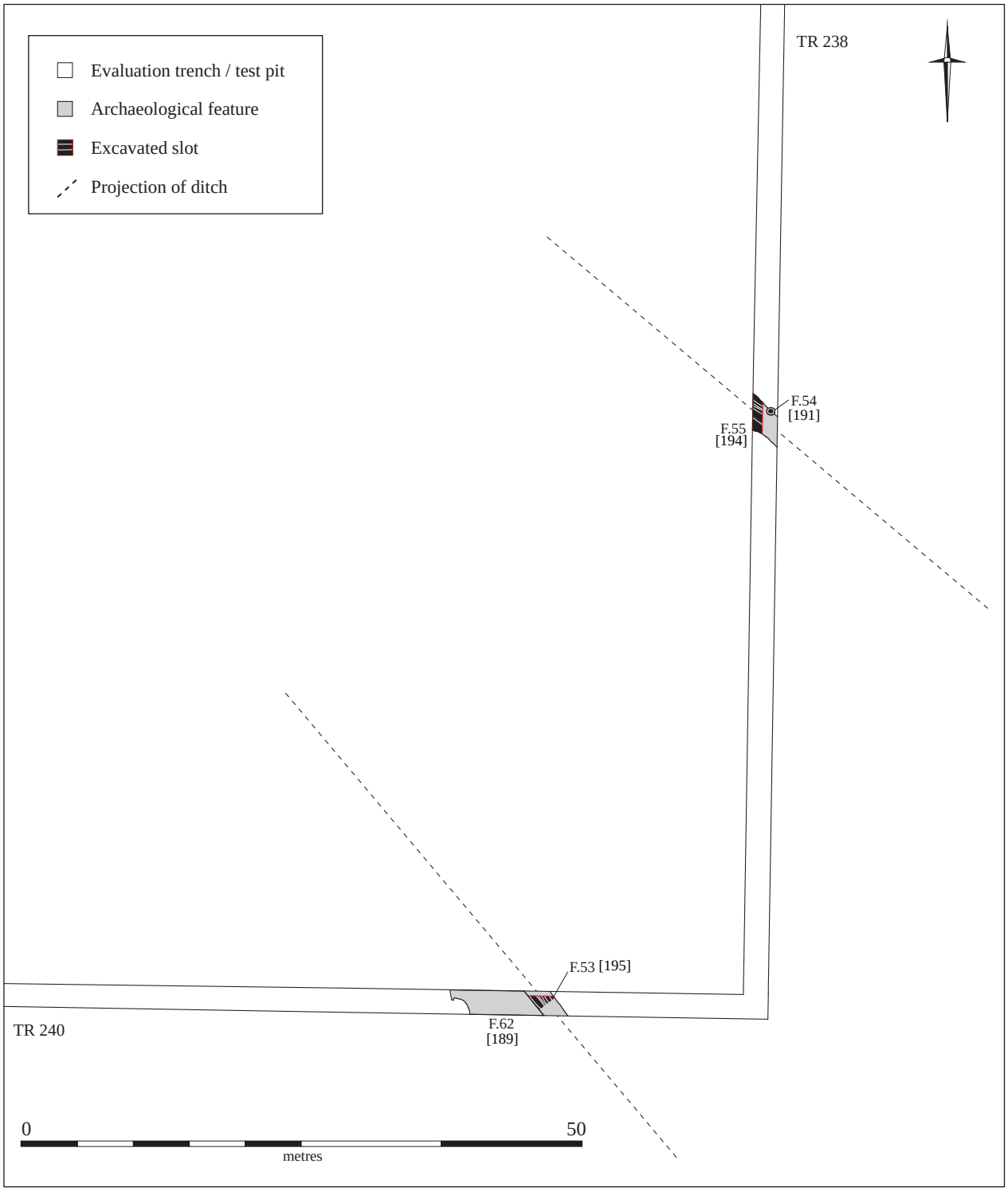


Figure 30. Archaeological Zone XV

Trench 244

Although not defined as an archaeological zone – and entirely lacking in any material culture – Trench 244 is worthy of mention due to the presence of a gravel layer sitting directly upon the underlying sandy silt deposit (see Boreham, above). Initially identified as a potential metalled surface a 2x2m sample of the layer was hand cleaned and two additional judgemental trenches (Trenches 284 and 285) were excavated in an attempt to determine its extent (*c.* 55m north-south and at least 35m east-west). While it remains possible that this layer is a deliberately 'laid' metalled surface, it was found to be poorly defined and inconsistent, and the possibility that it could be the remains of a stream bed or other naturally derived feature should also be considered.

The Post-Medieval Landscape

Post-Medieval/modern ditches, which were 'cut' from just below the topsoil, were recorded in 16 trenches. All were machine excavated and therefore the date of their backfilling has not been closely determined; having said that, the presence of plastic in many suggests a number were open until relatively recently. The location of all of the ditches corresponds closely to the 1880 First Edition Ordnance Survey map (Figure 31), which show the area sub-divided into many more fields than at present; a field layout that persisted until the second half of the 20th century. Most appear to be minor field boundaries although a ditch recorded in Trenches 148, 149, 168, 175 and 183 clearly relates to the *Fifteenth Public Drain* running adjacent to *White's Bank*; no trace of the bank itself was recorded.

A pit (**F.46**), with timber revetment along one edge, recorded in Trench 154 also dated to the post-Medieval period. The revetment comprised 13 vertical posts and two horizontal sawn planks and had evidently been constructed in order to stabilise and provide access to the northern edge of the pit (Figure 32). It was evidently a rather *ad hoc* feature and included in its construction at least two timbers salvaged from a local vernacular building, probably a barn (see Newman and Tabor, below). Behind the revetment a dump of gravel effectively created a solid platform at the pit's edge. The pit itself (2.7m x 0.8m x 0.55m deep), appeared to be fed by a shallow ditch (**F.47**), which corresponds to a boundary ditch marked on the 1880 Ordnance Survey map. Finds recovered from pit F.46 and ditch F.47 include fragments of two late 19th/early 20th century glass bottles, indicating that the feature was probably backfilled during - and is unlikely to substantially predate - this period. The exact function of F.46 is unclear, although the revetment/platform was clearly intended to provide access to the pit, probably to draw water.

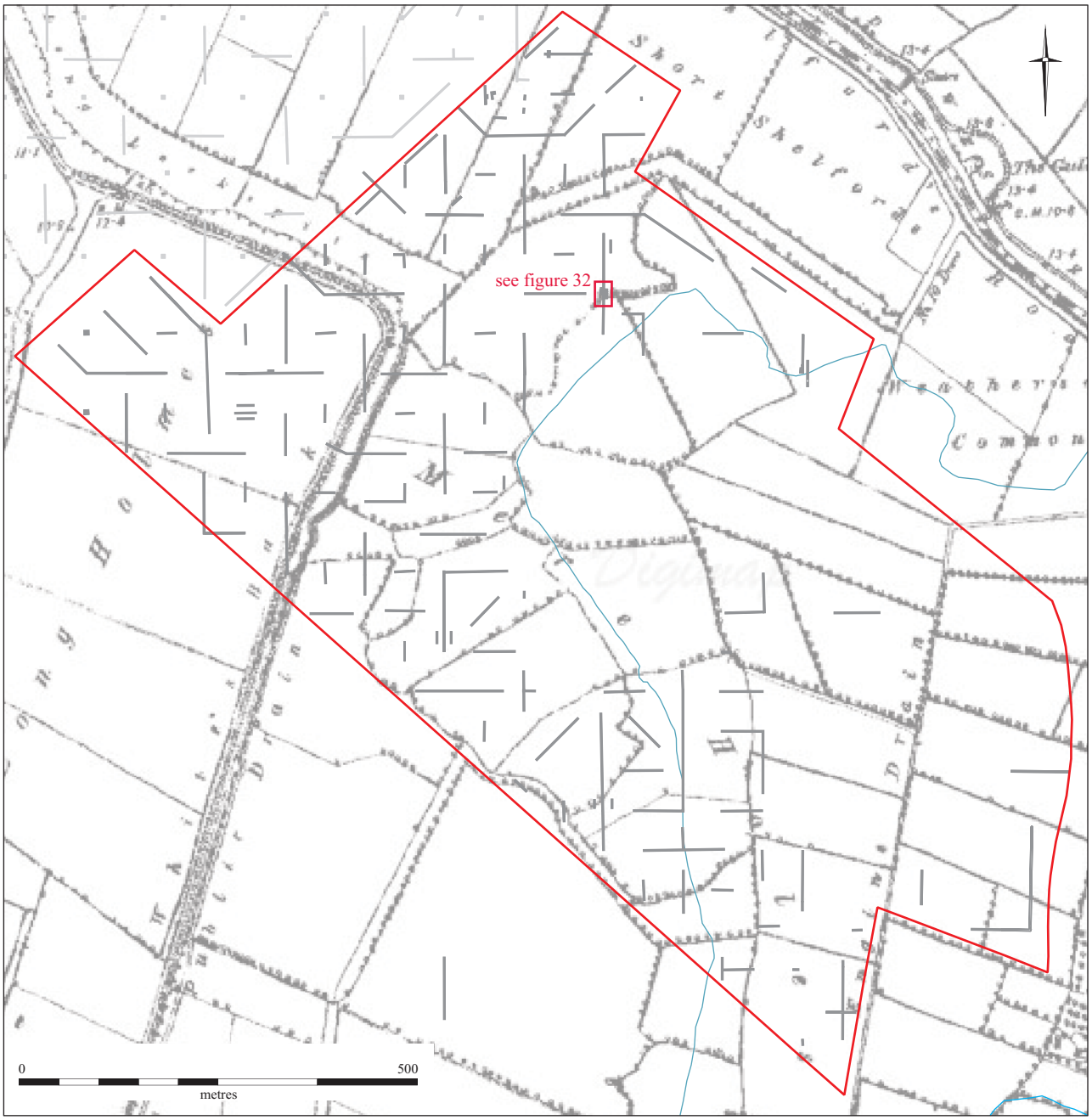
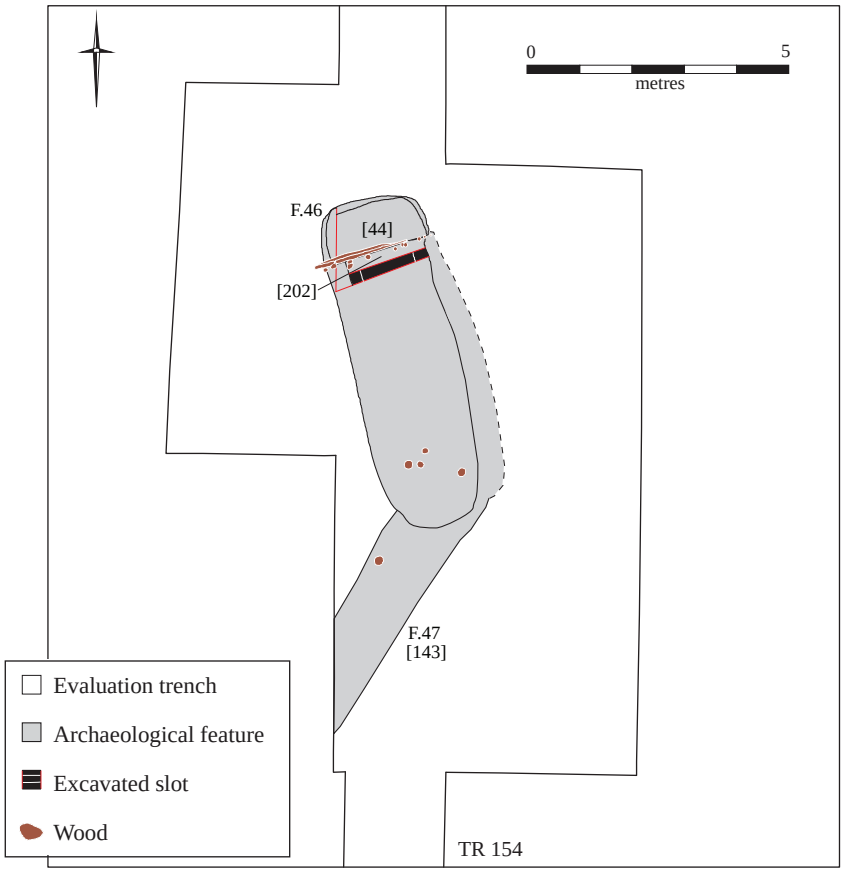


Figure 31. 1st edition Ordnance Survey map showing late 19th century land division



Photograph looking north

Figure 32. Post Medieval pit (F.46) with timber revetment (Trench 154)

The 'Cursus' Investigations

To the south of the main evaluation area two additional trenches targeted a suspected cursus monument visible as a cropmark on aerial photographs. Trench 263 was located at the western end of the suspected feature, which appears on aerial photographs to extend for a distance of over 1km east to west, while Trench 283 was located centrally. In the event neither trench produced any evidence of a cursus, although Trench 263 did expose a single ditch. The ditch (**F.48**) was aligned northwest/southeast and yielded a single abraded sherd of Beaker pottery, which seems likely to have been residual. Both its alignment, and size (0.97m wide x 0.55m deep), as well as its location suggest the ditch is not the suspected cursus and it probably represents part of a Bronze Age fieldsystem.

SPECIALIST STUDIES

The Flint – *Lawrence Billington*

A total of 73 worked flints and 41 (283g) unworked burnt flint were recovered from the excavations (Table 8). Despite its small size, the worked flint assemblage is of considerable interest, demonstrating Neolithic and Early Bronze Age activity with an apparent complete absence of earlier, Mesolithic, material. Of special interest was the recovery of a cache of six relatively large minimally worked cores together with a polished flint axe, deposited in a small pit, F.50. Whilst the majority of the assemblage was recovered from buried soil sampling, several discrete assemblages of flintwork were recovered from the fills of several Neolithic/Early Bronze Age pits.

	features	buried soil sampling	stray finds	**Totals**
chip		4	1	5
flake	12	23	1	36
narrow flake		4		4
blade	1	1		2
blade-like flake	1	2		3
end scraper	2	1		3
horse shoe scraper	2			2
piercer			1	1
chisel arrowhead		1		1
flint axe	1			1
retouched flake	2	1		3
serrated flake/blade		3		3
Bifacially worked fragment	1			1
multiple platform core		1		1
core fragment		1		1
minimally worked core	6			6
totals	**28**	**42**	**3**	**73**
burnt unworked flint (no.)	35	6		41
burnt unworked flint (g)	247	36		283

Table 8. Basic quantification of the flint assemblage.

Buried Soil Sampling

A total of 42 worked flints were recovered from 27 individual test points (Table 9). The assemblage is generally in very good condition and recortication (patination) is entirely absent.

Test Point	chip	flake	narrow flake	blade	blade like flake	end scraper	chisel arrowhead	retouched flake	serrated flake	serrated blade	multiple platform core	core fragment	**Totals**
113		2											2
114						1							1
117		1											1
132	1	1											2
146		1											1
152		1											1
157		1											1
161	1												1
165		1	1										2
168		4											4
174		1											1
176	1							1					2
180										1			1
181		1					1						2
182		1											1
203		1											1
204					1								1
205		1											1
207			1								1		2
208		1			1							1	3
209				1									1
211		1	1										2
215									1				1
216	1	1	1										3
222		2								1			3
223		1											1
totals	4	23	4	1	2	1	1	1	1	2	1	1	42

Table 9: Worked flint from buried soil sampling.

The assemblage is overwhelmingly dominated by flake based material typical of later Neolithic/Early Bronze Age technologies and includes a high proportion of retouched pieces, (6 pieces, 14% of the assemblage). The assemblage is entirely typical of the later Neolithic and Early Bronze Age lithic material recovered from earlier phases at Over, but is remarkable for the complete absence of demonstrably Mesolithic material. This stands in very stark contrast to the buried soil derived assemblages from the Godwin and O'Connell Ridges to the northwest and raises the strong possibility that Mesolithic activity was restricted to certain landscape zones. Early Neolithic material is also poorly represented in the assemblage, although this paucity is a feature of almost all of the assemblages from the Over investigations, contrasting with the evidence for earlier Neolithic settlement across the river at the Barleycroft Paddocks (Evans *et al*. 1999). This said, several of the more blade like and narrow flake removals may well relate to earlier Neolithic activity, as may the serrated blades,

although these also form a minor component of later tool inventories. Although Early Bronze Age flintwork is almost certainly present within the assemblage, both the technological characteristics and character of the retouched tools suggest a high proportion of the assemblage is of later Neolithic date. This is seen most clearly in the case of the chisel arrowhead recovered from Test Point 181 but is also evinced by widespread evidence for levallois-like core technologies in the form of flakes with finely faceted striking platforms and multi directional dorsal scars (Ballin 2011). Flint deriving from primary chalk deposits was also relatively well represented, a characteristic of later Neolithic, Grooved Ware associated, assemblages from elsewhere in the Over environs and the southern and western fen edge more generally (e.g. Brown 1996).

Cut Features

A total of 28 worked flints were recovered from the fills of cut features. The most important of these are the seven flints recovered from cache F.50, discussed in detail below. However, several pits also contained small but coherent assemblages of worked flint, in most cases associated with other contemporary finds.

A pit containing sherds of Peterborough Ware, F.28, also contained a single worked flint, a relatively large flake with small two areas of invasive retouch this piece has clearly been used as a cutting tool. The excavation of posthole F.20, situated close to F.28, yielded a single tertiary blade that may be broadly contemporary with the pottery and flint recovered from F.28.

Flint assemblages were also recovered from two Grooved Ware associated pits. F.03 contained a fine extended end scraper and a flake that appears to have been struck along the edge of a discoidal or levallois like core. F.58 contained the largest flint assemblage from any of the cut features, ten pieces in total. The majority of these were small waste flakes but also included two fine scrapers and a less formally retouched flake.

A further pit, F.52, was not associated with any pottery but contained three flints including a small horseshoe scraper manufactured on a blank derived from a primary chalk source and two flakes, one of which had been heavily utilised. Although not strongly diagnostic, this material is clearly of late Neolithic or Early Bronze Age date.

The remaining flints were recovered as pieces probably incidentally caught up in the fills of the Middle Bronze Age fieldsystem ditches and a single flint was recovered from the buried soil derived fill of tree throw F.31. These flints are comparable to the late Neolithic/Early Bronze age flints recovered during the buried soil sampling and the only notable piece is a fine thin flake fragment from ditch F.19. This piece has a small amount of invasive bifacial retouch and may be a fragment of a chisel or oblique arrowhead of late Neolithic date.

Feature Type	Late Neolithic pits		Late Neolithic/Early Bronze Age pit	Peterborough Ware Pit	flint cache	other features	Totals
Feature No.	**3**	**58**	**52**	**28**	**50**	**31**	
flake	1	7	2			2	**12**
blade						1	**1**
blade like flake						1	**1**
end scraper	1	1					**2**
horseshoe scraper		1	1				**2**
polished flint axe					1		**1**
retouched flake		1		1			**2**
bifacially worked fragment						1	**1**
minimally worked 'pre-core'					6		**6**
totals	**2**	**10**	**3**	**1**	**7**	**1**	**28**

Table 10. Worked flint from cut features.

Cache F.50

A cache of six partially worked cores together with a single polished flint axe were recovered from a small pit in Trench 201. The flints were tightly packed into the pit and clearly represent a deliberate and very unusual deposit of flintwork.

The polished flint axe (SF 2) has a maximum length of 144mm, width of 54mm, thickness of 24mm and weighs 204.3g. The axe is made on a dark brown flint with large areas of lighter brown coarse grained inclusions. The blank used for the axe is somewhat irregular with an asymmetrical cross section and is distinctly curved along its longitudinal axis. The irregularity of the flaked blank has affected the grinding and polishing of the axe, only at the cutting edge is the axe completely polished, with no traces of remnant flake scars. Elsewhere, polish is largely confined to the ridges (*arrises*) between flake scars. Post-polish damage or reworking is evinced by a single small flake removed from the cutting edge, which could have been detached during use rather than being deliberately struck.

