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ASSESSMENT REPORT APPENDICES

By

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APPENDIX 1: POTTERY

1. INTRODUCTION

An assemblage of over 2000 sherds of prehistoric date was recovered from the site. The vast majority is of Iron Age date with a few examples of Late Bronze Age material. A small amount of Roman, medieval and post-medieval material was also recovered.

The prehistoric assemblage is of considerable significance, being the largest such group found within the boundaries of the City of York. With a few exceptions it is essentially domestic in character so provides a useful comparison for collections of contemporary funerary material from sites in the wider region of the North Yorkshire Moors, the Yorkshire Wolds and the Vale of Pickering.

The pottery was recovered from a number of cut features and surface deposits across the site with a concentration around the hut circles and pond area features. Being so clearly associated with a prehistoric landscape makes the assemblage of particular significance

The material has been shown to a number of specialists whose views have been incorporated into the discussion below and their recommendations have been taken on board. YAT is very grateful for the contributions and advice from Peter Didsbury, Terry Manby and Blaise Vyner.

2. PREHISTORIC POTTERY

By A. Jenner

2.1 METHODOLOGY

Where possible the assessment has been undertaken using the guidelines issued by the Prehistoric Ceramics Research Group (PCRG) and a table of quantities and types has been incorporated (see Table 1). The range of variables recorded is in accordance with these guidelines, although until further reconstruction work has been carried out (at the analysis stage), height, shoulder and maximum girth measurements have not been included.

The handmade, prehistoric sherds are generally large and mostly in fairly good condition. A few required consolidation (see Appendix 7) by YAT conservators. Clearly many sherds had not moved far from their original place of deposition and it has been possible to reconstruct a number of profiles which will ultimately provide a good typology of shapes and forms.

The Roman, medieval and post-medieval sherds (described below), by contrast, are often small and abraded. The exception is an almost complete flagon which was found smashed into small sherds and placed at the corner of a Roman field boundary. The medieval and post-medieval sherds probably arrived on the site as the result of manuring and the spread of night soil.

2.2 DATE RANGE

At an early stage, while excavation was still in progress, Blaise Vyner saw the pottery then available and suggested a pre-Roman Iron Age date (5th to the 2nd century BC) for the majority of the vessels, pointing out that this type of pottery changed and developed little over a long period.

Terry Manby saw sherds from one of the round house gullies and suggested a date of 300BC or later, drawing parallels with the hard fired material from Brompton St Giles (Manby pers. comm.), dated by C14 dates.

At a more advanced stage Peter Didsbury saw the majority of the material and agreed that it was a homogeneous assemblage which dated for the most part to the later part of the Iron Age. His method of recording was used in preparing this report.

The majority of the assemblage therefore is understood to fit broadly into the pre-Roman Iron Age but there is a small amount of earlier material. Amongst this is an early to mid Bronze Age collared urn (Sf387) which appears to be of a date somewhere after 2000 BC and before 1500 BC. This almost complete profile was found after excavation, during road construction, and therefore has no clear stratigraphic relationship with the excavated material, though it appears to be considerably earlier than the earliest excavated pottery.

Apart from the urn mentioned above, the early pottery includes material believed to of a Late Bronze Age/early Iron Age date (e.g. from Context 2594 Sf234) . There is, however, flint of Mesolithic, Neolithic and earlier Bronze Age date suggesting that the site may have been occupied and used for hunting and fishing from a much earlier date (see Appendix 2) so it is possible that some of the pottery has earlier origins.

Two of the Late Bronze Age/early Iron Age sherds came from one of the earliest stratified features. They were found within the fill (Context 2594) of a pit (Context 2655) cut into an earlier feature which contained the remnants of two discarded pieces of a wooden cylinder shaped objects (Contexts 2773-4). These wooden artefacts are now thought to be parts of a

trough, which had a C14 date in the Late Bronze Age (see Appendix 5). Another similar sherd derives from a potentially early ditch-fill.

These examples serve to show that there is some sequence of activity on site with different phases of activity cutting earlier features, and it might be possible, at analysis stage, to associate different forms/typologies with discrete periods of activity. This is likely to be most rewarding in the area around the pond feature and the densest concentration of roundhouses. The conservative nature of pottery production at this time might, however, mean that no changes in the ceramic sequence are discernible but it would be worth the attempt given the size and importance of the assemblage. If successful this task might provide some relative dating evidence not available from other sites.

In terms of absolute dating, the specialists were hopeful that soots and burned-on residues might provide enough material for further C14 dates; a useful addition to the suite of absolute dates for the area.

2.3 FORMS

2.3.1 BRONZE AGE MATERIAL

Collared urn

The earliest Bronze Age material includes the almost complete profile of an early to mid Bronze Age collared urn which was found outside the area of excavation and is currently being consolidated by the YAT Conservation team. The urn was found placed upside down over a small cremation, which included pieces of human bone (see Appendix 8).

This vessel can be paralleled with one thought to be of a “Primary Series” type (Longworth 1984, 27) which would give it a terminus ante quem post 2000BC and a terminus post quem of circa 1500 BC (Manby et al. (eds) 2003, 37 Table 4, ‘Relative chronology for the Bronze Age’). Its form and decoration are almost identical to a collared urn which Longworth suggests might be from the Scottish “Borders” region and has the same zones and style of stabbed decorated on its internal and external surfaces (Longworth 1984, 1771 plate 16 b).

The Late Bronze Age/early Iron Age pottery recognised so far consist of two or three sherds, two probably from the same globular bowl (Context 2594), decorated with bird bone or finger nail impressions. Their dark fabric and smooth surfaces, as well as their form and decoration resemble wares from Staple Howe (Challis and Harding 1975, Figure 22 no 13) in East Yorkshire, though further analysis of their fabric and form might help to confirm this. Material from the excavations of the Bronze Age defended enclosure at Staple Howe were dated from 900 to 700BC (Brewster 1963)

2.3.2 IRON AGE MATERIAL

The Iron Age forms comprise mainly jars of different shapes and sizes as well as a few bowl forms. Most would have functioned in a domestic context.

The exception to this is a few sherds of possibly three crucibles (Context 1198) suggesting that copper smelting or glass working may have taken place (Jenner 2008; Vyner pers. comm.). A possible piece of a tuyere was found in context with these sherds (see Appendix 9).

Jars and Storage Jars

In an effort to distinguish different jar forms and sizes, sherds were grouped into those with walls of <10mm (referred to initially simply as jars) and sherds with walls of >10mm (referred to as storage jars). Some of the latter were almost 15mm wide, though clearly wall thicknesses vary, being thicker at the base/wall angle than in the body walls. Rims are also frequently (but not always) thickened and body walls vary throughout their length, making wall thickness alone an imperfect means of distinguishing between these vessels when only a small proportion of the body of a vessel is present.

Profiles of adjoining rim/neck/shoulder sherds cannot always be joined with profiles of lower wall and base sherds, and where complete profiles do exist they tend to be of the smaller vessels. Taller vessels were presumably storage jars. Jars and storage jars can also be divided according to their shape; globular, slightly shouldered and those with almost straight sides. Bases where they exist are usually flat or occasionally have a small footring (Figure 11).

A large number of rims was recovered and rim forms were examined and compared with Didsbury's type series and Challis and Harding's catalogue of Late Iron Age forms (Challis and Harding 1975) on which Didsbury's series was based. Other relevant catalogues include Stead's work on Iron Age cemeteries in East Yorkshire and those illustrated in the British Museum's East Yorkshire settlements project (Rigby 2004). Some convincing parallels were also made with material from the Humber Wetlands (Van de Noort and Ellis 2000). Further reference to these and other comparanda will be carried out at analysis stage but initial findings are given below.

Rims forms included:

1. Short everted rims (Figure 1)

These can be beaded or pinched and occur on globular bowls and jars. Those with pinched necks and thick walls occur on later storage jars. Similar bowl forms are noted from

Attenborough, Nottinghamshire (Challis and Harding1975, Figure 17 no 2). A similar jar and storage jar form can be seen at Willington, Derbyshire (ibid., Figure 15 no 1) and Honington Hill, Nottinghamshire (ibid., Figure 15 no 18). A fairly thick walled (12mm) storage jar has fairly straight sides which thin slightly to a short fairly upright rounded rim with internal edge sloping inwards. Jars with this type of rim have been described from a grave group at Rudstone, East Yorkshire, as "pinched" and "shapeless" (Stead 1991, 189 Figure 102 R13 no1 and 188 Figure 101 R2 no 1).

2. Longer everted and thickened flanged rims (Figure 2)

These occur on both jars and storage jars

3. Flattened slightly everted rims (Figure 3)

These occur on storage jars similar to one from Saltshouse School, Yorkshire, and (Didsbury's type 5; Challis and Harding 1975 Figure 41 no 1*).*

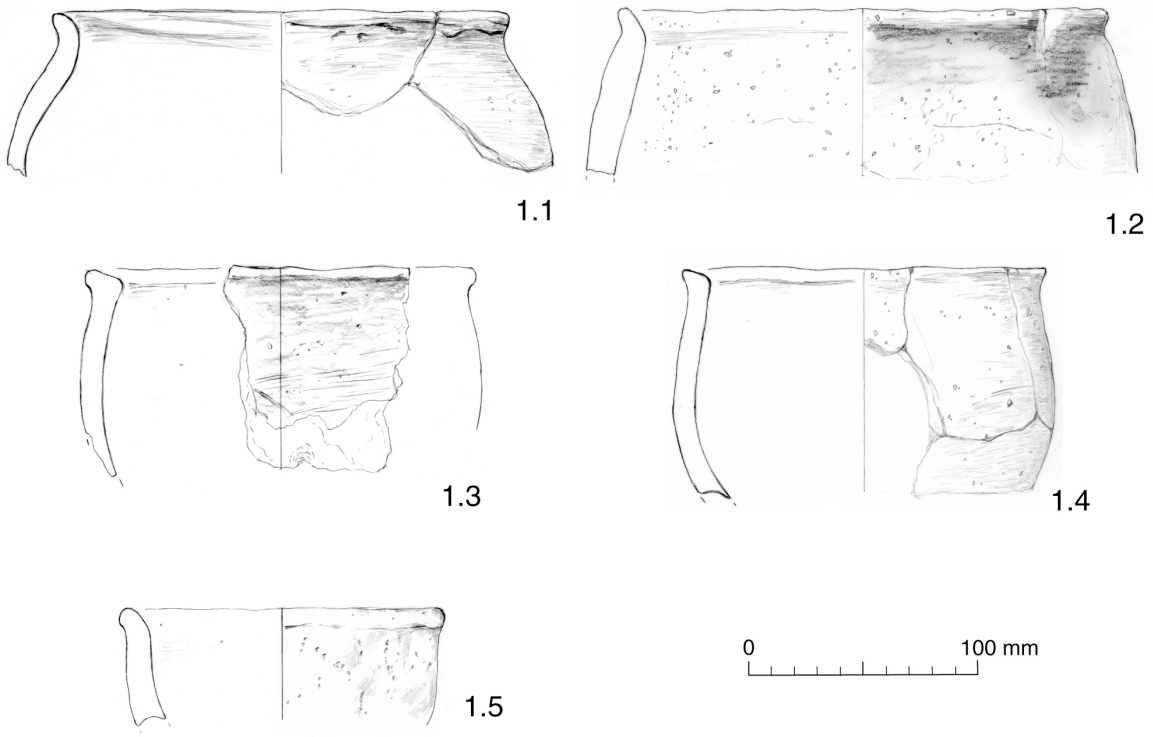

Figure 1 *Globular bowls, storage jars and jars with short everted pinched and beaded rims.*

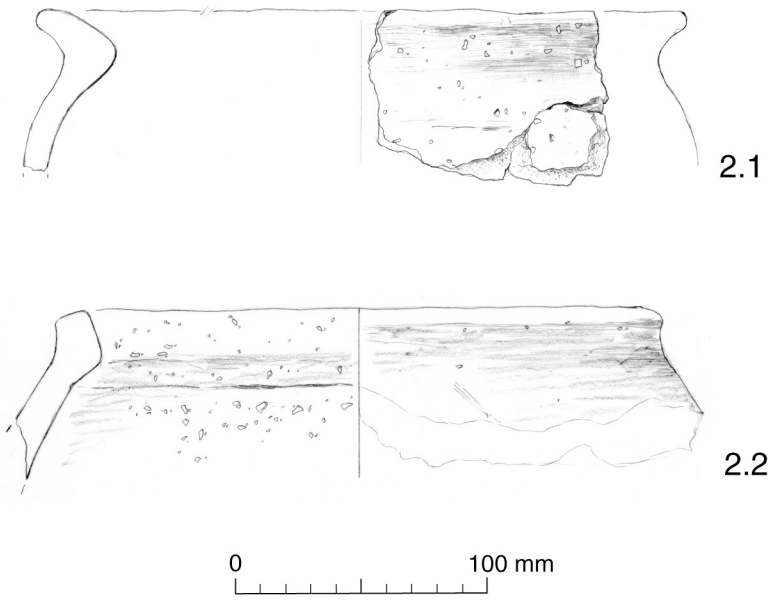

Figure 2 *Storage jars with thickened longer flanged everted rims*

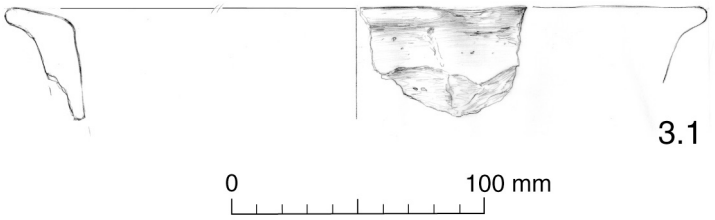

Figure 3 *Storage jar with flattened slightly everted flanged rim and internal bevel/chamfer.*

4. Upright rims thickened internally or externally (Figure 4)

These rim types occur on jars and storage jars. One thickened and triangular shaped rim resembles Didsbury's type 3, from South Cave, Yorkshire (Challis and Harding 1975, Figure 35 no 9). An upright rim with upper rim surface bevelled resembles that of a calcite gritted storage jar; part of an assemblage of "abundant pottery and metalwork debris" from Kelk, in the Yorkshire Wolds area (Van de Noort and Ellis (eds) 2000, 122 Figure 7.12 Kelk-6 top right) though the Kelk example does not have such a pronounced groove in the upper rim surface

5. Simple "S" shaped or everted rims (Figure 5)

These occur on small bowls

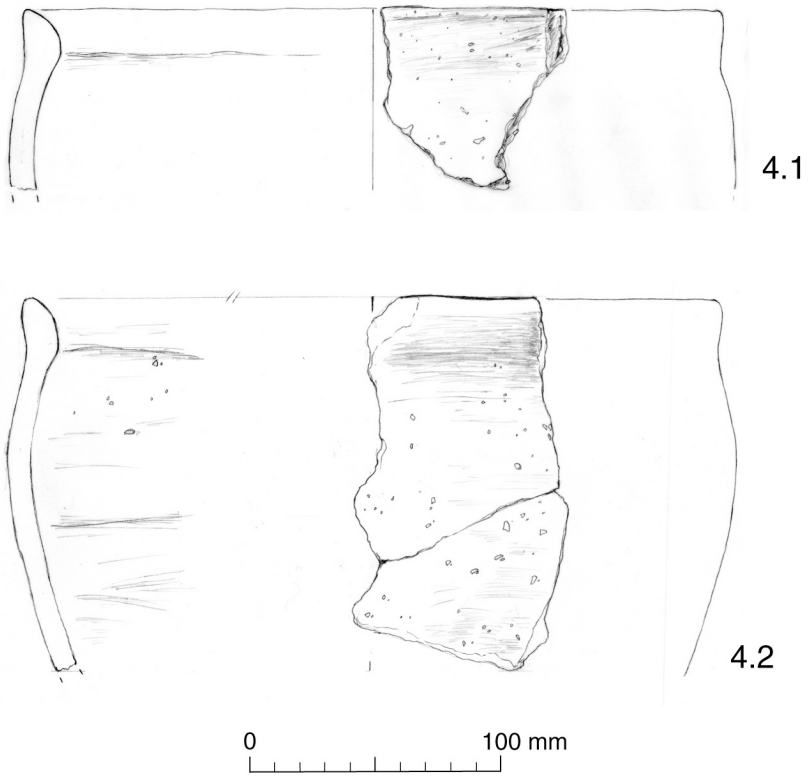

Figure 4 *Storage jars with fairly shapeless body and upright rim with internal thickening and storage jars with upright rim and external thickening.*

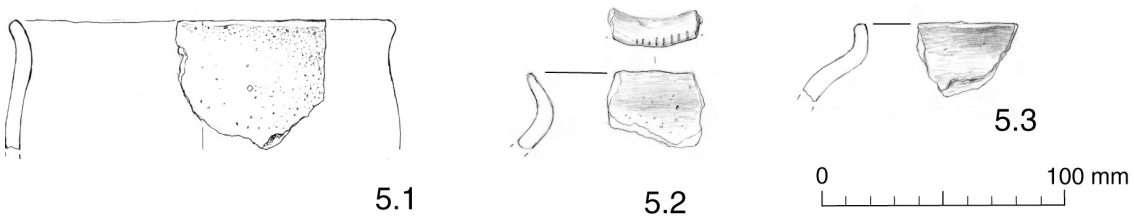

Figure 5 *Small bowls with "S" shaped everted rimmed.*

6. Everted rims (Figure 6)

These occur on large jar/storage jars One vessel with moderately thick walls (1cm) has a thickened flange which slopes downwards and inwards towards the centre of the vessel and then turns out at the shoulder in an 'S' shape similar to Didsbury's type 1 and Flaxfleet "A" Humber foreshore area (Challis and Harding 1975, 20 Figure 39 no 1) but with a more pronounced thickening at the shoulder/rim junction.

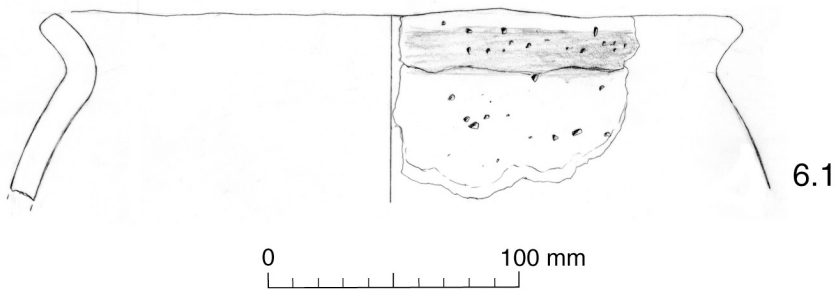

Figure 6 *Storage jar with "S" shaped or everted rim.*

7. Fairly upright and slightly everted rims (Figure 7)

Rims of this type with slight external thickening and deep internal bevel occur on storage jars, jars and bowls. They may have had sides sloping straight down to the base with little or no foot ring like those from enclosure A, Levisham Moor, East Yorkshire (ibid., Figure 49 no 1). Similar rims can be paralleled at Garton Slack, Yorkshire (ibid., Figure 33 no 2) and Didsbury's type 3A (Didsbury unpublished).

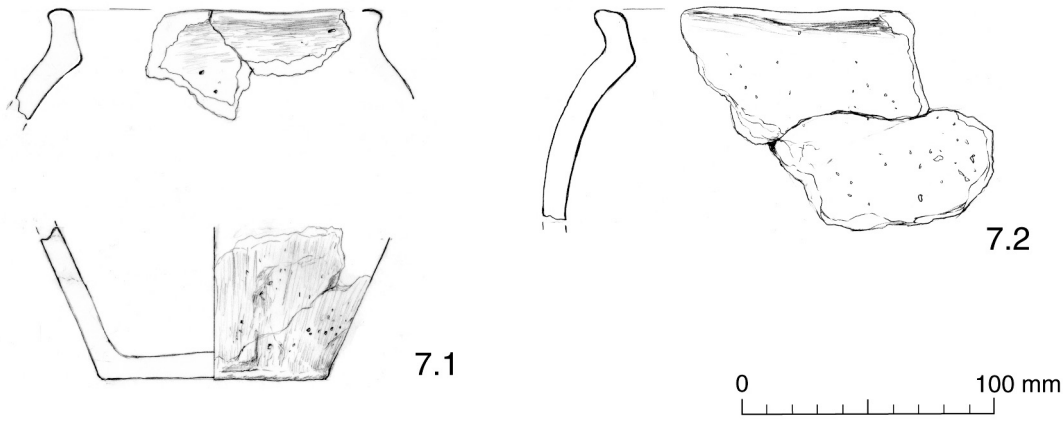

Figure 7 *Jar, storage jars and small bowl/jar with fairly upright slightly everted rims with slight external thickening and deep internal bevel.*

8. Pinched necked or reversed "S" shaped rim/necks (Figure 8)

These occur on jar/storage jars. A close parallel can be found with a beach find from Kilnsea in East Yorkshire/ Humberside (Challis and Harding 1975, Figure 21 no 6).

9. Lid-seated "hammer-headed" rim (Figure 9)

A rim of this type occurs on a jar/storage jar. A similar but flatter rim form can be seen at Catcote, East Yorkshire (ibid., Figure 47 no's 9 and 12).

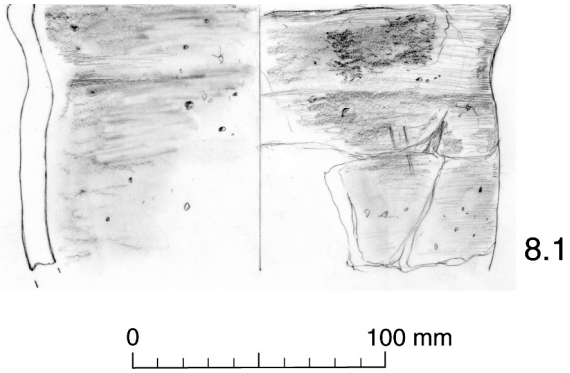

Figure 8 *Storage jars with pinched neck and reversed "S" shaped rim.*

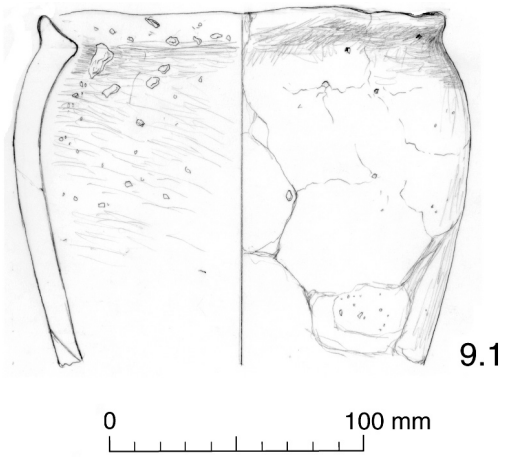

Figure 9 *Jar/storage jar with lid-seated slightly "hammer-headed" rim and slight shoulder.*

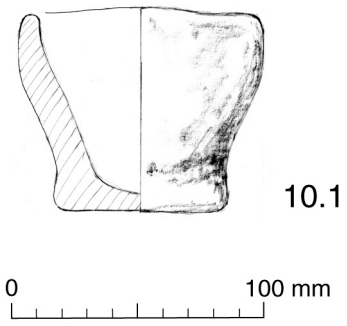

Figure 10 *Bowl/jar with upright cup shape which curves inwards slightly to a rounded rim.*

10. Upright and rounded rim (Figure 10)

This form appears on one bowl only from the water hole and resembles the "barrel jar" shape in Rigby's type series for East Yorkshire (Rigby 2004, Figure 4) and Stead's "shapeless lipless" jar in his "erratic" tempered group (Stead 1991, 98 Figure 71 R22).

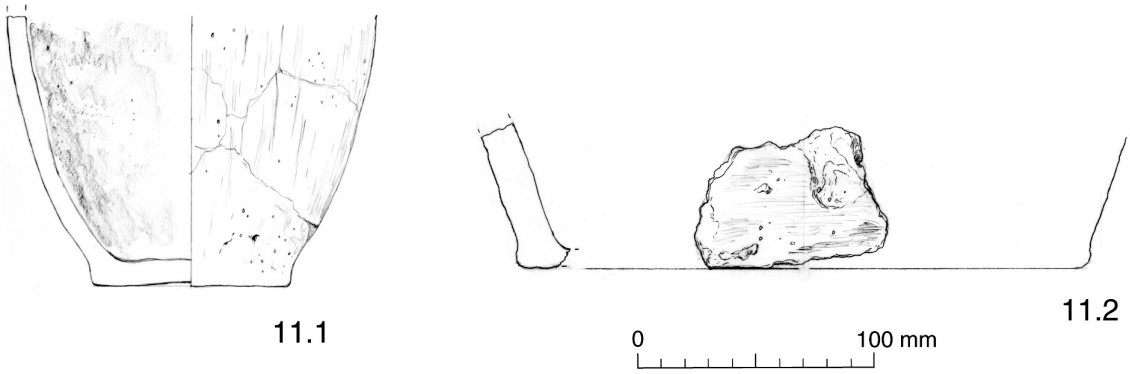

Figure 11 *Flat bottomed bases*

Bowls

Drinking bowls

Some vessels originally classed as small globular jars were re-categorised as drinking bowls or cups following discussion with Terry Manby (Manby pers. comm.). They are almost always oxidised and tempered with large angular white-veined quartz. Wall thickness are approximately 8mm, diameter 12cms across the rim and height approximately 8.5cms. Bowls normally have a wider rim measurement than their height and this description is consistent with these examples.

Drinking bowl rims have an internal bevelled shape that slopes inwards with a very slightly outward flick or everted point on the outer edge. Their bases, approximately 8cms in diameter, are either slightly footed or with a more defined foot-ring. These vessels can be paralleled with a vessel from Black Tor (Challis and Harding 1975, Figure 3 no 15) and others from a pit at the West Field site in the Yorkshire Wolds (Rigby 2004, 179 Figure 65 no 3). Similar forms can also be found at Littlethorpe, East Yorkshire (Challis and Harding 1975, Figure 40 no 1) and Saltshouse School, East Yorkshire (ibid., Figure 41 no 7) though the rims differ slightly.

Other bowls

Medium sized bowl with slight shoulder and slightly in-turned rim.

One jar/bowl, found above the fill of the water hole (Context 1101), has a dark vesicular fabric, a foot-ring, a slight shoulder and a simple flattened but slightly rounded rim (Figure 10). Its dimensions are just within the bowl definition above. It is close in form to one from a pit alignment above square barrows, possibly of the type associated with the Arras culture, at Burton Flemming, opposite Argam Lane, on the boundary between Burton Flemming and Rudstone (Stead 1991, 16), in the Yorkshire Wolds (ibid., 102 Figure 73 “BF6”). This “lipless”

pot is associated with brooch type C which is thought to be of a La Tene II type (ibid., 82-3). The La Tene style is dated from the 5^{h} century to the 1st century BC.

2.3.3 DISCUSSION OF FORMS

There is a wide range of forms on this site and these are likely to be the product of function as well as fashion. There is also inevitably considerable variation in the handmade products of several potters. Within the literature the range of terms used to describe these wares varies from one researcher to the next making textual comparisons difficult. This large assemblage offers the opportunity to produce a useful typology and provide a benchmark for the area.

2.4 FABRIC AND MANUFACTURE

Initially the fabrics were analysed using a hand lens and x2 binocular microscope and split, rather over-zealously, into approximately thirty different types on the basis of their inclusions and texture. This was subsequently drastically reduced following discussion and guidance from Pete Didsbury (see Table 2 for concordance).

All fell within his broad category H, handmade. The vessels included hand made, ring/coil built and coarsely tempered with 'stone' (Didsbury's category H2). White inclusions were evident in varying amounts in some of the sherds. A sample was tested using dilute hydrochloric acid which revealed that none of these had calcite in them. Not all were tested but initial findings suggest that the inclusions are white veined quartz and not calcite and thus fall into Didsbury's category H2Q.

One large, thick walled, coil built, storage jar with a quartz and sand tempered body, oxidised external surface and deliberately reduced core and internal surface, (not illustrated) appears to have had its base formed by pressing a slab of clay into a turned mould leaving two concentric raised rings under its base (Context 5031). No parallels have been found for this example which appears to be unique to this site.

A few vessels have smaller amounts and sizes of inclusions of a coarse sandy nature which might result from intentionally crushing larger quartz particles, Didsbury's category H2QS.

A smaller group are categorised as 'vesicular', having voids in the fabric where quartz, calcite or vegetal matter has leached out, Didsbury's broad fabric group H4. Those which are thought to have had an organic temper are often reduced throughout, whereas the rest of the vesicular group are lightly oxidised with buff surfaces and a grey core with angular and

rounded voids. These vessels feel much lighter than those of the quartz tempered group mentioned above.

One fabric group has a fine, fairly smooth feel and little temper, Didsbury's category H0.

One small fabric group, H2X, is sparsely tempered with unknown black minerals and has a smooth, soapy feel and dark greyish brown surfaces (old fabric number 23) more characteristic of the Bronze Age material. This category consists of one bulbous, carinated jar (Context 2594, Sf234) and is unique on the site. It has finger nail imprints around the edge of the rim and deeper finger nail or bird bone decoration round the shoulder. It is believed to be of Bronze Age/early Iron Age date and resembles forms from Staple Howe.

One bowl sherd (Context 1198) was thought to have had some slag temper included with the more ubiquitous quartz inclusions (pers. comm. Terry Manby), however further examination suggests that this is probably due to its proximity to slag during burial. Further analysis might help to clarify the exact type and quantities of inclusions used as well as its provenance.

Slag appears with the Iron Age pottery in a number of contexts across the site (Contexts 1202, 1070, 1543, 1217, 1312, 1277, 1543, 2493, 2645, 1327 and 1208) and it is known to have been used as temper on pottery found during excavations at the Easingwold Bypass (Manby pers. comm.).

2.4.1 FIRING

Most vessels appear to have been fired in bonfire kilns as their surfaces are frequently patchy, with areas of oxidisation ranging from buff to orange and areas of a darker character. Some vessels have clearly been starved of oxygen internally, either by being fired upside down or by being covered during firing. This causes their internal surfaces to be a dark grey while their external surfaces are mainly oxidised, though often patchy, as above.

It is possible that a certain level of care was taken to achieve consistent results; for example, while the Bronze Age urn is a fairly uniform buff colour, the later Bronze Age Staple Howe types and the vessel found above the water hole are reduced throughout. The Iron Age vessels are often oxidised externally but can be a greyish buff colour through to patchy oxidised and reduced. A few vessels appear to have been deliberately reduced over all surfaces.

2.5 FIND SPOTS AND ZONING

The excavators have plotted the concentrations of pottery across the site and although these findings have not been fully analysed at this stage, the following initial conclusions can be made.

Most of the pottery was found in features including ditches and roundhouse gullies. This is more or less inevitable as few surface deposits were recognisable and the site comprised essentially cut features. This was also true at Creyke Beck, Yorkshire (Didsbury pers. comm.). The pottery from East Heslington occurs in four main types of feature; roundhouse gullies, roundhouse enclosures, a water hole/stock pond and four elongated ditches which emanate from the pond and combine to form one main ditch which runs from north to south, effectively cutting the site in two.

The two earliest of the three elongated north/south boundary/drainage ditches are those lying to the east and west of the long central ditch. These features produced the most pottery. A considerable amount was also found in the round house gullies/ring ditches and water hole.

2.5.1 DEPOSITION

Most of the Iron Age material appears to be from primary deposits as most of the sherds are well preserved and there is little abrasion that might otherwise have occurred on sherds exposed to the elements on the surface. Individual sherd sizes range from approximately 0.5cm to 18cms at their maximum girth. Where there are scraps these appear to have splayed off the vessels after excavation as sherds dried out.

Categorisation of sherd size and condition was not undertaken using Rigby's method to assess the type of deposition at Heslerton (Rigby 1986, 141-44) and although this type of investigation could be done in the future, the material was so obviously primary that it was not thought necessary.

Although most of the material may have been discarded as rubbish, there is little organic or other domestic refuse associated with them and few finds other than the earlier re-deposited flints mentioned above. There is no sign of any burning on broken edges that might indicate spoilage through fire during or after deposition.

At least one vessel has a residue within it and others have sufficient sooting to suggest that some were used as cook pots while others were perhaps used for storage; small bowls might have been used for scooping liquids, eating or drinking. Inturned rims may have been

deliberately made to reduce liquid spillages, while short everted rims may have been more useful for scooping, drinking or pouring. Exactly how shape varies in relation to function may be an interesting avenue of ethnographic research.

A few of the sherds appear to have been deliberately placed rather than thrown away as rubbish. This is particularly true of the almost complete vessel found centrally, immediately above the peaty organic fill of the water hole/stock pond (Context 1101 Sf43) as well as the sherds possibly deliberately placed together in the gully of a round house.

The few Roman sherds recovered are in the main extremely abraded, with the exception of what appears to be a smashed Roman grey ware flagon, found sealing the corner of a ditch/field boundary. Medieval and post-medieval material was similarly abraded.

2.5.2 ASSOCIATED SMALL FINDS

Several contexts produced small finds and pottery, whether discarded as rubbish or deliberately placed together in specific features. For example, a bone object Sf22 with an unknown function, a possible rubbing stone Sf29, perhaps used in conjunction with a saddle quern, and a burnt pebble fragment Sf39 were all found in Context 1114 as a group of prehistoric pottery.

Further research on the finds associated with the pottery might help to clarify their mode of deposition and their significance, if any, in relation to each other and the site as a whole.

3. ROMAN AND POST-ROMAN POTTERY

By A.J. Mainman

3.1 ROMAN POTTERY

The Roman pottery from the site is of limited further potential. It is a small assemblage, *c.*200 sherds, badly abraded and occurs most commonly in the top fills of ditches.

It comprises Ebor wares, grey wares, a relatively high proportion of samian and a small amount of colour-coated and white wares. At this stage it has not been viewed by a Roman pottery specialist but this is recommended as part of the analysis stage when the phasing, and therefore the significance, of the later features has been agreed.

The occurrence of Roman pottery on the site might result from several different activities. The proximity of a Roman occupation site, possibly a villa, raises the likelihood that some of it derives from there and this material should be considered together with that nearby assemblage. In addition, however, there is at least one cremation on the site which included a partially complete Roman flagon (Context 1676), so it is possible that some of the Roman pottery had a funerary function. Ritual might also account for the presence of a second semi-complete flagon (Context 1789) which appeared to be deliberately placed adjacent to field boundary. Ritual deposition of material, which might include the coin hoard described elsewhere (see Appendix 10), in and around the pond feature might have continued beyond the Iron Age into the Roman period. Finally, there is the possibility that iron-working on the site might date to the Roman period and some of the pottery therefore, might be associated with craft activities.

3.2 POST-ROMAN POTTERY

The earliest post-Roman pottery is 11th or 12th century in date, but there is very little of it, only *c.*50 sherds. Gritty wares are ubiquitous in York from the 11th century so it is of little surprise that sherds have been found on site. There is a thin scatter of abraded medieval, post-medieval and modern pottery in upper fills of features but this has no further potential.

The Roman and post-Roman pottery has been included in the quantification table (Table 1)

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5. TABLES

Context	Find #	Quantity	Spotdate	Details
1006	BF00010	7	IRON AGE	7 jar and storage jar handmade mostly fabric H2Q with large subangular white veined quartz inclusions but one sherd of H4Q which is vessicular but possibly had a temper of smaller quartz grains
1012	BF00011	1	IRON AGE	1 jar handmade in H2QS fabric
1016	BF00012	1	IRON AGE	1 jar handmade in H2Q fabric with large subangular quartz inclusions
1029	BF00013	3	IRON AGE	3 two storage jars and jar handmade in H2Q fabric storage jars walls are 12 and 15mm thick
1031	BF00014	1	IRON AGE	1 jar H2Q fabric
1037	BF00015	4	IRON AGE	1 jar handmade fabric H2Q 1 jar handmade fabric H0 sparse temper 2 jar handmade with H2Q hard fabric with bellamite? fossil
1039	BF00401	1	ROMAN	1 sherd Roman
1048	BF00009	0	IRON AGE	US A2
1054	BF00016	1	IRON AGE	1 jar with everted rim in fabric H04
1068	BF00017	1	IRON AGE	1 jar fabric H2Q
1070	BF00018	1	IRON AGE	jar handmade in H2 fabric with white veined quartz temper light grey core and coarse sandy buff surfaces
1089	BF00019	2	ROMAN	2 Ebor
1090	BF00020	67	IRON AGE	29 sherds of several small and medium sized jars mainly fabric H2Q 2 small jar handmade hard fired with nail impressions round internal rim edge in fabric H2QS which has coarse sandy temper and no large white veined quartz 15 sherds of fabric H0 sparsely tempered hard fired and smoothed 17 sherds H0 with little temper and softer fired than H2QS and slightly vesicular 1 jar fabric H2QS 3 jar fabric H2QS
1094	BF00286	1	IRON AGE	1 jar fabric H4
1101	BF00583	7	IRON AGE	7 jar handmade with complete profile and fairly soft slightly vessicular reduced fabric perhaps leached vegetal matter from the water hole
1113	BF00021	1	IRON AGE	1 storage jar fabric H2Q
1114	BF00022	55	IRON AGE	1 Samian abraded 23 jar with complete base H04 slightly softer than H2QS with not much temper and slightly vessicular 16 jar H4 vessicular fabric with leached chaff or similar organic leached material 11 jar H04 fabric 3 jar in fabric H2QS with dark shiny minerals with conchoidal fracture otherwise like black mica 1 storage jar or jar fabric H2Q

1118	BF00008	1	IRON AGE	1 storage jar base in fabric H2Q with ?chert
1173	BF00023	19	IRON AGE	19 jar with everted rim fabric HO4
1198	BF00024	142	IRON AGE	23 crucible in fine brittle light grey fabric 74 jar in fabric H2QS 16 jar in fabric H04 6 storage jar in fabric H4 vessicular but with quartz 2 storage jar in fabric H2QS with veined quartz and ?chert 3 jar base in fabric H2Q with dark mineral inclusions 2 jar in fabric H2Q with quartz temper from 1 to 7mm across 8 jar in fabric H0 6 storage jar in H2Q with chert 1 tuyere 1 jar fabric H2QS
1201	BF00025	3	IRON AGE	1 jar in fabric H2Q with chert 1 ?crucible fine and oxidised 1 lid seated jar in fabric H2QS
1202	BF00278	61	IRON AGE/ROMAN	53 jar and storage jar with everted rim in fabric H2Q with quartz 6 jar 1 Ebor but grittier 1 jar fabric H2Q
1204	BF00027	3	IRON AGE	3 storage jar in fabric H4 vessicular light firing and with quartz walls 10mm
1206	BF00028	8	IRON AGE	7 storage jar in fabric H4 vessicular light firing and with quartz with external concretion 1 fragment of fence lining
1208	BF00029	37	IRON AGE	12 storage jar in fabric H2QS 1 storage jar in fabric H2Q with chert 1 wide lid seated jar with boneor nail decorated rim in fabric H2Q with chert 13 jar in fabric H2QS 8 storage jar fabric H2QS 2 jar fabric H2QS possibly parts of six different vessels
1217	BF00030	171	IRON AGE	1 storage jar with flat rim fabric H2Q with chert 1 fragment of daub 161 jar and jar with flange rim fabric H2Q with 2 to 5mm well sorted grains 4 jar fabric H2Q but sparse quartz 1 jar fabric H2QS 3 jar fabric H2QS
1220	BF00031	1	IRON AGE	1 storage jar in fabric H2QS
1228	BF00032	184	IRON AGE	80 jar with everted rim storage jar and jar with squared off rim in fabric HO 6 storage jar with thickened rounded rim in fabric HO4 67 sherds from two jars with flanged rims in fabric H2Q 19 jars including small jar in fabric H2QS with slightly lid seated hammer headed rim and jar with everted rim 1 jar base in fabric H4 vessicular

				5 storage jar in fabric H2QS with abundant rather fine crushed quartz sandstone with larger inclusions more sparse approx 5mm 1 jar in fabric H2Q with chert or similar 2 jar in fabric H2Q 1 to 7mm 2 jar 2 jar fabric H4 1 jar fabric H2QS
1260	BF00033	11	IRON AGE	1 storage jar fabric H4 2 jar fabric H2Q 8 jar fabric HO4
1263	BF00584	18	IRON AGE	18 jar fabric H2Q with chert
1266	BF00034	7	IRON AGE	7 jar fabric H2QS
1268	BF00035	10	IRON AGE	1 shouldered jar with everted rim fabric H2QS 1 jar fabric H2QS 8 jar fabric H2Q
1271	BF00036	1	IRON AGE	1 jar with everted rim in fabric H2QS
1273	BF00037	1	IRON AGE	1 jar in fabric H2Q
1275	BF00038	3	IRON AGE	3 jar fabric H4 small sherds
1277	BF00039	15	IRON AGE	15 jar with squared off flared rim fabric HO4
1296	BF00040	3	IRON AGE	1 small dish rim fabric H2Q with chert 1 jar fabric H2QS 1 jar fabric H4
1312	BF00041	13	IRON AGE	13 jar fabric H2Q with angular white veined quartz
1324	BF00295	2	IRON AGE	2 jar fabric H4 possibly
1327	BF00094	1	IRON AGE	1 jar possibly fabric HO4
1329	BF00042	39	IRON AGE	39 jar with triangular shaped rim and storage jar fabric H2QS
1341	BF00043	2	IRON AGE	2 storage jar in fabric H2QS
1391	BF00044	1	IRON AGE	1 straight sided jar with everted rim in fabric H2QS with series of linear marks left on surface after smoothing
1404	BF00045	31	IRON AGE	31 jar in fabric H2Q with large white veined quartz
1406	BF00046	1	IRON AGE	1 jar fabric H2QS
1414	BF00047	2	IRON AGE	1 storage jar abraded fabric H2Q with large grains abraded 1 unknown ceramic building material slightly abraded
1436	BF00048	4	IRON AGE	4 jar fabric with little temper and quite soft similar to Staple Howe jar in context 2594
1463	BF00049	1	IRON AGE	1 jar fabric H4 leached organics
1494	BF00050	25	IRON AGE AND ROMAN	5 storage jar fabric H2QS abundantly tempered with crushed quartz sandstone 1 ?Ebor bowl 1 storage jar fabric H2QS 18 jar fabric H2Q
1495	BF00051	2	ROMAN	1 Roman 1 jar fabric H2QS
1497	BF00026	2	IRON AGE	2 jar fabric H2 angular with white quartz
1501	BF00301	1	IRON AGE	1 jar fabric H2QS with coarse sandy gritty feel sandstone 2 to 3mm and black shiny inclusions
1518	BF00412	2	ROMAN	2 sherds Roman