The six minimally worked cores or ’pre-cores’ (SFs 2-8) all take the form of partially worked nodule fragments retaining substantial areas of cortex. The pieces vary in size, the largest, SF 50, weighs 699.7g, whilst the smallest, SF 4, weighs 186.5g; the total weight of the 6 cores is 2426.8g. The cores all appear to derive from sub-rounded nodules of flint, and at least three individual nodules are represented. SFs 3, 6 and 8 share a very similar dark grey/brown flint, mottled with patches of lighter browns and greys. The cortex on these three pieces is also similar, generally thin (1-4mm thick), but relatively unweathered and is possible that they all derive from a single large nodule. The remaining three cores all appear to derive from different nodules and have generally thinner and more abraded cortical surfaces. Two of these cores, SFs 4 and 5, have naturally fractured non-cortical surfaces. The evidence for working on the cores appears to be largely restricted to removing some cortical surfaces and preparing the pieces for more intensive reduction, although a few fine, often blade like or narrow, flake removals have been made from most of the cores. A particular feature of all the cores is the careful preparation and strengthening of striking platform edges by heavy dorsal trimming, although no platforms have elaborate preparation such as faceting.

The sources of the flint itself may well have been varied. The raw material represented by SF 3, SF 6 and SF 8, with its relatively unabraded cortex and nodular form could well have derived directly from primary chalk deposits. A very similar flint is described by Reynolds and Conneller (2006) in their discussion of an exceptionally large core recovered from a buried soil deposit upstream at Hill Row Doles, Haddenham, who suggest this mottled brown flint is available in the Cambridgeshire chalk some 20km south of this part of the lower Ouse Valley. The more abraded cortex and natural, thermally fractured surfaces on two of the remaining cores suggests they are more likely to derive from secondary flint deposits, perhaps more local terrace gravels or glacial deposits.

Although the presence of a polished flint axe very clearly indicates a Neolithic date for the deposit of flintwork it is difficult to suggest a more precise date than this. Although the blade like character of some of the removals on the cores and the extensive use of platform edge trimming are perhaps more typical of earlier Neolithic technologies they are by no means absent in the later Neolithic. Similarly, although the all-over polishing and relatively broad butt of the polished axe are features commonly seen in 'earlier' axes (Manby 1979), considerable uncertainty still surrounds the chronology and typology of polished axes (see Pitts 1996).

Deliberate caches of flintwork are reasonably well documented in the literature on Neolithic Britain. Pitts has comprehensively reviewed caches containing Neolithic flint and stone axes, concluding that the motives for burying axes and other associated cached artefacts were varied, ranging from a functional concern with retaining 'quarry moisture' in flints destined for future use, to the ritualised deposition of lithic material as a votive offering or sacrifice (1996: 339-342). The composition of the Over cache is unusual in contrast to those collated by Pitts, where the vast majority of caches consist only of axes or, more rarely, axes associated with other bifacially worked tools such as discoidal knives (as at Great Baddow, Essex, and Two Mile Bottom, Suffolk). In light of the presence of the partly worked cores in the Over cache it would be easy to regard the deposit as a cache of raw material that was intended to be recovered for later use. In this context it is worth noting the evidence for the re-use of polished axe-heads as cores for flake production seen locally in Neolithic contexts, as in the Grooved Ware associated assemblage of flintwork from Over Site II (Evans and Tabor 2010b) Clearly the cache represents a large and valuable body of raw material, weighing over 2.5kg, in an area where good quality flint is very scarce and average core weights from broadly contemporary domestic sites are well under 50g. Conversely, the very value of the raw material may have made it an appropriate body of material for votive/sacrificial deposition.

Discussion

The flint assemblage from the 2012 evaluation clearly demonstrates Neolithic and Early Bronze Age activity broadly comparable to that seen in earlier phases of work at Over and the relatively small quantities of Neolithic and Early Bronze Age flint, both from buried soil deposits and cut features, are entirely typical of the material generated by earlier phases of work. The absence of Mesolithic material from the assemblage is of considerable interest considering its ubiquitous presence on the sandy ridges to the northwest and suggests that the terraces away from the river may

have been very much peripheral to Mesolithic activity and occupation in the valley. The flint cache is of considerable interest and is without direct parallel in the local area. Whatever the underlying motives for its deposition, this assemblage potentially provides a valuable insight into the scheduling and organisation of raw material procurement and transport in the area. As such, a more exhaustive review of the literature would be beneficial in placing the cache in its local and regional context.

Prehistoric Pottery - *Mark Knight*

The prehistoric pottery assemblage comprised 50 sherds weighing 315g (MSW 6.3g). The assemblage included a few large, relatively fresh pieces, alongside multiple smaller abraded fragments. Overall the condition was good and the collection incorporated many diagnostic elements together with 5 rims, 2 bases and 15 decorated sherds. Six different fabric types were identified, and all but one (Fabric 6) contained grog as a principal opening material.

Feature	Context	Qty.	Weight	Fabric	Type
3	9	23	217g	1, 2	*Grooved Ware*
8	19	1	24g	5	*Collared Urn*
28	66	11	44g	3	*Peterborough Ware*
48	149	1	3g	4	*Beaker*
58	199	6	5g	2	*Grooved Ware*
	TP 172	5	2g	6	*Early Neolithic*
	TP 208	2	18g	6	*Early Neolithic*
	TP 215	1	2g	3	*Peterborough Ware*
Totals:		*50*	*315g*	*6*	

Table 11: Assemblage Breakdown.

Five different pottery types were identified: Early Neolithic (Fabric 6); Peterborough Ware (Fabric 3); Grooved Ware (Fabric 1 & 2); Beaker (Fabric 4) and Collared Urn (Fabric 5). The largest component was Grooved Ware, which made up 58% of the total number and 69% of the total weight. Peterborough Ware represented the next largest constituent (22% by number and 14% by weight); the smallest comprised single sherds of Beaker and Collared Urn.

Fabric	Description
1	Medium hard with frequent medium-large GROG and occasional burnt FLINT and SAND
2	Medium hard with common large GROG, medium angular STONE, burnt FLINT and SAND
3	Medium hard with common FLINT and possible GROG
4	Medium with frequent SAND and common small GROG
5	Medium with common medium-large GROG and rare SAND
6	Hard with abundant, poorly sorted, small-medium burnt FLINT and common SAND

The main Grooved Ware context (F.3) produced the remains of at least two different Durrington-Walls style vessels, as characterised by vertical cordons, incised panels and tapered rims with internal ledges. Similarly, the Peterborough Ware context (F.28) also contained fragments of two vessels, of which one was decorated with incised herring-bone decoration, and the other with impressed ‘maggots’. The Early Neolithic assemblage (TP 172 & TP 208) was made up of plain body sherds whilst a

comb-impressed fragment (parallel horizontal lines) represented Beaker (F.48) and a plain large collar sherd represented Collared Urn (F.8).

Copper Alloy Finds – *Grahame Appleby*

A palstave was recovered from metalled surface F.42:

<089> F.42 [4], SF1. Trench 1. Length 152.75mm; blade width 69.68mm; weight 431g. This is a complete, well-preserved palstave axe with a brown patina and 'shield pattern' with a 'splayed' ridge extending from the shield, initially rounded and flattening out as it protrudes down the axe blade. Casting seams are present on the lateral surfaces and appear to have been hammered or ground flat, clearly demonstrating that this piece was manufactured in a bivalve mould. The butt-end has an irregular transverse break. Macroscopic and visual inspection of the break suggest the metal in this area is somewhat porous (and the point from where the liquid metal was poured into the mould) and brittle. The blade edge is reasonably well preserved and shows that it has been ground to a cutting edge; there are numerous small dents and nicks and a relatively large triangular-shaped nick present and are indicative of use, although not necessarily conclusive proof.

The palstave is similar in date and design to that found during excavation along the Godwin Ridge in 2008 (Appleby and Roberts in Evans and Vander Linden 2008: 107). As reported by Roberts, Rowlands (1976, 28-30 see also Plate 28 Axes 407 and 340 from Horningsea and Bottisham) classifies these as Developed shield-pattern palstaves with this being more specifically placed in Group 3, which is not only the most common but is also heavily concentrated in East Anglia and in particular Cambridgeshire. According to associations they date to the Taunton (1400-1200 BC) – Penard metalwork period (1300-1150 BC), but are also found in later hoards in East Anglia, such as Rayne, Essex and Cumberlow Green, Hertfordshire, which are typologically Late Bronze Age and, thereby, indicating that this variety continue is use, manufacture or circulation for a considerable period.

Burnt Clay – *Simon Timberlake*

Late Neolithic pits F.58 and F.03 produced a small quantity of burnt clay:

<051> Tr.180 F.03 [9]. Fairly large, irregular lump of burnt clay (daub) with at least one large thumbprint and other squeeze marks. Dimensions: 70mm x 50mm x 45mm. Weight: 110g. Composed of a reddish to light brown clayey silty fabric with inclusions of older red-coloured flaky daub fragments plus rare grit as grog, as well as finely dispersed microscopic charcoal.

<085> Tr.161 F.58 [199]. x5 small fragments of burnt clay (daub?). Weight 6g (dimensions 8mm – 15mm). Consists of rounded and waterworn fragments of reddish sandy daub, all fairly amorphous looking, and quite possibly re-deposited. Probably of local provenance.

Burnt Stone – *Simon Timberlake*

A total of 1.897 kg (45 pieces) of burnt stone was recovered from the excavation of test pits and features during this phase of trenching. The largest amounts of burnt stone came from F.03 (716g) and F. 58 (746g), both Late Neolithic features. The small size of the burnt fragments implies repeated firings of the stone and perhaps the use of this for cooking or boiling.

Cat. No.	Feature/ SF	Context	Nos. frags	Size (mm)	Weight (g)	Geology	Notes
051	Trench 180 F.3	9	7	40-80	716	sandstone (3) + micaceous sstn + quartzitic sstn + carstone + white silstone	x1 fragment to BC
058	Trench 230 F.27	71	1	30	18	white siltstone-fine sstn	
087	Trench 161 F.58	199	10	30-70	746	micaceous sstn + quartzitic sstn + chert + unburnt flint (1)	
017	TP 165		2	30	44	white sstn	
027	TP 204		3	30	28	white sstn + calcined flint or chert	
032	TP 208 (bucket sample W of Tr 220)		1	50	34	fossiliferous sstn	
040	TP 217		1	30	14	quartz porphyry	
081	Trench 171 F.56	196	13	30	154	BF (2) + chert + lmstn + siltstone + quartz grit + vein quartz + white sstn (3) + Fe sstn	
062	Trench 220 F.28	66	1	55	44	micaceous quartzitic sstn	
053	F.7	18	2	5-10	1	yellow sstn	
055	Trench 192 F.13	33	2	20	12	BF + yellow sstn	
096	Trench 240 TP 223		2	40	86	white fine gr sstn + coarse gr sstn	

Table 12: Burnt stone from the excavations.

Waterlogged Wood – *Maisie Taylor*

F.44 [123] Stake, roundwood, trimmed 1 end/all directions L.790 D.51/57mm.

A roundwood stake from F.44 was examined. It is a diffuse porous wood, probably one of the common fen species such as alder, willow, poplar etc. It is sharpened at one end from all directions with a flat bladed axe. The sharpening was done in such way as to compensate for a slight curve in the stem. A curve such as this is usually an indication that the stem was cut from a coppice stool. The axe which trimmed the end had a completely flat blade and is likely to have been iron.

F.54 [190] Roundwood debris, ½ split with side branches, 2 pieces L.666 x 50 x 25mm and L.420 x 52 x 30mm. Dowel made from ¼ split log L.470 x 38 x 28mm.

Two pieces of half split roundwood from F.54 had sidebranches, but no sign of working. Another piece, a dowel was carved from a quarter of a log approximately 80mm diameter. The wood was diffuse porous indicating that it was likely to have been willow, poplar, alder etc., the most common trees in the wet environment.

Post-Medieval Finds - *Richard Newman*

A small assemblage of post-Medieval material – totalling 16 items, weighing 3366g – was recovered during the recent evaluation. This group includes pottery, glass and ceramic building materials. Spatially, this material was distributed across a relatively discrete area; all of the items were recovered from within, or else in close proximity to, Trench 154. The assemblage comprised:

F.47, [142]: This feature, a drain which fed into adjacent timber-lined pit/soakaway F.46, contained three items. The first comprised a Codd mineral water bottle fragment, weighing 335g. This was manufactured by J. Wadsworth, who had bottling works in both Cambridge and St. Ives during the late 19th century, and dates to *c*. 1875-1920 (Talbot 1974). Also present was the neck of an English Utilitarian Stoneware bottle, weighing 78g, which is again 19th century in date. Finally, an unfrogged coarse red brick fragment – weighing 621g – was recovered, although this was heavily abraded. Altogether, therefore, it appears likely that this feature was backfilled during the late 19th century.

F.46, [210]: This large timber-lined pit/soakaway contained two items. Firstly, the neck fragment of a green glass cylindrical utility bottle, weighing 98g, was identified. This dates to the mid to late 19th century. Secondly, a coarse dark red handmade brick fragment, weighing 281g, was also recovered. It is probably 17th or 18th century in date, but was heavily abraded and clearly residual. As a result, this feature again appears most likely to have been backfilled during the late 19th century.

Trench 154: A surface scatter of post-Medieval material was visible in the area immediately surrounding Trench 154, and a fieldwalking survey of this zone produced a small quantity of material. In the first instance, two fragments of pottery were recovered. These comprised a sherd derived from a large Glazed Red Earthenware bowl, weighing 94g, which is 17th to 19th century in date, and a sherd derived for an English Utilitarian Stoneware bottle, which is 19th century in date. In addition, nine fragments of ceramic building materials – weighing 1796g – were also identified. All of these items were composed of brick, and most were small and abraded. The majority consisted of 19th century yellow fabrics and were machine-made in form, although one larger, unfrogged hand-made fragment was also present. This was probably 18th century in date, and had been heavily burnt. The absence of mortar and other associated building materials within the assemblage, allied with the fragments' abraded nature, suggests that this material is unlikely to have been derived from the demolition of a nearby building. Instead, it was more probably introduced as hardcore in order to consolidate/level the surrounding area.

Post-Medieval Worked Wood – *Richard Newman and Jonathan Tabor*

Of the fifteen pieces of timber (thirteen upright stakes and two planks) from post-Medieval pit F.46, two were collected for more detailed recording:

Timber (03): F.46 - A fragment of hand sawn timber (length=930mm, width=100mm, depth=55mm) with four mortises utilised as an upright stake. This is clearly a re-used timber, possibly formerly part of a tiebeam from the roof truss of a vernacular building. Woodworm infestation suggests the building may have stood for some time. Partially charred.

Timber (14): F.46 - A hand sawn plank (length=1470mm, width=230mm, depth=65mm). Also probably formerly part of a vernacular structure. Partially charred.

The two timbers are likely to originally derive from a vernacular building dating to the Late Medieval or Post-Medieval period. Evidence of charring on both suggests it potentially may have burnt down with surviving timbers being salvaged for re-use.

Faunal Remains - *Vida Rajkovača*

Animal bone came from bucket sampling of the buried soil (TP.152 and 211), two Late Neolithic pits and a probably Middle Bronze Age ditch. Material was, rather like the rest of the animal bone from the Over landscape, heavily eroded and fragmented. Test pit material consisted of a single cattle molar and a fragment of a red deer

metatarsus. The Late Neolithic pits had remains of a cow tooth, loose pig teeth and red deer antler fragments. A single cattle-sized mammal long bone splinter was recovered from a ditch F.53.

Taxon	*NISP*
Cow	2
Pig	4
Red deer	2
Sub-total to species	**8**
Cattle-sized	1
Total	**9**

Table 13: Number of Identified Specimens for all species from the excavations.

Environmental Bulk Samples – *Anne de Vareilles*

Fifteen bulk soil samples were assessed, totalling 100 litres from man-made features and natural silt deposits with Trench 281. All but three samples were floated using a modified version of the Siraf tank (Williams 1973). Samples from the middle and lower silt deposits, and the sandy sediment were treated as waterlogged and therefore wet-sieved in the GPR Laboratory, McDonald Institute, University of Cambridge. Flots were collected in 300µm sieves and the remaining heavy residues washed over a 1mm mesh. Flots were sorted using a low-power binocular microscope (x6-x40), and heavy residues dried with components greater than 4mm sorted by eye. Full raw data is listed in Table 15. Nomenclature follows Stace (1997) for all flora and an updated version of Beedham (1972) for molluscs.

Charred plant remains were scarce and waterlogged ones infrequent. Cereal remains are completely absent, as are any possible arable weed seeds. In fact the only charred plant remains other than charcoal are some hazel nut shells representing one or two nuts in features F.3 and F.28. Three samples, from features F.48, F.51 and F.58, were not obviously waterlogged but did contain a few uncharred seeds. It is unclear whether these seeds were waterlogged or untransformed, intrusive specimens. However, as most of the species were also found in the waterlogged silt deposits, the former is the more likely scenario. The silt deposits did not contain numerous seeds (total count) despite the apparent ideal conditions for waterlogged preservation. Charred plant remains were not found. Signs of iron oxide (oxidation) were not observed, and it is possible that the silts built up rapidly, or in an area devoid of lush vegetation;omparing the macrofossils to the pollen data should be informative.

Mollusc shells were very rare, only occurring in two samples from features F.45 and F.190. In both cases only one or two shells were found, all fresh-water species. Insect remains were abundant in the middle silt deposit [207] in the form of wing fragments. Their absence from the other silt deposits suggests a change in the immediate environmental conditions. Enough sample remains to be sent for entomological analyses.

Results

Charcoal was most abundant in the burnt stones from F.59 and undated (Bronze Age?) pit F.54 [190]; however, since it was not identified (just quantified), only samples with other plant remains shall be discussed in this section.

Late Neolithic pit F.3 [9] and Middle Neolithic pit F.28 [66] - Not unsurprisingly both features contained hazel nut shells (*Corylus avellana*), though not enough to suggest this food was regularly eaten nearby. The charred algae 'seed' and fresh water snail in F.28 were probably introduced with water collected to quench the fire.

Late Neolithic Pit F.58, Early Bronze Age Hearth F.51 and Middle Bronze Age ditch F.48 [150]. Very little charcoal and a few seeds (probably once waterlogged now dry) were recovered. 12 species are represented which appear to show an area used by humans and/or animals; seed frequencies are too low to be more specific. F.51 and F.58 had only one and two seeds respectively.

Organic Silt Sequence - Although the 15 litre sample from the upper organic silt deposit [206] was floated like a dry sample, it did not produce a greater variety of seeds than the other 0.5 litre silt samples. The lower sandy silt [209] sample showed the worst level of preservation, with only ix species represented; the remainder of the sample could be floated.

All four samples had evidence for the same wet environment, with a slight indication of human and/or animal disturbance. Conversely, the middle organic silt deposit [207] had many more insect remains than the other deposits, suggesting a definite change between silting episodes. Though there are no obvious indicators of nutrient enrichment, thistles (*Carduus/Cirsium* sp.), nettles (*Urtica dioica*), brambles (*Rubus* sp.) and greater plantain (*Plantago major*) grow well in soils that have been disturbed. Pondweeds *(Potamogeton* spp. & *Zanichelia palustris*), sedges (Carex spp.) and crowfoots (*Ranunculus* subgen. BATRACHIUM) occurred most frequently, and point to a very high water-table. The area was probably under water for most, if not all of the year. The freshwater micro-organism Cristatella mucedo seen in the upper and middle silt layers indicate that the water was clean.

Overall, very few archaeobotanical remains were recovered. The results differ significantly to those from the South Ridge and nearby Barrows where cereal grains and chaff, associated arable weed seeds and indicators of nutrient rich soils all point to an agricultural settlement. The features sampled for this report appear to have lain outside the main area of occupation/use – at least in terms of arable agriculture and food processing. It is possible that it was simply too wet for most activities. The absence of data cannot contribute to the discussion on the relative importance of wild verses cultivated foods during the Neolithic and Bronze Age.