1534	BF00052	11	ROMAN AND IRON AGE	9 Roman and Iron Age including Ebor grey and amphora 2 jar fabric H4 vessicular caused by leaching of organic material some voids are chaff shaped
1543	BF00053	1	IRON AGE	1 storage jar fabric H2QS
1545	BF00054	1	IRON AGE	1 jar fabric H2Q
1547	BF00055	20	IRON AGE	17 jar fabric HO4 3 jar fabric H2Q with chert
1555	BF00056	1	IRON AGE	1 jar similar in fabric to context 1658 H2QS with no large grains
1561	BF00057	15	IRON AGE	15 jar fabric H2QS small sherds
1589	BF00058	1	ROMAN?	1 buff sandy ware with lightly oxidised surfaces
1599	BF00059	1	IRON AGE	1 jar fabric H2Q with chert
1603	BF00060	5	IRON AGE	2 storage jar fabric H4 abraded 1 storage jar fabric H2QS abraded 2 storage jar fabric H2QS
1621	BF00061	3	IRON AGE AND ROMAN	1 Roman 2 jar fabric H2QS gritty and sandy no large quartz
1623	BF00062	5	IRON AGE	2 jar fabric H2Q with quartz grains 1 to 7mm 2 jar fabric H2QS abraded small sherds 1 jar fabric H2QS sandy and gritty with no large quartz
1624	BF00063	1	IRON AGE	1 storage jar fabric H2QS
1627	BF00064	6	IRON AGE	6 jar fabric HO4
1630	BF00065	5	IRON AGE	5 jar fabric H4 leached organics
1642	BF00066	2	IRON AGE	2 jar fabric H2QS
1658	BF00067	1	IRON AGE	1 jar fabric H2QS with small coarse sand inclusions and no large white quartz
1670	BF00288	6	IRON AGE	1 jar fabric H2Q 5 scraps
1677	BF00099	4	IRON AGE	3 jar base and body fabric H2Q 1 possible storage jar rim possibly fabric H2Q
1716	BF00090	1	IRON AGE	1 jar fabric H2Q
1728	BF00068	2	ROMAN	2 Ebor
1759	BF00069	2	IRON AGE	2 jar fabric H4 vessicular leached organics
1762	BF00070	1	IRON AGE	1 jar fabric H4 vessicular leached organics
1767	BF00071	2	IRON AGE	2 jar fabric H2Q with chert
1789	BF00072	67	ROMAN	67 Roman flagon smashed and almost complete
1794	BF00410	1	19TH CENTURY	1 sherd 19th century
1851	BF00073	9	IRON AGE	9 jar fabric HO4
1854	BF00096	1	IRON AGE	1 jar rim fabric HO4
1922	BF00074	1	IRON AGE	1 jar fabric H4 with holes where organics have leached out
1977	BF00075	2	IRON AGE	2 jar fabric H2QS with smoothing marks
1981	BF00290	1	IRON AGE	1 jar fabric HO4
1987	BF00098	2	IRON AGE	2 storage jar fabric H2QS
2002	BF00076	2	IRON AGE	1 jar fabric H2QS with sand grains 2 to 3mm 1 jar fabric H2Q with large grains
2010	BF00091	5	IRON AGE	6 jar fabric H2Q
2106	BF00077	33	IRON AGE	15 sherds include jar with flanged rim and sooting and

				storage jar fabric H2Q 18 jar fabric H2QS with black shiny flint like inclusions
2146	BF00078	1	IRON AGE	1 jar fabric H2Q
2200	BF00432	4	18TH/19TH CENTURY	4 sherds of post-medieval pottery . Black internal glaze.
2222	BF00433	2	17/18TH CENTURY	2 sherds of post-medieval pottery
2322	BF00079	2	IRON AGE	2 jar fabric H2QS sandy and gritty with no large quartz
2337	BF00092	1	IRON AGE	1 jar fabric H2QS
2347	BF00080	148	IRON AGE	100 jar fabric H2QS 1 jar fabric H4 3 jar fabric H2Q with large white quartz 42 jar fabric H2Q very small sherds smaller than 2cm 2 scraps fabric H2QS
2348	BF00081	17	IRON AGE	4 jar fabric HO4 slightly abraded 1 jar fabric H2 abraded 10 jar fabric HO4 2 jar fabric H2QS slightly abraded
2414	BF00585	6	IRON AGE	1 jar fabric HO 5 jar fabric H4 vessicular
2421	BF00082	3	IRON AGE	2 jar fabric H4 vessicular 1 jar fabric H2Q
2426	BF00608	13	IRON AGE	13 storage jar with high shoulder short neck and thickened rounded rim which has been flattened on its upper surface residue fairly large sherds fabric HO4
2455	BF00266	1	ROMAN	1 Ebor rim
2465	BF00083	1	IRON AGE	1 jar fabric H4 with voids where organic material and or chaff have burnt or leached out
2466	BF00093	3	IRON AGE	3 storage jar fabric H2QS hard fired with black flint like inclusions
2493	BF00383	1	IRON AGE	1 jar fabric H2Q
2594	BF00586	3	LATE BRONZE/EARLY IRON AGE	3 Staple Howe type small hand made bulbous carinated jar in soft sparsely tempered fabric with small finger nail impressions on external surface just below slightly out turned rim and wider nail or bird bone impressions on shoulder see small find no 234
2632	BF00381	1	IRON AGE	1 jar rim fabric H2QS
2645	BF00097	1	IRON AGE	2 storage jar fabric H2QS
2662	BF00384	22	IRON AGE	22 jar fabric HO4
3000	BF00372	2	ROMAN/IRON AGE	2 jar
3001	BF00371	94	IRON AGE	92 jar fabric H2QS 2 jar fabric H2QS no large angular quartz
3002	BF00374	16	ROMAN	16 Roman wheelthrown vessicular
3006	BF00298	5	IRON AGE	5 jar fabric H2Q large grains
3016	BF00300	2	IRON AGE	1 jar rim fabric H2Q 1 storage jar fabric H2Q
3027	BF00084	3	IRON AGE	3 jar fabric H2Q

3028	BF00297	18	IRON AGE	10 jar fabric H2Q 5 jar fabric H2QS 3 jar fabric H2QS
3029	BF00085	3	IRON AGE	1 jar fabric H4 with voids from leached or burnt organics 2 jar fabric H2QS coarse sand and no large white quartz
3036	BF00086	1	IRON AGE	1 jar fabric H2QS
3048	BF00087	7	IRON AGE	7 jar rim fabric H2Q
3083	BF00095	2	IRON AGE AND ROMAN	1 Ebor flagon 1 jar fabric H2Q large quartz
3115	BF00100	12	IRON AGE	5 jar rim body and base fabric H2Q 7 jar body base fabric HO4
3203	BF00446	1	ROMAN	Roman
3237	BF00438	1	ROMAN	Roman
3246	BF00445	1	19TH CENTURY	post medieval
3265	BF00443	1	ROMAN	Roman
3274	BF00437	1	MEDIEVAL	Medieval
3281	BF00299	59	IRON AGE	1 jar rim with fairly straight side and short out turn at rim fabric HO sparsely tempered but unusually heavy fine with sandy external surface and smoother interior and gold mica platelets visible on internal surface 2 jar rim fabric H2Q 18 jar fabric H2QS 1 jar base H2QS 37 small rounded jar with vertical straight area 1 cm above base and small kicked out rim with internal bevell fabric H2QS with overall intentionally oxidised orange surfaces and core sometimes a lighter grey
3293	BF00436	4	ROMAN	Roman
3319	BF00453	1	13TH CENTURY	abraded 13th century pottery
3330	BF00267	3	ROMAN AND IRON AGE	2 Roman 1 jar fabric H2QS
3332	BF00302	1	IRON AGE	1 jar rim fabric H2QS
3337	BF00447	1	POST MEDIEVAL	post medieval pottery
3343	BF00268	2	ROMAN	2 Roman
3344	BF00269	2	ROMAN	2 Roman
3415	BF00452	1	ROMAN	Roman
3430	BF00455	4	MEDIEVAL	3 Roman 1 medieval
3474	BF00440	1	ROMAN	Roman
3482	BF00439	1	ROMAN	Roman
3499	BF00293	1	IRON AGE	1 jar rim fabric H2Q
3506	BF00265	34	IRON AGE	22 jar fabric H2Q but sparse and well sorted sub category 12 scraps
3552	BF00284	1	ROMAN	1 Roman
3563	BF00270	9	IRON AGE	9 jar fabric H2Q but quite well sorted quartz 2 to 5mm

3567	BF00283	11	ROMAN AND IRON AGE	11 Roman sherds 3 Iron Age or Roman
3595	BF00442	1	ROMAN	Roman
3613	BF00285	4	IRON AGE	4 jar fabric H2QS
3614	BF00271	105	IRON AGE	14 jar fabric H2QS with black shiny inclusions like flint 2 jar fabric HO4 48 jar fabric HO4 and H2Q large quartz 21 jar fabric H2Q large grains 8 jar fabric H2Q large angular grains 7 jar fabric H2Q with chert 5 jar fabric H2QS with occasional large quartz and crushed sand stone
3694	BF00441	3	ROMAN	Roman
3992	BF00451	2	MEDEIVAL	2 medieval
4000	BF00456	1	ROMAN	Roman
4005	BF00457	1	19TH CENTURY	post-medieval
4029	BF00471	1	19TH CENTURY	post medieval
4097	BF00292	2	LATE BRONZE AGE/IRON AGE	2 jar fabric H2X
4101	BF00398	5	ROMAN	5 Roman
4103	BF00279	3	EARLY IRON AGE	3 jar fabric H4 vessicular with leached out vegetal matter
4159	BF00461	1	MEDIEVAL	Medieval
4176	BF00467	1	ROMAN	1 Roman
4200	BF00400	10	ROMAN	10 Roman
4211	BF00460	1	ROMAN	Roman
4215	BF00470	3	MEDIEVAL	Medieval
4296	BF00272	5	ROMAN	5 Ebor ware
4307	BF00462	1	ROMAN	Roman
4333	BF00464	2	MEDEIVAL	Medieval
4415	BF00459	1	ROMAN	Roman
4420	BF00466	1	ROMAN	Roman
4421	BF00472	2	ROMAN	Roman
4498	BF00473	1	POST MEDIEVAL	post medieval
4502	BF00273	2	IRON AGE	2 jar fabric H2Q but a sparsely tempered sub category
4511	BF00296	1	ROMAN	1 Ebor
4516	BF00303	3	IRON AGE	3 jar fabric H2 for stone inclusions but softer and sparsely tempered with some small quartz but not the same as H2Q includes some unknown speckled temper therefore H2X Pete Didsbury pers comm C14 could be taken on soot abraded
4520	BF00379	4	EARLY IRON AGE	2 jar fabric H2Q 2 jar fabric H4 vessicular with voids from vegetal matter

				possibly earlier Iron Age or earlier pers comm Pete Didsbury
4522	BF00003	2	IRON AGE	1 jar 1 jar fabric H2QS
4525	BF00281	27	IRON AGE	3 jar fabric H2QS 1 jar fabric possibly H2Q 21 jar fabric H2QS 2 scraps H2QS
4544	BF00375	11	IRON AGE	11 jar body and base fabric H2QS
4581	BF00373	3	IRON AGE	2 jar fabric H2QS 1 jar fabric H2QS
4583	BF00304	1	IRON AGE	1 jar fabric H2Q with chert
4589	BF00305	1	IRON AGE	1 jar fabric H2QS no large quartz
4604	BF00469	1	16TH CENTURY	late medieval
4615	BF00465	8	POST MEDIEVAL	7 Roman 1 post medieval
4644	BF00274	8	IRON AGE	8 jar fabric H2QS
4648	BF00275	2	MEDEIVAL	Medieval 1 Iron Age fabric H2QS
4676	BF00264	117	IRON AGE	38 jar fabric H2QS 20 jar fabric H2Q large quartz inclusions 1 jar fabric H2QS 25 jar fabric H2QS 33 jar fabric H4 black heavily reduced smooth and soapy
4686	BF00458	1	MEDIEVAL	1 medieval
4688	BF00376	13	IRON AGE	13 jar fabric H2QS
4690	BF00287	2	IRON AGE	2 jar fabric H2Q
4704	BF00463	1	POST MEDEIVAL	post medieval
4706	BF00276	1	IRON AGE	1 jar rim fabric H2QS
4721	BF00002	36	IRON AGE	36 storage jar almost complete base fabric H2QS
4735	BF00277	16	IRON AGE	16 jar fabric H2QS with vertical smoothing marks
4749	BF00397	5	ROMAN	5 Roman
4767	BF00378	2	IRON AGE	2 jar with round body and everted rim which is slightly flattened at the top fabric H4 vessicular with light buff internal surface and dark external surface soapy smooth feel with few inclusions but voids are rounded to angular and range from 2mm to approximately 5mm across not due to calcite leaching out but may have been quartz
4768	BF00280	1	IRON AGE	1 jar fabric H2Q with large quartz from 1 to 5mm
5008	BF00306	2	IRON AGE AND MEDIEVAL	1 medeival 1 jar fabric H2Q
5031	BF00294	23	IRON AGE AND ROMAN	15 Roman 8 storage jar base with impression from turned artifact fabric H2QS *draw
5054	BF00282	8	ROMAN	3 Samian bowl 5 grey ware flanged bowl

11001	BF00088	2	IRON AGE AND ROMAN	1 Ebor ware slightly abraded 1 jar fabric HO4 slightly abraded
13000	BF00476	1	MEDIEVAL	Medeival
15007	BF00474	3	MEDEIVAL	medieval
15008	BF00475	2	11TH CENTURY	Medieval
20005	BF00479	2	13TH CENTURY	Medieval
20007	BF00478	2	POST MEDIEVAL	post medieval
24001	BF00595	55	IRON AGE/ROMAN	37 jar with everted rim inc 11 scraps 5 small jar 1 ?Roman grey ware 1 ?stone 2 jar with rounded everted rim 1 rim or base edge in hard sandy fabric with incised lines 38 jar fabric HO4 8 Roman or Iron Age
24003	BF00593	2	IRON AGE	1 ?jar 1 jar fabric HO4
24015	BF00594	4	IRON AGE	2 storage jar 2 storage jar fabric HO4

Table 1 *The pottery quantification*

Fabric code	Related fabric numbers	Description
H	1-30	
H1	0	Hand made calcite and shell tempered
H2X	23	Hand made and stone tempered but sparsely with light speckled.grains. A bulbous carinated form Bronze Age/early Iron Age (see Staple Howe for similar)
H2Q	23,4,5,10,13,14,20	Hand made and tempered with quartz which is generally with moderate to abundant large white veined and fairly angular.grains. Sometimes has sparse chert and small black rounded particles
H2QS	2,6,8,9v1,12,15,18,19,21,22,24,27,28	Hand made and tempered with quartz sand which generally have smaller perhaps crushed quartz. Some also have polished rounded dark inclusions and dark coloured minerals
H2QS variant		Sparse quartz and smoothing marks
H2QS fairly well sorted		As H2QS but quite well sorted with quartz grains of 2-5mm
H0	7,	Sparse or no significant temper
H3		Mixed temper or other temper
H4	1,29	Vesicular – no29 has chaff shaped voids
H4 early	26.1, 30	Voids where organic/vegetal temper has leached out. Didsbury thinks that this might be earlier than Iron Age
H04	9	
CRUCIBLE	11	Fine light grey no inclusions visible
ROMAN	25,25.1	Ebor coarse and fine respectively

Table 2 *Concordance for original fabric number codes and new fabric codes based on Didsbury's type series (see Table 1 for context and fabric number concordance)*

APPENDIX 2: FLINT

By P. Makey

1. INTRODUCTION

The assemblage incidence and composition is given in tables 1 & 2.

The excavations produced 157 struck and utilised pieces of flint, a further 59 pieces of un-struck natural were recovered. The material was dispersed over 94 separate stratified contexts (20 pieces were un-stratified). Only seven contexts (Context 1670 x5, Context 2166 x4, 2432 x3, 2459 x5, 2656 x3, 2865 x3, 3469 x4) produced more than 2 pieces.

Although comparatively small the assemblage contains a wide range of retouched implements many of which are highly diagnostic; possessing limited affinities. Extant flake scars on some of the pieces hint at further quality material that is not present in the assemblage. Most of the retouched implements are of a domestic nature with the possible exceptions of a ground stone axe (Sf105, Context 3314, area 2) and the plano-convex knives (Sfs 148 & 155, Contexts 2334 & 2363).

There appear to be at least five separate phases of lithic deposition on the site. These phases are:
Phase 1 Early Mesolithic.
Deposits reworked and by fluviatile action. There are some indications of Mesolithic settlement evidence, notably including a serrated edged saw (Sf353). This material was probably subsequently sealed. This material is chiefly from Area 2.

Phase 2 Later Mesolithic.
Fine blade like flakes that tend to be un-patinated.

Phase 3 Early to Middle Neolithic.
Phase 4 Later Neolithic / Early Bronze Age.
Phase 5 Early Bronze Age with only limited evidence of 'Beaker' type material.

2. STATE

The overall degree of breakage is remarkably low (38 pieces, 24%) if one considers the nature of the deposits. Most of the extant breakage is minimal and it is notable that many

pieces have been manufactured on a very fine grained flint that is more susceptible than normal with regard to damage. The very fresh state of many of the pieces is consistent with their having been dropped in soft silt and immediately covered. This could take the form of lacustrine, fluviatile and flood deposits.

There is a clear phase separation in the material of Mesolithic character. The material of earlier Mesolithic character exhibits some degree of reworking that is context related, and exhibits a differentiation in patina. It is suggested that an earlier Mesolithic deposit containing flint has been scoured by a moving river or stream.

Most of the material from the area of the cobbled surface is abraded, consistent with its contextual residuality. The material (4 pieces) from the fill of possible Iron Age gully 3469 is of later Neolithic character. Context 1670 (levelling over pit 1655) produced 5 pieces of struck flint. The pieces; includes a chisel arrowhead fragment (Sf125), broken flake (Sf119), piercer (Sf128), extended end (double) and side scraper (Sf123) and a broken serrated edged blade (Sf116). The arrowhead is of a later Neolithic, form although the scraper and serrated edged blade are of a later Mesolithic aspect. The state of the material is reasonably fresh and suggests intentional dumping of a soil that has been moved from a nearby sealed context.

The freshest material comes from ditch fill 2166. The pieces from this context include a core rejuvenation flake (Sf101), a flake (Sf100), miscellaneously retouched flake (Sf99) and a possible segmented blade fragment (Sf102). Once again this material is of a multi period aspect and is inconsistent with its context. Perhaps this linear cut through an earlier feature such as a Neolithic pit.

Traces of burning are present on 18 pieces (11.5%). Nine of these pieces are from the fills of pits or ditches; although at present there is no clear pattern to the distribution of this trait, the pieces from the vicinity of the 'Water Hole' appear to have been subjected to a greater degree of burning.

Patination is present on 47 (30%) of the pieces. Most of the burnt pieces betray traces of patina. The degree of individual flint patination appears to be related to an individual flints contextural distribution rather than its age.

3. RAW MATERIAL & KNAPPING

A variety of different knapping traits are present on the material, although most pieces appear to have been struck via the application of hard hammers. There is a limited evidence for the possible use of anvil knapping technology (i.e. a flint may have been rested on a larger nodule during the knapping process). One flint hammer stone (Sf17) was recovered from the fill of an enclosure ditch in Area A1. The piece is unusual for being a substantially chalky corticated nodule characteristic of flint from the East coast.

Only 10-13 (6-8%) of the pieces come from primary (initial) stages of core reduction. An unusually large proportion (>50 %) of the material dose not possess any trace of cortex and the quality of knapping is high throughout all periods. The extant cores are exhausted. Many of the fresh flakes and blades betray dorsal scars (blade and flake), indicating further removals that have not been recovered. It is clear that throughout all periods a substantial proportion of the flint assemblage has been manufactured on raw material nodules/tablets that have been substantially prepared prior to having been brought to the site. The extant core assemblage is remarkably small, amounting to only 8 pieces (c5%).

The use of raw material is one of the most intriguing aspects of the assemblage. The raw material appears to have been selectively procured throughout all periods. The quality of the raw material is quite high. The selection of the raw material is atypical for the region. Almost half of the flint assemblage appears to have been manufactured on the till derived, olive black to olive grey coloured flint commonly found throughout the flint assemblages from Eastern Yorkshire and obtained from the East coast, however assemblage contains an unusually large proportion (c>20%) of fine grained moderate brown (Munsell 5YR 4/4) and yellowish brown (Munsell 10YR 5/4) coloured flint of an uncertain origin. The source for this may be remarkably localised and relate to dumps on the margins of the York moraine. Olive grey coloured flint is present as a natural deposit as evidenced by a very large nodule (Sf382, Context 2742) that was recovered during the excavation. This piece is much abraded and has not been used. This piece is more granular (therefore unsuited to knapping) than the material employed to make most of the struck assemblage.

4. USE WEAR, MICRO WEAR & POLISH

Macroscopic traces of edge use are present on over 36% of the assemblage and micro-wear is present on at least 17 (c30%) pieces. Where present the degree of micro-wear tends to be heavy. The assemblage contains a (Sf378, Context 1603) small chunky flake edge

retouched flake with a surface polish that is reminiscent of a polished flint axe (although not from an axe).

5. THE RETOUCHED PIECES (TABLES 1 & 2)

The ratio of retouched tools and utilised pieces to debitage is higher than 1:3. This is unusually high; greater than might normally be encountered on a flint assemblage obtained from a pre-Iron Age settlement site.

In addition to the types described in detail there is a variety of retouched edge and miscellaneously retouched pieces on a range of different supports.

5.1 THE ARROWHEADS

Four arrowheads are present in the assemblage. Levelling context Context 2515 (small find 220) produced a bifacially flaked piece that is probably a leaf shaped arrowhead of Green's (1980) class 3Aj. Regionally such pieces tend to be of early to later Neolithic date. The three remaining arrowheads include (Sfs 125, 226 & 97; Contexts 1670, 2568 & 1938) chisel forms of Clark's (1934) class B/C, and C and an oblique arrowhead of Clarks type H. Types C tend to be associated with Peterborough and Beaker pottery (Clark 1934, 42: Makey 1989). The type tends to have prehistoric pottery associations with Grooved Ware of Durrington Walls style (Manby 1974, 82 Figure 33).

5.2 THE SCRAPERS

The scraper assemblage comprises a wide variety of typological forms and includes diagnostic examples from all periods of post glacial flint working traditions. One of the most significant of which is a long end scraper (Sf112) from the fill (Context 3469) of a possible Iron Age gully. This piece is of a distinctly Mesolithic character.

5.3 THE STONE AXE

Perhaps the most important piece in the assemblage is a distal (cutting edge/end) fragment from a ground stone axe (Sf105). The piece comes from context 3469 (Area 2). The axe appears to have been manufactured on a relatively soft yellowish grey (Munsell 5Y 8/1) coloured limestone (very unusual) and is slightly asymmetrical in plan and of bi-convex section. The breakage may have been initiated along the line of an internal fault caused by the inclusion of a fossil. The fossil appears to be part of the trunk section of a trilobite (Cambrian to Permian period 542-251 million years ago). The source of the raw material needs further and careful consideration since it is not local. Fossil inclusions in stone axes are rare, although 2 examples are known from Fulford (Terry Manby, pers. comm.) which is

notably close. However the fossil would not have been visible on the surface of the Heslington axe, unless it was on the missing (butt) fragment. The major source for trilobite bearing limestone in Britain is from a Silurian deposit (443-416 million years) at 'Wrens Nest', Dudley (colour and nature of this deposit needs comparing). Stone axes tend to be earlier rather than later Neolithic in date. There is another limestone axe from the York area (Bryan Antoni, pers. comm.). This specimen came from St Paul's Green, Holgate (NGR SE 5921 5130: Yorkshire Museum accession code, YORYM: 1999.251) and was recovered from a peat filled kettle-hole.

5.4 THE SPUR, PIERCERS, POINT & AWL

An un-stratified (Sf96, Context 3000, Area A2) spurred flake is characteristic of later Neolithic to Early Bronze Age assemblages. The 4 piercers are of a variety of forms and represent more than 1 phase of activity. Build up context 2669 produced a point (Sf248) with basal backing that is reminiscent of an early Mesolithic backed blade. The awl (Sf3) from context 20012 is notable for having been manufactured on a broken or discarded chisel arrowhead (not included in arrowhead totals).

5.5 THE NOTCH, DENTICULATE, SAW & SERRATED EDGED FLAKES & BLADES

The occurrence of such pieces is a good indicator of settlement. The saw and serrated edged pieces are of a distinctly Mesolithic character.

5.6 THE KNIVES

Two plano-convex knives (Sfs 91, 155; Contexts 2012 & 2363) are in a remarkably fresh state. Such pieces occur infrequently in un-stratified assemblages and are known to have predominately later Neolithic and early Bronze Age associations, where they tend to be associated with Beakers and food vessels, frequently being associated with cremations. The flaking of these is reminiscent of retouched implements from the excavations (M.A.P archaeological Consultancy Ltd) at Fulford Gate. A crude, broken double edged flake knife (small find 148) from Context 2334 appears to have been manufactured on what was originally intended to be an oblique arrowhead.

6. SPATIAL DISTRIBUTION

The material from Area 2 is of an earlier character than that from Area 1. Features in this area contain bladelets and blades of Mesolithic character. Of particular note is a long end, scraper (Sf112) from Context 3469.

7. SIGNIFICANCE

The flint assemblage is highly significant. The selective nature of the raw material, its fresh state and an apparent late stage of core reduction is a feature common to the diagnostic pieces from all ages. This implies that most of the assemblage is not just the result of casual loss; i.e. they are not background scattering. It is probable that most of the material represents successive phases of occupation on the site. It is possible that sealed lithic assemblages may be present on the site these may be large and sealed by extensive colluvium / alluvium. The presence of some very small chunks, chippings and flakes in the assemblage is consistent with a high level of field recovery, to an extent that it is probable that the assemblage composition has not been skewed.

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9. TABLES

Artefact Class	Total Number	Number Broken	Context / (Small Find Number)
RETOUCHED			
Arrowheads:- Leaf	1	1	2515 (220)
Chisel P.t.d Class B, C & H	3	2	1670 (125), 1938 (97), 2568 (226)
Scrapers	18	2	U/S (324), 1006 (5), 1056 (9), 1198 (33), 1599 (65), 1670 (123), 1721 (129), 1847 (94), 2002 (152), 2156 (64), 2432 (179), 2474 (196), 2521 (207), 2582 (224), 2865 (187), 3000 (96), 3469 (112), 4596 (416),
Stone Axes	1	1	3314 (105)
Spurs	1		3000 (96)
Piercers	4		1670 (128), 2363 (176), 2422 (177), 2683 (263)
Point	1		2669 (248)
Awls (on a chisel arrowhead)	1		20012 (3)
Notches	1		2674 (249)
Denticulate (plus misc Ret)	1		3469 (112)
Saw	1		3000 (317)
Serrated Edged Flakes & Blades	2	1	1670 (116), 4544 (353)
Knives:- Plano Convex	2	1	2012 (91), 263 (155)
Double Edged	1	1	2334 (148)
Polished Flakes (Retouched)	1		1603 (378)
Edge Retouched Core Rejuvenation Flakes	1		1468 (66)
Edge Retouched Flakes	3	1	1468 (66), 2414 (166), 2603 (230)
Edge Retouched Blades	1		2564 (221)
Backed Blades	1		1746 (322)

(edge ret RHS)			
Miscellaneous Retouched Flakes	3		U/S (11), 1114 (30), 2166 (99)
UTILISED			
Hammer Stones	1		1228 (17)
Edge Utilised Core Rejuvenation Flakes	1	1	41382 (6010)
Edge Utilised Chunks	1		41311 (6008)
Edge Utilised Flakes	7		1655 (316), 2594 (236), 2604 (233), 2865 (204), 3000 (96), 3477 (301) 3478 (302)
Totals	58	11	

Table 1 *Composition of the retouched flint and worked stone assemblage.*

Artefact Class	Total Number	Number Broken	Context / (Small Find Number)
CORES & UN-RETOUCHED			
Cores: Single Platformed	4	1	1102 (35), 1462 (67), 1837 (362), 2542 (218)
Multi-Platformed	1		1454 (153)
Keeled	2	1	3000 (96), 3478 (302)
Unclassifiable	1	1	1002 (134)
Core Rejuvenation Flakes	10	2	1173 (31), 1271 (42), 1484 (68), 1667 (312), 1687 (89), 2020 (132), 2166 (101), 2632 (244), 3381 (311),, 3992 (326),
Nodules / Struck	2	4	40992 (6003), 41159 (5989)
Chunks	6		U/S (11), 1099 (34), 1114 (381), 2568 (225), 2582 (224), 2645 (242)
Chippings	4		2367 (80), 2459x2 (192 & 194), 596 (416)
Spalls	5		U/Sx2 (404 & 410), 1534 (318), 2656 (245), 3469 (112)
Flakes	52	9	U/Sx4 (70, 188, 371 & 384), 1044 (4), 1052 (8), 1112 (32), 1260 (41), 1464 (69), 1505 (121), 1534 (318), 1588 X2 (139-140), 1629x2 (314), 1669 (157), 1670 (119), 1721 (130), 1837 (362), 1872 (133), 1977 (92) 2002x2 (151x2), 2020 (131), 2166 (100), 2362 (313), 2394x2

			(161 & 162), 2395 (163), 2414 (166), 2422 (178), 2432x2 (184x2), 2459x3 (191, 193 & 195), 2519 (352), 2594 (235), 2645 (237), 2679 (270) 2656x2 (246 & 247), 2679 (271), 2723 (262), 2865/1670 (208), 3000x3 (96), 3046 (421), 2413 (110), 2469 (112), 4130 (403), 4633 (420)
Blades	5	4	1010 (7), 1492 (71), 2865 (158), 3000 (96), 4521 (411)
Bladelets	5	4	U/S (181 & 238), 2365 (319), 2669 (250), 3100 (308)
Truncated Bladelets	1		1655 (315)
Segmented Blade	1	1	21666 (102)
Totals	99	27	

Table 2 *Composition of the un-retouched flint and worked stone assemblage.*

APPENDIX 3: ARTEFACTS

By N. Rogers

The small finds assemblage has been studied by several specialists who contribute their own reports; this report covers objects made from jet, shale, bone, antler, glass, iron, lead alloy, and copper alloy (but not including coins).

1. JET/SHALE OBJECTS

The assemblage of jet, shale and jet/shale finds derives from Areas A1 and A2; apart from Sf109, context 3390 which may be an incomplete object, all the material from A2 appears to be working debris, either worked fragments, or offcuts. Some of this material comes from deposits of the Iron Age, or perhaps earlier: for example, worked fragment Sf107, Context 3314 comes from a Phase 501 ?pre-Iron Age pit. Features from Phases 505, 507, 508 and 509 also produced worked fragments. Material also came from Roman and modern features – this material may all be residual, although it is certainly possible that Roman material is represented here. There does not appear to be any significant chronological distribution to the shale as opposed to the jet, the implication being that the materials were in use contemporaneously.

Jet and shale objects were found in area A1, and some working debris was also recovered. Sfs 27-8 are jet rings both found in Context 1546, and possibly deliberately deposited. The rings are not quite annular, and have sub-oval perforations, and are probably ear-pendants: a similar ring was found in an Iron Age burial at Kirkburn, East Yorkshire close to the top of the jaw (Stead 1991, 92-3). An incomplete shale ring Sf81, Context 1764 may have had a similar function. A jet hairpin Sf98, Context 1001 was found in a modern feature but dates to the 3rd or 4th century. The remainder of the material from Area A1 comprises jet and shale worked fragments

2. BONE AND ANTLER OBJECTS

All the small finds made of bone or antler were recovered from Area A1. A virtually complete antler Sf159 Context 1564 may have been ritually deposited within the fill of a slump: there are no signs of working, and the antler is still attached to the remains of the deer skull, indicating that a dead animal – or at any rate the head of a dead deer – had been brought to the site. A second deer skull with part of the burr (antler base) still attached (Sf325 Context 2384) must also have come to the site in this way; worked fragments of antler Sf323 were

found in the same context. Sf22, Context 1114 and Sf321, Context 2549 are both objects made of bone with unknown functions.

3. STONE

All the stone objects were recovered from Area A1. These include four saddle quern fragments which were identified by Blaise Vyner; they comprise Sfs 95, Context 2020; Sf182, Context 2451; Sf185, Context 2865; Sf300, unstratified. Possible rubbing stones have also been identified: Sfs29, Context 1114 ; Sf222, Context 2551. Saddle querns were in use as early as the Neolithic period: Vyner notes that the Heslington querns could be residual, or may be of Iron Age origin (B. Vyner pers. comm.). It seems likely that they were used to grind metal ores, in association with the metalworking which was occurring on the site.

The other stone finds include apparently burnt pebble fragments (Sf39 Context 1114), one stone with possible traces of red paint (Sf136 Context 2345), and others of uncertain function (Sf183 Context 2865; Sf213, Context 2542).

4. GLASS

An incomplete small blue annular bead Sf138, Context 1588 was recovered from a dumped deposit in Area A1. Such a bead might be of Iron Age, Roman (or even potentially of post-Roman date), but may be datable once the date of its context is established. Two glass finds were recovered from Area A2: Sf401, Context 4101 is a bangle fragment, found in a Phase 512 ditch fill, and probably dating to the late 1st-2nd century A.D. Possibly of much earlier date, Sf108, Context 3363 appears to be a melted glass fragment, which was found in a Phase 502 deposit.

5. FIRED CLAY

Fragments of fired clay of uncertain function were found in a build up level in Area A1 (Sf117, Context 1670); it is possible these may be associated with metalworking.

6. IRON

Of the iron objects recovered from Area A1, the most significant is the large hooked object Sf52 Context 1534 which was found in a spread which also contained the hoard of silver and copper alloy coins of the mid 4th century. Initially identified as a linch pin, this object may

alternatively be a hook from a large cauldron chain; it requires further conservation investigation to enable a final identification. Other iron objects from this area comprise nails, and a bar Sf341 Context 1027 from a modern feature.

In Area A2, one backfill deposit relating to an Iron Age enclosure (Context 3011, Phase 508) produced a possible nail (Sf414), a suspension ring fragment (Sf415), and an unidentifiable fragment (Sf417). Fragments of an iron and copper alloy object, probably a vessel (Sf304, Context 3482), and an unidentified object which requires further conservation investigation to enable a final identification (Sf356, Context 5050) both came from Roman features.

Ironwork from unstratified deposits included a possible tool (Sf58), and a possible knife tang (Sf340).

7. COPPER ALLOY (NOT COINS)

Apart from the coins, only five copper alloy small finds were recovered from the site. Of most interest is a possible ingot Sf305 from Context 3062 in Area A2; this deposit dates to Phase 505, the 2nd use of an Iron Age enclosure (see Appendix 9*)*. An unidentified fragment Sf106 was found in the same deposit.

A post medieval button (Sf1, Context 20005) was retrieved from Trench10. Other finds from the site were unidentified (Sf49, Context 1534), or unstratified (Sf228 - a possible suspension ring fragment).

8. LEAD ALLOY

All the lead alloy finds came from Area A1. Large sheet fragments with nail holes Sfs76-78, Context 1607 were found in the base of a cut; it has been suggested that these had been deliberately placed here, in the area of metalworking, and may have marked the ritual end of metalworking use of this area.

The other lead alloy finds comprise a sheet fragment Sf37, Context 1090 found in a pit, and a possible metalworking fragment from a spread deposit Sf48, Context 1534. Another sheet fragment Sf339 was unstratified.

9. SUMMARY AND CONCLUSIONS

Much of the assemblage relates to the Iron Age activity on the site and includes metalworking, indicated not just by the metal debris (see Appendix 9), but also possibly by the querns. Jet and/or shale working may also have occurred at this period.

Possible ritual deposition is indicated by the complete antlers; it may be that other finds including the jet ?earrings have also been deliberately deposited although these have been found in graves on other sites of this period, for example in East Yorkshire (Stead 1991).

The Roman finds are mainly personal items such as pins and jewellery, although the large iron object found in the same deposit as the mid 4th century coins may also be Roman.

10. BIBLIOGRAPHY

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11. TABLE

Find	Context	Name	Material
Sf00159	1564	Antler	Antler
Sf00323	2384	Fragments, Objects	Antler
Sf00325	2384	Fragment	Antler
Sf00022	1114	Object	Bone
Sf00321	2549	Object	Bone
Sf00228	0	Fragment	Copper Alloy
Sf00409	0	Coin	Copper Alloy
Sf00049	1534	Fragment	Copper Alloy
Sf00050	1534	Coin	Copper Alloy
Sf00051	1534	Coin	Copper Alloy
Sf00057	1534	Coin	Copper Alloy
Sf00059	1534	Coin	Copper Alloy
Sf00060	1534	Object	Copper Alloy
Sf00045	1554	Coin	Copper Alloy
Sf00046	1554	Coin	Copper Alloy
Sf00024	1563	Coin	Copper Alloy
Sf00093	1911	Coin	Copper Alloy
Sf00106	3062	Fragment	Copper Alloy
Sf00305	3062	Ingot	Copper Alloy
Sf00001	20005	Button	Copper Alloy
Sf00117	1670	Fragments	Fired Clay
Sf00138	1588	Bead Fragment	Glass

Sf00108	3363	Fragment	Glass
Sf00401	4101	Bangle Fragment	Glass
Sf00002	0	Strip	Iron
Sf00058	0	Object	Iron
Sf00340	0	Object	Iron
Sf00341	1027	Object	Iron
Sf00044	1090	Fragment	Iron
Sf00047	1534	Nail	Iron
Sf00052	1534	Object	Iron
Sf00075	1543	Nail	Iron
Sf00333	1981	Fragment	Iron
Sf00414	3011	Nail	Iron
Sf00415	3011	Object	Iron
Sf00417	3011	Fragment	Iron
Sf00332	3177	Nail	Iron
Sf00356	5050	Object	Iron
Sf00304	3482	Object	Iron, Copper Alloy
Sf00098	1001	Hair Pin	Jet
Sf00122	1363	Worked Fragment	Jet
Sf00027	1546	Ring	Jet
Sf00028	1546	Ring	Jet
Sf00114	1670	Worked Fragment	Jet
Sf00083	1878	Object	Jet
Sf00345	3083	Worked Fragment	Jet
Sf00320	3115	Fragment	Jet
Sf00359	3281	Worked Fragments	Jet
Sf00107	3314	Worked Fragment	Jet
Sf00386	2542	Offcut	Jet, Shale
Sf00347	3452	Fragments	Jet, Shale
Sf00344	3689	Worked Fragments	Jet, shale
Sf00407	4198	Fragment	Jet, Shale
Sf00346	4768	Worked Fragments	Jet, shale
Sf00339	0	Sheet Fragment	Lead Alloy
Sf00037	1090	Sheet Fragment	Lead Alloy
Sf00048	1534	Metalworking Fragment	Lead Alloy
Sf00076	1607	Sheet Fragment	Lead Alloy
Sf00077	1607	Sheet Fragment	Lead Alloy
Sf00078	1607	Sheet Fragment	Lead Alloy
Sf00120	1505	Fragments	Shale
Sf00081	1764	Ring	Shale
Sf00219	2542	Fragment	Shale
Sf00109	3390	Object	Shale
Sf00343	3535	Worked Fragment	Shale
Sf00400	4067	Object	Shale
Sf00062	0	Coin	Silver
Sf00053	1534	Coin	Silver
Sf00054	1534	Coin	Silver

Sf00055	1534	Coin	Silver
Sf00056	1534	Coin	Silver
Sf00331	0	Slag	Slag
Sf00335	0	Slag	Slag
Sf00351	0	Slag	Slag
Sf00358	0	Slag	Slag
Sf00021	1070	Slag	Slag
Sf00040	1102	Slag	Slag
Sf00013	1202	Slag	Slag
Sf00357	1208	Slag	Slag
Sf00072	1217	Slag	Slag
Sf00074	1277	Slag	Slag
Sf00073	1312	Slag	Slag
Sf00330	1327	Slag	Slag
Sf00354	1355	Slag	Slag
Sf00327	1406	Slag	Slag
Sf00025	1537	Slag	Slag
Sf00026	1543	Slag	Slag
Sf00338	1579	Slag	Slag
Sf00063	1584	Slag	Slag
Sf00342	1793	Slag	Slag
Sf00088	1995	Slag	Slag
Sf00336	2220	Slag	Slag
Sf00337	2221	Slag	Slag
Sf00334	2355	Slag	Slag
Sf00142	2373	Slag	Slag
Sf00143	2373	Slag	Slag
Sf00144	2373	Slag	Slag
Sf00145	2373	Slag	Slag
Sf00146	2373	Slag	Slag
Sf00168	2373	Slag	Slag
Sf00169	2373	Slag	Slag
Sf00170	2373	Slag	Slag
Sf00171	2373	Slag	Slag
Sf00160	2377	Slag	Slag
Sf00141	2399	Slag	Slag
Sf00198	2461	Slag	Slag
Sf00203	2493	Slag	Slag
Sf00206	2510	Slag	Slag
Sf00199	2516	Slag	Slag
Sf00205	2516	Slag	Slag
Sf00210	2516	Slag	Slag
Sf00211	2516	Slag	Slag
Sf00214	2542	Slag	Slag
Sf00355	2555	Slag	Slag
Sf00240	2645	Slag	Slag
Sf00328	4615	Slag	Slag

Sf00329	4768	Slag	Slag
Sf00310	5052	Slag	Slag
Sf00309	5065	Slag	Slag
Sf00300	0	Quern Fragment	Stone
Sf00348	0	Haematite	Stone
Sf00029	1114	Rubbing Stone Fragment	Stone
Sf00039	1114	Fragments	Stone
Sf00019	1440	Haematite	Stone
Sf00349	1534	Haematite	Stone
Sf00095	2020	Worked Fragment	Stone
Sf00136	2345	Fragment	Stone
Sf00147	2355	Object	Stone
Sf00182	2451	Quern Fragment	Stone
Sf00212	2514	Fragment	Stone
Sf00213	2542	Worked Fragment	Stone
Sf00222	2551	Object	Stone
Sf00223	2551	Cobble	Stone
Sf00252	2691	Haematite	Stone
Sf00350	2804	Haematite	Stone
Sf00276	2825	Haematite	Stone
Sf00183	2865	Worked Fragment	Stone
Sf00185	2865	Quern Fragment	Stone
Sf00307	3221	Quern Fragment	Stone
Sf00105	3314	Axe Fragment	Stone

Table 1 *List of Artefacts including Bone, Antler, Metal, Glass, Jet, Shale, Stone and Metal-working debris listed according to material type.*

APPENDIX 4: CERAMIC BUILDING MATERIAL

By J.M. McComish

A total of 9.08kg of Ceramic Building Material (CBM) was examined from the excavations. A number of forms were identified ranging from Roman to modern in date. The CBM was recorded following standard YAT procedures.

1. FORMS

The bulk of the material present was of Roman date (8.270kg). This included five imbrex fragments, four tegula fragments, and abundant fragments of Roman brick (Rbrick in the catalogue), much of which was highly abraded. The imbrex ranged from 16-30mm thick, while the tegulae were 18-28mm thick. Only one tegula flange survived and this was 59mm high. The bricks ranged from 14-59mm thick and one had keying lines on the upper surface. A few of the Roman fragments were slightly underfired. Very little medieval material was present (just 815g) which consisted of eight fragments of plain tile ranging from 14-18mm thick. The only modern material was a fragment of a brown glazed sewer pipe weighing just 5g. All of the CBM was in fabrics seen elsewhere in York. The material was also typical in terms of the dimensions present.

2. SUMMARY

There was very little CBM from the site, especially in the light of the scale of the excavations. Although Roman material made up the bulk of the collection, given the area excavated very little material was present, suggesting that Roman activity in the area was on a limited scale. The minute quantity of medieval and later material present suggests that the area was little used from the medieval period to the present. The material was typical in terms of fabric, forms and dimensions for York as a whole. The material is of use for dating individual contexts it is too limited a collection to add to the study of CBM from York as a whole. No further work is recommended.

Context	*Date*	*Forms*
1003	*13-16TH*	*Plain*
1009	*1-4TH*	*Imbrex*
1027	*1-4TH*	*Imbrex*
1217	*1-4TH*	*Rbrick*
1308	*1-4TH*	*Rbrick*
1351	*13-16TH*	*Plain*
1361	*1-4TH*	*Tegula*
1361	*1-4TH*	*Imbrex*

1363	1-4TH	Tegula
1414	1-4TH	Rbrick
1446	13-16TH	Rbrick, plain
1534	1-4TH	Rbrick
1589	1-4TH	Rbrick
1603	1-4TH	Rbrick
1686	1-4TH	Imbrex
1733	1-4TH	Rbrick
1793	1-4TH	Rbrick
1793	1-4TH	Rbrick
1821	1-4TH	Rbrick
2010	1-4TH	Rbrick
2200	1-4TH	Rbrick
2222	13-16TH	Plain
2714	1-4TH	Tegula
3178	1-4TH	Rbrick
3203	13-16TH	Plain
3469	1-4TH	Rbrick
3510	L19TH-20TH	Sewer, Rbrick
3567	1-4TH	Rbrick, tegula
4101	1-4TH	Rbrick
4164	1-4TH	Rbrick
4176	1-4TH	Rbrick
4211	13-16TH	Plain, rbrick
4307	1-4TH	Rbrick
4648	1-4TH	Rbrick
4749	1-4TH	Rbrick
5050	1-4TH	Rbrick
5054	1-4TH	Rbrick
11001	1-4TH	Rbrick
15007	1-4TH	Rbrick
20007	1-4TH	Rbrick

Table 1 *Ceramic Building Material by Context*

APPENDIX 5: ASSESSMENT OF WATERLOGGED WOOD

By S. J. Allen

1. INTRODUCTION

This report covers the assessment of an assemblage of waterlogged wood recovered during excavations at Heslington East, York in 2008.

2. AIMS AND OBJECTIVES

This report aims to meet the requirements of MAP2, Phase 3, Assessment of Potential for Analysis, (English Heritage, 1991). The work carried out has been the cleaning and examination of the material recovered and assessment of its condition. Some C14 dating samples were taken and despatched at the request of the excavation team. An evaluation of the potential for further investigation is included, with recommendations for further recording, retention and long term stabilisation where appropriate.

3. PROCEDURES

The author initially visited the site in January 2008 to see a wood lined feature partially exposed in the ground. This was initially identified as a waterhole with a revetted step in the base at the foot of an access ramp. Advice on sampling and recording the feature was given.

Over the remaining course of the year, several further site visits were made to see wood in situ as further areas of waterlogged deposits were identified and sampled. Intermittently, samples were recovered for C14 dating and despatched to the laboratories of Beta Analytic of Miami, Florida for processing. Samples of wood were recovered by the field team and sent in to the laboratory for recording at intermittent intervals. Most of the wood was processed in the intervals between other external projects as and when time allowed. Excavations finished at the end of October 2008 and by the end of November, all fragments of wood recovered from the site had been recorded.

In each case, the wood was taken from its packaging, washed under cold running water to remove adhering burial deposits, recorded, species identification carried out then either repacked or returned to its original packaging as necessary to await the decision based on the recommendations made. Recording was done using handwritten notes which were

subsequently transferred to IADB, which forms the catalogue for this project. All wood species were identified where possible following Schweingruber (1982).

4. CONDITION

In almost all cases the wood had been preserved through burial in a waterlogged anoxic environment and it appears that these conditions were maintained up to the time of excavation. Most of these burial contexts appear to have been highly localised- the base deposits of negative features such as pits, ditches, waterholes and the like, cut to a depth below that of the local water table. Wood found at the upper margins of the water table had suffered from decay, in some cases very badly. Several upright timbers or stakes had well preserved bases or tips below the water table but above the level of permanent waterlogging, decay had set in with the loss of upper ends and surfaces. In some cases these had rotted off altogether, in others the surviving upper end was extremely fragile.

The only wood present which had not been preserved by waterlogging had been heavily charred. Very little such material was recovered from waterlogged and non-waterlogged contexts across the site as a whole, and it must be presumed that carbonised material was either not present in significant quantities in the locality, or had been broken up beyond recognition in its burial context prior to excavation.