Radiocarbon Dating

Samples from three features were submitted for AMS radiocarbon dating. The results are shown below in Table 15.

Laboratory code	*Feature*	*Material*	*13C/12C (o/oo)*	*Radiocarbon Age (BP)*	*Calibrated Date (95% confidence)*
Beta-335810	F.28	Charred hazelnut	-25.3	4320 +/-30	3010-2890 BC
Beta-335812	F.51	Charcoal	-23.9	3430+/-30	1870-1680 BC
Beta-335811	F.44	Waterlogged wood	-26.3	1790+/-30	AD 130-330

Table 15: Radiocarbon dating results.

Sample number		<1>	<2>	<3>	<4>	<7>	<8>	<9>	<10>	<12>	<13>	<14>	<15>	<16>	<17>	<18>
Context number		[9]	[33]	[66]	[127]	[150]	[171]	[172]	[174]	[54]	[199]	[203]	[206]	[207]	[208]	[209]
Feature number		**F.3**	**F.13**	**F.28**	**F.45**	**F.48**	**F.51**	**F.51**	**F.52**	**F.190**	**F.58**	**F.59**	**N/A**	**N/A**	**N/A**	**N/A**
Evaluation trench letter																
Feature type		Pit	Ditch	Pit	fired clay?	Ditch	in situ hearth	charred timber	Pit	pit full of peat	Pit	burnt stones	upper silt deposit	middle silt layer	lower silt deposit	sandy silt
Period		late Neo	M.B.A?	Mid Neo		M.B.A?	E.B.A.	E.B.A.	L.Neo/EBA	LBA?	L.Neo/EBA	B.A.				
Sample volume/ litres		14 L.	8 L.	12 L.	7 L.	6 L.	3 L.	<1 L.	7 L.	15 L.	8 L.	3 L.	15 L.	0.5 L.	0.5 L.	0.5 L.
Fraction of flot sorted		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Fraction of heavy residue sorted																
Latin Name	**English Name**															
WATERLOGGED (w) and CHARRED NON-CEREALS																
cf. *Nymphaea alba* L.	white water-lily												- w			
Ranunculus cf. *acris* L./*repens* L./*bulbosus* L.	c.f. Meadow/Creeping/Bulbous Buttercup													- w		
Ranunculus subgen. BATRACHIUM	crowfoots												++ w	++ w	+++ w	- w
Thalictrum flavum L.	meadow rue												- w			
Urtica dioica L.	stinging nettle					1 u/w							+ w	- w	+ w	
Urtica urens L.	lesser nettle					1 u/w										
Corylus avellana L. nutshell	hazelnut shell fragment	4		8												
Chenopodium sp.	goosefoots					1 u/w					2 u/w					
Stellaria media (L.) Vill.	chickweed					1 u/w										
Stellaria neglecta Weihe	greater chickweed														+ w	
Rorippa nasturtium-aquaticum (L.) Hayek -	Water-cress														- w	
Rubus Subgen. *RUBUS*	bramble					1u/w								- w		
Potentilla anserina L.	silverweed												+ w	- w	+ w	
Potentilla sp.	Cinquefoils					2 u/w	1 u/w									
Myriophyllum sp.	water-milfoil													+ w		
Hydrocotyle vulgaris L.	Marsh Pennywort												- w			
Sium latifolium L.	greater water-parsnip												- w			
Apiaceae indet.	Carrot Family					1 u/w									- w	
Solanum dulcamara L.	bittersweet												+ w			
Stachys cf. *sylvatica*	possible Black Horehound													- w		- w
Lycopus europaeus L.	gypsywort												+ w			
Mentha spp.	mints					+ u/w							+ w	++ w	+ w	- w
Plantago major L.	greater plantain														- w	+ w
Pinguicula vulgaris L.	Common Butterwort													+ w		
Carduus/Cirsium sp.	thistle													- w		
Alisma plantago-aquatica L.	water-plantain					2 u/w							++ w	- w	+ w	
Potamogeton spp.	pondweeds												+++ w		- w	+ w
Zannichellia palustris L.	horned pondweed													+++ w	+ w	
Lemna sp.	Duckweeds														++ w	
Juncus spp.	rushes													++ w	+ w	
Eleocharis cf. *palustris* (L.) Roem. & Schult.	common spike-rush												+ w		+ w	++ w
Schoenopletus cf. *lacustris* (L.) Palla	common club-rush															

Carex cf. *disticha* Hudson												+++ w			
Carex acuta L. /elata All.	slender tufted-sedge/ tufted-sedge														
trigonous-seeded *Carex* spp.	true sedges											+++ w		++ w	- w
Iris pseudacorus L.	yellow iris														
small *Poaceae* sp.	small grass seed												- w	- w	
indet. Insect wing fragments													+++ w	+ w	
Charophyte oogonium	green algae 'seed'			1 C								+ w	+++ w	++ w	
CHARCOAL															
estimated charcoal volume/ ml.		5 ml.	<1 ml.	3 ml.	<1 ml.	<1 ml.	1 ml.	3 ml.	<1 ml.	10 ml.	<1 ml.	25 ml.	0 ml.	0 ml.	0 ml.	<1 ml.
large charcoal, incl. from heavy residue (>4mm)		+++		++		-	+	+		+	+	+++				-
med. charcoal (2-4mm)		+++		+++	+		++	++	+	+++	+	+++				+
small charcoal (<2mm)		+++	++	+++	++	++	+++	+++	+++	+++	++	+++				+++
parenchymous tissue		-		-												
OTHER BIOLOGICAL ITEMS, EXCLUDING MOLLUSCS																
burnt bone fragments		++		++												
bone fragments									-	-	+					
small bone					-											
Cristatella mucedo statoblast	freshwater micro-organism											+	+			
intrusive roots		P	P	P	P	P	P	P	P		P	P				
MOLLUSCS																
Anisus leucostoma Millet	seasonal ponds and ditches				1, 1C											
Cochlicopa lubrica/lubricella	moist & shady places									2						
OTHER ARTEFACTS, from flots and >4mm heavy residues																
worked flint		+		-							+					
burnt flint		-				-					-	++				
burnt stone		+										+++				
burnt clay					++		+				+	++				
potsherd		++		+++												

Key: '-' 1 or 2, '+' <10, '++' 11-50, '+++' >50 items. W = waterlogged, u = untransformed

Table 15: Results from the Bulk Soil Samples

DISCUSSION

The investigations form part of an on-going programme of work which has recorded a significant archaeological landscape and evidence of a diverse and changing prehistoric environment. The current evaluation has enabled this landscape to be further characterised and revealed a continuation of the Neolithic and Bronze Age activity recorded on the Low Grounds and O'Connell Ridge to the west (Evans and Tabor 2010a). However, while the archaeological remains encountered are in many ways familiar, palaeoenvironmental investigations have shown that they occupy a landscape zone, which is markedly different. The area also represents a key landscape zone, which spatially at least, comes close to 'connecting' the Over/Barleycroft landscape to the Haddenham/Upper Delphs environs to east (Evans and Hodder 2006).

Given the immediate proximity of the Mere's basin, to some extent it was surprising that more archaeology was not actually encountered, especially along the basin's edges. On the whole, while activity traces were relatively widespread/dispersed across the terraces, they were of very low density (Fig. 33) and this is further confirmed by the test point-sampling results (Fig. 34). That said, by clustering of the latter's higher values along the southern side of the area - and the eastern extension of the fieldsystem axes at that point - one is left with the impression that, as the land rises southward from this area, so too will finds densities and the number of sites as such; in other words, these generally seem to be marginal lands.

In terms of the prehistoric landscape, while the nature and extent of occupation/activity at the *Over Narrows* to the west, was largely determined by the river channels and the 'delta' landscape, which they created, such major landscape features are absent from the current evaluation area. Instead, the prehistoric landscape comprised a shallow valley system, which evidently drained to the northeast/east, with slightly raised terraces to the north, west and south. At present archaeological remains appear to be largely confined to these 'dry zones' – The Long Holmes, Shelfords and *Bridge Farm Terrace*s – with the lower lying areas (below 0.1-0.2m AOD) possibly too 'wet' for prolonged occupation during much of prehistory (see Figure 33). Having said this, evaluation of these low lying zones was limited by a combination of trench depth, the high watertable and the resulting trench instability; in the event only a small portion of it could be trenched and it is perhaps too soon to dismiss its archaeological potential.

Topographic survey has indicated that the prehistoric land surface is situated at a maximum height of 1m AOD, markedly lower than the Godwin/Marlow Ridge and, indeed, much of the O'Connell Ridge/terrace-island to the west. Consequently, as a result of the rising watertable/marine inundation, which appears to have made much of the area uninhabitable from the mid-late Bronze Age onwards, no features or artefacts dating or post-dating this period (excluding post-drainage features and wooden stake F.44, see below) were recorded. Hence, nothing to compare to the extremely dense Late Bronze Age artefact scatters of the Godwin Ridge, for example, was encountered. Perhaps more surprising is the absence of evidence for Mesolithic activity, in what would during this period have been a largely 'dry' landscape.

Evidently the intensive activity recorded on the Godwin/Marlow Ridge was restricted to the immediate vicinity of the main river course(s) to the west. It is, therefore, during the Neolithic and earlier Bronze Age periods, that these low-lying gravel terraces seem to have been occupied and seen the most intense activity.

Evidence of activity spanning the Neolithic activity was recorded and at present appears largely confined to the southwest of the current evaluation area on the *Long Holmes Terrace*. An Early Neolithic presence on the terrace was detectable through buried soil finds, although in very small numbers; five pot sherds and two serrated blades within a flint assemblage, which is largely only broadly attributable to the Neolithic. That said, given the low numbers of buried soil finds recovered generally, in Zones X and XI, the Early Neolithic material forms a not insignificant proportion of the overall assemblage. In addition, flint 'cache' F.50, itself an unusual and potentially significant feature – as discussed by Billington above – is potentially earlier Neolithic (although a later Neolithic date cannot be ruled out). As such, the potential for Early Neolithic remains appears to be somewhat higher than was recorded on the Godwin/Marlow and O'Connell Ridges to the west, which yielded only very limited evidence from this period (Evans *et al*. forthcoming).

The later Neolithic evidence suggests a continuation of the extensive Grooved Ware associated activity recorded on the Godwin/Marlow and O'Connell Ridges whilst also indicating a slightly earlier Middle Neolithic-, Peterborough Ware-associated presence. In Zones IX, X and XI (all situated on the Long Holmes Terrace), features and buried soil finds indicate probable occupation sites. Of the features, the two Grooved Ware and a Late Neolithic/Early Bronze Age pits are typical of the Over landscape; in contrast, the Peterborough Ware pit (F.28) with its radiocarbon determination of 3010-2890 cal. BC is the first feature of this date recorded within the quarry to the east of the Ouse. Of particular significance the posthole cluster around Peterborough Ware pit F.28 is potentially indicative of a structure/house.

Also, of note is the comparatively limited time span and discrete nature of the Neolithic 'sites' in comparison to the 'palimpsests' recorded on the Godwin/Marlow and O'Connell Ridges. Not only does this partially account for the low buried soil finds densities but also suggests occupation sites that are less truncated by later activity and that can potentially be 'seen' with greater clarity.

Turning to the Bronze Age, it is in some ways surprising, given the close proximity of the Site III barrow immediately to the east of the evaluated area, that more evidence of Early Bronze Age activity was not encountered in the vicinity. That said this is in many ways reminiscent of the Low Grounds/O'Connell Ridge where, although six barrows were recorded, only limited evidence of contemporary occupation was recorded. The three possible Collared Urn pits in Zone XII, which unfortunately could not be test excavated do, however, attest to activity and potentially occupation during this period. In addition, the radiocarbon date achieved for hearth F.51 (1870-1680 cal. BC) places this firmly within the Early Bronze Age/Collared Urn period and suggests that the adjacent pit (F.52) also dates to this period. Such a 'domestic' feature clearly indicates occupation of the *Long Holmes Terrace* and suggests the presence of more extensive remains.

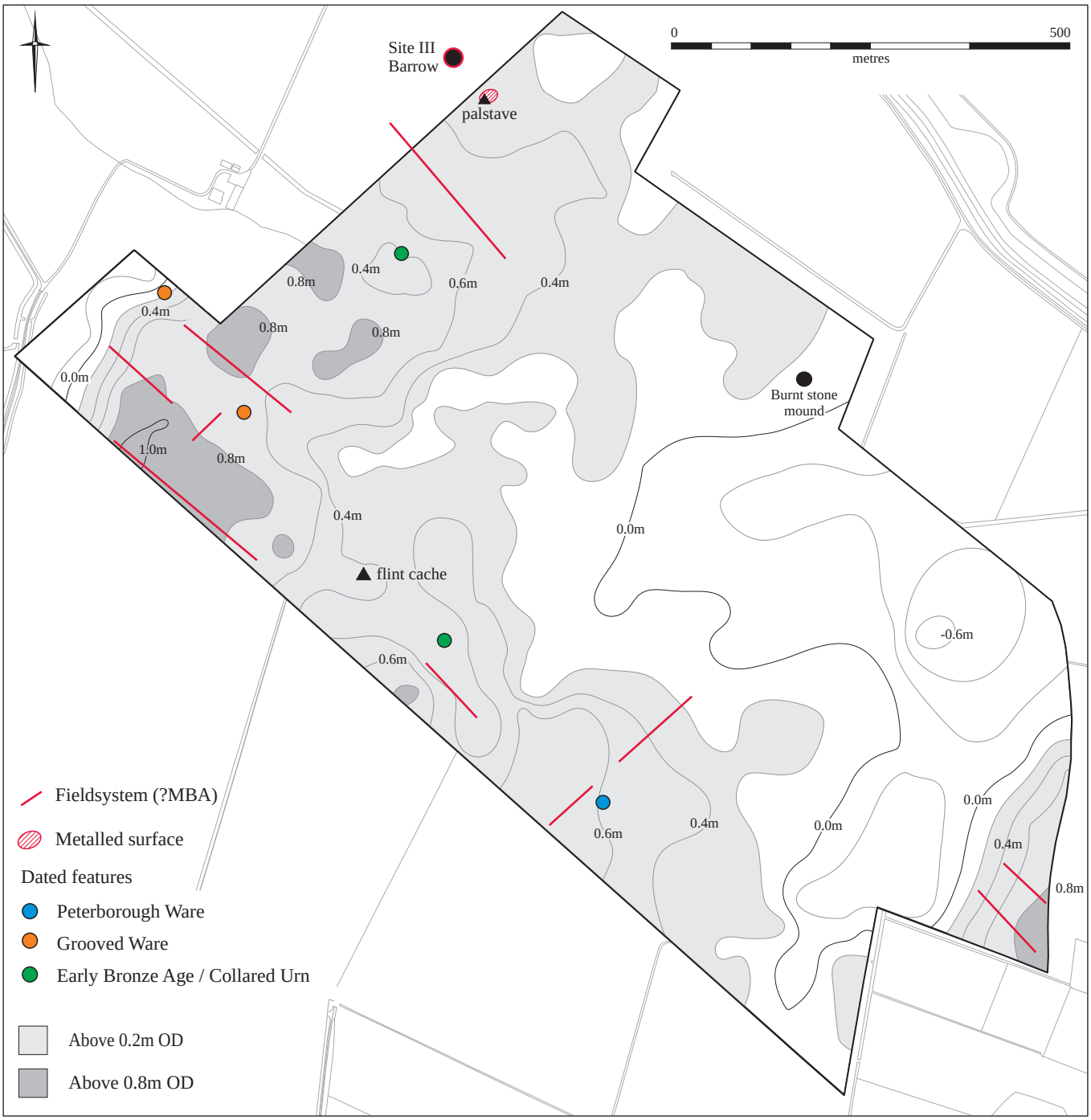


Figure 33. Contour map with prehistoric feature locations and fieldsystem

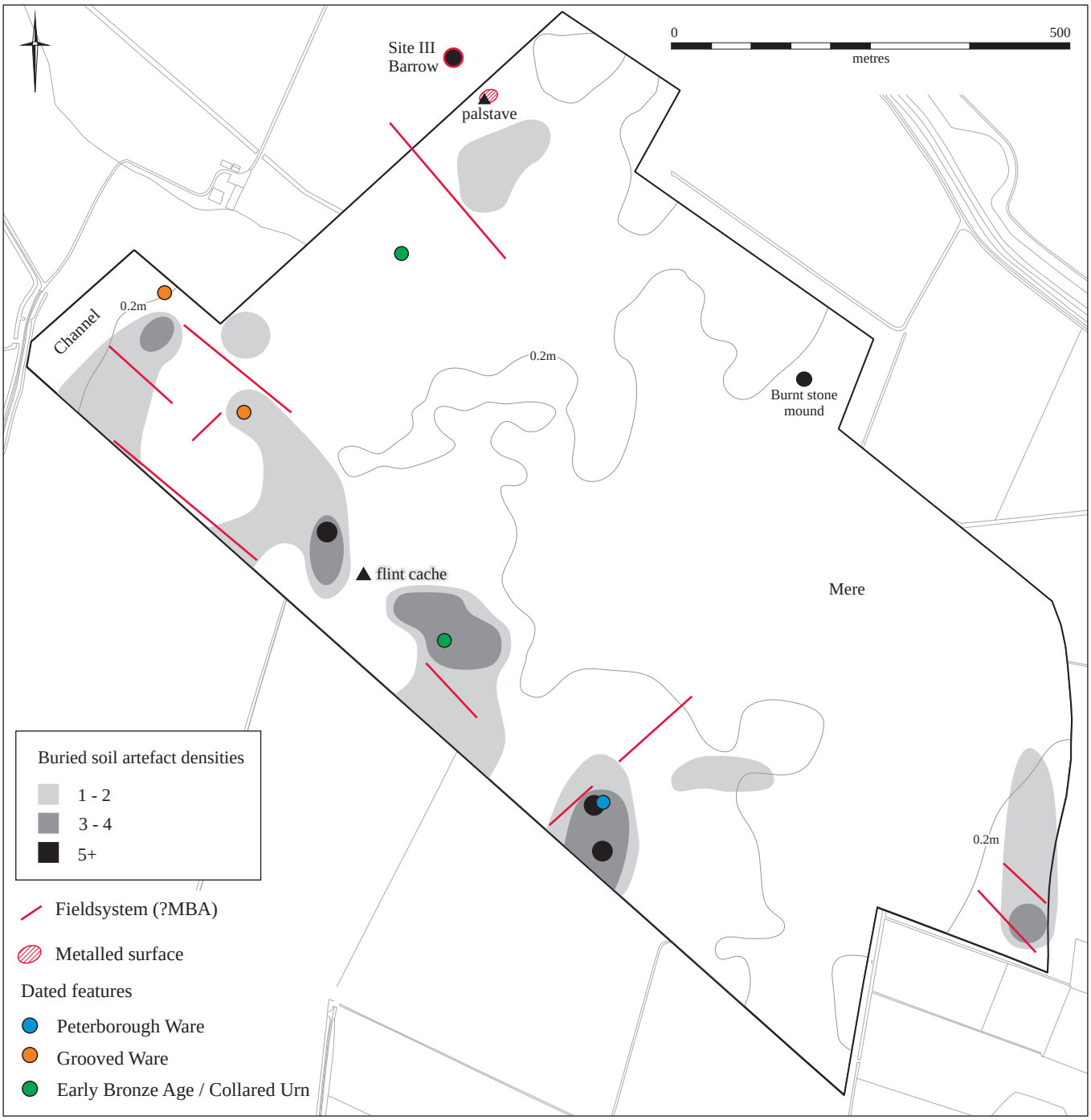


Figure 34. Contour plot of buried soil finds with prehistoric feature locations and fieldsystem

The fieldsystem(s) recorded on all three terraces, which although undated can be attributed to the Middle Bronze Age field with relative confidence, once again represents a continuation of the contemporary landscape to the west. Occupying the same alignment to the O'Connell Ridge system, it appears confined to the 'higher' ground and was not traced into the lower lying 'valley bottom' (see Figure 33). Further to the fieldsystem, no evidence of occupation or extensive activity dating to this period was recorded, which tallies with the evidence that the Middle Bronze Age saw the onset of fen conditions (see Evans *et al.* 2011). Boreham's analysis of the environmental/sedimentary sequence shows that clearly by the mid-late Bronze Age the landscape generally was becoming wetter – indeed seasonal flooding may have periodically seen the first 'incarnation' of Willingham Mere – and its usage changing. Conditions were clearly unsuitable for intensive use and the fieldsystem ditches were silted up and certainly no longer in use by the time the lower organic silts were deposited/formed. The 'metalled surfaces' recorded in Zones XII and XV, probably represent an attempt to consolidate pathways/areas within this landscape and the presence of the Bronze palstave in Zone XII is indicative of 'water's edge' ritual, and reminiscent of the metalwork deposited on the Godwin Ridge (see Roberts in Evans and Vander Linden 2008). The burnt stone spread F.59, effectively a small or eroded burnt stone mound, is also characteristic of a 'fen-edge' landscape and most likely dates to the Middle Bronze Age.

The lack of evidence of post-Bronze Age activity – although pit F.54 may be later prehistoric – is a reflection of the environmental conditions that persisted in the local landscape until post-Medieval drainage. During this period Willingham Mere formed depositing lake marl deposits over much of the eastern half of the evaluation area. The potential for Roman and Medieval remains associated with the mere has been considered throughout the design and when undertaking the archaeological evaluation; however, in the event, little evidence of mere-related activity – such as fishing platforms like those found at Whittlesea Mere, for example - was encountered. The radiocarbon date of cal. AD 130-330 achieved for wooden stake F.44 is, therefore, something of a surprise, but important none the less. The presence of the stake in Zone XII, slightly to the northwest of the site of Willingham Mere (and on the opposite side of the mere to the supposed Roman settlements to the north of Willingham) confirms that this part of the landscape, which would have been permanent fen was being utilised. Furthermore, it indicates that while the majority of any Roman or Medieval remains have probably been lost through relatively recent erosion and deflation of the upper peats, the potential for further features/remains dating to these periods surviving nevertheless exists.

Finally, in terms of the post-Medieval landscape, only limited evidence relating to the drainage of the fens was encountered. Of the two major drains crossing the evaluation area, *The Fifteenth Public Drain* and *Engine Drain*, the former was recorded in trial trenches – albeit only as a relatively recently in-filled ditch – while the latter is still active. The remainder of the recorded post-Medieval/ modern ditches, however, appear to have been minor field boundaries/dykes. Pit F.46, although an interesting feature was probably a watering hole of some description, fed by a minor drain and for agricultural use.

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APPENDIX 1

Trench Descriptions

Trench No.	Orientation	Length (m)	Depth of Trench (m)			Depth of basal sands/gravel (m)		Depositional sequence	Buried soil present	Features present	Notes
			Start point	Mid point	End point	Start point	End point				
130	W-E	60	1.8	1.5	2	1.8	2	A2	NO		'Crumbly' layer on top of lower organic silt recorded at western end. No finds or evidence of human activity recorded– prob. Natural?
131	S-N	25	1.5	n/a	1.5	1.5	1.5	A2	NO	Metalled surface	Bronze palstave recovered
132	S-N	25	1.6	n/a	1.6	1.6	1.6	A2	NO		Trench replaced by two test pits (a and b) due to depth
133	W-E	25	1.6	n/a	1.6	1.6	1.6	A2	NO		
134	SE-NW	50	1.5	1.5	1.5	1.5	1.5	A1	NO?		
135	W-E	100	1.5	1.1	1.2	1.5	1.2	A1	YES		
136	SW-NE	50	1.35	1.3	1.5	1.35	1.5	A2	NO		
137	S-N	25	1.4	n/a	1.3	1.4	1.3	A1	YES		
138	S-N	75	1.25	1.3	1.4	1.25	1.4	A1	YES?	Prehistoric ditch	
139	W-E	25	1.5	n/a	1.45	1.5	1.45	A1	YES		
140	S-N	125	1.5	1.5	1.5	1.5	1.5	A2	YES		
141	S-N	25	1.3	n/a	1.2	1.3	1.2	A2	NO		
142	W-E	50	1.5	1.55	1.6	1.5	1.6	A2	NO		
143	S-N	75	1.3	1.5	1.5	1.3	1.5	A2	NO	Post Med. ditch	
144	NW-SE	100	1.3	1.3	1.3	1.3	1.3	A1	YES		
145	W-E	75	1.7	1.5	1.55	1.7	1.55	A2	NO	Prehistoric ditch	
146	W-E	100	1.3	1.3	1.4	1.3	1.4	A2	NO		
147	NW-SE	50	1.3	1.4	1.3	1.3	1.3	A2	NO		Reed rooting' in trench could be indicative of a former field boundary/drain close by.
148	S-N	25	1.4	n/a	1.45	1.4	1.45	A1	YES		
149	S-N	25	1.5	n/a	1.65	1.5	1.65	A1	YES		
150	W-E	10	1.6	n/a	1.6	1.6	1.6	A1	YES	Early Bronze Age (?) pits	
151	S-N	25	1.5	n/a	1.55	1.5	1.55	A2	NO?		
152	S-N	25	1.35	n/a	1.35	1.35	1.35	A	NO?		
153	W-E	25	1.2	n/a	1.4	1.2	1.4	A2	NO		
154	S-N	75	1.2	1.2	1.4	1.2	1.4	B2	NO	Post Med. revetted feature and prehistoric (?) pit (unexcavated)	

Trench No.	Orientation	Length (m)	Depth of Trench (m)			Depth of basal sands/gravel (m)		Depositional sequence	Buried soil present	Features present	Notes
			Start point	Mid point	End point	Start point	End point				
156	SE-NW	75	1.4	1.4	1.4	1.4	1.4	A1	YES		
157	W-E	100	1.4	1.4	1.5	1.4	1.5	A1	YES	Post Med./modern ditch	Ditch fill contained plastic
158	S-N	100	1.3	1.15	1.25	1.3	1.25	A2	NO	Post Med./modern ditch	
159	W-E	75	1.4	1.4	1.4	1.4	1.4	A2/B2	NO		
161	W-E	85	1.1	1.1	1.2	2	1.2	A1/A2	YES		
162	SE-NW	75	1.2	1.2	1.6	1.2	1.8	A1/A2	YES		
163	W-E	25	1.05	n/a	1.1	1.05	1.1	A1	YES		
164	S-N	25	1.05	n/a	1	1.05	1	A1	YES		Discontinuous washed sand deposit present
165	S-N	100	1.2	1.2	1.4	1.2	1.4	A1	YES		
166	W-E	25	1.1	n/a	1.1	1.1	1.1	A1	YES		
167	S-N	100	1.3	1.2	1.2			A1	YES		Trench not excavated down to gravel along entire length due to depth/trench instability
168	S-N	25	1.5	n/a	1.5	1.5	1.5	A2	NO	Post Med./modern ditch	
169	W-E	25	1.3	n/a	1.25	1.3	1.25	A2	NO		
171	SE-NW	50	1.1	n/a	1.3	1.7	2	?		Buried soil-filled hollow (?) with frequent burnt stone	
172	W-E	100	1.1	1.2	1.1	1.1	1.9	A1/A2	YES	Prehistoric ditch	
173	S-N	100	1.2	1.2	1.2	1.2	1.2	A1	YES	Prehistoric ditch	
174	W-E	125	1.2	1.25	1.3	1.2	1.3	A1	YES	Prehistoric ditch	
175	W-E	75	1.15	1.7	1.7		1.7	A2	YES	Prehistoric ditch	Trench reduced from 125m to 75m to due to depth. Test pit excavated at 125m (Tr.175b) to determine depth.
176	S-N	100	1.7	1.7	1.4	1.7	1.4	B2	NO	Post Med./modern ditch and pit	
178	S-N	75	1.15	1.1	1.2	1.15	1.2	A1	YES	Prehistoric ditch, Post Med./modern ditch	
179	S-N	25	1.2	n/a	1.2	1.2	1.2	A1	YES		
180	W-E	25	1.2	n/a	1.15	1.2	1.15	A1	NO	Late Neolithic pit	
181	S-N	25	1.4	n/a	1.4	1.4	1.4	A1	YES		
182	W-E	1.3	1.45	1.3	1.3	1.45	1.3	A2?	NO		
183	S-N	25	1.5	n/a	1.5	1.5	1.5	B2	NO		
185	W-E	100	1.4	1.3	1.3	1.4	1.3	A1	YES		
186	S-N	100	1.2	1.2	1.2	1.2	1.2				
187	NW-SE	25	1.6	n/a	1.5	1.6	1.5	A2	NO		
188	W-E	75	1.5	1.5	1.6	1.5	1.6	A2	NO		
189	S-N	75	1.5	1.45	1.5	1.5	1.5	A1?	NO		

Trench No.	Orientation	Length (m)	Depth of Trench (m)			Depth of basal sands/gravel (m)		Depositional sequence	Buried soil present	Features present	Notes
			Start point	Mid point	End point	Start point	End point				
190	W-E	50	1.5	1.5	1.6	1.5	1.6	B2	NO		
192	S-N	50	1.2	1	1	1.2	1	A1	YES	Prehistoric ditch	
193	S-N	25	1.2	n/a	1.2	1.2	1.2	A1	YES		
194	W-E	25	1.2	n/a	1.2	1.2	1.2				
195	W-E	50	1.6	1.5	1.6	1.4	1.4	?			
196	S-N	25	1.45	n/a	1.4	1.45	1.4	A2	NO		
197	W-E	25	1.3	n/a	1.5	1.3	1.5	B2	NO		
199	W-E	50	1	1	1.2	1	1.2	A1	NO	Prehistoric ditch	
200	S-N	75	1.3	1.4	1.3	1.5	1.3	A1	NO		
201	S-N	75	1.3	1.3	1.3	1.3	1.3	A2	YES	Neolithic flint 'cache'	
202	W-E	75	1.3	1.6	1.6	1.3	1.6	A2/B2	NO		
205	S-N	20	1.5	n/a	1.55	1.5	1.55	?	?		
206	W-E	25	1.5	n/a	1.5	1.5	1.5	A2	NO		
207	W-E	75	1.35	1.5	1.7	1.35	1.7	B1/B2	YES		
208	W-E	50	1.5	1.45	1.45	1.5	1.45	A2	NO		
209	W-E	50	1.5	1.45	1.5	1.5	1.5	B2	NO		
210	S-N	100	1.2	1.3	1.45	1.2	1.45	A1/A2	YES	Hearth remains and Late Neolithic/Early Bronze Age pit	
211	SW-NE	50	1.4	1.4	1.5	1.4	1.5	B1/B2	YES		
212	S-N	100	1.1	1.5	1.7	1.1	1.7	A1/B2	YES		Trench only fully excavated to gravel for first 25m (due to depth).
213	S-N	25	1.2	n/a	1.1	1.2	1.1	A1	YES?		
214	W-E	50	1.35		1.6	1.35	1.6	B1	YES	NO	
216	W-E	115	1.1	1.1	1.35	1.1	1.35	A1/B1	YES	Prehistoric ditch	
217	W-E	10	1.6		1.7	1.6	1.7	B2	NO		
218	S-N	25	1.5		1.5	1.5	1.5	A1/A2			
219	SW-NE	75	1.1	1	1.1			A1	YES		
220	S-N	125	1.35		1.2	1.35	1.5	A1	YES	Cluster of prehistoric pits/postholes, Post Med./modern ditch	
221	NW-SE	50	1.25		1.3			B1	NO	Prehistoric ditch and bank	
222	S-N	150	1.15	1.2	1.6		1.6	A1/A2	YES	Prehistoric ditch, Post Med./modern ditch	
224	S-N	75	1.45	1.4	1.4			A2	NO		
225	NW-SE	15	1.3		1.3			A1/A2	YES		
226	S-N	25	1.3		1.1			A1	YES	Prehistoric ditch	
227	W-E	50	1.2	1.2	1.2		1.5	A1	YES		
229	W-E	65	1.15	1.15	1.15	1.45		A1	YES	Post Med./modern ditch	

Trench No.	Orientation	Length (m)	Depth of Trench (m)			Depth of basal sands/gravel (m)		Depositional sequence	Buried soil present	Features present	Notes
			Start point	Mid point	End point	Start point	End point				
230	W-E	100	1.3		1.1			A1	YES		
231	S-N	25	1.4		1.35			A1	YES		
232	S-N	50	1.2	1.3	1.2		1.6	B1	YES		
233	W-E	25	1.1		1.3		1.6	B1	YES		
234	S-N	25	1.2		1.4			B1	YES		
235	S-N	50	1.35	1.45	1.55	1.8	1.8	B2	NO		
237	N/A	2	2			2		B2	NO		Trench replaced by test pit due to depth
238	S-N	125	0.85	1	1.4	0.85	1.4	A1/A2	YES?	Prehistoric ditch, peat-filled pit and prehistoric pit	
239	N/A	2	1.8		1.8	1.8	1.8	B2	NO		
240	W-E	75	1.4	1.05	0.9	1.4	0.9	A1	YES	Prehistoric ditch and possible 'metalled' surface	?
241	S-N	25	1.5		1.5	1.5	1.5				
242	W-E	35	1.55		1.8	1.55	1.8	B2	NO		
243	N/A	2	1.9		1.9	1.9	1.9	B2	NO		Trench replaced by test pit due to depth
244	S-N	100	1.5	1.6	1.4	1.55	2	B2	NO	?Gravel spread/'metalled surface'?	Unclear whether ‘metalling’ could be of natural origin
245	N/A	2	1.9		1.9	1.9	1.9	B2	NO		Trench replaced by test pit due to depth
246	W-E	50	1.6		1.7	1.6	1.7	B2	NO		Not taken to full depth over majority of the trench
247	S-N	50	1.7		1.7	1.7	1.7	B2	NO		Not taken to full depth over majority of the trench
248	S-N	25	1.1		1.1			A1	YES		
250	W-E	15	1.9		1.9	1.9	1.9	B2	NO	Post Med./modern ditch	
251	W-E	50	1.6		1.4	1.6	1.4	B2	NO		
252	S-N	10	1.1		1.1			A2	YES	Possible prehistoric pit/posthole (unexcavated)	
253	S-N	10	1.1		1.1			A2	YES		
254	W-E	15	1.1		1.1	1.1	1.1	A2	YES		
255	W-E	15	1.1		1.2	1.1	1.2	A2	YES		
256	S-N	10	1.5		1.4	1.5	1.4	A2	NO		
257	W-E	20	1.4		1.65	1.4	1.65	A2	NO		
258	S-N	10	1.1		1.2			A2	NO	Metaled surface and wooden stake	
259	SW-NE	40	1.5	1.5	1.5	1.5	1.5	A2	NO		
260	S-N	15	1.3		1.4	1.3	1.4	A2	NO		

Trench No.	Orientation	Length (m)	Depth of Trench (m)			Depth of basal sands/gravel (m)		Depositional sequence	Buried soil present	Features present	Notes
			Start point	Mid point	End point	Start point	End point				
261	S-N	15	1.2		1.3	1.2	1.3	A2	NO		
262	SW-NE	15									
263	S-N	50	1.25	1.2	1.2	1.25	1.2		YES?	Prehistoric ditch	"
264	W-E	50	1.7		1.05	1.7	1.05	A1/A2	YES?		
265	SW-NE	50	1.3	1.3	1.2	1.3	1.2	A2	NO	Prehistoric ditch	
266	SW-NE	50	1.3	1.6	1.45	1.3	1.45	A2	NO		
267	W-E	50	1.2	1.2	1.2	1.5	1.6	A2	YES		
268	W-E	50	1.5	1.5	1.5	1.7	1.7	B2	YES?		
269	W-E	50	1.5	1.35	1.45	1.7	1.45	B2	YES?	Post Med./modern ditch	
270	W-E	50	1	1.25	1.3			B1	YES	Post Med./modern ditch	
271	W-E	25	1.7		1.6	1.7	1.6	B2	NO		
272	S-N	15	1.1		1.2	1.1	1.2	A1	YES	Possible prehistoric pit	Pit unexcavated
273	S-N	15	1.25		1.15	1.25	1.1	A1	YES		
274	S-N	50	1.6	1.5	1.6	1.6	1.6	A2	NO	Post Med./modern ditch	
275	S-N	25	1.4		1.3	1.4	1.3	A2/B2	NO		
276	W-E	50	1.2	1.4	1.5	1.2	1.4	A2	NO		
277	W-E	50	1.2	1.15	1.2	1.2	1.2	A2	NO		
278	S-N	50	1.3	1.4	1.3	1.3	1.3	A2	NO	Possible prehistoric pit	
279	W-E	25	1.45		1.6	1.45	1.6	A2	NO	Post Med./modern ditch	'Reed rooting' in trench probably the result of former field boundary/drain.
280	S-N	20	1		1	1.15	1.15	A2	NO	Burnt stone spread	
281	SW-NE	50	1.6	1.5	1.65	1.6	1.65	A2	NO		
282	S-N	15	1.4		1.5	1.4	1.5	A2	NO		
283	S-N	75	0.95		1	0.95	1	A1	YES		
284	W-E	20	1.6			1.8		A2	NO	Possible 'metalling'	Gravel spread/metalling could be natural in origin eg. Stream bed?
285	W-E	15	1.6			1.8				Possible 'metalling'	Gravel spread/metalling could be natural in origin eg. Stream bed?

Key: A1: Topsoil and 'organic unit' overlying gravel/weathered gravel. A2: Topsoil and 'organic unit' overlying sandy silt. B1: Topsoil overlying lake marl and 'organic unit' overlying gravel/weathered gravel. B2: Topsoil overlying lake marl and 'organic unit' overlying sandy silt.