5. QUANTIFICATION

2981 pieces of wood were recovered from 112 separate contexts. Three more pieces of wood from three other contexts were selected on site for C14 dating and despatched before assessment. This sum does not include several bags of wood recovered from site which were too degraded to record or identify but whose presence has been noted under the appropriate sample and context number. Four bags of material were not labelled and as it was impossible to track down where this wood had originated, the material had to be discarded.

6. DISCUSSION

At the time of writing, preparation of the written stratigraphic sequences are underway and consequently, it is not presently known how these pieces of wood relate to each other

chronologically or spatially. Once this is available a full report can be prepared for the analysis phase of the project.

It is none the less clear at this stage, that the wood derives from contexts which span a significant amount of time including the bronze age and iron age. There is very little prehistoric waterlogged wood from York or its immediate hinterland and this means the assemblage is of great importance. Most of the material consists of small diameter roundwood, some of which is derived from wattle structures which will give an insight into woodland exploitation. Other roundwood material is more difficult to categorize. Some may be from wattle structures not recognised or sampled as such in the ground, some from wattle structures broken up before they entered the archaeological record. Root material is present in a number of contexts and reflect the tree or shrub species growing in the area, as well as those brought in from elsewhere. Chippings are present, some derived from the breaking up of pieces of roundwood, but others from the working of larger pieces of wood and timber in the vicinity.

Many worked stakes have been recovered and it may be possible to identify working techniques specific to a particular era and whether these change through time or space.

Very little in the way of artefactual wood has been recovered from the site. What there is includes several fragments of boards (contexts 1114, 1184, 2669 and 4673), tapering pegs cut from roundwood (context 2693, 3715), part of a broken shovel or scoop (context 2828), two quarters of (the same) hollowed wooden cylinder (context 2773; 2774) and part of a second hollowed cylinder of similar size (context 2850). There are also some timber fragments which may be from a structural context, cut from pieces of medium diameter roundwood with two opposing hewn faces and hints of through mortices present (contexts 1153, 3715).

Of these objects the parts of the hollowed cylinders are of most interest. Two (2773, 2774) were found side by side and are almost certainly two parts of the same object. This was not a trough as the surviving end is shaped and hollowed, not solid to retain any contents. Direct parallels are not easy to find and this will require further research. None the less, there is good evidence for the working on these pieces of wood, solid C14 dates in the late bronze age and this will repay further study. The object(s) are certainly worth retention for display and publication.

The shovel or scoop was badly damaged before entering the burial records but parallels should be straightforward to find. Similar objects are known form late prehistoric contexts in

the Trent Valley and Severn Levels. The tapering pegs are unusual and may be relicts of carpentry, perhaps associated with the small worked timbers identified in context 3715. Again, these are worth further study and publication.

The assemblage has the potential to show what species were growing in the locality, which ones were being exploited and how and why those species were being exploited. Knowing what environmental conditions favour the growth of these species, we can infer what associated plants and animals might have been nearby. The range of species at present is not unusual and includes:

Acer campestre L.,	Field Maple
Alnus spp.,	Alders- exact species not determined.
Corylus avellana L.,	Hazel
Fraxinus excelsior L.,	Ash
Pinus sylvestris L.	Scots Pine
Prunus spp.,	Stone fruits including Blackthorn, Cherry, Hawthorn
Quercus spp.,	Oaks- exact species not determined.
Salix spp.,	Willows- exact species not determined.
Sambucus nigra L.,	Elder
Taxus baccata L.	Yew
Ulmus spp.	Elms- exact species not determined.

All of these species are native to the British Isles and their appearance should not be a surprise. However the presence of Scots Pine is very unusual. This tree was not exploited in Britain as a significant source of timber until the post-medieval period. Prior to this its presence is usually attributable to importation from Scandinavia or the Baltic region. Pieces of Scots Pine are found at Heslington in several contexts (1115, 2347 and 2729 as chippings, 1168 as stakes and 2379 as roundwood). This type of material is unlikely to have been imported. Its presence at Heslington suggests a local source of Scots Pine and could be an extremely rare example of its exploitation in a prehistoric context. A C14 date for the two Pine stakes would be extremely valuable and confirm that this wood is not intrusive.

7. BIBLIOGRAPHY

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APPENDIX 6: ASSESSMENT OF BIOLOGICAL REMAINS

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SUMMARY

One hundred and eight bulk sediment samples and six boxes of bone (including some material recovered from samples processed by YAT), recovered from deposits encountered during excavations at Heslington East, Heslington, York, were submitted for an assessment of their bioarchaeological potential. Almost all of the features encountered were of Iron Age date, with a few that were of earlier or later origin, located within two main areas of excavation (designated Areas 1 and 2).

Approximately half of the deposits considered by this assessment contained organic remains preserved by anoxic waterlogging, a small number gave identifiable charred plant remains and, in an occasional deposit, both charred and waterlogged preservation was evident. However, most of the organic material from waterlogged deposits recovered was indeterminate 'woody' and herbaceous plant matter and identifiable remains showed significant fragmentation and decay. A small number of deposits, mostly in Area 1, showed significantly better preservation and a wider range of remains – some of these also included invertebrate macrofossils. In general, the waterlogged preservation appeared to be of better quality and more extensive in Area 1 and the identifiable components of the larger assemblages suggested alder carr, with some drier areas of hedgerow and grassland. Evidence of human food waste or activities such as crop processing was scant, with only a few deposits producing small quantities of rather poorly preserved charred cereal grains and chaff. Charred remains from several deposits also hinted at the burning of turves. Some of the deposits examined showed sufficiently well preserved pollen grains/spores to suggest that further analysis of these remains from suitable samples would provide addition useful information regarding vegetation in the wider landscape.

The vertebrate material recovered was mostly poorly preserved, with a high degree of fragmentation. Teeth and burnt remains were prevalent reflecting a bias towards those fragments which survive where poor preservational conditions prevail. The collections of horse and cattle teeth seen may represent the deposition of complete skulls/heads into some of the deposits which may be of ritual significance. However, given the poor preservation, it was not possible to ascertain whether these were deposits of particular significance or whether they represented general refuse. Any detailed interpretation of these remains would be hindered by this inherent bias towards certain species and skeletal elements.

Waterlogged preservation of organic remains is rare from prehistoric sites in this region and the assemblages seen here have the potential to provide detailed information regarding past environments of the area subject to the establishment of a reliable chronology for the deposits.

Keywords: Heslington East; Heslington; York; assessment; late Bronze Age; Iron Age; Romano-British; plant remains; charred plant remains; charred cereal remains; invertebrate remains; insects; vertebrate remains; microfossils; pollen/spores

1. INTRODUCTION

Archaeological excavations at Heslington East, Heslington, York (approximate NGR SE 638 509), have been undertaken by York Archaeological Trust (YAT) since late in 2007 and continued into early 2009. The works were carried out in advance of proposed development of the site by the University of York.

Evaluation trial trenching in 2007 and 2008 at Heslington East identified several areas of archaeological potential, particularly for the prehistoric and Roman periods. This report assesses biological material recovered from the subsequent large scale excavation of Areas 1 (south of Field Lane; NGR SE 6355 5075) and 2 (north of Low Lane; NGR SE 6380 5060). Almost all of the features encountered were of Iron Age date, with a few that were of earlier or later origin. Some of the earliest activity was associated with a waterhole in Area 1, with features of Bronze Age date and this continued into the Iron Age, with evidence for votive offerings. Iron Age field systems, with associated enclosures were also identified, together with a number of roundhouses and some smaller ring gullies (?ancillary buildings). The ditch system showed a sequence of complex developments, of which some elements appeared to continue in use into the Roman period. Medieval activity was restricted to ridge and furrow, whilst later features were mainly of an agricultural nature.

The sediment samples examined during this assessment were selected by the excavator and represented a range of features and periods from throughout Areas 1 and 2, together with a few from deposits encountered during evaluation trial trenching.

One hundred and eight bulk sediment samples ('GBA'/'BS' sensu Dobney et al. 1992) and six boxes of bone (five 'standard' boxes, of approximately 16 litres and one small box, approximately two litres), including both hand-collected remains and bone recovered from samples processed on-site by YAT, were submitted to Palaeoecology Research Services Limited (PRS), County Durham, for an assessment of their bioarchaeological potential.

2. METHODS

2.1 SEDIMENT SAMPLES

The sediment samples were inspected in the laboratory and their lithologies were recorded using a standard pro forma. Subsamples were taken from each and processed, broadly following the techniques of Kenward et al. (1980), for the recovery of plant and invertebrate macrofossils. Before processing the subsamples were disaggregated in water and their volumes recorded in a waterlogged state.

Owing to the financial constraints it was not possible to assess the remains from all of the deposits in any detail. However, all of the fractions were examined and notes made as to whether the deposits contained organic remains preserved by charring, anoxic waterlogging or both (see Table 1). Plant remains from the subsample fractions (residues and washovers) from 63 of the deposits were recorded briefly by 'scanning' using a low-power microscope, identifiable taxa and other biological and artefactual components being listed on paper. All of the residues and approximately half of the washovers (overall and also from the selection assessed in more details) were primarily mineral in nature, or composed largely of charred remains, and were dried prior to recording. The remaining washover fractions were composed largely of waterlogged plant remains and were examined wet.

The financial limitations of the project also precluded the use of paraffin flotation (sensu Kenward et al. 1980) to separate invertebrates from the plant remains for those washovers with waterlogged organic preservation. This hampered the assessment of these remains but their presence was recorded (see Tables 4-8) and where more numerous (and also for a selection of samples with smaller quantities of remains) – 19 in total – these were examined in a little more detail (see Tables 9 and 10) following Kenward et al. (1980; 1986).

Nineteen of the samples (the same subset as selected for closer examination of the invertebrate remains) were examined via a series of subsamples using the 'squash' technique of Dainton (1992). This was originally developed to quickly assess deposits for their content of eggs of intestinal parasitic nematodes but routinely reveals other microfossils such as pollen and diatoms. In this instance, the primary purpose of the subsamples was to determine the presence/absence of these other microfossil remains (pollen in particular) and, if present, assess their state of preservation. Assessment slides were scanned at 150x magnification with 600x used where necessary.

Nomenclature for plant species follows Stace (1997), cereal identifications follow Jacomet (2006) and charcoal identifications follow Schoch et al. (2004). Insects follow Kloet and Hincks (1964-77).

2.2 VERTEBRATE REMAINS

For the vertebrate remains, data were entered directly into a series of tables using a purpose-built input system and Paradox software. Records were made concerning the state of preservation, colour of the fragments, and the appearance of broken surfaces ('angularity'). Other information, such as fragment size, dog gnawing, burning, butchery and fresh breaks, was noted, where applicable.

Fragments were identified to species or species group using the PRS modern comparative reference collection. The bones which could not be identified to species were described as the 'unidentified' fraction. Within this fraction fragments were grouped into a number of categories: large mammal (assumed to be cattle, horse or large cervid), medium-sized mammal (assumed to be caprovid, pig or small cervid), and totally unidentifiable. The latter groups are represented in Table 13 by the category labelled 'Unidentified'.

3. RESULTS

Summary information regarding the samples processed, including the sediment and residue descriptions and notes regarding the presence of charred and/or waterlogged organic remains, are presented in Tables 1 to 3.

More detailed results from the recording of plant remains from the 63 selected samples are presented in Tables 4 to 6, including notes regarding any material suitable for radiocarbon dating. In addition, for those deposits with waterlogged preservation of ancient botanical remains lists of recorded plant taxa, with notes on other biological and inorganic components, are given in Tables 7 and 8. Further details for invertebrate macrofossil remains from 19 deposits are shown in Tables 9 and 10 and microfossil records for this same selection of samples are given in Tables 11 and 12.

3.1 PLANT MACROFOSSIL REMAINS

The 63 assessed deposits were mostly ditch and other cut feature fills (e.g. gullies, palaeochannel, pits), with some dump/levelling build-up deposits representing both excavation areas (Areas 1 and 2) and the evaluation intervention (Trenches 12-17). Limited

dating evidence suggested that most of the deposits were of Iron Age date, with a little earlier (late Bronze Age) and later (Romano-British) activity.

Almost half of the assessed subsamples revealed waterlogged ancient plant remains and the washover fractions of these were largely composed of organic detritus (wood and twig fragments, roots/rootlets, unidentifiable plant fibres), with some charcoal and mosses (Bryophyta), and occasionally coal and cinder/slag. In general, the plant material from these 'organic-rich' deposits was actually rather thinly distributed within the deposits and poorly preserved demonstrating significant decay (considerable fragmentation and surface erosion). However, a wide range of better preserved waterlogged seeds and fruits was recovered from a nine of the subsamples – from Contexts 1632 (fill of ditch 1666), 1664 (fill of linear pit cut 1665), 1669 (fill of ditch 1766), 1681 (fill of ditch 1774), 2375 (fill of LBA pit below N-S ditch 2405), 2442 (fill of N-S ditch 2631), 2517 (fill of ?LBA pit, cut by N-S ditch 2405), 2643 (fill of pit 2644) and 2662 (fill of E-W ditch 2671) – with the identifiable remains mostly representing plants growing in natural habitats such as wetland areas (e.g. fen, heath, riverbanks, marshes and swamps, and the margins of wet ditches), with some other wild taxa indicative of areas of waste/open ground, hedges and grasslands.

There were frequent records for remains of alder, including buds, nuts and male catkin fragments, together with twigs, in most of the 'organic-rich' samples and evidence of other trees and shrubs included remains of birch, blackberry, elder, hawthorns, hazel, holly, raspberry and sloe.

Botanical remains from several of the deposits in Area 1 and one in Area 2 provided evidence of standing water within their respective features. Aquatic plant remains included muskgrass (Context 1632), pondweed (Contexts 1664 and 2375, and Area 2 deposit Context 4693 – fill of northern boundary ditch) and horned pondweed (Contexts 1632; 1642 – fill of ditch 1766; 1664; 1669; 1681; 2324 – fill of N-S ditch 2364; 2662).

A few poorly preserved (puffed, distorted and eroded) charred cereal grains were recovered from a small number of the deposits (six from Area 1 – Contexts 1220, 1546, 1642, 1707/1708, 2375 and 2442); four from Area 2 – Contexts 3062, 4525, 4097 and 4525; one from evaluation trenches 12-17 – Context 23003) and a few of these also contained associated chaff fragments (rachis segments, glume bases and spikelet forks). Barley and emmer and/or spelt wheat were represented but, unfortunately, these remains were too infrequent to be of any additional interpretative value.

A single charred bulb of onion couch was found from Context 1050 (fill of E-W boundary ditch – cut 1051) and other charred remains of plants such as cinquefoil, heath-grass, ribwort plantain, sedge and spike-rush were noted from Context 1546 (basal fill of pit 1553), together with charred fragments of rhizome/root/rootlet, and it seems most likely, that these remains derived from the burning of turves. Both of these deposits were located in Area 1 and some other deposits investigated gave evidence of similar material (further charred fragments of rhizome/root/rootlets – see Tables 4 to 6).

3.2 INVERTEBRATE MACROFOSSIL REMAINS

Quite well preserved cladoceran ephippia were recorded from three deposits in Area 1 – Contexts 1681 (fill of ditch 1774), 2128 (fill of N-S ditch 2138) and 2517 (fill of ?LBA pit – cut by N-S ditch), and a single deposit in Area 2 – Context 4097 (fill of northern boundary ditch), and perhaps indicate that standing water in these features (Contexts 2128 and 2517 certainly lacked records for aquatic plants) was temporary and subject to drying out, or at least significant reduction.

The washovers from nineteen of the samples (17 from Area 1 and 2 from Area 2 – see Tables 9 and 10) were examined for invertebrate macrofossils. Nine of these (all from Area 1) were those where better preservation of the plant remains had been seen and the remainder were selected from others where small quantities of invertebrate remains had been noted during the botanical assessment. Recording was made difficult by the fact that paraffin flotation could not be employed to separate the invertebrate remains from the larger bulk of plant material as a result of the financial constraints of the assessment. However, some general notes could be made and occasional specific identifications were possible (at least in part).

Preservation of the remains (other than cladocerans – see above) was highly variable. Eight of the assemblages consisted of no more than unidentifiable ‘scraps’ of insect cuticle (Contexts 1669; 1681; 2442; 2517; 2594 – fill of pit 2655; 2770 – fill of pit 2778; 2811 – dump/build up deposit; and 4693; Context 4693 from Area 2, the rest from Area 1) and one, Context 2571 (another fill of pit 2655) gave just a few fragments of fly puparia. Invertebrate remains in the other ten washovers (Contexts 1515 – fill of N-S aligned ?palaeochannel; 1632; 1664; 2128 – fill of N-S ditch 2138; 2328 – fill of N-S ditch 2364; 2375; 2491 – basal fill of ditch 2492; 2643; 2662; 4097 – fill of northern boundary ditch; the last from Area 2 and the rest from Area 1) were also predominantly of small unidentified fragments but with occasional much better preserved remains (complete, or largely so, beetle sclerites exhibiting varying degrees of chemical erosion). Some of these could be readily identified, including Cercyon analis (and probably also Megasternum obscurum) from Context 2375 –

indicative of rotting organic matter often in waterside situations. Several species of ground and rove beetle (Carabidae and Staphylinidae, respectively) were noted and there was a weevil (Ceutorhynchus sp.) elytron in Context 1664. There were certainly other remains that could be identified by further study.

3.3 MICROFOSSILS

The same subset of the submitted samples as was selected for closer investigation of invertebrate macrofossils (see previous paragraph and Tables 11 and 12) was examined for microfossil (primarily pollen) survival. Five of the 'squash' subsamples, from Contexts 2328, 2491, 2517, 2594 and 2770 (all from Area 1), revealed no interpretatively valuable microfossil remains. Small numbers of poorly preserved (crumpled, broken, eroded) pollen grains/spores were recorded from seven of the deposits (Contexts 1515, 1669, 2128, 2375, 2442, and 2571 from Area 1, and Context 4097 from Area 2) but these were largely unidentified and of little interpretative potential – Context 2442 also gave a somewhat unexpected record of a single Capillaria sp. parasite egg which lacked both polar plugs and could not be identified more closely. The remaining seven deposits (Contexts 1632, 1664, 1681, 2643, 2662 and 2811 from Area 1, and Context 4693 from Area 2) each contained pollen grains/spores which were sufficiently well preserved to be of interpretative value (preservation was variable within most of these deposits and, in most cases, only some of the pollen grains/spores seen would be identifiable).

A few spot identifications revealed that the pollen assemblages included remains consistent with the plant macrofossil records, with tree species such as birch, hazel and alder being represented, together with trilete spores which were probably from mosses (and perhaps included Sphagnum) – a little caution should be exercised with the last, however, as modern contaminant moss was seen growing on exposed surfaces of a number of the sediment samples.

3.4 VERTEBRATE REMAINS RECOVERED BY HAND-COLLECTION AND FROM SAMPLES PROCESSED BY YAT

Animal bone recovered from the excavations at Heslington East amounted to 2959 fragments, of which 1921 came from 169 deposits in Area 1 and 1038 were from 69 deposits in Area 2 (for summary information see Table 13). Much of the assemblage came from the many ditches (ring, boundary and enclosure) encountered at the site, with smaller quantities from pits, gullies and build-up deposits. Bone was also recovered from deposits associated with a water hole and cobbled surfacing in Area 1. Although dating evidence was somewhat scarce, most of the activity was of probable Iron Age date, with a few pre-Iron Age and Romano-British features evident.

Preservation of the vertebrate remains was, on the whole, extremely poor, with surface erosion being frequently observed. Some of the bone surfaces had also lost their outer 'face' and were splitting into layers, whilst other fragments had 'concretions' adhering to their surfaces, rendering them almost unrecognisable. A high degree of fragmentation was characteristic of many of the assemblages, accounting for the presence of large numbers of unidentified fragments. Fresh breakage during excavation and/or post-excavation processes was responsible for much of this damage, but the very fragile nature of some of the bones was almost certainly a contributory factor. Some of the assemblages were clearly made up of fragments representing the same skeletal element, for example, many fragments from Context 3592 were probably the remains of a horse mandible (the teeth had all survived relatively intact), whilst cranium fragments from Context 4525 were likely to represent a single cow skull. Burnt and scorched fragments were also fairly frequently encountered and significant quantities of burnt bones were recovered from a few deposits (e.g. Contexts 1114, 1277 and 2362). Evidence of butchery and other modifications, such as gnawing, were scarce as a result of the eroded nature of the surfaces of most bones.

Vertebrate material from some of the deposits that were described by the excavator as being 'organic' was occasionally quite well preserved and this may, perhaps, be attributed to the waterlogged conditions in these features. Burnt bones and teeth also tended to be of better preservation. Bones identified as caprovid were mostly burnt and this may be why they survived despite being more fragile and smaller than those of horse or cattle.

Vertebrate assemblages from both areas were dominated by the remains of the main domestic mammals, cattle, horse, caprovid and pig. In Area 1, cattle remains were most numerous, and although a range of skeletal elements were present, isolated teeth were predominant. A similar pattern was apparent for the horse and pig remains but, for caprovids, although isolated teeth were still the most frequently recorded element, other skeletal elements such as radii, astragalii, metapodials and phalanges were also relatively common. In Area 2, the bulk of the fragments were horse, although cattle remains were almost as numerous. However, as seen in Area 1, isolated teeth were again the most commonly occurring fragment for both these species.

Horse remains were recovered from 50 deposits (of which 16 were from Area 2) but the bulk of the fragments were from just four (Contexts 1114, 3083, 3592 and 4310). In all of these, the finds were primarily isolated teeth and, in each case, individual animals were represented. Many of the fragments from Context 1114 were part of a horse mandible, together with four molars/premolars, two incisors and two canines. This animal was aged between approximately five and eight years old when it died, whilst the canines suggested it

was probably a male individual. Contexts 3083 and 3592 gave mandibular teeth from young horses, with the individual from Context 3592 being approximately 2 to 2.5 years old when it died. Remains from Context 4310 were mostly maxilliary teeth, together with three incisors. One of these (a third incisor) showed no sign of tooth wear, which suggested that the horse was approximately 4 to 5 years of age at death.

Evidence was noted for the presence of burnt caprovid remains in some of the contexts, this was more frequently observed in Area 1 (e.g. Contexts 1228, 2347, 2362 and 2453), but also noted from Area 2 (e.g. Contexts 3097 and 4067). Some of these assemblages may represent remains of complete animals, with possibly more than one individual present in some of the deposits (Context 2362, for example). Overall, the burnt remains were mostly those of caprovids but occasionally burnt fragments representing larger mammals, possibly including cattle, were present (e.g. Context 1198).

Three fragments from Area 1 (from Contexts 2190, 2532 and 2592) were identified as dog and six deposits in Area 2 yielded a further 24. These were mostly teeth or mandible fragments and concentrated in Contexts 3614 and 24001. Material from the former included part of a scapula and three metapodials, whilst the latter produced a collection of isolated teeth, mandible and maxilla fragments, all probably representing the head of the same animal. One small mandible was recorded as canid; this bone was consistent in size with fox but could not be confidently identified more closely at this stage.