APPENDIX 2

Borehole Transect Stratigraphy – *Steve Boreham*

Transect 3

BH1 TL 39943 73828

0 - 25cm	Ploughsoil – brown-black silty clay 'alluvium' with rootlets
25 - 49cm	Grey-orange-brown mottled silty clay
49 – 96cm	Grey-brown organic silt with rootlets, reed stems and shell fragments
96 – 100cm	Black organic detritus mud with wood and reed fragments
100 – 107cm	Grey-brown organic silt with wood fragments
107 – 110cm	Wet grey sand and gravel
110cm	Borehole stopped on sand and gravel

BH2 TL 39965 73785

0 - 25cm	Ploughsoil – brown-black silty clay 'alluvium' with rootlets
25 - 50cm	Grey silty clay
50 – 58cm	Grey-black organic detritus mud with a little sand
58 – 60cm	White-buff sand lens
60 – 69cm	Grey-black organic detritus mud with wood and reed fragments
96 – 75cm	Grey silt with rootlets
75 – 104cm	Grey-brown organic detritus mud with rootlets and reed fragments
104 – 116cm	Grey-brown slightly silty organic detritus mud with shells and rootlets
116 – 122cm	Grey sandy silt with a little organic material
122– 125cm	Grey sand and gravel
125cm	Borehole stopped on sand and gravel

BH3 TL 39986 73732

0 - 25cm	Ploughsoil – brown-black silty clay 'alluvium' with rootlets
25 - 43cm	Soft light grey-brown silty clay
43 – 72cm	Grey-black organic detritus mud with wood fragments
72 – 75cm	Stiff grey-brown silty organic material with shells fragments
75 – 119cm	Grey-black organic detritus mud with rootlets and shell fragments
119 – 123cm	Grey sandy silt with pebbles
123– 125cm	Grey sand and gravel
125cm	Borehole stopped on sand and gravel

BH4 TL 40007 73683

0 - 25cm	Ploughsoil – brown-black silty clay 'alluvium' with rootlets
25 - 57cm	Stiff orange-grey mottled silty clay
57 – 63cm	White-buff marl with organic material and shell fragments
63 – 68cm	Black-brown wood peat
68 – 145cm	Black-brown detritus mud with orange mottling, rootlets and wood fragments
145 – 146cm	Grey sandy silt
146– 150cm	Grey sand and gravel
150cm	Borehole stopped on sand and gravel

BH5 TL 40026 73636

0 - 25cm	Ploughsoil – light grey-brown silt with marl inclusions
25 - 50cm	Damp grey-buff silt
50 – 79cm	Grey-orange mottled marl with shell fragments
79 – 85cm	Grey-black detritus mud with orange mottling, rootlets and wood fragments
85 – 100cm	Grey-brown organic silt with orange mottling, rootlets and shell fragments

100– 133cm	Grey-black detritus mud with rootlets
133– 136cm	Chocolate brown detritus mud with rootlets and a little marl
136– 146cm	Grey-brown silty detritus mud with large wood fragments
146– 150cm	Grey silty sand and gravel
150cm	Borehole stopped on sand and gravel

BH6 TL 40044 73591

0 - 25cm	Ploughsoil – light brown silt with marl inclusions
25 - 47cm	Brown silt with shell fragments and marl inclusions
47 – 83cm	Grey-buff marl with shell fragments
83 – 97cm	Grey-brown mottled silt with marl, organic material and shell fragments
97 – 138cm	Black-grey silty organic detrital mud with shell fragments
138– 140cm	Grey silt
140– 142cm	Grey sandy silt with pebbles
142– 160cm	Grey silty clay with rootlets
160– 170cm	Grey-green silty sand with pebbles
170cm	Borehole stopped on sand and gravel

BH7 TL 40065 73542

0 - 25cm	Ploughsoil – grey-brown silt with marl inclusions
25 - 37cm	Grey-brown marly silt
37 – 50cm	Grey-buff marl with shell fragments
50 – 82cm	Grey-buff marl with iron staining
82 – 93cm	Grey-brown silty organic detritus mud with reed fragments and some marl
93– 100cm	Grey-black detritus mud with reed fragments and shells
100– 104cm	Grey-buff band of marl
104– 114cm	Grey-brown organic detritus mud with shells
114– 140cm	Grey-brown silty organic detritus mud with reed stems and shells
140– 141cm	Band of pebbles
141– 183cm	Grey sandy silt with pebbles and occasional wood fragments
183– 190cm	Grey silty sand and gravel
190cm	Borehole stopped on sand and gravel

BH8 TL 40085 73500

0 - 20cm	Ploughsoil – grey-buff marly silt
20 - 89cm	Grey-buff marl with shell fragments and iron staining
89 – 106cm	Black-brown mottled marly silty detritus mud with reed stems and shells
106 – 130cm	Grey organic silt with reed stems, shells and rootlets
130– 139cm	Brown-black organic detritus mud
139– 151cm	Grey-brown organic silty clay with shell fragments
151– 195cm	Green-grey silty clay with a little organic
195– 220cm	Pale blue-grey sandy silty clay with marl
220cm	Borehole stopped on sand and gravel

BH9 TL 40105 73452

0 - 25cm	Ploughsoil – brown marly silt
25 - 42cm	Soft brown silt
42 – 86cm	Grey-buff marl with shell fragments and iron staining
86 – 100cm	Black-brown mottled peat with rootlets, reed stems and a little silt
100 – 115cm	Black-brown mottled peat with rootlets, reed stems and a little marl
115– 126cm	Grey silt with rootlets and shells
126– 138cm	Black silty organic detritus mud
138 – 150cm	Grey silt
150 – 158cm	Brown-black fibrous wood peat and detritus mud
158 – 190cm	Blue-grey sandy silt with pebbles

190cm	Borehole stopped on sand and gravel

BH10 TL 40122 73410

0 - 25cm	Ploughsoil – brown marly silt
25 - 62cm	Soft grey-brown silt
63 – 83cm	Grey-buff marl with shell fragments and iron staining
83 – 103cm	Dark grey mottled marl with a little silt
103 – 121cm	Black-brown organic detritus mud with silt and rootlets
121 – 150cm	Blue-grey sandy silt
150 – 165cm	Green mottled sandy silt with pebbles and organic
165cm	Borehole stopped on sand and gravel

BH11 TL 40138 73371

0 - 25cm	Ploughsoil – brown marly silt
25 - 42cm	Soft brown silt
42 – 79cm	Grey-buff marl with shell fragments and iron staining
79 – 93cm	Dark grey mottled organic silt with shells
93 - 121cm	Light grey silt with shells and a little marl
121 – 130cm	Black-brown Black organic detritus mud with rootlets and a little silt
130– 135cm	Grey silt with a little organic material
135– 150cm	Blue-grey sandy silt
150 – 180cm	Green-grey sandy silt
180cm	Borehole stopped on sand and gravel

BH12 = T5 BH9 TL 40154 73336

0 - 25cm	Ploughsoil – grey-brown marly silt
25 - 38cm	Grey-brown silt
38 – 91cm	Grey-buff marl with shell fragments and iron staining
91 – 98cm	Grey-brown mottled organic silt with shells
98 - 100cm	Grey silt
100 – 110cm	Grey-brown mottled silt with shells and a little organic material
110– 120cm	Grey silt with rootlets, shells and a little organic material
120– 132cm	Black-brown organic detritus mud with rootlets and a little silt.
132 – 138cm	Grey-brown silt with rootlets
138 – 150cm	Grey-blue-black silty sand
150 – 190cm	Wet green-grey sand
190cm	Borehole stopped on sand and gravel

BH13 TL 40171 73290

0 - 25cm	Ploughsoil – brown marly silt
25 - 43cm	Soft brown silt
43 – 75cm	Grey-buff marl with shell fragments and iron staining
75 – 83cm	Dark grey silty marl with shells
83 - 91cm	Black-grey mottled organic silt with shells
91 – 100cm	Grey silt with a little silt and marl
100– 116cm	Grey-brown silt with shell fragments
116– 130cm	Brown-black peaty detritus mud with rootlets and a little silt
130 – 137cm	Grey silt with rootlets and a little organic material
137 – 145cm	Grey-black organic silt
145 – 150cm	Blue-grey sandy silt
150 – 170cm	Blue-grey sandy silt with pebbles
170cm	Borehole stopped on sand and gravel

BH14 TL 40190 73252

0 - 25cm	Ploughsoil – brown marly silt
25 - 42cm	Soft brown silt
42 – 80cm	Grey-buff marl with shell fragments and iron staining
80 – 92cm	Dark grey mottled silty marl with shells
92 – 110cm	Grey-brown mottled organic silt
110– 119cm	Grey silt with shells, rootlets and a little organic material
119– 129cm	Black organic silt with wood, rootlets and shells
129 – 134cm	Brown organic detritus mud with a little sand
134 – 150cm	White-grey medium sand
150 – 170cm	Blue-grey-green sandy silt with pebbles
170cm	Borehole stopped on sand and gravel

BH15 TL 40211 73206

0 - 25cm	Ploughsoil – grey-brown clayey silt
25 - 40cm	Brown silt
40 – 72cm	Grey-buff marl with shell fragments and iron staining
72 – 84cm	Grey mottled organic silt
84 – 103cm	Grey silt with shells, rootlets and a little organic material
103– 115cm	Buff silty marl
115 – 123cm	Black-grey organic silt with wood, rootlets and shells
123 – 134cm	Black organic detritus mud with reed stems
134 – 143cm	Dark grey organic sandy silt with rootlets and pebbles
143 – 175cm	Blue-grey sandy silt with pebbles
175 – 180cm	Brown medium sand
180cm	Borehole stopped on sand and gravel

BH16 TL 40228 73160

0 - 25cm	Ploughsoil – grey-brown silt
25 - 40cm	Brown silt
40 – 91cm	Grey-buff orange mottled marl with shell fragments
91 – 101cm	Grey-brown organic silt with rootlets and shells
101 – 105cm	Buff silty marl
105– 118cm	Grey-brown organic silt with shells and rootlets
118 – 142cm	Dark grey organic silt with reed stems, rootlets and shells
142 – 150cm	Black-grey organic detritus mud with wood, shells and a little silt
150 – 175cm	Grey-brown organic sandy marly silt
175 – 200cm	Blue-grey sandy silt with organic and pebbles
200cm	Borehole stopped on sand and gravel

BH17 TL 40249 73116

0 - 25cm	Ploughsoil – grey-brown silt
25 - 38cm	Brown silt
38 – 73cm	Grey-buff orange mottled marl with shell fragments
73 – 82cm	Dark grey marl with silt and organic material
82 – 91cm	Grey-brown organic silt with rootlets and shells
91 – 100cm	Grey silt
100– 112cm	Grey-brown organic silt with reed stems shells, rootlets and a little marl
112 – 120cm	Grey silt with shells
120 – 133cm	Dark grey organic silt with shells
133 – 138cm	Black-brown organic detritus mud with wood, shells and a little silt
138 – 150cm	Grey organic sandy silt
150 – 175cm	Blue-grey sandy silt with pebbles
175 – 191cm	Green-grey silty sand with pebbles
191 – 210cm	Orange-brown medium sand
210cm	Borehole stopped on sand and gravel

BH18 TL 40274 73072

0 - 25cm	Ploughsoil – brown silt
25 - 43cm	Brown silt
43 – 77cm	Grey-buff orange mottled marl with shell fragments
77 – 82cm	Dark grey marl with silt and organic material
82 – 93cm	Grey-brown organic silt with rootlets and shells
93 – 100cm	Grey silt with shell debris
100– 106cm	Grey-brown organic silt with reed stems shells, rootlets and a little marl
106 – 117cm	Grey mottled silt with shells
117 – 130cm	Dark grey organic silt with shells and rootlets
130 – 144cm	Black organic detritus mud with wood, shells and a little silt
144 – 150cm	Grey organic sandy silt
150 – 172cm	Blue-grey sandy silt with organic and pebbles
172 – 195cm	Green-grey silty sand with pebbles
195cm	Borehole stopped on sand and gravel

BH19 TL 40294 73030

0 - 25cm	Ploughsoil – grey-brown silt
25 - 37cm	Brown silt
37 – 82cm	Grey-buff orange mottled marl with shell fragments
82 – 95cm	Grey-brown organic silt with rootlets and shells
95 – 100cm	Grey silt with shell debris
100– 104cm	Grey-buff silty marl
104 – 114cm	Grey-brown organic silt with rootlets
114 – 140cm	Grey silt with shells and rootlets
140 – 150cm	Black organic detritus mud with a little sand
150 – 160cm	Grey organic silty sand
160 – 170cm	Blue-grey sandy silt with pebbles
170 – 175cm	Green-grey silty sand with pebbles
175cm	Borehole stopped on sand and gravel

Transect 4

Trench section TL 39651 73671

0 - 30cm	Ploughsoil – grey-brown silty clay ‘alluvium’ with rootlets
30 – 50cm	Very stiff grey orange mottled silty clay
50 - 55cm	Orange-brown iron-replaced peaty silt
55 - 70cm	Grey organic silt
70 – 90cm	Grey silt with shells
90 – 95cm	Grey-black organic silt
95 – 130cm	Blue grey mottled sandy silt
130 – 150cm	Orange-brown sand and gravel
150cm	Trench stopped on sand and gravel

BH0 TL 39702 73602

0 - 25cm	Ploughsoil – grey-brown silty clay ‘alluvium’ with rootlets
25 – 45cm	Very stiff grey mottled silty clay
45 - 62cm	White-buff orange marl with organic material and shell fragments
62 – 69cm	Black-grey mottled organic silt with a little marl
69 – 108cm	Grey mottled silt with a little organic
108 – 114cm	Blue grey silt with organic fragments
114 – 135cm	Blue-grey sandy silt with rootlets and shells
135 – 150cm	Grey silty sand with pebbles
150 – 160cm	Grey-brown sand
160cm	Borehole stopped on sand and gravel

BH1 TL 39754 73586

0 - 38cm	Ploughsoil – grey-brown silty clay ‘alluvium’ with rootlets
38 – 62cm	Very stiff grey mottled silty clay with shells
62 - 94cm	White-buff marl with organic material and shell fragments
94 – 106cm	Grey silt with organic material and shell fragments
106 – 119cm	Black-grey organic silt with rootlets and shell fragments
119 – 128cm	Black-grey silty organic detritus mud with reed stems, wood and rootlets
128 – 160cm	Grey-blue silty sand with pebbles
160cm	Borehole stopped on sand and gravel

BH2 TL 39801 73573

0 - 38cm	Ploughsoil – brown silty clay ‘alluvium’ with rootlets
38 – 77cm	White-buff marl with organic material and shell fragments
77 – 90cm	Grey-brown orange mottled organic silt with shells
90 – 116cm	Grey organic silt with shell fragments
116 – 130cm	Grey silt with rootlets and organic fragments
130 – 142cm	Black-brown organic detritus mud with a little silt
142 – 158cm	Grey silty sand with pebbles
158 – 180cm	Grey-green sandy silt with pebbles
180cm	Borehole stopped on sand and gravel

BH3 TL 39850 73553

0 - 35cm	Ploughsoil – brown silty clay ‘alluvium’ with rootlets
35 – 45cm	White-buff marl with organic material and shell fragments
45 – 62cm	Orange-black silty sand with pebbles
62 – 75cm	Grey silt with a little sand and occasional pebbles
75 – 117cm	Grey-brown orange mottled silty clay with shell and organic fragments
117 – 138cm	Black-grey silty organic detritus mud
138 – 145cm	Grey sandy silty clay with pebbles
145cm	Borehole stopped on sand and gravel

BH4 TL 39901 73536

0 - 30cm	Ploughsoil – brown silty clay ‘alluvium’ with rootlets
30 – 50cm	White-buff marl with organic material and shell fragments
50 – 73cm	White-buff marl with orange mottling
73 – 86cm	Grey-brown organic silt with shells
86 – 96cm	Grey silt with shell and organic fragments
96 – 106cm	Black-brown organic silt
106 – 114cm	Grey silty clay with rootlets, shell, reed and wood fragments
114 – 185cm	Grey sandy silt with pebbles
185cm	Borehole stopped on sand and gravel

BH5 TL 39952 73522

0 - 25cm	Ploughsoil – brown silty clay ‘alluvium’ with rootlets
25 - 40cm	Brown silty clay
40 – 65cm	White-buff marl with organic material and shell fragments
65 – 82cm	Black-brown silty organic detritus mud with shell fragments
82 – 100cm	Grey silt with shell and organic fragments
100 – 128cm	Grey-brown organic silt with shells and occasional pebbles
128 – 150cm	Grey-black sandy silt with pebbles
150 – 185cm	Grey-green silty sand with pebbles
185cm	Borehole stopped on sand and gravel

Transect 5

BH0 TL 39700 73387

0 - 25cm	Ploughsoil – grey-buff silty clay ‘alluvium’ with rootlets
25 – 46cm	Very stiff grey mottled silty clay
46 - 68cm	White-buff orange marl with organic material and shell fragments
68 – 81cm	Grey-brown organic silt with shells
81 – 119cm	Grey mottled silt with a little organic
119 – 125cm	Black-brown mottled organic silt
125 – 136cm	Brown organic detritus mud
136 – 150cm	Grey-blue sandy silt with pebbles and some organic
150 – 175cm	Grey sandy silt with pebbles and some organic
175cm	Borehole stopped on sand and gravel

BH1 TL 39748 73379

0 - 25cm	Ploughsoil – grey-buff silty clay ‘alluvium’ with rootlets
25 – 45cm	Very stiff grey mottled silty clay
45 - 70cm	White-buff orange marl with organic material and shell fragments
70 – 94cm	Grey-brown organic silt with shells
94 – 118cm	Grey mottled silt with shell fragments
118 – 123cm	Grey organic silt with abundant rootlets, reed stems and shell debris
123 – 130cm	Black organic detritus mud
130 – 139cm	Grey silt with rootlets
139 – 150cm	Blue-grey sandy silt
150 – 182cm	Grey green sandy silt with pebbles and some organic
182 – 185cm	Green-grey medium sand
185cm	Borehole stopped on sand and gravel

BH2 TL 39802 73376

0 - 30cm	Ploughsoil – brown silty clay ‘alluvium’ with rootlets
30 – 70cm	Grey-buff marl with shells
70 – 77cm	Orange-grey mottled silt
77 – 136cm	grey silt with shells
136 – 146cm	Black-grey organic detritus mud with a little silt
146 – 150cm	Blue-grey sandy silt
150 – 165cm	Grey-blue silty sand with pebbles
165cm	Borehole stopped on sand and gravel

BH3 TL 39849 73370

0 - 30cm	Ploughsoil – brown silty clay ‘alluvium’ with rootlets
30 – 58cm	White-buff marl with organic material and shell fragments
58 – 69cm	Grey-black mottled organic silt with shells
69 – 90cm	Grey silt with rootlets, shells and a little organic material
90 – 126cm	Grey organic silt with shells
126 – 132cm	Grey-brown organic silt with wood and reed stems
132 – 140cm	Grey silt
140 - 165cm	Grey-blue sandy silty clay with pebbles
165 – 175cm	Wet blue-grey sand
175cm	Borehole stopped on sand and gravel

BH4 TL 39900 73365

0 - 25cm	Ploughsoil – brown silty clay ‘alluvium’ with rootlets
25 – 43cm	Soft brown silty clay
43 – 50cm	White-buff marl with organic material and shell fragments
50 – 73cm	White-buff marl with orange mottling

73 – 125cm	Grey silt with rootlets, shells and a little organic material
125 – 150cm	Black-brown-grey organic silt
150 – 175cm	Blue-grey sandy silt with pebbles
175cm	Borehole stopped on sand and gravel

BH5 TL 39949 73359

0 - 25cm	Ploughsoil – brown silt with rootlets
25 - 40cm	Brown silt
40 – 63cm	White-buff marl with organic material and shell fragments
63 – 71cm	Grey mottled organic silt
71 – 113cm	Grey silt with shell and organic fragments
113 – 120cm	Grey-black organic silt with rootlets
120 – 132cm	Grey silt with reed stems
132 – 142cm	Grey silty sand with pebbles
142 – 160cm	Blue-grey sandy silt with a little organic
160 – 165cm	Wet brown-grey sand
165cm	Borehole stopped on sand and gravel

BH6 TL 40000 73351

0 - 25cm	Ploughsoil – brown silt with rootlets
25 - 35cm	Brown silt
35 – 68cm	White-buff marl with organic material and shell fragments
68 – 78cm	Grey-black organic silt with rootlets and shells
78 – 107cm	Grey mottled silt with rootlets and shells
107 – 125cm	Grey-brown organic silt with rootlets
125 – 130cm	Black detritus mud with a little silt
130 – 160cm	Blue-grey sandy silt with a little organic
160 – 165cm	Wet brown-grey sand
165cm	Borehole stopped on sand and gravel

BH7 TL 40049 73348

0 - 25cm	Ploughsoil – brown silt with rootlets
25 - 38cm	Brown silt
38 – 79cm	White-buff marl with organic material and shell fragments
79 – 91cm	Grey mottled organic silt with rootlets and shells
91 – 100cm	Grey silt with rootlets, shells and a little organic
100 – 123cm	Grey-brown silt with shells and a little organic
123 – 128cm	Grey organic silt with shells
128 – 139cm	Black-grey silty detritus mud with rootlets
139 – 146cm	Grey-black silt with rootlets and a little organic material
146 – 150cm	Blue-grey sandy silt with pebbles
150 – 200cm	Green-grey sandy silt with pebbles
200 - 205cm	Wet orange-buff medium sand
205cm	Borehole stopped on sand and gravel

BH8 TL 40100 73341

0 - 25cm	Ploughsoil – brown-grey silt with rootlets
25 - 40cm	Brown-grey silt
40 – 94cm	White-buff marl with organic material and shell fragments
94 – 100cm	Grey-brown organic silt with rootlets and shells
100 – 108cm	Grey-brown silt with rootlets, shells and a little organic
108 – 121cm	Grey silt with shells and a little organic
121 – 129cm	Grey-black organic detritus mud with rootlets
129 – 141cm	Grey-brown silt with organic
141 – 166cm	Blue-grey-black sandy silt with rootlets and a little organic material
166 – 190cm	Light blue-grey sandy silt with pebbles

190cm	Borehole stopped on sand and gravel

BH9 = T3 BH11 TL 40154 73336

0 - 25cm	Ploughsoil – grey-brown marly silt
25 - 38cm	Grey-brown silt
38 – 91cm	Grey-buff marl with shell fragments and iron staining
91 – 98cm	Grey-brown mottled organic silt with shells
98 - 100cm	Grey silt
100 – 110cm	Grey-brown mottled silt with shells and a little organic material
110– 120cm	Grey silt with rootlets, shells and a little organic material
120– 132cm	Black-brown organic detritus mud with rootlets and a little silt.
132 – 138cm	Grey-brown silt with rootlets
138 – 150cm	Grey-blue-black silty sand
150 – 190cm	Wet green-grey sand
190cm	Borehole stopped on sand and gravel

BH10 TL 40201 73328

0 - 25cm	Ploughsoil – brown-grey silt with rootlets
25 - 38cm	Brown-grey silt
38 – 80cm	White-buff marl with organic material and shell fragments
80 – 88cm	Black peat with reed stems and shells
88 – 112cm	Grey-brown organic silt with abundant rootlets, shells and wood
112 – 124cm	Black-brown organic detritus mud with rootlets and reed stems
124 – 137cm	Grey silt with rootlets and organic material
137 – 150cm	Blue-grey sandy silt with pebbles
150 – 175cm	Wet green-grey silty sand
175cm	Borehole stopped on sand and gravel

BH11 TL 40249 73323

0 - 25cm	Ploughsoil – brown-grey silt with rootlets
25 - 45cm	Brown-grey silt
45 – 98cm	White-buff marl with organic material and shell fragments
98 – 103cm	Black-grey organic silt with abundant rootlets
103 – 125cm	Dark grey mottled silt with shells
125 – 135cm	Black-grey organic detritus mud with rootlets and a little silt
135 – 146cm	Grey silt with rootlets and organic material
146 – 170cm	Blue-grey sandy silt with pebbles
170 – 225cm	Wet blue-grey silty sand
255cm	Borehole stopped on sand and gravel

Transect 6

BH1 TL 39919 73105

0 - 25cm	Ploughsoil – brown-black silty clay ‘alluvium’ with rootlets
25 – 72cm	Very stiff grey mottled silty clay
72 - 88cm	White-buff orange marl with organic material and shell fragments
88 – 96cm	Grey-brown orange mottled organic silt with shells
96 – 107cm	Grey mottled silt with shell fragments
107 – 117cm	Grey marly silt with shell debris
117 – 122cm	Black organic silty detritus mud
122 – 125cm	Grey-brown silty sand with pebbles
125 – 142cm	Blue-grey silty sand
142 – 160cm	Orange-grey mottled sandy silt
160 – 165cm	Orange-brown medium sand
165cm	Borehole stopped on sand and gravel

BH2 TL 39972 73109

0 - 25cm	Ploughsoil – grey-brown silty clay ‘alluvium’ with marl and rootlets
25 – 45cm	Grey-brown silty clay with marl and rootlets
45 - 59cm	White-buff marl with organic material and shell fragments
59 – 70cm	Grey-brown mottled organic silt with shells
70 – 78cm	Grey mottled silt with marl, shell fragments
78 – 97cm	Grey-brown marly silt with shell debris
97 – 108cm	Black-grey organic silty detritus mud
108 – 110cm	Grey organic sand with pebbles
110 – 125cm	Grey-orange mottled sandy silt with pebbles
125 – 135cm	Orange-grey mottled silty sand with pebbles
135cm	Borehole stopped on sand and gravel

BH3 TL 40026 73120

0 - 25cm	Ploughsoil – grey-brown silty clay ‘alluvium’ with marl and rootlets
25 – 87cm	Brown silt
87 - 98cm	Grey-orange mottled marl with organic material and shell fragments
98 – 103cm	Grey-brown mottled organic silt with shells
103 – 110cm	Grey silt
110 – 123cm	Grey marly silt with shell fragments
123 – 125cm	Black-grey organic detritus mud
125 – 133cm	Black-grey silty organic detritus mud with rootlets
133 – 138cm	Brown organic silty sand
138 – 150cm	Blue-grey sandy silt
150 – 155cm	Grey medium sand
155cm	Borehole stopped on sand and gravel

BH4 TL 40078 73125

0 - 25cm	Ploughsoil – grey-brown silt
25 – 45cm	Grey-brown silt
45 - 65cm	White-buff marl with shell fragments
65 – 73cm	Grey-brown mottled organic silt with shells and rootlets
73 – 90cm	Grey mottled silt with shells
90 – 108cm	Grey marly silt with shells
108 – 115cm	Black-brown organic silty detritus mud
115 – 120cm	Grey-brown organic silty sand
120 – 136cm	Grey sandy silt with pebbles
136 – 160cm	Blue-grey sandy silt with pebbles
160 – 170cm	Brown medium sand
170cm	Borehole stopped on sand and gravel

BH5 TL 40128 73132

0 - 25cm	Ploughsoil – grey-brown silt with marl
25 – 43cm	Brown silt
43 - 71cm	White-buff marl with shell fragments
71 – 86cm	Grey-brown mottled organic silt
86 – 98cm	Grey silt
98 – 114cm	Grey-brown marly silt with shells
114 – 118cm	Black-brown organic silty detritus mud
118 – 137cm	Grey-brown organic sandy silt
137 – 143cm	Grey sandy silt with pebbles
143 – 165cm	Blue-grey sandy silt with organic
165cm	Borehole stopped on sand and gravel

BH6 TL 40178 73141

0 - 25cm	Ploughsoil – grey-brown silt
25 – 40cm	Brown silt
40 - 74cm	White-buff orange mottled marl with shell fragments
74 – 88cm	Grey-brown orange mottled organic silt
88 – 114cm	Grey silt
114 – 130cm	Dark grey marly silt with shells and rootlets
130 – 137cm	Black-brown silty detritus mud with shells
137 – 142cm	Grey organic sandy silt
142 – 185cm	Blue-grey sandy silt with organic and pebbles
185 – 190cm	Orange-brown medium sand
190cm	Borehole stopped on sand and gravel

BH7 TL 40229 73151

0 - 25cm	Ploughsoil – grey-brown silt
25 – 40cm	Brown silt
40 - 106cm	White-buff orange mottled marl with shell fragments
106 – 111cm	Grey-brown orange mottled organic silt with rootlets
111 – 120cm	Grey- orange mottled silt
120 – 135cm	Dark grey organic silt with shells and rootlets
135 – 165cm	Black-brown silty detritus mud with wood
165 – 195cm	Blue-grey-green sandy silt with organic and pebbles
195 – 225cm	Brown-grey medium sand
225cm	Borehole stopped on sand and gravel

BH8 TL 40283 73160

0 - 25cm	Ploughsoil – grey-brown silt
25 – 42cm	Brown silt
42 - 85cm	White-buff orange mottled marl with shell fragments
85 – 94cm	Grey-brown orange mottled organic silt
94 – 100cm	Grey-orange mottled silt
100 – 114cm	Dark grey silt
114 – 122cm	Black organic detritus mud
122 – 140cm	Dark grey organic silt with shells and rootlets
140 – 154cm	Light grey-brown-buff organic marly silt
154 – 158cm	Black organic detritus mud
158 – 166cm	Grey-blue sandy silt with organic and pebbles
166 – 177cm	Green-grey silty sand
177 – 190cm	Brown-grey medium sand
190cm	Borehole stopped on sand and gravel

BH9 TL 40326 73166

0 - 25cm	Ploughsoil – grey-brown silt
25 – 37cm	Brown silt
37 - 77cm	White-buff orange mottled marl with shell fragments
77 – 92cm	Grey-brown organic marly silt with shells and iron staining
92 – 110cm	Grey-orange mottled silt
110 – 113cm	Dark grey silt
113 – 136cm	Grey organic silt with rootlets and mollusc fragments
136 – 148cm	Black organic detritus mud with shells and rootlets
148 – 158cm	Grey silt
158 – 170cm	Black organic detritus mud with wood, rootlets and a little silt
170 – 177cm	Grey organic sandy silt with pebbles
177 – 188cm	Grey-blue sandy silt with pebbles
188 – 225cm	Brown-grey medium sand
225cm	Borehole stopped on sand and gravel

BH10 TL 40374 73175

0 - 25cm	Ploughsoil – grey-brown silt with rootlets
25 – 36cm	Brown silt
36 - 84cm	White-buff orange mottled marl with shell fragments
84 – 95cm	Grey-brown orange mottled organic silt
95 – 100cm	Grey silt
100 – 113cm	Grey-brown marly silt with a little organic material
113 – 127cm	Grey mottled silt with rootlets and reed stems
127 – 150cm	Black organic detritus mud with shells and rootlets
150 – 180cm	Grey-blue silty sand with pebbles
180cm	Borehole stopped on sand and gravel

BH11 TL 40422 73178

0 - 25cm	Ploughsoil – grey-brown silt with rootlets
25 – 34cm	Brown silt
34 - 60cm	White-buff orange mottled marl with shell fragments
60 – 88cm	Grey silt with shells
88 – 95cm	Black-grey organic sand
95 – 104cm	Grey organic sandy silt
104 – 125cm	Grey-blue sandy silt with organic and pebbles
125 – 130cm	Green-brown medium sand
130cm	Borehole stopped on sand and gravel

BH12 TL 40471 73189

0 - 25cm	Ploughsoil – brown silt with rootlets
25 – 44cm	Brown silt
44 - 48cm	White-buff orange mottled marl with shell fragments
48 – 64cm	Grey-brown organic silt
64 – 80cm	Grey silt with shells and a little organic material
80 – 84cm	Grey organic silty sand with pebbles
84 – 95cm	Grey sandy silt with a little organic material
95 – 125cm	Grey-orange silty sand
125 – 150cm	Grey-orange medium sand
150cm	Borehole stopped on sand and gravel

Checker Logs

BHA TL 40167 73440

0 - 25cm	Ploughsoil –brown silt with rootlets
25 – 35cm	Soft brown silt with shells
35 - 70cm	White-buff marl with organic material and shell fragments
70 – 81cm	Grey-brown mottled marl with a little silt
81 – 90cm	Black silty peat with rootlets
90 – 100cm	Grey silt with shells, rootlets and a little organic material
100 – 115cm	Buff silty marl
115 – 125cm	Grey organic silt with rootlets
125 – 131cm	Black organic detritus mud with a little silt
131 – 150cm	Blue-grey sandy silt with pebbles
150 - 175cm	Grey-blue sandy silt
175cm	Borehole stopped on sand and gravel

BHB TL 40273 73448

0 - 25cm	Ploughsoil – brown silt with rootlets
25 – 65cm	Brown silty clay

65 – 120cm	White-buff marl with organic material and shell fragments
120 – 137cm	Grey-brown orange mottled organic silt with shells
137 – 148cm	Grey-brown silt with shells and a little marl
148 – 153cm	Grey organic silt with rootlets and shells
153 – 163cm	Black-brown silty organic detritus mud
163 – 175cm	Blue-grey sandy silt with organic material
175– 215cm	Grey-blue clay with sand and pebbles
215cm	Borehole stopped on sand and gravel

BHC TL 40263 73390

0 - 25cm	Ploughsoil – brown silt with rootlets
25 – 45cm	Stiff brown silty clay
45 – 93cm	White-buff marl with organic material and shell fragments
93 – 102cm	Grey-brown-black organic silt with shells
102 – 115cm	Grey mottled silt with shells and a little organic material
115 – 125cm	Grey organic silt with reed stems, rootlets and shells
125 – 141cm	Grey silt with shells and a little organic
141 – 164cm	Grey-brown organic silt with reed stems
164 – 175cm	Grey-brown silt with shells and a little organic material
175 – 191cm	Grey-brown organic silt
191 – 225cm	Grey sandy silt with pebbles
225cm	Borehole stopped on sand and gravel

BHD TL 40235 73241

0 - 25cm	Ploughsoil – brown silt with rootlets
25 – 45cm	Soft brown silt with shells
45 – 102cm	White-buff marl with organic material and shell fragments
102 – 116cm	White-buff marl with orange mottling
116 – 131cm	Grey mottled organic silt
131 – 145cm	Brown-black organic silty detrital mud
145 – 154cm	Grey-brown silt with rootlets and a little organic material
154 – 175cm	Grey silty sand with pebbles
175 – 197cm	Blue-grey sandy silt
197 – 225cm	Green-grey silty sand with pebbles
225cm	Borehole stopped on sand and gravel

BHE TL 40217 72997

0 - 25cm	Ploughsoil – grey-brown sandy silt with rootlets
25 – 70cm	White-buff marl with organic material and shell fragments
70 – 75cm	Grey-brown organic silt
75 – 88cm	Buff-grey silty marl
88 – 99cm	Grey-brown marly organic silt with shells
99 – 110cm	Grey organic silt with shells
110 – 125cm	Grey silt with rootlets and shells fragments
125– 131cm	Brown-buff marly organic silt
131 – 157cm	Dark grey organic silt
157 – 175cm	Blue-grey sandy silt with pebbles
175 – 180cm	Grey-green silty sand with pebbles
180cm	Borehole stopped on sand and gravel

Additional Boreholes

BH I **TL 40042 73818**

0 - 30cm	Ploughsoil – brown silt with rootlets
30 – 75cm	Brown-black clayey silt with rootlets
75 - 86cm	Iron-stained organic silt with rootlets
86 – 93cm	Grey silt
93 – 106cm	Brown-black organic silt with rootlets
106 – 117cm	Grey silt with a little organic material
117 – 130cm	Grey sandy silt with pebbles
130cm	Borehole stopped on sand and gravel

BH II **TL 39943 73719**

0 - 35cm	Ploughsoil – brown silt with rootlets
35 – 40cm	Grey-brown silty clay
40 – 50cm	Orange-white iron-stained marl
50 -75cm	White-buff marl
75 – 88cm	Black organic detritus mud with a little silt
88 – 95cm	Grey-buff-orange iron-stained marl
95 – 100cm	Grey-brown organic silt
100 – 104cm	Black-brown silty organic detritus mud
104 – 116cm	Grey organic silt
116 – 145cm	Blue-grey sandy silt with organic material
175– 145cm	Grey sandy silt with flints and flecks of organic
145cm	Borehole stopped on sand and gravel

BH III **TL 40140 73721**

0 - 25cm	Ploughsoil – brown silt with rootlets
25 – 68cm	Brown-black clayey silt with rootlets
68 – 70cm	Grey-buff marl with silt
70 – 90cm	Grey-brown organic silt with reed stems
90 – 98cm	Grey silt
98 – 105cm	Soft grey-black organic silt with reed stems
105 – 111cm	Grey silt
111 – 120cm	Grey silty sand with pebbles
120cm	Borehole stopped on sand and gravel

BH IV **TL 39938 73616**

0 - 25cm	Ploughsoil – brown silty clay with rootlets
25 – 47cm	Stiff grey-brown silty clay
47 – 55cm	Buff-orange marl with shell fragments
55 - 80cm	Grey-black mottled silty organic detrital mud
80 – 89cm	Grey silt with a little organic material
89 - 96cm	Black peaty detritus mud with shell fragments and a little silt
96 – 125cm	Grey silty sand with pebbles
125 – 150cm	Green-grey sandy silt
150 – 175cm	Green-grey sand with pebbles
175cm	Borehole stopped on sand and gravel

BH V **TL 40140 73619**

0 - 30cm	Ploughsoil – grey-brown silty clay with rootlets
30 – 35cm	Grey-brown silty clay
35 – 41cm	Grey-buff marl with shells
41 – 61cm	Grey-brown organic silt with a little marl
61 – 64cm	Brown-black detritus mud

64 – 67cm	Brown-buff marl
67 – 100cm	Grey organic silt with rootlets and shells
100 – 127cm	Grey-black silty organic detritus mud
127 – 136cm	Brown slightly organic sandy silt
136 – 150cm	Blue-grey silty sand with pebbles
150 – 155cm	Blue-grey sand with pebbles
155cm	Borehole stopped on sand and gravel

BH VI TL 40042 73506

0 - 35cm	Ploughsoil – grey-brown silty clay with rootlets
35 – 45cm	Grey-brown silty clay
45 – 96cm	Grey-buff marl with shells and iron staining
96 – 100cm	Brown-black detritus mud with a little marl
100 – 106cm	Grey-buff silty clay with shells and a little marl
106 – 112cm	Grey-black silty organic detritus mud with rootlets
112 – 145cm	Grey organic silt with rootlets, reed stems and shells
145 – 150cm	Black peaty detritus mud
150 – 160cm	Blue-grey sandy silt with pebbles
160cm	Borehole stopped on sand and gravel

BH VII TL 40224 73487

0 - 25cm	Ploughsoil – brown silty clay with pebbles
25 – 62cm	Brown silty clay
62 – 98cm	Grey-buff marl with shells
98 – 100cm	Grey-brown organic silt with shells
100 – 126cm	Grey-brown organic silt with reed stems
126 - 155cm	Brown-black organic detritus mud
155 – 178cm	Black-brown sandy organic silt
178 – 200cm	White-grey silty sand with pebbles
200 – 225cm	Grey medium sand
225cm	Borehole stopped on sand and gravel

BH VIII TL 40051 73404

0 - 30cm	Ploughsoil – grey-brown silty clay with rootlets
30 – 38cm	Grey-brown silty clay
38 – 71cm	Grey-buff marl with shells and iron staining
71 – 85cm	Grey-brown organic silt with shells
85 – 103cm	Grey silt with shells
103 – 106cm	Grey organic silt with shells and rootlets
106 – 127cm	Grey-black peaty organic detritus mud with rootlets
127 – 133cm	Grey sandy silt
133 – 166cm	Blue-grey sand with pebbles
166 – 196cm	Blue-grey sand
196cm	Borehole stopped on sand and gravel

BH IX TL 40232 73404

0 - 30cm	Ploughsoil – brown silt
30 – 40cm	Brown silty clay
40 – 90cm	Grey-buff marl with shells
90 – 116cm	Grey-brown organic silt with shells
116 – 129cm	Brown-black organic detritus mud
129 - 135cm	Grey-brown organic silt
135 – 150cm	Black-brown sandy organic silt
150 – 190cm	Blue-grey sandy silt with pebbles
190cm	Borehole stopped on sand and gravel

BH X TL 39921 73296

0 - 30cm	Ploughsoil – brown silt
30 – 43cm	Brown silt
43 – 67cm	Grey-buff marl with shells
67 – 74cm	Grey-brown organic silt with shells
74 – 86cm	Grey silt
86 – 102cm	Grey-brown organic silt with shells
102 – 106cm	Grey-brown silty organic detritus mud
106 – 120cm	Grey-blue sandy silt with pebbles
120 – 125cm	Grey-orange silty sand
125cm	Borehole stopped on sand and gravel

BH XI TL 40033 73288

0 - 30cm	Ploughsoil – brown silt
30 – 37cm	Brown silt
37 – 86cm	Grey-buff marl with shells
86 – 95cm	Grey-brown organic silt with shells
95 – 110cm	Grey silt
110 – 120cm	Grey-brown organic silt
120 – 125cm	Grey-blue-brown sandy silt with pebbles
125cm	Borehole stopped on sand and gravel

BH XII TL 40148 73265

0 - 35cm	Ploughsoil – brown silt
35 – 95cm	Grey-buff marl with shells
95 – 100cm	Grey-brown organic silt
100 – 110cm	Grey-buff marl
110 – 113cm	Grey-brown organic silt
113 – 123cm	Grey silt with a little organic
123 – 132cm	Grey organic silt with shells
132 – 134cm	Brown-black organic detritus mud
134 – 160cm	Grey sandy silt with pebbles
160 – 180cm	Green-blue-brown sandy silt with pebbles
180cm	Borehole stopped on sand and gravel