Exploitation of wild mammals was hinted at by the presence of a few red and roe deer fragments (Contexts 2459 and 2828, and Context 1115, respectively) from Area 1. A well preserved red deer metatarsal was also noted amongst the unstratified bones from Area 2. Also from Area 1 were the fragmented remains of a large pig canine and mandible from Context 2685 and these, together with pieces of another large canine from Context 1094, may represent wild boar (based purely on size) although the fragments were extremely fragile.

As a consequence of the extremely fragmentary nature of the material, mandibles with teeth in situ and measurable bones were not particularly numerous. The assessed material produced just 14 measurable fragments, five mandibles, and approximately 40 isolated mandibular teeth of use for providing age-at-death and biometrical data. The isolated teeth may be of limited value and their usefulness very much depends on the condition of individual teeth.

4. DISCUSSION AND STATEMENT OF POTENTIAL

Most of the organic material recovered from deposits with waterlogged preservation was 'woody' and herbaceous plant material, with identifiable ancient plant remains present in these subsamples largely in the form of rather poorly preserved waterlogged seeds and fruits. Overall, the identifiable plant assemblages from all of the excavation areas were mostly rather small, with individual remains showing significant damage and decay (i.e. fragmented and with seed coats most often corroded). Nine deposits in Area 1 gave larger, more diverse and much better preserved assemblages of interpretatively valuable waterlogged seeds and fruits, however (see Table 7). This seems to reflect that waterlogged preservation was of better quality in Area 1 as well as more extensive – 29 of the 48 assessed subsamples (~60 %) from Area 1 gave waterlogged remains, whereas there were only two from the 13 from Area 2 (~15 %).

The identifiable components of these larger assemblages were dominated by waterlogged remains of wild plant taxa, predominately from a wide range of plant species of damp/wet soils. Most of these plants would have grown in wetland areas such as riverbanks, marshes and swamps, and the margins of wet ditches. Remains of alder, which favours wet and waterlogged soils, were frequently recorded in most of the more organic assemblages and suggested that this was the dominant canopy species – overall, perhaps an area of alder carr is implied.

The presence of obligate aquatic plants (e.g. muskgrass, horned pondweed and pondweed) indicated that some of the features in Areas 1 and 2 held standing water at the time of the formation of these deposits. However, in some instances this may have been subject to drying out, or at least significant reduction (perhaps seasonally) as two ditch fills and a pit fill in Area 1 and a fill of the northern boundary ditch in Area 2 contained cladoceran ephippia which are often produced in such circumstances (although they may form in response to other environmental stress such as pollution).

Evidence of other trees and shrubs included remains of birch (which may have grown together with the alder) and blackberry, elder, hawthorn, hazel, holly, raspberry and sloe, indicating drier (better drained) areas of scrub woodland/hedgerow, and there was also evidence of grassland and perhaps hints of heath.

Only traces of human food remains or waste from human activities (e.g. crop processing) were apparent. Six deposits from Area 1, four from Area 2 and one deposit from evaluation trenches 12-17, gave occasional charred grains and a few of these also contained chaff

fragments (rachis segments, glume bases and spikelet forks), representing barley and emmer and/or spelt wheat. All the cereal remains presumably derived from human activity in the area, but the remains were too few to suggest that this occurred on any scale in the immediate vicinity or to be of any further interpretative value.

Two Area 1 deposits gave limited evidence for the burning of turves in the form of charred remains of onion couch, cinquefoil, heath-grass, ribwort plantain, sedge and spike-rush, with similar, but less definitive, evidence (charred rhizome/root/rootlet) seen from several other deposits (from both areas of the main excavation and also in the evaluation trench samples). Records reflecting the use of turves are quite common from deposits from the Neolithic onwards (see Hall 2003), and it would seem that this resource was widely utilised, as fuel and/or in construction (e.g. for turf roofs), in prehistoric and later times. Here the remains were too few to provide more than a hint of the possibility of such activities, however.

The true interpretative potential of the invertebrate macrofossils from the deposits at Heslington East was difficult to determine as full separation techniques could not be employed. However, several deposits in Area 1 and one deposit in Area 2 yielded small numbers of fairly well preserved beetle remains within assemblages which largely consisted of indeterminate fragments. Few identifications were possible within the constraints of this assessment but the processing of large subsamples from at least some of the deposits with waterlogged preservation would undoubtedly yield interpretatively valuable assemblages of beetle remains for more detailed study.

Similarly, some of the deposits examined showed sufficiently well preserved pollen grains/spores to show that a detailed analysis of these remains from suitable samples (a sequence of close interval 'spit' samples or a stratified column sequence, for example) would most likely provide useful additional information regarding vegetation in the wider landscape provided that a reliable chronology for the deposits could be established.

The characters of the plant and invertebrate assemblages seen here were, subjectively, similar to those seen from another (much smaller) intervention at Germany Beck, Fulford, York (see Kenward et al. 2004). In the wider region, technical reports for 'natural' assemblages from similar deposits (i.e. late Iron Age/Romano-British ditch fills) at excavations near Doncaster, South Yorkshire (Allison et al. 2008) and at Aldbrough, East Riding of Yorkshire (Schmidl et al. 2008) revealed extensive information regarding the past local environments. A similar detailed investigation of the assemblages from Heslington East may also provide such information and be of interest since we know so little of the environs

of York in the past – provided adequate dating of the deposits can be obtained (a series of radiocarbon dates might achieve this in the absence of other evidence).

Despite its apparent large size, interpretation of the vertebrate assemblage from excavations at Heslington East was restricted by the poor condition of the recovered remains. As a result, few fragments could be identified to species and only a small number of fragments able to provide useful biometrical and age-at-death information were recovered. The high proportion of isolated teeth and pieces of tooth enamel clearly highlighted a taphonomic bias in favour of certain skeletal elements, i.e. those which are more durable and survive better when preservational conditions are poor – teeth tend to be prevalent in such conditions because of their higher mineral content (in comparison to bone). It was also apparent that whilst isolated teeth were dominant for cattle and horses, caprovids, primarily identified from collections of burnt bones, were represented by a more varied selection of skeletal elements which appeared to have survived as a result of having been burnt – heating can recrystallise the minerals in bone into a very stable structure and calcined bone can be found at many sites where even tooth enamel has decomposed (English Heritage 2002).

As noted in the results section, some deposits produced sets of horse and cattle teeth, the bone of the maxilla or mandible having been destroyed or only represented by fragments. This suggested that heads of cattle and horses were being deposited whole in some of the features. Similar examples were noted during the evaluation stage of this project (Hall et al. 2004b) and at Easington, North Yorkshire (Carrott et al. 1993) where they were interpreted as deliberate depositions of a ritual nature. Given the problems with preservation and limitations resulting from taphonomic factors in the Heslington East assemblage, it was not possible to acertain whether these were deposits of some significance or whether they merely represented the disposal of rubbish – as other remains originally present in these deposits may not have survived. Equally, the accumulations of burnt bones in some of the features, of which there are similar occurrences elsewhere in the East Riding of Yorkshire – e.g. at Hayton (Jaques 2004), North Cave (Hall et al. 2004a) and Melton (Jaques et al. 2007) – may be evidence of ritual activity but could also represent domestic refuse or food waste.

Inevitably, any interpretation of these remains will be hindered by this inherent bias towards certain species and skeletal elements, and results from any detailed analysis are unlikely to reflect the true economic significance of the various species represented, nor the original composition of the discarded remains.

5. ARCHIVE

All material is currently stored by Palaeoecology Research Services (Unit 8, Dabble Duck Industrial Estate, Shildon, County Durham), along with paper and electronic records pertaining to the work described here.

6. ACKNOWLEDGEMENTS

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8. TABLES

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess?
1050	2	fill of E-W boundary ditch (cut 1051)	Moist, light to mid grey-brown to mid grey, unconsolidated to crumbly, silty-sand, with stones (6 to 20 mm) present	3/2	1 g	0.316 kg	Mostly sand, with stones (to 29 mm) and traces of charcoal (to 11 mm), burnt bone (to 10 mm; <1 g) and 'iron-rich' mineral concretion (to 11 mm)	No	Yes	Yes
1052	1	fill of E-W boundary ditch (cut 1053)	Moist, mid brown to mid grey-brown, unconsolidated to crumbly (working somewhat soft and slightly sticky), slightly silty slightly clay sand, with stone (20 to over 60 mm) and modern rootlets present	3/2.5	1 g	0.377 kg	Mostly sand and stones (to 42 mm), with a little charcoal (to 5 mm; <1 g) and ?red ochre (to 6 mm; <1 g)	No	Yes	Yes
1070	5	fill of central pit (cut 1071) within small ring gully, structure 1078	Just moist, mid slightly orange brown to mid grey-brown, unconsolidated, sand, with stones (20 to over 60 mm) and modern moss present	3/2	<1 g	0.390 kg	Mostly sand, with stones (to 26 mm) and traces of charcoal (to 11 mm; <1 g)	No	Yes	Yes
1072	6	fill of small ring gully (cut 1073), structure 1078	Moist, mid slightly orange brown to mid grey-brown, unconsolidated, silty-sand, with stones (20 to 60 mm) present	3/2	1 g	0.402 kg	Mostly stones (to 59 mm) and sand, with a trace of burnt bone (to 5 mm; <1 g)	No	Yes	Yes
1173	60	backfill of ring gully	Just moist, light to mid brown to	3/1.75	6 g	0.323	Mostly sand and mineral	No	Yes	No

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess?
		segment (cut 1176) containing large amount of pottery	grey to grey-brown, unconsolidated (working soft), sandy clay silt, with stones (6 to 20 mm) and modern moss present			kg	concretions, with some stones and traces of brick/tile (to 5 mm), charcoal (to 10 mm) and bone (to 5 mm)			
1178	62	backfill of ring gully segment (cut 1179), structure 1191	Waterlogged, mid grey-brown, compacted/thixotropic to unconsolidated, ?slightly silty-sand, with trace of organic detritus and stones (2 to 20 mm) present	3/1.5	5 g	0.349 kg	Mostly sand and 'iron-rich' mineral concretions (to 27 mm), with a few stones (to 30 mm)	No	Yes	Yes
1194	65	backfill of ring gully segment (cut 1195), part of structure 124	Just moist, mid brown to mid grey, unconsolidated (working soft), slightly sandy slightly clay silt, with stones (6 to over 60 mm) and modern moss present	3/1.5	15 g	0.576 kg	Mostly mineral concretions (to 30 mm), with some sand and traces of brick/tile (to 5 mm, ?pottery (to 9 mm) and burnt bone (to 10 mm)	No	No	No
1208	71	backfill of ring gully segment (cut 1203), part of structure 1240	Just moist, light to mid grey (with patches of light to mid grey-brown and a slight orange cast in places), crumbly to slightly sticky (working soft), silty-clay sand, with a little ?charcoal present	3/2.5	5 g	0.434 kg	Mostly mineral concretions (to 36 mm), with some stones (to 28 mm), sand and charcoal (to 21 mm) and traces of pottery (to 35 mm), ?fired clay (to 25 mm) and burnt bone (to 24 mm)	No	Yes	No
1215	74	fill of segment through N-S ditch (cut 1216)	Just moist, light to mid orange-brown to mid brown to mid to dark grey-brown, stiff to	3/2	2 g	0.214 kg	Mostly sand and 'iron-rich' mineral concretions, with some stones (to 15 mm)	No	No	No

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess?
			brittle/indurated (working crumbly then soft), clay silt (to silty clay), with modern rootlets present				and a little coal (to 5 mm)			
1219	92	backfill of N-S enclosure ditch segment (cut 1284)	Just moist, mid grey-brown to mid grey (light to mid yellowish-brown in places), brittle to crumbly (working soft and slightly plastic), clay silt (to silty-clay in places)	3/2.25	4 g	0.131 kg	Mostly sand and 'iron-rich' mineral concretions, with some stones (to 28 mm) and a little charcoal (to 6 mm) and burnt bone (to 7 mm)	No	Yes	No
1220	78	fill of posthole (cut 1221), part of structure 1241/1240	Just moist, mid brown to mid grey-brown to mid to dark grey, unconsolidated to crumbly, slightly silty-sand, with stones (20 to 60 mm) and modern moss present	3/2	3 g	0.589 kg	Mostly orange-coloured 'iron-rich' mineral concretion, with some sand, a few stones (to 38 mm) and a trace of charcoal (to 8 mm)	No	Yes	Yes
1222	76	backfill of ring gully segment (cut 1223), part of structure 1241	Just moist, mid grey-brown to mid grey (light to mid brown in places), crumbly to unconsolidated (working soft and somewhat plastic), sandy clay silt (to silty clay), with stones (20 to 60 mm), ?charcoal and modern moss present	3/2	10 g	0.619 kg	Mostly orange-coloured 'iron-rich' mineral concretion, with a little sand and a few stones (to 41 mm)	No	No	No
1228	83	backfill of ditch (cut 1283) segment	Just moist, mid to dark grey (with occasional patches of mid	3/2	1 g	0.825 kg	Mostly mineral concretions (to 16 mm), with some	Yes	Yes	No

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess?
			brown), crumbly to unconsolidated (working soft), slightly sandy slightly clay silt, with large stones (over 60 mm) common and smaller stones (6 to 60 mm) present				stones (to 70 mm) and a little pottery (to 51 mm; 59 g), charcoal (to 20 mm) and burnt bone (to 15 mm)			
1258	91	backfill of E-W ditch segment (cut 1259)	Just moist, light grey-brown to light to mid grey (with patches of mid orange), unconsolidated, slightly silty-sand (with some clay patches), with stones (20 to 60 mm) present	3/2	7 g	0.264 kg	Mostly stones (to 46 mm) and sand, with a little charcoal (to 7 mm)	No	Yes	No
1277	89	backfill of ring gully segment (cut 1277), part of structure 1265	Just moist, light to mid orange-brown to mid grey-brown to mid to dark grey, crumbly to unconsolidated (working soft), slightly sandy clay silt (much more clay in places), with large stones (over 60 mm) present	3/2	27 g	0.308 kg	Mostly sand and mineral concretions, with some stones (to 14 mm) and traces of charcoal (to 10 mm) and burnt bone (to 15 mm)	No	Yes	No
1281	99	backfill of ring gully segment cut 1282, part of structure 1265	Just moist, mid grey-brown to mid grey (with occasional streaks of light to mid brown), unconsolidated, slightly clay silty-sand, with stones (6 to 20 mm) and modern moss present	3/1.5	4 g	0.376 kg	Mostly 'iron-rich' mineral concretions (to 30 mm), with a little sand, a few stones (to 22 mm) and a trace of bone (to 11 mm; 1 g)	No	Yes	Yes
1343	111	fill of burnt pit (cut 1344)	Just moist, dark brown to dark	3/2	2 g	0.886	Mostly sand and stones (to	No	Yes	Yes

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess?
			grey, crumbly to unconsolidated, very stony (stones of 6 to 60 mm were common and of over 60 mm abundant), ?ashy sandy slightly clay silt, with ?modern rootlets present			kg	51), with some charcoal (to 12 mm; 11 g of larger fragments sorted from residue)			
1368	141	backfill of E-W ditch segment (cut 1368)	Just moist, mixed shades of light to mid brown, grey and grey-brown, crumbly to unconsolidated, slightly silty-sand and mid grey, stiff (working plastic), clay. Modern rootlets and ?seedlings were present	3/2	2 g	0.440 kg	Mostly sand, with a few stones (to 25 mm) and traces of coal (to 5 mm), 'iron-rich' mineral concretions (to 8 mm) and charcoal (to 12 mm)	No	Yes	Yes
1380	149	backfill of N-S ditch segment (cut 1381)	Moist, light to mid grey, crumbly (working soft and more or less plastic), slightly silty clay, with some patches of mid orange clay sand. Modern rootlets were present	3/2	15 g	0.576 kg	Mostly sand, with some 'iron-rich' mineral concretions (to 10 mm) and coal (to 15 mm), and a few stones (to 18 mm)	No	No	No
1391	117	backfill of ring gully segment (cut 1392), structure 1403	Just moist, light to mid grey-brown to mid grey, unconsolidated (working soft), clay silty-sand, with stones (6 to over 60 mm) and modern moss present	3/1.75	25 g	0.622 kg	Mostly stones (to 50 mm), sand and mineral concretions (to 40 mm), with a little charcoal (to 20 mm) and burnt bone (to 14 mm)	No	Yes	No

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess?
1408	123	backfill of ring gully segment (cut 1409), structure 1420	Just moist, light to mid grey-brown to mid grey (with occasional streaks of light to mid orange-brown), unconsolidated to very slightly sticky (working soft), sandy clay silt, with large stones (over 60 mm) present	3/2	<1 g	0.609 kg	Mostly sand and 'iron-rich' mineral concretions, with a few stones (to 66 mm)	No	Yes	Yes
1412	124	backfill of ring gully segment (cut 1413), structure 1420	Moist, mid brown to mid grey-brown, crumbly to slightly sticky (working soft), silty-clay sand, with stones (6 to 20 mm) and modern moss present	3/2	5 g	0.456 kg	Mostly sand and 'iron-rich' mineral concretions (to 29 mm), with a few stones (to 17 mm)	No	No	No
1515	178	wood rich fill of N-S aligned ?palaeochannel	Moist, light to mid grey-brown to mid grey (with occasional light brown patches), unconsolidated to sticky (working soft), clay silty-sand (more clay in places), with rotted wood fragments present	3/2	250 ml	0.072 kg	Mostly sand, with a few stones (to 11 mm) and a little charcoal/black ash (to 3 mm)	Yes	Yes	Yes
1534	179	build-up of grey material above water-hole (sampled in several areas)	Just moist, mid brown to mid grey-brown, unconsolidated (working soft), silty-clay sand, with stones (6 to 60 mm) and modern moss present	3/2.25	13 g	0.498 kg	Mostly stones (to 55 mm) and sand, with some mineral concretions (to 10 mm) and a little ?pottery (to 16 mm)	No	No	No
1545	191	spread sealing ditches adjacent to iron working	More or less dry, mid brown to mid grey, unconsolidated,	3/1.75	12 g	0.356 kg	Mostly sand, with some stones (to 29 mm) and a	No	Yes	Yes

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess?
		area	slightly silty-sand, with stones (6 to 20 mm) and modern moss present				little ?charcoal/wood (to 14 mm; <1 g)			
1546	194	basal fill of pit 1553	Moist, mid to dark brown to mid to dark grey-brown, unconsolidated to crumbly (working soft), ?humic slightly sandy slightly clay silt, with large stones (over 60 mm) and modern moss present	3/1.75	22 g	0.053 kg	Mostly sand, with a few stones (to 21 mm) and traces of ?black ash (to 4 mm) and bone (to 9 mm; <1 g)	No	Yes	Yes
1600	206	uppermost fill of ditch 1666	Just moist, mid grey-brown to mid to dark grey, unconsolidated, stony (large stones of over 60 mm abundant, those of 20 to 60 mm common and smaller stones, 2 to 20 mm, present), slightly clay silty-sand (more clay in places)	3/2	14 g	0.726 kg	Mostly sand and stones (to 52 mm), with a little brick/tile (to 8 mm) and charcoal (to 5 mm)	No	Yes	No
1603	207	possible levelling deposit over cobble surface of water-hole	Waterlogged, mid to dark brown to grey-brown, unconsolidated, stony (stones of 20 to over 60 mm were abundant), sandy silty-clay (to clay silt)	3/2	4 g	1.289 kg	Sand and stones (to 75 mm)	No	Yes	No
1632	212	fill of ditch 1666 (south end)	Just moist, dark grey (with streaks of mid grey-brown), brittle and stiff to crumbly	3/2	30 ml	0.054 kg	Mostly sand, with some stones (to 26 mm)	Yes	Yes	Yes

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess?
			(working soft and more or less plastic), slightly sandy clay silt (to silty clay)							
1642	223	fill of ditch 1766	Moist, mid grey-brown to mid to dark grey (with occasional patches of mid grey-brown), unconsolidated, slightly silty-sand, with stones (20 to 60 mm) and modern moss present	3/2	30 ml	0.601 kg	Stones (to 44 mm) and sand	Yes	Yes	Yes
1662	217	fill of ditch 1666 (north end)	Moist, dark brown to dark grey-brown, crumbly to unconsolidated (working soft), humic slightly sandy silt, with stones (20 to over 60 mm) and wood fragments present	3/2	300 ml	0.354 kg	Mostly stones (to 55 mm) and sand, with a little charcoal (to 5 mm)	Yes	Yes	No
1664	219	fill of linear pit cut 1665	Moist, mid brown to mid to dark grey-brown (flecked with light to mid brown), unconsolidated, slightly clay slightly silty-sand, with abundant stones – very small stones (2 to 6 mm) present, stones (6 to 60 mm) common and large stones (over 60 mm) abundant	3/1.75	60 ml	0.837 kg	Stones (to 48mm) and sand	Yes	Yes	Yes
1669	229	fill of ditch 1766	Moist, mid brown to mid to dark grey-brown (mostly the latter),	3/1.5	100 ml	0.561 kg	Stones (to 46 mm) and sand	Yes	Yes	Yes

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess?
			unconsolidated (working soft in places), slightly silty slightly clay sand (more clay in places), with stones (6 to 60 mm), ?rotted wood and modern moss and seedlings present							
1681	228	fill of ditch 1774	Just moist, mid to dark grey-brown (with lighter and darker shades of brown, grey and grey-brown in patches), brittle to crumbly or unconsolidated, silty-sand (slightly clay in places), with large stones (over 60 mm) present	3/1.75	60 ml	0.307 kg	Mostly sand, with some stones (to 52 mm)	Yes	Yes	Yes
1707/1708	243	fill of pit 1702 (Zone 3)	Moist, light grey-brown to mid brown (through shades of brown, grey and grey-brown between), unconsolidated to crumbly, slightly sitly sand, with stones (6 to 60 mm) present	3/2	28 g	0.273 kg	Mostly sand, with some stones (to 40 mm) and a trace of charcoal (to 10 mm; <1 g)	No	Yes	Yes
1772	298	fill of N-S ditch 2164 – highly organic/wood rich	Dry to just moist, dark grey-brown to very dark grey (with occasional patches of mid brown), brittle to crumbly, ?humic, silty-sand, with twig fragments present	3/2	250 ml	0.106 kg	Mostly sand and stones (to 20 mm), with a little coal (to 4 mm)	Yes	No	No