BH XIIITL 40228 73293

0 - 30cm	Ploughsoil – brown silt
30 – 42cm	Brown silty clay
42 – 80cm	Grey-buff marl with shells
80 – 92cm	Grey marl with a little organic and silt
92 – 107cm	Grey-brown organic silt with shells
107 – 116cm	Brown organic silt with shells
116 – 127cm	Brown-black organic detritus mud
127 - 133cm	Grey silty sand
133 – 140cm	Grey-brown sandy organic silt
140 – 155cm	Blue-grey sandy silt with pebbles
155cm	Borehole stopped on sand and gravel

BH XIVTL 40339 73306

0 - 25cm	Ploughsoil – grey-brown silty clay with rootlets
25 – 71cm	Grey-buff marl
71 – 86cm	Grey-buff detritus mud with a little marl
86 – 97cm	Grey silt
97 – 100cm	Grey-black organic silt
100 – 108cm	Grey-buff marly silt

108 – 121cm	Grey organic silt with shells
121 – 141cm	Brown organic detritus mud with wood
141 – 160cm	Grey sandy organic silt
160 – 210cm	Blue-grey sandy silt with pebbles
210cm	Borehole stopped on sand and gravel

BH XV TL 40439 73286

0 - 30cm	Ploughsoil – grey-brown silty clay with rootlets
30 – 63cm	Grey-buff marl
63 – 70cm	Grey-brown organic detritus mud with a little silt
70 – 79cm	Grey silt with a little marl
79 – 108cm	Grey organic silt with shells
108 – 116cm	Grey-brown organic detritus mud with shells and a little silt
116 – 122cm	Grey-brown silty clay
122 – 137cm	Grey-brown-black sandy silt with organic and pebbles
137 – 177cm	Blue-grey sandy silt with pebbles
177 – 180cm	Blue-brown-orange sand
180 – 205cm	Blue-grey silt with organic, rootlets and pebbles
205cm	Borehole stopped on sand and gravel

BH XVITL 40141 73218

0 - 30cm	Ploughsoil – brown silt
30 – 45cm	Brown silty clay
45 – 95cm	Grey-buff marl with shells
95 – 100cm	Grey-brown organic silt
100 – 115cm	Grey-brown silt with a little organic
115 – 129cm	Grey organic silt with rootlets and shells
129 – 142cm	Brown-black organic detritus mud
142 – 158cm	Brown sandy organic silt with pebbles
158 – 175cm	Black-grey silty sand with pebbles
175cm	Borehole stopped on sand and gravel

BH XVII TL 40340 73215

0 - 30cm	Ploughsoil – grey-brown silty clay
30 – 38cm	Brown silty clay
38 – 73cm	Grey-buff marl with shells
73 – 87cm	Grey organic silt with a little marl
87 – 97cm	Grey-buff silty marl with shells
97 – 116cm	Grey silt with organic material
116 – 136cm	Grey brown organic silt
136 – 180cm	Brown-black silty organic detritus mud
180 – 190cm	Blue-grey sandy silt with pebbles
190 – 205cm	Blue-grey sandy silt with rootlets and pebbles
205 – 215cm	Orange medium sand
215 – 225cm	Blue sandy silty clay with pebbles and rootlets
195 – 230cm	Orange sand
230cm	Borehole stopped on sand and gravel

BH XVIII TL 40440 73221

0 - 30cm	Ploughsoil – grey-brown silty clay
30 – 38cm	Brown silty clay with pebbles and iron staining
38 – 69cm	Grey-buff marl with shells
69 – 77cm	Grey-black organic silt
77 - 79cm	Buff-brown silt
79 – 104cm	Grey silt with a little organic
104 – 129cm	Grey-brown organic silt with a little sand

129 – 133cm	Grey silty clay
133 – 150cm	Blue-grey sandy silt with organic material and rootlets
150 – 163cm	Brown – black organic sandy silt with a few shells
163 – 195cm	Grey-green-orange mottled silty sand with pebbles and rootlets
195 – 225cm	Orange sand
225cm	Borehole stopped on sand and gravel

BH XIXTL 40216 73112

0 - 30cm	Ploughsoil – grey-brown silty clay
30 – 38cm	Brown silty clay
38 – 70cm	Grey-buff marl with shells
70 – 81cm	Grey marl with silt and organic material
81 – 89cm	Grey-brown organic silt
89 – 120cm	Grey silt
120 – 136cm	Grey organic silt with rootlets and shells
136 – 143cm	Brown-black organic detritus mud
143 – 149cm	Brown organic silt
149 – 165cm	Blue-grey sandy silt
165 – 183cm	Blue-grey silty sand
183 – 195cm	Orange-brown medium sand
195cm	Borehole stopped on sand and gravel

BH XX TL 40340 73119

0 - 30cm	Ploughsoil – grey-brown silty clay
30 – 73cm	Grey-buff marl with shells
73 – 79cm	Brown-black organic silt
79 – 84cm	Grey silt with reed stems and iron staining
84 – 95cm	Grey organic silt
95 – 122cm	Grey organic silt with reed stems and shells
122 – 150cm	Brown-black silty organic detritus mud with rootlets and shells
150 – 160cm	Brown-black silty organic detritus mud with wood
160 – 195cm	Blue-grey sandy silt with rootlets and pebbles
195cm	Borehole stopped on sand and gravel

BH XXITL 40442 73122

0 - 30cm	Ploughsoil – grey-brown silt
30 – 40cm	Brown silty clay
40 – 81cm	Grey-buff marl with iron staining
81 – 84cm	Grey silt
84 – 88cm	Grey-brown organic silt
88 – 91cm	Brown-black organic detritus mud
91 – 94cm	Grey sandy silt
94 – 100cm	Grey-orange sandy silty clay with pebbles
100 – 145cm	Grey-orange mottled sandy silty clay with pebbles
145 – 150cm	Orange sand
150 – 195cm	Blue-grey sandy silt
195 – 215cm	Blue-orange-brown-green silty sand
215 – 225cm	Blue-grey silty clay with pebbles
225 – 250cm	Grey sand
250cm	Borehole stopped on sand and gravel

BH XXII TL 40438 73017

0 - 30cm	Ploughsoil – grey-brown silt
30 – 41cm	Brown silty clay
41 – 73cm	Grey-buff marl with iron staining
73 – 80cm	Grey silt with marl and shells

80 – 84cm	Grey-buff silty marl with shells
84 – 93cm	Grey-black organic detritus mud
93 – 95cm	Grey silty clay
95 – 100cm	Grey sandy silt with pebbles
100cm	Borehole stopped on sand and gravel

BH Y TL 40339 73616

0 - 30cm	Ploughsoil – grey-brown silty clay with rootlets
30 – 45cm	Grey-brown silty clay
45 – 83cm	Brown silt with a little organic material
83 – 86cm	Grey silty clay
86 – 120cm	Black-grey-brown organic silt with wood and rootlets
120 – 150cm	Blue-grey sandy silt with pebbles
150cm	Borehole stopped on sand and gravel

BH Z TL 40338 73520

0 - 30cm	Ploughsoil – grey-brown silty clay with rootlets
30 – 47cm	Grey-brown silty clay
47 – 77cm	Brown silty clay
77 – 85cm	Grey organic silt with shells
85 – 94cm	Grey silt
94 – 122cm	Grey-brown organic silt with reed stems and rootlets
122 – 130cm	Grey-brown organic sand with pebbles
130 – 150cm	Brown sandy organic silt with pebbles
150 – 165cm	Blue-grey sandy silt with pebbles
165 – 175cm	Green-grey sand
175cm	Borehole stopped on sand and gravel

BH ZZ TL 40365 73427

0 - 30cm	Ploughsoil – grey-brown silty clay with rootlets
30 – 45cm	Grey-brown silty clay
45 – 95cm	Grey-buff marl
95 – 116cm	Grey-brown organic detritus mud with shells
116 – 124cm	Grey-buff silt
124 – 138cm	Grey-brown organic silt with shells
138 – 150cm	Brown organic detritus mud
150 – 200cm	Blue-grey sandy silt with pebbles
200cm	Borehole stopped on sand and gravel

BH YY TL 40429 72901

0 - 30cm	Ploughsoil – grey-brown silty clay with pebbles
30 – 45cm	Brown silty clay
45 – 68cm	Grey-buff marl
68 – 76cm	Brown-black organic silt with a little marl
76 - 89cm	Grey-buff silty marl with shells
89 – 93cm	Grey-black organic detritus mud
93 – 97cm	Grey sandy organic silt
97 – 100cm	Orange medium sand
100cm	Borehole stopped on sand and gravel

BH P TL 40164 72958

0 - 30cm	Ploughsoil – grey-brown silty clay
30 – 36cm	Brown silty clay
36 – 68cm	Grey-buff marl with shells
68 – 74cm	Grey marly organic silt

74 – 115cm	Grey silt
115 – 120cm	Grey-brown organic silt with shells
120 – 175cm	Blue-grey sandy silt
175cm	Borehole stopped on sand and gravel

BH Q TL 39988 73009

0 - 30cm	Ploughsoil – grey-brown silty clay
30 – 62cm	Grey-buff marl with shells
62 – 76cm	Grey mottled organic silt
76 – 95cm	Grey silt with shells
95 – 100cm	Black organic detritus mud
100 – 106cm	Grey silt clay
106 – 125cm	Orange-grey sandy silt with pebbles
125cm	Borehole stopped on sand and gravel

BH R TL 39951 73025

0 - 30cm	Ploughsoil – grey-brown silty clay
30 – 42cm	Brown silty clay
42 – 67cm	Grey-buff marl with shells
67 – 74cm	Grey-brown organic silt
74 – 83cm	Grey silt with shells
83 – 102cm	Grey-buff silty marl
102 – 113cm	Black-brown organic detritus mud
113 – 152cm	Grey-orange mottled sandy silt with pebbles
152 – 155cm	Blue-white medium sand
155cm	Borehole stopped on sand and gravel

BH S TL 39924 73158

0 - 25cm	Ploughsoil – grey-brown silty clay
25 – 35cm	Brown silty clay
35 – 50cm	Grey-buff marl with shells
50 – 60cm	Grey-brown organic silt with shells
60 – 70cm	Grey silty clay
70 – 88cm	Grey-brown organic silt with shells
88 – 93cm	Grey silt with shells
93 – 95cm	Black-brown organic detritus mud
95 – 135cm	Grey-orange sandy silt with pebbles
135 – 145cm	Orange medium sand

145cm Borehole stopped on sand and gravel

APPENDIX 3:

T6 BH9: Percentage Pollen Data

Depth (cm)	200	190	180	170	162	150	140	130	120	110	100	91	80	70	60
Trees & Shrubs															
Betula			0.0	0.0	1.1	3.7	1.6	0.0	1.5	1.6	3.0	3.0	4.2		
Pinus			0.0	1.6	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0		
Ulmus			0.0	1.6	1.1	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.4		
Quercus			1.9	4.0	2.1	2.5	1.6	1.8	1.5	3.2	3.0	3.0	2.8		
Tilia			0.0	1.6	1.1	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Alnus			3.8	6.4	9.5	4.9	7.8	5.4	2.9	3.2	4.5	4.5	1.4		
Carpinus			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0		
Fraxinus			0.0	1.6	2.1	0.0	1.6	0.0	1.5	1.6	0.0	0.0	0.0		
Corylus			7.7	11.2	10.5	9.9	7.8	7.1	7.4	4.8	7.5	19.7	16.7		
Salix			5.8	12.0	6.3	1.2	1.6	0.0	0.0	1.6	3.0	1.5	1.4		
Juniperus			1.9	1.6	3.2	6.2	3.1	3.6	1.5	0.0	0.0	0.0	0.0		
Herbs															
Poaceae			42.3	24.0	24.2	21.0	28.1	42.9	47.1	40.3	38.8	30.3	36.1		
Cereals			1.9	3.2	3.2	11.1	4.7	1.8	4.4	3.2	3.0	3.0	2.8		
Cyperaceae			1.9	1.6	6.3	3.7	7.8	1.8	5.9	8.1	11.9	9.1	6.9		
Asteraceae (Asteroidea/Cardueae) undif.			0.0	0.0	0.0	1.2	3.1	1.8	0.0	0.0	0.0	0.0	0.0		
Asteraceae (Lactuceae) undif.			1.9	0.0	1.1	1.2	1.6	0.0	1.5	1.6	0.0	1.5	1.4		
Centaurea nigra type			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4		
Caryophyllaceae			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0		
Chenopodiaceae			1.9	3.2	2.1	1.2	1.6	1.8	1.5	1.6	1.5	3.0	1.4		
Brassicaceae			1.9	3.2	4.2	2.5	3.1	3.6	1.5	1.6	1.5	0.0	1.4		
Fabaceae			0.0	1.6	3.2	0.0	0.0	1.8	0.0	0.0	0.0	0.0	1.4		
Filipendula			0.0	0.0	0.0	1.2	1.6	1.8	1.5	1.6	1.5	3.0	2.8		
Lamiaceae			0.0	0.8	1.1	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Oxyria type			0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Plantago lanceolata	*barren*	*barren*	1.9	0.8	0.0	1.2	0.0	0.0	1.5	1.6	0.0	0.0	1.4	*barren*	*barren*
Ranunculus type			3.8	4.8	3.2	8.6	1.6	3.6	2.9	1.6	3.0	3.0	1.4		

Depth (cm)	200	190	180	170	162	150	140	130	120	110	100	91	80	70	60
Rumex			1.9	2.4	1.1	1.2	0.0	1.8	1.5	4.8	1.5	0.0	0.0		
Apiaceae			3.8	3.2	3.2	2.5	1.6	0.0	0.0	3.2	1.5	1.5	1.4		
Liliaceae			0.0	0.0	1.1	3.7	3.1	3.6	0.0	0.0	0.0	0.0	0.0		
Epilobium			0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0		
Lower plants															
Equisetum			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0		
Polypodium			1.9	1.6	2.1	1.2	1.6	1.8	0.0	0.0	0.0	0.0	0.0		
Pteropsida (monolete) undif.			11.5	5.6	6.3	6.2	12.5	10.7	10.3	12.9	10.4	9.1	9.7		
Pteropsida (trilete) undif.			1.9	1.6	1.1	1.2	1.6	3.6	2.9	1.6	1.5	1.5	2.8		
Sphagnum			0.0	0.0	0.0	0.0	0.0	0.0	2.9	1.6	1.5	0.0	0.0		
Aquatics															
Myriophyllym vert.			0.0	0.8	3.2	6.2	1.6	0.0	0.0	0.0	0.0	0.0	0.0		
Nuphar type			0.0	0.0	0.0	1.2	0.0	0.0	0.0	1.6	1.5	1.5	0.0		
Sparganium type			13.5	12.0	12.6	11.1	17.2	16.1	11.8	17.7	11.9	9.1	11.1		
Typha latifolia			0.0	0.0	1.1	1.2	0.0	0.0	0.0	0.0	1.5	3.0	1.4		
Sum trees			5.8	16.8	16.8	12.3	14.1	7.1	7.4	9.7	11.9	12.1	9.7		
Sum shrubs			15.4	24.8	20.0	17.3	12.5	10.7	8.8	6.5	10.4	21.2	18.1		
Sum herbs			63.5	49.6	53.7	61.7	57.8	66.1	70.6	69.4	64.2	56.1	59.7		
Sum spores			15.4	8.8	9.5	8.6	15.6	16.1	13.2	14.5	11.9	10.6	12.5		
Main Sum			52	125	95	81	64	56	68	62	67	66	72		
Concentration (grains per ml)	<1052	<1052	19532	54776	47577	56792	61190	65439	65014	50158	44040	40831	37861	<1052	<1052

APPENDIX 4

Site-visit Résumé – *Mike Allen*

The site at Over was visited on 11th October 2012, with the principle aim of examining and defining the landscape zones between Willingham Mere and the raised terrace, and examining the broader geoarchaeology of this landscape zone. A tour of the sequences exposed in the evaluation trenches was conducted by Jonny Tabor who provided some sedimentary background.

The area can be divided into a three clear basic topographical zones (Fig. 35) comprising the 'higher raised terrace' on which the barrow cemeteries are located; the 'lower (flooded) terrace', and Willingham Mere. The 'lower flooded terrace' is viewed as a band of land fringing the base of the barrow cemeteries on the higher raised terrace, and forms a broad linear zone between this higher land and Willingham Mere (Fig. 36).

A couple of 'standard' sequences were rapidly described to assist in the characterisation of the local landscape zones

Mere Edge

10cm	Upper light silt slightly calcareous gleyed - typically Late Iron Age to Romano-British
15cm	Upper organic silt representing alder carr and phragmites reed (can be thicker)
20cm	Silty (clay), largely inorganic with shells
	Lower organic silt - typically Middle to Late Bronze Age
	Tenacious bluish grey sandy silt over Gravels - Late Glacial/Early Post Glacial
0-25cm	Alluvial brown earth soil A
35-70cm	Alluvial B: grey, fine-grained silty clay with medium to large blocky structure
70-220cm	Alluvium: grey fine-grained silty clay with large to very large blocky structure
220-240cm	bA/B; buried soil
240cm	C: sands and gravel

Upper End of the Flooded Terrace Zone

Peat / peaty soils =? upper marl
Weakly organic silt
lighter brown silt = reed silt
thin band of dark organic silt
greyish blue silty and, oxidising to strong brown ('orange')

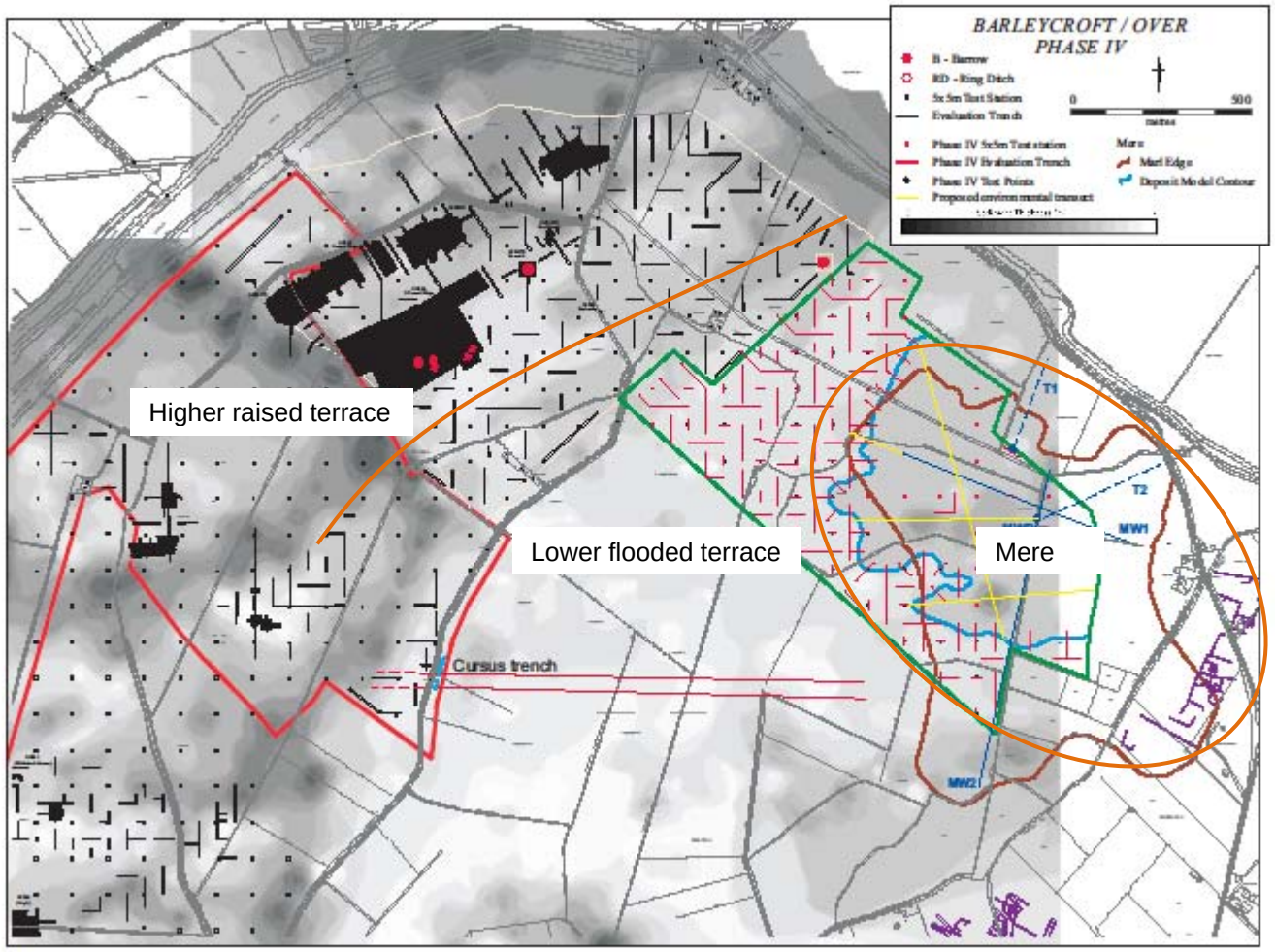

Figure 35: Basic landscape zone hypothesis.