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess?
1887	261	fill of ditch 1886 – charcoal rich	Moist, light to mid yellow-brown to light to mid grey, unconsolidated to slightly sticky (working soft), silty-clay sand, with coal present	3/2	36 g	0.926 kg	Mostly sand, with 'iron-rich' mineral concretions (to 15 mm) and coal (to 30 mm)	No	No	No
1914	266	fill of NE-SW ditch 1915	Moist, mid brown to mid grey-brown (with patches of light to mid yellow-brown and orange-brown), slightly sticky to unconsolidated (working soft and somewhat plastic), clay sand (more clay in places)	3/1.5	6 g	0.205 kg	Mostly sand, with a few stones (to 9 mm), 'iron-rich' mineral concretions (to 16 mm) and traces of ?charcoal/black ash (to 4 mm)	No	Yes	Yes
1922	267	fill of ring gully segment (cut 1924, Zone 3)	Just moist, light to mid grey-brown to mid grey to mid grey-brown, unconsolidated (working soft), sandy clay silt, with modern moss present	3/2	1 g	0.273 kg	Mostly sand, with some stones (to 16 mm) and 'iron-rich' mineral concretions and a trace of burnt bone (to 5 mm; <1 g)	No	Yes	Yes
1925	268	burnt wood within deposit 1847 (pit ?1848, Zone 3)	Moist, light to mid grey-brown to light to mid grey (with occasional patches of light to mid orange-brown), slightly stiff to sticky (working soft and sticky), silty-sand, with abundant charcoal	1.5/1	89 g	0.042 kg	Mostly sand, with some stones (to 45 mm) and a little charcoal (to 6 mm)	No	Yes	No
2014	269	fill of E-W ditch ?2530 (part of roundhouse enclosure ditch, N side)	Just moist, mid brown, crumbly to slightly sticky (working soft then plastic), slightly sandy	3/2	none	0.116 kg	Mostly sand and stones (to 17 mm), with some bone (to 10 mm) and a little charcoal	Yes	Yes	No

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess?
			slightly silty clay, with some lumps of light to mid orange stiff (working plastic) clay				(to 7 mm)			
2100	320	fill of ditch 2101 (Zone 3)	Just moist, light to mid grey-brown to mid grey, crumbly to unconsolidated and slightly sticky (working soft and somewhat plastic), sandy clay silt, with stones (6 to 60 mm) present	3/2	<1 g	0.568 kg	Sand and stones (to 55 mm)	No	No	No
2127	296	fill of E-W ditch ?1747	Just moist, mid grey to mid to dark grey-brown, stiff to crumbly (working soft then plastic), sandy clay silt (to silty-clay in places), with some patches of light to mid grey-brown sand	3/2.5	75 ml	0.650 kg	Mostly sand, with some stones (to 37 mm) and a little mineral concretion (to 15 mm)	Yes	No	No
2128	301	fill of N-S ditch 2138	Moist, mid to dark grey-brown, soft and slightly sticky to crumbly (working soft and slightly plastic), slightly sandy clay silt, with stone (20 to over 60 mm) present	3/2.5	250 ml	0.380 kg	Mostly sand and stones (to 60 mm), with a little ?rotted wood (to 12 mm) and charcoal (to 13 mm; <1 g)	Yes	Yes	Yes
2150	309	fill of posthole 2158 – wood/charcoal present	Just moist, light to mid brown to light to mid grey-brown to mid grey, stiff to crumbly (working more or less plastic), slightly	3/1.25	150 ml	0.183 kg	Mostly sand, with traces of charcoal and a few stones	Yes	Yes	No

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess?
			sandy silty clay, with large stones (over 60 mm) present							
2154	310	fill of N-S ditch 2168 – wood, charcoal and pottery present	Moist, mid grey-brown, brittle to crumbly (working soft), ?humic, silt	3/3	250 ml	0.540 kg	Mostly sand, with some stones (to 24 mm)	Yes	No	No
2161	313	fill of N-S ditch 2168 – wood, charcoal and organics present	More or less dry, mid to dark grey-brown to mid to dark grey, crumbly (working soft), slightly clay silty-sand, with some patches of clay	3/2	125 ml	0.210 kg	Mostly sand, with some stones (to 32 mm)	Yes	No	No
2324	337	fill of N-S ditch 2364	Just moist, light to mid grey-brown to mid grey, unconsolidated (to soft in places), stony (stones 20 to 60 mm were common and larger stones of over 60 mm were abundant), slightly clay sand (more clay in places)	3/2	135 ml	1.075 kg	Stones (to 58mm) and sand	Yes	Yes	Yes
2328	341	fill of N-S ditch 2364	Moist, mid brown to mid grey, unconsolidated to slightly sticky, slightly silty slightly clay sand. The sample was moderately stony (stones of 2 to 6 mm were present, of 6 to 20 mm and over 60 mm were common and of 20 to 60 mm)	3/1.5	200 ml	1.540 kg	Stones (to 67 mm) and sand	Yes	Yes	Yes

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess?
2335	344	primary fill of pit 2333 – wood content very high	Waterlogged, mid to dark brown to dark grey-brown (with patches of mid brown), crumbly to slightly sticky (working soft), humic, slightly clay silt, with large stones (over 60 mm) common and smaller stones (6 to 60 mm) and ?modern rootlets present	3/2	250 ml	0.976 kg	Mostly sand and stones, with traces of ?red ochre (to 5 mm) and burnt bone (to 15 mm)	Yes	No	No
2368	361	highly organic fill of pit 2390 (assoc. with timber Sf137 and cut by ditch 1598)	Just moist to dry, mid to dark grey (streaked with mid grey-brown), brittle to crumbly or unconsolidated (working soft), silty-clay sand, with stones (20 to over 60 mm) and rotted wood present	3/2	350 ml	0.458 kg	Mostly sand and stones (to 43 mm), with a little ?red ochre (to 20 mm; 3 g)	Yes	No	No
2375	363	fill of LBA pit, below N-S ditch 2405	Moist, mid to dark grey-brown to dark grey (mostly the latter) with occasional patches of mid brown, stiff to crumbly (working soft and somewhat plastic), slightly sandy clay silt (to silty-clay in places), with stones (20 to over 60 mm) present	3/2	125 ml	0.438 kg	Mostly sand and stones (to 65 mm), with a little ?red ochre (to 17 mm; 2 g)	Yes	Yes	Yes
2407	370	burnt? material(s) within posthole 2395	Dry, mid brown to very dark grey, brittle to crumbly, humic,	0.5/0.5	250 ml	0.280 kg	Sand and stones (to 28 mm)	Yes	No	No

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess?
			?ashy, sandy silt, with stones (20 to 60 mm) and modern rootlets present							
2409	383	trample/build-up deposit above cobble surface associated with water-hole	Dry, mid brown to mid to dark grey-brown, unconsolidated, stony (stones of 6 to 60 mm common and larger, over 60 mm, and smaller, 2 to 6 mm, stones present), sandy silt	3/2	2 g	1.500 kg	Mostly stones (to 72 mm), with some sand and bone (to 67 mm; 15 g)	No	No	No
2414	375	levelling/build-up deposit over fills of ditch ?2413	Just moist, light grey-brown to mid grey, unconsolidated to crumbly, slightly silty-sand, with stones (6 to 60 mm) and rotted wood present	3/2	125 ml	0.891 kg	Sand and stones (to 47 mm)	Yes	No	No
2423	524	basal fill of N-S ditch	Waterlogged, mid brown to mid grey-brown, sticky to unconsolidated, slightly sandy clay silt (some areas much more sandy), with stones (6 to over 60 mm) and waterlogged plant material present	3/1	350 ml	0.444 kg	Mostly sand and stones (to 58 mm), with a little black ash (to 3 mm)	Yes	Yes	Yes
2428	389	base fill of N-S ditch 2413	Just moist, light to mid brown to mid grey (mottled appearance), unconsolidated to crumbly (working soft – in those places with more clay content), slightly	3/1.5	100 ml	0.358 kg	Mostly sand, with some stones (to 36 mm) and a little ?charcoal/black ash (0.358 kg)	Yes	Yes	Yes

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess?
			clay sand (more clay in places), with stones (20 to over 60 mm) present							
2442	393	fill of N-S ditch 2631	Moist, mid brown to mid grey-brown to mid to dark grey, unconsolidated, very stony (stones of 2 to 6 mm present, of 6 to 60 mm common and of over 60 mm abundant), sand	3/1	100 ml	1.700 kg	Stones (to 59 mm) and sand	Yes	Yes	Yes
2453	398	highly organic/humic fill of N-S ditch 2631	Moist, mid grey-brown to dark grey, unconsolidated to crumbly (working more or less soft), silty-clay sand, with some lumps of clay silt (to 30 mm), stones (6 to over 60 mm) and ?rotted wood present	3/2	750 ml	0.778 kg	Mostly sand and stones (to 49 mm), with a little burnt bone (to 11 mm) and ?red ochre (to 7 mm)	Yes	No	No
2465	405	fill of N-S ditch 2413	Waterlogged, mid brown to mid to dark grey-brown, stiff to crumbly (working soft and slightly sticky), sandy clay silt, with stones (6 to 20 mm) and wood fragments present	3/2.5	140 ml	0.317 kg	Mostly sand and stones (to 56 mm), with a little ?rotted wood (to 4 mm)	Yes	No	Yes
2484	417	fill of N-S ditch 2485	Just moist, mid to dark grey (with occasional streaks of mid brown), unconsolidated to somewhat stiff (working soft),	3/1.75	250 ml	0.066 kg	Sand and stones (to 18 mm)	Yes	No	Yes

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess?
			slightly silty-clay sand (much more clay in places), with stones (6 to 20 mm) present							
2491	423	basal fill of ditch 2492	Just moist, light to mid brown to mid grey-brown (with occasional patches of light to mid orange-brown), unconsolidated, silty-sand (slightly clay in places), with bone present	3/1	125 ml	0.021 kg	Mostly sand, with a single large bone fragment (to 76 mm; 13 g) and a few stones (to 16 mm)	Yes	No	Yes
2509	412	fill of pit 2576	Moist, mid to dark grey-brown to dark grey, unconsolidated (working soft where more clay content), slightly clay silty-sand (much more clay in places). Stones (20 to 60 mm) were present and larger stones (over 60 mm) were common and there were also some rotted wood fragments present (with white mould on their surfaces)	3/1.5	250 ml	0.349 kg	Sand and stones (to 45 mm)	Yes	Yes	Yes
2517	411	fill of ?LBA pit (cut by N-S ditch 2405)	Moist, mid to dark grey, slightly stiff to crumbly and slightly sticky (working soft and somewhat plastic), slightly silty-sandy clay (to clay sand in places), with stones (20 to over 60 mm)	3/1	250 ml	0.477 kg	Sand and stones (to 55 mm)	Yes	Yes	Yes

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess?
			present							
2571	430	fill of pit 2655	Moist, light to mid brown to mid to dark grey-brown (mottled appearance), unconsolidated to crumbly, slightly clay slightly silty-sand, with stones (20 to 60 mm) common and smaller stones (2 to 20 mm) present	3/1.75	50 ml	0.925 kg	Mostly stones (to 47 mm) and sand, with a trace of ?red ochre (to 22 mm; 4 g)	Yes	Yes	Yes
2594	434	fill of pit 2655	Moist, dark grey-brown (flecked with pale brown/off white sand grains), unconsolidated to slightly sticky (working slightly soft), slightly clay silty-sand (to sandy silt), with stones (6 to 60 mm) present	3/2	250 ml	0.810 kg	Sand and stones (to 42 mm)	Yes	Yes	Yes
2624	440	fill of pit 2625	Just moist, mid to dark grey (with occasional patches of light brown), crumbly to unconsolidated (working more or less soft), slightly silty slightly clay sand, with stones (20 to over 60 mm) and rotted wood present (white mold on surfaces of this last). There were also minor matrix components of light	3/3	350 ml	0.390 kg	Stones (to 70 mm) and sand, with a trace of bone (to 10 mm; ,1 g)	Yes	Yes	Yes

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess?
			to mid grey clay silt/silty-clay and mid to dark grey clay							
2632	441	levelling/build-up on cobble surface 2656	Just moist, mid grey (flecked with light to mid brown), slightly clay slightly silty-sand	3/1.75	6 g	0.804 kg	Mostly stones (to 45 mm) and sand, with traces of charcoal (to 6 mm; <1 g), bone (to 11 mm; <1 g) and ?red ochre (to 4 mm; <1 g)	No	Yes	Yes
2643	444	fill of pit 2644	Moist, mid to dark grey (with occasional lighter shades of grey and patches of light to mid brown), crumbly to unconsolidated, clay sand, with stones (20 to 60 mm), twigs and modern roots and rootlets present	3/2	500 ml	0.275 kg	Stones (to 42 mm) and sand, with a trace of ?humic flecks (to 2 mm)	Yes	No	Yes
2662	446	fill of E-W ditch 2671	Waterlogged, dark purplish-brown, crumbly or unconsolidated to slightly sticky (working soft), humic, slightly sandy silt, with stones (6 to over 60 mm) and twig/wood fragments present	2/1	60 ml	0.308 kg	Sand and stones (to 56 mm)	Yes	Yes	Yes
2669	471	organic fill of pit 2669	Just moist, light to mid grey to mid grey to mid to dark grey-brown, crumbly to unconsolidated (working soft),	0.5/0.5	150 ml	0.073 kg	Sand and stones (to 32 mm)	Yes	No	No

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess?
			slightly silty slightly clay sand (much more clay in places), with stones (20 to 60 mm) present							
2674	449	fill of ?pit 2836	Just moist, light to mid brown to mid to dark grey-brown (overall mottled appearance), unconsolidated, slightly silty-sand, with stones (6 to over 60 mm) and nut shell fragments present and wood/woody root common	3/2.5	700 ml	0.755 kg	Sand and stones (to 36 mm)	Yes	Yes	Yes
2687	473	fill of ?pit	Moist, varicoloured (mostly mid to dark grey-brown but also lighter and darker shades of brown, grey and grey-brown), crumbly to unconsolidated (working soft), clay sand (more clay in places) with stones (6 to 60 mm), rotted ?wood and rotted ?charcoal present	3/1.25	250 ml	0.450 kg	Mostly sand, with some stones (to 38 mm) and a little rotted wood (to 22 mm; <1 g)	Yes	No	Yes
2688	454	fill of ?pit/levelling/build-up deposit (?charcoal-rich)	Just moist, mid grey-brown (with occasional small patches of light brown), unconsolidated, silty-sand, with stones (6 to over 60 mm) present	3/2.5	1 g	0.428 kg	Mostly sand, stones (to 38 mm) and 'iron-rich' mineral concretion (to 26 mm), with some cinder (to 18 mm) and a little charcoal (to 27 mm; 1 g)	No	Yes	Yes

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess?
2689	474	organic wood rich fill of pit 2778?	Just moist, mid to dark brown to very dark grey (with light to mid grey sand flecks), unconsolidated (working soft), ?ashy, sandy silt, with stones (6 to 60 mm) present	3/1.75	500 ml	0.866 kg	Sand and stones (to 39 mm)	Yes	No	No
2703	458	fill of pit 2716 (truncated by N-S ditch 2671)	Moist, light to mid brown to grey-brown to mid grey, unconsolidated, slightly silty-sand, with stones (6 to 60 mm) present	3/2	8 g	0.377 kg	Mostly sand, with some stones (to 40 mm) and a trace of charcoal (to 6 mm)	No	Yes	Yes
2718	461	deposit immediately above wooden ?well shaft linings/trough (EBA?)	Waterlogged, mid grey-brown, unconsolidated to slightly sticky, slightly clay sandy silt, with stones (6 to 20 mm) abundant, larger stones (20 to 60 mm) common and small and large stones (2 to 6 mm and over 60 mm, respectively) present. There was also some modern contaminant grass (the sample tub lid had broken)	3/2	100 ml	2.000 kg	Stones (to 85 mm) and sand	Yes	No	Yes
2723	467	fill of pit 2712	Just moist, light slightly orange brown to mid grey-brown, unconsolidated, sand, with stones (6 to over 60 mm)	3/1.75	12 g	0.749 kg	Sand and stones (to 42 mm)	No	Yes	Yes

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess?
			present (those of 20 to 60 mm being common)							
2770	482	fill of pit 2778	Moist, mid to dark grey-brown to dark grey, unconsolidated, slightly clay silty-sand, with stones (6 to 60 mm) present	3/2	20 ml	0.595 kg	Mostly sand and stones (to 37 mm), with a trace of charcoal (to 8 mm; <1 g of larger fragments sorted)	Yes	Yes	Yes
2782	483	dump/levelling/build-up deposit	Moist, mid grey-brown to dark grey (mottled appearance), unconsolidated, slightly clay silty-sand, with numerous stones (2 to 6 mm and over 60 mm present and intermediate sizes, 6 to 60 mm, common) and waterlogged plant material present	3/1.5	375 ml	0.980 kg	Mostly sand and stones (to 60 mm), with traces of ?brick/tile (to 4 mm; <1 g), ?red ochre (to 4 mm; <1 g) and bone (to 6 mm; <1 g)	Yes	No	Yes
2811	511	dump/build-up deposit	Moist, mid to dark grey (with a slight blue-ish cast and some patches of mid grey-brown), stiff or unconsolidated to sticky or soft (working soft and more or less plastic), sandy clay to clay sand, with abundant large stones (over 60 mm) and slightly smaller stones (20 to 60 mm) present	3/1.5	200 ml	0.355 kg	Mostly sand and stones (to 40 mm), with a little ?slag (to 35 mm; 21 g) and burnt bone (to 9 mm; <1 g)	Yes	No	Yes

Table 1 *Area 1: Sediment and residue description for the processed samples, with notes on the type(s) of preservation of organic remains present.*

Key: 'Con' = Context number; 'Sam' = Sample number; 'kg/l' = amount of sediment processed in kilograms and litres; 'w/o' = washover in grammes or millilitres; 'res' = residue dry weight in kg; 'W/l pres?' = waterlogged preservation evident?; 'Ch pres?' = charred preservation evident?; 'Assess?' = assessment of processed subsample undertaken?

Note: Where weights are given for residue components these have been sorted from the residue, whereas if only maximum dimension is given they have not.

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess ?
2619	639	no information	Just moist, light to mid grey to dark grey (with occasional patches of mid olive-brown), crumbly to slightly sticky (working soft and somewhat plastic), sandy clay silt (to silty clay), with rotted ?wood and ?twigs present	3/2	1300 ml	0.245 kg	Mostly sand and stones (to 30 mm), with a little ?charcoal/part-charred wood (to 43 mm; 4 g)	Yes	?Yes	No
3005	650	fill of a ring ditch (southern end of the site)	Moist, light to mid slightly orange brown to light to mid grey-brown to mid grey, unconsolidated to slightly sticky (working soft and more or less plastic), sandy clay to clay sand, with stones (20 to over 60 mm) present	3/2	1 g	0.656 kg	Mostly sand, with some stones and mineral concretions (to 16 mm) and traces of ?pot (to 23 mm; 2 g), charcoal (to 10 mm; 2 g) and burnt bone (to 7 mm; <1 g)	No	Yes	Yes
3011	662	deposit within A2 enclosure	Just moist to dry, dark brown to dark grey-brown (mid grey-brown in places), unconsolidated to crumbly, ?silty-sand, with stones (6 to 20 mm), burnt bone and modern seedlings and ?rootlets present	3/2	4 g	0.832 kg	Mostly sand and stones (to 43 mm), with traces of burnt bone (to 11 mm; 1 g) and ?charcoal (to 18 mm; 1 g of larger fragments sorted)	No	Yes	Yes
3062	738	deposit within A2 enclosure	Just moist, dark brown to dark grey-brown, unconsolidated, slightly clay sand, with a little ?charcoal present	3/2	67 g	0.195 kg	Mostly sand, with some charcoal (to 20 mm; 1 g of larger fragments sorted) and a few stones (to 14 mm)	No	Yes	Yes
3105	728	from a curving gully	Just moist, light to mid brown to mid	3/2	2 g	0.398	Mostly ‘iron-rich’ mineral	No	No	No

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess ?
			grey-brown, crumbly to unconsolidated and slightly sticky (working soft), slightly silty-clay sand, with large stones (over 60 mm) present			kg	concretions (to 25 mm), with some stones (to 60 mm) and sand			
3263	606	fill from possible third recut of the northern enclosure boundary ditch	Moist, mid grey (to mid grey-brown in places), unconsolidated to crumbly (working soft), sandy clay silt, with some stones (6 to 20 mm) and modern moss present	3/2	2 g	0.725 kg	Mostly sand and mineral concretions, with traces of charcoal and burnt bone	No	Yes	No
3281	700	from a curvilinear ditch pre-dating the enclosure and related ditches	Just moist, mid brown to mid grey-brown, unconsolidated to crumbly, sand	3/2	5 g	0.680 kg	Mostly sand, with some 'iron-rich' mineral concretions (to 20 mm), stones (to 20 mm) and coal (to 5 mm)	No	No	No
3330	705	from an arc shaped gully to the south of the enclosure	Just moist, light to mid brown to mid brown to mid grey-brown, unconsolidated to crumbly, sand, with some lumps of light to mid slightly orange brown stiff clay (to 40 mm). Stones (20 to 60 mm) and modern rootlets were present	3/2	12 g	0.936 kg	Mostly fine sand, with a few stones (to 65 mm), mineral concretions (to 15 mm) and fragments of charcoal (to 20 mm)	No	Yes	No
3332	706	from an arc shaped gully to the south of the enclosure	Just moist, mid brown to mid to dark grey (with occasional patches of mid slightly orange brown), crumbly to unconsolidated (working somewhat	3/2	<1 g	0.734 kg	Mostly sand, with a few stones (to 51 mm; most <15 mm) and traces of charcoal (to 12 mm; 9 g),	No	Yes	Yes

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess ?
			soft), slightly silty-clay sand, with stones (2 to 60 mm) present				shell (to 8 mm; 1 g) and burnt bone (to 11 mm; 1 g)			
3334	707	from an arc shaped gully to the south of the enclosure	More or less dry, mid grey-brown to mid to dark grey (with occasional patches of light to mid brown), unconsolidated (working slightly soft), slightly clay silty-sand, with stones (20 to 60 mm), bone fragments and modern rootlets present	3/2	1 g	0.620 kg	Mostly sand, with some 'iron-rich' mineral concretions (to 19 mm), a few stones (to 43 mm) and traces of charred ?twig (to 20 mm) and bone (to 20 mm; 1 g)	No	Yes	Yes
3416	713	fill of curvilinear ditch predating the enclosure and related ditches	Moist, mid grey-brown (with occasional patches of mid brown), unconsolidated, slightly clay slightly silty-sand	3/2	1 g	0.617 kg	Mostly sand, with a few stones (to 24 mm) and traces of coal (to 10 mm) and 'iron-rich' mineral concretion (to 12 mm)	No	No	Yes
3604	744	from the western boundary ditch of the enclosure	Just moist, mid grey (with a somewhat purplish cast in places), crumbly to unconsolidated (working soft), slightly sandy clay silt, with stones (20 to over 60 mm), rotted wood and modern moss present	3/2.25	125 ml	0.543 kg	Mostly sand and stones (to 35 mm), with a little 'iron-rich' mineral concretion and occasional fragments of burnt bone (to 6 mm)	Yes	No	No
3692	755	from a large pit or water-hole at the southern end of the site. The only dating was Roman pottery	Moist, mid grey (with patches of mid brown and mid to dark orange-brown), crumbly to stiff in places (working soft), slightly sandy clay silt (more clay in places), with rotted	3/2	250 ml	0.282 kg	Mostly sand, with some stones and a few mineral concretions (root cast) and a little charcoal	Yes	Yes	No