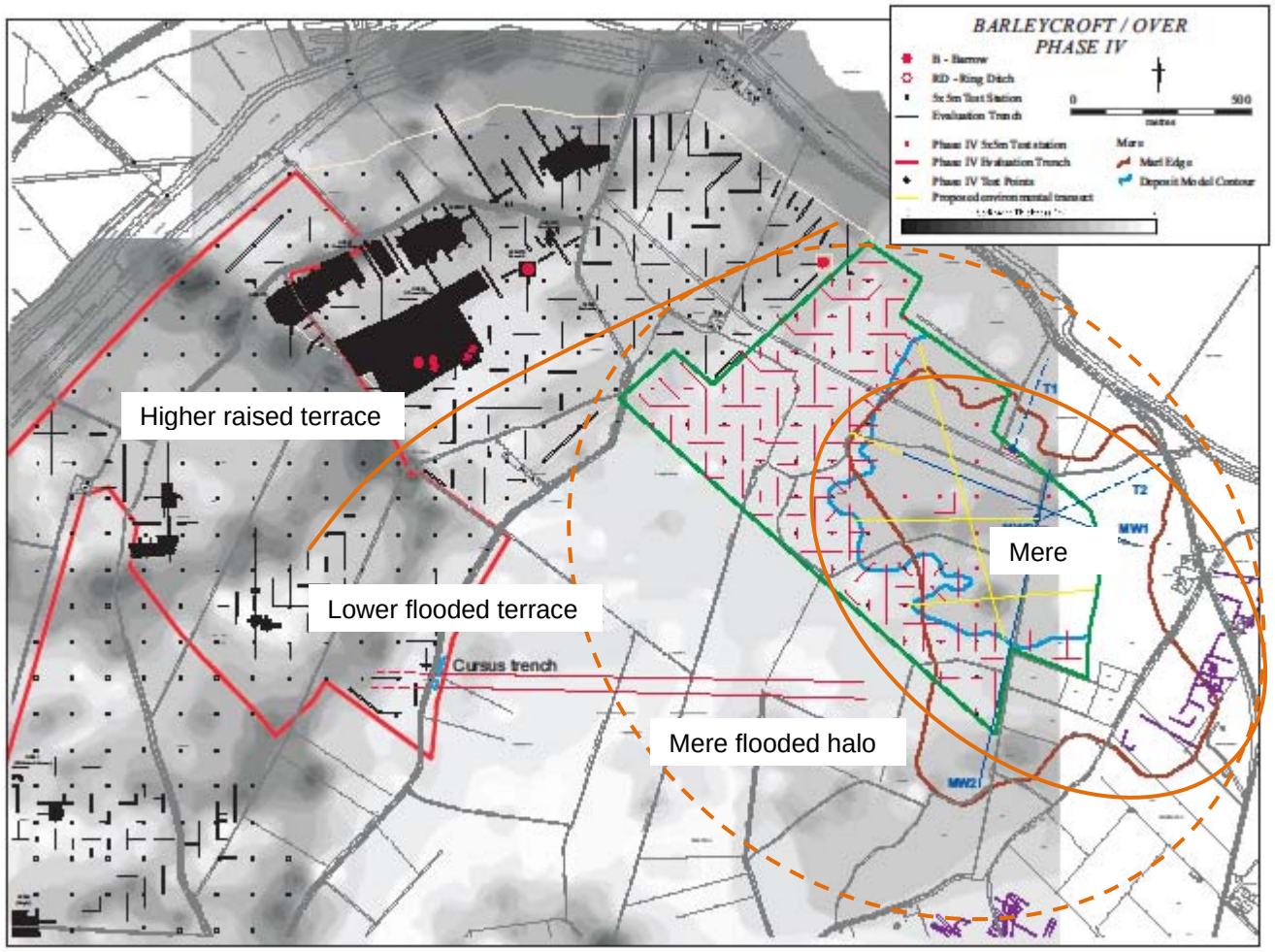

Figure 36: Revised landscape zone hypothesis

Landscape Zones

Following the field visit on 11/12/12 the initial hypotheses of linear bands or zones from the higher (dry) raised terrace and across the lower (flooded) terrace which is 'punctured' by Willingham Mere (Fig. 35), has been tentatively revised. The use of the higher ground is clear with barrow cemeteries and settlement along the sand ridge. The extent of Willingham Mere has been mapped and can be chronologically plotted as a result of the ongoing work by Steve Boreham. The nature of the 'twilight zone' in between has yet to be defined.

The initial visit to the area suggests that this linear zoned concept could be re-considered with the lower flooded terrace zone forming an aureole or halo around the Mere; an area subject to flooding and submergence relating to the increasing and decreasing nature of the Mere and its local hydrology, and sitting within the lower flooded terrace (Fig. 36). This enables us to view a broad and changing zone surrounding the Mere, but still leaves the character of the lower flooded terrace to be defined.

The Mere flooded halo seems to contain a relatively thick marl and thin sequence of organic silt and thin intermittent (Bronze Age) peaty soil. Sequences on the upper fringes of this area show oxidised sand colluviating from the sand ridge, with fine-grained overbank floodplain alluvium from the south and south east.

i) Higher raised terrace - as before
ii) Willingham Mere - as before
iii) Lower flooded terrace -is now proposed to be restricted to a halo or aureole immediately surrounding the Mere, and that much of the remaining area is largely dry (i.e. no alluvium or over bank floodplain deposits)

Discussion

This suggestion does not define the Lower (flooded) terrace, but subdivides this zone allowing attention to be focussed in each area rather than concentrating on a single zone. Further, the key area of the lower flooded terrace to the south west of the Mere, may form a separate intermediate zone which has yet to be fully characterised. Investigation here – where the putative cursus was thought to be located - would aid in characterising this proposed zone and would form the first, tentative foray into the comprehension of this zone. This would assist in planning appropriate revisions and modifications to the landscape interpretation and the evaluation and excavation strategies.

The records of the evaluation trenches could be examined to attempt to define its consistent character and any significant variation across the lower terrace zones, and start to characterise this sequence.

APPENDIX 5

Buried Soil Test Point Sampling Results

Test Point No.	Archaeological Zone	Flint	Pot	Animal Bone	Burnt Stone/Flint	Total
114	XII	1				**1**
117	XII	1				**1**
132	IX	2			1	**3**
133	IX	2				**2**
138	IX				1	**1**
146	IX	1				**1**
152		1		1		**2**
157		1				**1**
161	X	1				**1**
165	X	2			2	**4**
168	X	4				**4**
172	X		3			**3**
174	X	1				**1**
176		2				**2**
180	XI	1				**1**
181	XI	2				**2**
182	XI	1				**1**
203	IX	1				**1**
204	IX	1			3	**4**
205	IX	1				**1**
207		2				**2**
208	XI	3	2		1	**6**
209	IX	1				**1**
211	X	2		3		**5**
215	XI	1	2			**3**
216	XI	3			3	**6**
217	X				3	**3**
218	XV				1	**1**
222	X	3				**3**
223	XV	1			2	**3**
226	XV	2			1	**3**
Total		**44**	**7**	**4**	**18**	**73**

APPENDIX 6

Feature List

Feature No.	Trench No.	Feature Type	Context No.	Context Type	Length (m)	Width (m)	Depth (m)	Selected Artefacts	Comments
1	173	Ditch	1	Cut	N/A	1.96	0.35		Aligned NW-SE
			2	Fill					
			3	Fill					
2	173	Gully/Tree Throw?	6	Cut	N/A	0.42	0.12		
			7	Fill					
3	180	Pit	8	Cut	0.77	0.7	0.32	Pottery, Flint	Late Neolithic (Grooved Ware)
			9	Fill					
			10	Fill					
4	173	Ditch	11	Cut	N/A	0.4	0.15		Aligned NE-SW
			12	Fill					
5	173	Hollow, filled with buried soil	13	Cut	0.6	0.34	0.04		
			14	Fill					
6	173	Hollow, filled with buried soil	15	Cut	0.46	0.34	0.06		
			16	Fill					
7	226	Ditch	17	Cut	N/A	1.02	0.24		Aligned NW-SE
			18	Fill					
8	150	Pit	19	Fill				Pottery	Early Bronze Age/Collared Urn (Unexcavated)
			20	Cut					
9	150	Possible pit	N/A						(Unexcavated)
10	150	Possible pit	N/A						(Unexcavated)

Feature No.	Trench No.	Feature Type	Context No.	Context Type	Length (m)	Width (m)	Depth (m)	Selected Artefacts	Comments
12	178	Tree throw	44	Fill					
			45	Fill					
			46	Cut	N/A	1.42	0.38		
13	199	Ditch	23	Cut	N/A	1.1	0.48		Aligned NW-SE
			24	Fill					
			25	Fill					
			26	Fill					
			33	Fill					
			34	Fill					
			35	Fill					
			36	Cut	N/A	1	0.45		
14	173	Tree throw	29	Fill					
			30	Cut	N/A	1.49	0.57		
15	178	Tree throw	27	Fill					
			28	Cut	3.45	1.4	0.39		
16	199	Tree throw	31	Cut	N/A	N/A	0.5		
			32	Fill					
17	178	Ditch	37	Cut	N/A	0.92	0.38		Aligned NW-SE
			38	Fill					
			39	Fill					
			40	Fill					
			41	Fill					
			42	Fill					
			43	Fill					
18	220	Posthole	52	Cut	0.3	0.3	0.08		
			53	Fill					

Feature No.	Trench No.	Feature Type	Context No.	Context Type	Length (m)	Width (m)	Depth (m)	Selected Artefacts	Comments
19	172	Ditch	47	Fill					Aligned NW-SE
			48	Cut	N/A	0.76	0.26		
20	220	Posthole	54	Cut	0.4	0.4	0.16		
			55	Fill					
21	220	Posthole	56	Cut	0.26	0.25	0.13		
			57	Fill					
22	220	Possible posthole	58	Cut	0.48	0.3	0.16		
			59	Fill					
23	220	Posthole	60	Cut	0.2	0.2	0.1		
			61	Fill					
24	220	Tree throw	62	Cut	N/A	N/A	0.46		
			63	Fill					
25	220	Tree throw	64	Cut	N/A	0.8	0.5		
			65	Fill					
26	230	Tree throw	50	Cut	N/A	N/A	0.14		
			51	Fill					
27	230	Tree throw	70	Cut	N/A	0.9	0.25		
			71	Fill					
28	220	Pit	66	Fill	0.76	0.7	0.2	Pottery, flint	Neolithic (Peterborough Ware)
			67	Cut					
29	165	Pit	68	Cut	0.7	0.6	0.04		Highly truncated
			69	Fill					
30	222	Tree throw	89	Cut	N/A	1.8	0.23		
			90	Fill					
31	222	Tree throw	83	Cut	1.8	1.9	0.65		
			84	Fill					

Feature No.	Trench No.	Feature Type	Context No.	Context Type	Length (m)	Width (m)	Depth (m)	Selected Artefacts	Comments
32	222	Tree throw	81	Cut	N/A	1.2	0.18		
			82	Fill					
33	222	Tree throw / buried soil-filled hollow?	80	Layer					
34	222	Ditch	73	Cut	N/A	1.26	0.5		Also recorded in Trench 221 with associated bank to west c.2.5m wide
			74	Fill					
			75	Fill					
			76	Fill					
			77	Fill					
36	222	Tree throw	78	Cut	2.1	1.85	0.32		
			79	Fill					
37	222	Probable rooting (natural)	85	Cut	0.6	0.54	0.11		
			86	Fill					
38	222	Probable rooting (natural)	87	Cut	0.48	0.53	0.1		
			88	Fill					
39	262	Ditch	111	Fill					Ditch and bank
			112	Fill					
			113	Fill					
			114	Fill					
			115	Fill					
			116	Cut	N/A	2.04	0.85		
40	162	Tree throw	91	Cut	1.1	0.64	0.26		
			92	Fill					
			93	Fill					
41	174	Tree throw	94	Cut	N/A	1.05	0.35		
			95	Fill					
			96	Fill					

Feature No.	Trench No.	Feature Type	Context No.	Context Type	Length (m)	Width (m)	Depth (m)	Selected Artefacts	Comments
42	131	Metalled surface?	4	Layer	4	3.25	N/A	Bronze palstave	Palstave sitting on 'metalling',
			5	Layer					
43	258	Metalled surface?	121	Layer	2	1.75	N/A		
			122	Layer					
44	258	Wooden stake	123	Other					
45	130	Crumbly orange layer	127	Layer	c.3	c.2.5	0.02		No evidence of human acivity - probably natural.
46	154	Post-med pit with timber revetment	144	Fill				Glass, CBM, pottery	Post-med
			145	Other					
			146	Fill					
			147	Cut	2.7	0.8	0.55		
			201	Fill					
			202	Fill					
			210	Fill					
47	154	Ditch	142	Fill				Glass, CBM, pottery	Post-med
			143	Cut	N/A	0.9	0.3		
48	263	Ditch	148	Fill				Pottery	Middle Bronze Age? (pottery residual?)
			149	Fill					
			150	Fill					
			151	Fill					
			152	Cut	N/A	0.97	0.55		
49	216	Ditch	164	Fill					Aligned NW-SE
			165	Fill					
			166	Fill					
			167	Cut	N/A	0.99	0.25		
50	201	Pit/ Flint 'cache'	213	Fill				Flint	Neolithic
			214	Cut					

Feature No.	Trench No.	Feature Type	Context No.	Context Type	Length (m)	Width (m)	Depth (m)	Selected Artefacts	Comments
51	210	Hearth	169	Fill					
			170	Fill					
			171	Fill					
			172	Fill					
			173	Cut	0.75	0.61	0.09		
52	210	Pit	174	Fill				Flint	Late Neolithic/Early Bronze Age
			175	Cut	0.55	0.5	0.12		
53	240	Ditch	185	Fill					Aligned NW-SE
			186	Fill					
			187	Fill					
			188	Fill					
			195	Cut	N/A	1.78	0.51		
54	238	Pit	190	Fill					
			191	Cut	0.6	0.6	0.46		
55	238	Ditch	192	Fill					
			193	Fill					
			194	Cut	N/A		0.58		
56	171	Tree throw / buried soil-filled hollow?	196	Fill	2	1.45	0.15		
			212	Cut					
57	172	Possible posthole	197	Fill					
			198	Cut	0.6	0.45	0.28		
58	161	Pit	199	Fill				Flint, pottery, bone/antler	Late Neolithic (Grooved Ware)
			200	Cut	0.75	0.71	0.12		
59	280	Burnt mound/spread	203	Layer	6.25	>2	0.05	Burnt stone/flint	
			211	Layer					

Feature No.	Trench No.	Feature Type	Context No.	Context Type	Length (m)	Width (m)	Depth (m)	Selected Artefacts	Comments
60	278	Pit	204	Fill					(Unexcavated)
			205	Cut	c.4.5	c.2.25			
61	154	Pit	N/A	N/A		c.3m	N/A		(Unexcavated)
62	240	Metalled surface?	189	Layer	>2m	7	N/A		
63	244	Metalled surface?	176	Layer	c.55m	>35m	N/A		

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OASIS ID: cambridg3-140321

Project details

Project name	The Over Lowland Investigations IV. The 2012 Evaluation
Short description of the project	Archaeological evaluation was undertaken across a c.83ha area located on the eastern side of the River Great Ouse at its junction with the fens at Earith/Haddenham (centred on TL 39900 73500).The investigation area constituted the fourth mitigation phase of Hanson's Over/Needingworth Quarry and encompassed an area immediately to the east of the existing quarry including the site of Willingham Mere; a former lake extending over some 37ha within the eastern half of proposed development zone. Investigations revaled a buried landscape comprising a series of submerged terraces around a shallow valley system. Within this landscape, which pre-dates the formation of Willingham Mere proper (during Roman period) evidence of archaeological activity was largely confined to the gravel terraces. Archaeological remains recorded include Grooved Ware and Peterborough Ware associated Neolithic pits, a 'cache' of Neolithic flint nodules amongst which was a polished axe, an Early Bronze Age hearth, a Middle Bronze Age palstave and elements of a probably Middle Bronze Age fieldsystem.
Project dates	Start: 03-09-2012 End: 23-10-2012
Previous/future work	Yes / Yes
Any associated project reference codes	ECB3913 - HER event no.
Any associated project reference codes	OVE12 - Sitecode
Type of project	Field evaluation
Site status	None
Current Land use	Cultivated Land 3 - Operations to a depth more than 0.25m
Monument type	PIT Middle Neolithic
Monument type	PIT Late Neolithic
Monument type	FIELDSYSTEM Middle Bronze Age
Monument type	HEARTH Early Bronze Age
Significant Finds	FLINT Neolithic
Significant Finds	PALSTAVE Middle Bronze Age
Significant Finds	POTTERY Early Neolithic
Significant Finds	POTTERY Middle Neolithic
Significant Finds	POTTERY Late Neolithic
Significant Finds	POTTERY Early Bronze Age
Methods & techniques	"'Augering'","'Environmental Sampling'","'Sample Trenches'","'Test Pits'"
Development type	Mineral extraction (e.g. sand, gravel, stone, coal, ore, etc.)
Prompt	Direction from Local Planning Authority - PPG16
Position in the planning process	After full determination (eg. As a condition)

Project location

Country	England
Site location	CAMBRIDGESHIRE SOUTH CAMBRIDGESHIRE WILLINGHAM Over/Needingworth Quarry
Postcode	PE28 3PS
Study area	83.00 Hectares
Site coordinates	TL 39900 73500 52 0 52 20 28 N 000 03 13 E Point

Project creators

Name of Organisation	Cambridge Archaeological Unit
Project brief originator	Local Authority Archaeologist and/or Planning Authority/advisory body
Project design originator	Christopher Evans
Project director/manager	Christopher Evans
Project supervisor	Jonathan Tabor
Type of sponsor/funding body	Developer
Name of sponsor/funding body	Hanson Aggregates

Project archives

Physical Archive recipient	Cambridge Archaeological Unit
Physical Archive ID	OVE12
Physical Contents	"Animal Bones","Ceramics","Environmental","Metal","Wood","Worked stone/lithics"
Digital Archive recipient	Cambridge Archaeological Unit
Digital Archive ID	OVE12
Digital Contents	"Animal Bones","Ceramics","Environmental","Metal","Survey","Wood","Worked stone/lithics"
Digital Media available	"Images raster / digital photography","Spreadsheets","Survey","Text"
Paper Archive recipient	Cambridge Archaeological Unit
Paper Archive ID	OVE12
Paper Contents	"Animal Bones","Ceramics","Environmental","Metal","Survey","Wood","Worked stone/lithics"
Paper Media available	"Context sheet","Photograph","Plan","Report","Section","Survey "

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	The Over Lowland Investigations (IV). Archaeological Evaluation at Hanson's Over/Needingworth Quarry: The 2012 Evaluation
Author(s)/Editor(s)	Tabor, J.
Date	2013
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