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess ?
			?charcoal, ?twigs and modern moss and white mould present							
4067	601	earliest fill of the second recut of the northern enclosure boundary ditch	Moist to wet, mid brown to mid grey to mid to dark grey-brown, stiff and slightly sticky (working soft and somewhat plastic), clay silt (to silty clay), with ?charcoal, twigs and mammal bone present	3/2.5	250 ml	0.423 kg	Mostly 'iron-rich' mineral concretions (to 17 mm), with some sand and mammal bone (one large fragment to 190 mm; 64 g), a few stones (to 77 mm) and a little ?coal (to 9 mm)	Yes	?Yes	No
4092	610	third fill of the second recut of the northern enclosure boundary ditch	Moist, mid grey (with occasional light to mid brown patches), stiff to slightly crumbly (working plastic), slightly sandy slightly silty clay, with stones (20 to 60 mm) and modern moss and rootlets present	3/1.5	9 g	0.560 kg	Mostly sand and mineral concretions, with a few stones and traces of charcoal and bone (including some small mammal bone and some burnt fragments)	No	Yes	No
4095	609	second fill of the second recut of the northern enclosure boundary ditch	Waterlogged, mid grey (with occasional patches of mid brown), sticky to somewhat stiff (working soft and sticky), slightly sandy clay silt, with stones (20 to 60 mm), rotted wood and a trace of modern moss present	3/3	500 ml	0.251 kg	Mostly sand, with a litte mineral concretion (to 5 mm) and a few stones (to 34 mm)	Yes	No	No
4096	607	fill of northern boundary ditch	Moist, mid blue-grey to mid brown (mottled appearance), unconsolidated to sticky (working	3/2	1 g	0.556 kg	Mostly sand, with some 'iron-rich' mineral concretion (to 18 mm), a	No	Yes	Yes

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess ?
			soft and more or less plastic), slightly silty clay, with stones (20 to 60 mm) present				few stones (to 19 mm) and traces of charcoal (to 10 mm; 2 g) and burnt bone (to 10 mm; 1 g)			
4097	608	fill of northern boundary ditch	Moist, light to mid brown (with occasional patches of mid orange-brown), slightly clay sand and mid grey clay. In some parts the matrix components were separate and in others they were mixed – the overall texture was stiff and slightly sticky to crumbly (working plastic). Stones (20 to 60 mm) were present and wood fragments were common	3/1	60 ml	0.553 kg	Mostly sand, with a few stones (to 31 mm) and traces of ?coal (to 8 mm, but most less than 3 mm) and orange/orange-brown 'iron-rich' mineral concretion (to 21 mm)	Yes	Yes	Yes
4242	617	fill of L-shaped field boundary	Just moist, light to mid yellow-brown to light to mid grey-brown to mid grey (colours jumbled), unconsolidated, slightly clay slightly silty-sand (much more clay in places), with stones (20 to 60 mm) present	3/1.5	4 g	0.868 kg	Mostly sand, with some stones (to 34 mm) and a trace of ?charcoal (to 10 mm; 1 g)	No	Yes	Yes
4343	620	fill of curvilinear ditch predating the enclosure and related ditches	Just moist, light to mid grey-brown to mid grey-brown, unconsolidated to crumbly (working more or less soft), silty-sand, with stones (6 to 60 mm) and modern ?rootlets present	3/2	6 g	0.353 kg	Mostly sand, with a few stones (to 27 mm)	No	Yes	Yes

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess ?
4408	621	fill of a lattice like pattern of fields	Just moist, mid brown to mid grey-brown, unconsolidated, slightly clay silty-sand, with occasional patches of light to mid orange-brown sand	3/1.2	5 g	0.918 kg	Mostly sand, with a few small stones (to 5 mm) and a trace of ?charcoal (to 10 mm)	No	Yes	Yes
4525	654	no information	Dry to just moist, dark grey-brown (with patches of light to mid brown), brittle or unconsolidated to crumbly (some indurated lumps to 50 mm), silty-sand, with abundant large stones (over 60 mm)	3/2	6 g	0.482 kg	Mostly sand, with some stones (to 40 mm) and traces of ?charcoal (to 10 mm) and bone (to 20 mm; 3 g) some of which was burnt	No	Yes	Yes
4676	641	from a linear gully attached to a curving gully	Just moist, mid to dark grey (with occasional patches of mid brown), unconsolidated to crumbly (working soft), silty-clay sand	3/2	19 g	0.390 kg	Mostly sand, with some mineral concretions (to 12 mm), a few stones and traces of ?pottery (to 41 mm; 8 g), charcoal (to 12 mm) and large mammal bone (including tooth fragments and some which were burnt to 32 mm; 2 g)	No	Yes	No
4688	638	no information	Just moist, light to mid grey to light to mid grey-brown (speckled appearance), unconsolidated to crumbly (working soft), sandy clay silt (to silty clay), with rotted charcoal and bone (including tooth fragments) present	3/2	1 g	0.478 kg	Mostly sand and 'iron-rich' mineral concretions (to 15 mm), with some bone (mostly teeth with some burnt fragments to 50 mm; 43 g), a few stones (to 20 mm) and a little charcoal	No	Yes	No

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess ?
							(to 17 mm)			
4693	640	fill of northern boundary ditch	Just moist, light to mid brown to mid grey-brown (with a slight orange cast in places), brittle to crumbly, silty-sand	1/0.25	250 ml	0.152 kg	Mostly sand, with a few stones (to 15 mm) and a trace of ?charcoal/wood (to 10 mm, but mostly <5 mm)	Yes	Yes	Yes

Table 2 *Area 2: Sediment and residue description for the processed samples, with notes on the type(s) of preservation of organic remains present*

Key: 'Con' = Context number; 'Sam' = Sample number; 'kg/l' = amount of sediment processed in kilograms and litres; 'w/o' = washover in grammes or millilitres; 'res' = residue dry weight in kg; 'W/l pres?' = waterlogged preservation evident?; 'Ch pres?' = charred preservation evident?; 'Assess?' = assessment of processed subsample undertaken?

Note: Where weights are given for residue components these have been sorted from the residue, whereas if only maximum dimension is given they have not.

Con	Sam	Context description	Sediment description	kg/l	w/o	res	Residue description	W/l pres?	Ch pres?	Assess ?
23002	812	fill of a hearth	Just moist to dry, mid brown to grey-brown (with an orange cast in places), stiff and brittle (indurated) to crumbly (working plastic when wetted), ?slightly silty clay, with stones (over 60 mm) present	3/2	1 g	0.585 kg	Sand and stones (to 77 mm)	No	Yes	Yes
23003	813	fill of a hearth	Just moist to dry, mid brown to grey-brown, brittle to stiff or crumbly (working plastic when wetted), slightly sandy clay, with stones (20 to 60 mm) present	3/2	<1 g	0.396 kg	Mostly sand, with some stones (to 31 mm)	No	Yes	Yes

Table 3 *Evaluation Trench 12-17: Sediment and residue description for the processed samples, with notes on the type(s) of preservation of organic remains present.*

Key: 'Con' = Context number; 'Sam' = Sample number; 'kg/l' = amount of sediment processed in kilograms and litres; 'w/o' = washover in grammes or millilitres; 'res' = residue dry weight in kg; 'W/l pres?' = waterlogged preservation evident?; 'Ch pres?' = charred preservation evident?; 'Assess?' = assessment of processed subsample undertaken?

Note: Where weights are given for residue components these have been sorted from the residue, whereas if only maximum dimension is given they have not.

Con	Sam	Context description	kg/l	w/o	Identifiable ancient plant remains (charred and waterlogged)	IDs	Notes including modern contaminants (waterlogged)	A	D	Other notes
1050	2	fill of E-W boundary ditch (cut 1051)	3/2	1 g	mostly slightly silted charcoal (to 5 mm), some charred fragments of rhizome/root/rootlet (to 9 mm), a single charred bulb of onion couch (*Arrhenatherum elatius* (L.) P. Beauv. ex J. & C. Presl var. *bulbosum* (Willd.) St-Amans)	No	some rootlets, three seeds of orache/goosefoot (*Atriplex*/*Chenopodium*)	?Yes	No	some sand, a little coal (to 5 mm)
1052	1	fill of E-W boundary ditch (cut 1053)	3/2.5	1 g	traces of charcoal (to 4 mm)	No	some 'stems' and 'leaves' of mosses (Bryophyta)	No	No	mostly coal (to 4 mm) and sand, a little cinder/slag (to 4 mm)
1070	5	fill of central pit (cut 1071) within small ring gully, structure 1078	3/2	<1 g	charcoal (to 4 mm), one charred caryopsis of sedge (*Carex*)	No	rootlets, some 'stems' and 'leaves' of mosses (Bryophyta)	?Yes	No	cinder/slag (to 4 mm), some sand, traces of coal (to 3 mm), a few sclerotia (resting bodies) of the soil-dwelling fungus *Cenococcum geophilum*
1072	6	fill of small ring gully (cut 1073),	3/2	1 g	mostly silt encrusted charcoal (to 8 mm)	No	some 'stems' and 'leaves' of mosses (Bryophyta), one seed of ivy-leaved	No	No	traces of coal (to 3 mm) and cinder (to 3

Con	Sam	Context description	kg/l	w/o	Identifiable ancient plant remains (charred and waterlogged)	IDs	Notes including modern contaminants (waterlogged)	A	D	Other notes
		structure 1078					speedwell (*Veronica hederifolia* L.)			mm)
1178	62	backfill of ring gully segment (cut 1179), structure 1191	3/1.5	5 g	some charcoal, traces of charred rhizome/root/rootlet fragments (to 10 mm)	No	some rootlets	No	No	sand, 'iron-rich' mineral concretions (to 10 mm), some coal (to 3 mm)
1220	78	fill of posthole (cut 1221), part of structure 1241/1240	3/2	3 g	charcoal (to 5 mm), a single charred fragment of rhizome/root/rootlet (to 4 mm), one poorly preserved charred unidentifiable cereal grain (puffed and distorted), one charred endosperm of goosefoot family (Chenopodiaceae)	No	rootlets, 'stems' and 'leaves' of mosses (Bryophyta)	Yes	No	some coal (to 4 mm) and undisaggregated sediment lumps
1281	99	backfill of ring gully segment cut 1282, part of structure 1265	3/1.5	4 g	orange-coloured charcoal (to 10 mm), a few charred fragments of rhizome/root/rootlet (to 7 mm)	No	some rootlets, one earthworm egg capsule, one seed of orache/goosefoot (*Atriplex*/*Chenopodium*)	No	No	sand, 'iron-rich' mineral concretions, traces of coal (to 5 mm) and burnt bone fragments (to 3 mm), a few beetle sclerites
1343	111	fill of burnt pit (cut 1344)	3/2	2 g	slightly silted charcoal (to 8 mm)	No	some 'stems' and 'leaves' of mosses (Bryophyta)	No	No	sand, traces of cinder/slag (to 4 mm)

Con	Sam	Context description	kg/l	w/o	Identifiable ancient plant remains (charred and waterlogged)	IDs	Notes including modern contaminants (waterlogged)	A	D	Other notes
1368	141	backfill of E-W ditch segment (cut 1368)	3/2	2 g	a little charcoal (to 3 mm), a few charred pieces of rhizome/root/rootlet, one charred achene of dock (*Rumex*)	No	'stems' and 'leaves' of mosses (Bryophyta), one achene of common fumitory (*Fumaria officinalis* L.), numerous seeds of orache/goosefoot (*Atriplex*/*Chenopodium*)	?Yes	No	coal (to 4 mm), cinder (to 10 mm), a little sand
1408	123	backfill of ring gully segment (cut 1409), structure 1420	3/2	<1 g	heavily silt encrusted deformed charcoal (to 4 mm), one rachis segment of barley (*Hordeum distichon* L./*H. vulgare* L.), one glume base of emmer/spelt wheat (*Triticum dicoccum* Schübl./*T. spelta* L.), one awn fragment of oat (*Avena*), one nut of sedge (*Carex*) – all charred	No	a few 'stems' and 'leaves' of mosses (Bryophyta), one achene of common fumitory (*Fumaria officinalis* L.), one seed of orache/goosefoot (*Atriplex*/*Chenopodium*)	Yes	No	sand, coal (to 4 mm) and cinder (to 8 mm)
1515	178	wood rich fill of N-S aligned ?palaeochannel	3/2	250 ml	heavily decayed 'woody' and 'twiggy' material (to 30 mm), some unidentifiable plant fibres, a few buds, with a little charcoal (to 7 mm), a very small number of decayed seeds and fruits in waterlogged preservation – see Table 7 for detailed list of plant taxa	No	-	Yes	No	a few invertebrate remains (earthworm egg capsules, beetle sclerites) – see Table 9
1545	191	spread sealing ditches adjacent to iron working area	3/1.75	12 g	some orange-coloured charcoal (to 5 mm)	No	two seeds of orache/goosefoot (*Atriplex*/*Chenopodium*)	No	No	mostly sand, a little coal (to 4 mm) and cinder (to 3 mm)

Con	Sam	Context description	kg/l	w/o	Identifiable ancient plant remains (charred and waterlogged)	IDs	Notes including modern contaminants (waterlogged)	A	D	Other notes
1546	194	basal fill of pit 1553	3/1.75	22 g	mostly charcoal (to 15 mm) and charred fragments of rhizome/root/rootlet (including ?heather; to 12 mm), some charred twig fragments (to 10 mm) and a few charred culm fragments of grass family (Poaceae; to 4 mm), four grains of barley (*Hordeum distichon* L./*H. vulgare* L.; probably hulled variety), one grain of emmer wheat (*Triticum dicoccum* Schübl.), one unidentified cereal grain, 18 rachis segments of barley, twelve glume bases and eleven spikelet forks of emmer, two glume bases of emmer/spelt wheat (*Triticum dicoccum* Schübl./*T. spelta* L.), one caryopsis of brome (*Bromus*), one achene of buttercup (*Ranunculus* subg. *Ranunculus*), three achenes of cinquefoil (*Potentilla*), six caryopses of heath-grass (*Danthonia decumbens* (L.) DC.), three seeds of ribwort plantain (*Plantago lanceolata* L.), nine nuts of sedge (*Carex*), one fruit stone fragment of sloe (*Prunus spinosa* L.), one nut of spike-rush (*Eleocharis*), two scales of alder (*Alnus glutinosa* (L.) Gaertn.) – all charred	alder/ birch/ hazel (*Alnus/ Betula/ Corylus*)	a few rootlets, a few seeds and fruits of blackberry/raspberry (*Rubus fruticosus* L. agg./*R. idaeus* L.), elder (*Sambucus nigra* L.), hemlock (*Conium maculatum* L.) and sedge (*Carex*)	Yes	?Yes	a little sand, a few fragments of burnt bone (to 7 mm)

Con	Sam	Context description	kg/l	w/o	Identifiable ancient plant remains (charred and waterlogged)	IDs	Notes including modern contaminants (waterlogged)	A	D	Other notes
1632	212	fill of ditch 1666 (south end)	3/2	30 ml	very decayed organic material (mostly roots/rootlets, twig fragments – to 15 mm and unidentifiable plant fibres), a few charred fragments of rhizome/root/rootlet, a little charcoal (10 mm), a large number of slightly decayed seeds and fruits in waterlogged preservation – see Table 7 for detailed list of plant taxa	?hazel (*Corylus*)	-	Yes	Yes	a little sand and sediment lumps, a few fragments of fish bone, a small number of invertebrate remains (earthworm egg capsules, beetle sclerites) – see Table 9
1642	223	fill of ditch 1766	3/2	30 ml	decayed plant matrix (mostly roots/rootlets, wood fragments and unidentifiable plant fibres), with some charcoal (to 10 mm), two charred grain fragments of barley (*Hordeum distichon* L./*H. vulgare* L.) in poor preservation, a small number of decayed seeds and fruits in waterlogged preservation – see Table 7 for detailed list of plant taxa	No	-	No	No	a little sand, some snails
1664	219	fill of linear pit cut 1665	3/1.75	60 ml	decayed plant matrix (mostly roots/rootlets, wood fragments and unidentifiable plant fibres, with a few twig fragments), a few pieces of orange-coloured charcoal (to 5	No	-	Yes	?Yes	a little cinder, a small number of invertebrate remains

Con	Sam	Context description	kg/l	w/o	Identifiable ancient plant remains (charred and waterlogged)	IDs	Notes including modern contaminants (waterlogged)	A	D	Other notes
					mm), traces of charred rhizome/root/rootlet fragments (to 10 mm), a moderate to large number of decayed seeds and fruits in waterlogged preservation (slightly orange-coloured) – see Table 7 for detailed list of plant taxa					(earthworm egg capsules, beetle sclerites) – see Table 9
1669	229	fill of ditch 1766	3/1.5	100 ml	decayed organic material (mostly roots/rootlets, wood fragments and unidentifiable plant fibres), a few fragments of charcoal (10 mm), a moderate number of slightly decayed seeds and fruits in waterlogged preservation – see Table 7 for detailed list of plant taxa	No	-	No	No	a little sand, a few invertebrate remains (earthworm egg capsules, beetle sclerites) – see Table 9
1681	228	fill of ditch 1774	3/1.75	60 ml	decayed fine organic decayed plant material (mostly roots/rootlets and unidentifiable plant fibres), a few pieces of orange-coloured charcoal (to 5 mm), a small to moderate number of slightly decayed seeds and fruits in waterlogged preservation – see Table 7 for detailed list of plant taxa	?oak (*Quercus*)	-	Yes	?Yes	a moderate number of invertebrate remains (earthworm egg capsules, beetle sclerites, water flea ephippia), a few bone fragments (to 10 mm) – see Table 9

Con	Sam	Context description	kg/l	w/o	Identifiable ancient plant remains (charred and waterlogged)	IDs	Notes including modern contaminants (waterlogged)	A	D	Other notes
1707/ 1708	243	fill of pit 1702 (Zone 3)	3/2	28 g	silt encrusted orange-coloured charcaol (to 10 mm), one charred unidentifiable cereal grain	No	one seed of orache/goosefoot (*Atriplex*/*Chenopodium*)	Yes	No	sand, a little coal (to 4 mm) and cinder (to 7 mm)
1914	266	fill of NE-SW ditch 1915	3/1.5	6 g	some charcoal (to 20 mm)	No	rootlets	No	No	sand, coal (to 2 mm) and some cinder (to 7 mm)
1922	267	fill of ring gully segment (cut 1924, Zone 3)	3/2	1 g	some charcoal (to 5 mm), one charred fragment of rhizome/root/rootlet (to 7 mm)	No	mostly rootlets, some 'stems' and 'leaves' of mosses (Bryophyta), one achene of common fumitory (*Fumaria officinalis* L.) and one achene of prickly sow-thistle (*Sonchus asper* (L.) Hill)	No	No	some sand and coal (to 4 mm)
2128	301	fill of N-S ditch 2138	3/2.5	250 ml	mostly fine rootlets and unidentifiable plant fibres, traces of charcoal (to 4 mm), a small number of well preserved seeds and fruits in waterlogged preservation – see Table 7 for detailed list of plant taxa	No	-	Yes	Yes	a little coal (to 4 mm) and cinder (to 5 mm), a few sediment lumps, many excellent preserved invertebrate remains

Con	Sam	Context description	kg/l	w/o	Identifiable ancient plant remains (charred and waterlogged)	IDs	Notes including modern contaminants (waterlogged)	A	D	Other notes
										(earthworm egg capsules, water flea ephippia) – see Table 9
2324	337	fill of N-S ditch 2364	3/2	135 ml	mostly deecayed organic material (roots/rootlets, wood fragments and unidentifiable plant fibres), a few 'stems' and 'leaves' of mosses (Bryophyta) and charred fragments of rhizome/root/rootlets, traces of charcoal (to 5 mm), a small number of decayed waterlogged seeds and fruits – see Table 7 for detailed list of plant taxa	No	-			a little sand, two leather fragments, a small number of invertebrate remains (earthworm egg capsules and beetle sclerites)
2328	341	fill of N-S ditch 2364	3/1.5	200 ml	decayed 'woody' matrix, with some larger wood pieces - to 80 mm and also a single roundwood fragment – to 40 mm; diameter to 15 mm), with some unidentifiable plant fibres and a few fragments of charcoal (to 5 mm), a small number of decayed seeds and fruits in waterlogged preservation – see Table 7 for detailed list of plant taxa	No	-	Yes	No	a few invertebrate reamains (earthworm egg capsules, beetle sclerites) – see Table 9
2375	363	fill of LBA pit, below N-S ditch 2405	3/2	125 ml	organic material (mostly roots/rootlets, unidentifiable plant fibres and twig fragments of alder/hazel), with some charcoal (to 10 mm) and a few charred	alder/hazel (*Alnus*/ *Corylus*)	-	Yes	Yes	numerous quite well preserved invertebrate remains

Con	Sam	Context description	kg/l	w/o	Identifiable ancient plant remains (charred and waterlogged)	IDs	Notes including modern contaminants (waterlogged)	A	D	Other notes
					fragments of rhizome/root/rootlets (to 10 mm), a large number of well preserved waterlogged seeds and fruits – see Table 7 for detailed list of plant taxa					(earthworm egg capsules, fly puparia, beetle sclerites) – see Table 9
2423	524	basal fill of N-S ditch	3/1	350 ml	mostly decayed roots/rootlets (partly large fragments), with a few twig fragments (to 15 mm) and charcoal (to 6 mm), several buds of alder and hazel, a few moderate-preserved waterlogged seeds and fruits – see Table 7 for detailed list of plant taxa	No	-	Yes	No	traces of invertebrate remains (earthworm egg capsules, beetle sclerites), a few sclerotia (resting bodies) of the soil-dwelling fungus *Cenococcum geophilum*
2428	389	base fill of N-S ditch 2413	3/1.5	100 ml	decayed organic material (mostly roots/rootlets, wood fragments and unidentifiable plant fibres), a few fragments of charcoal (to 5 mm), a small number of decayed seeds and fruits in waterlogged preservation – see Table 7 for detailed list of plant taxa	No	-	Yes	No	a few invertebrate remains (earthworm egg capsules, beetle sclerites), traces of bone fragments (to 5

Con	Sam	Context description	kg/l	w/o	Identifiable ancient plant remains (charred and waterlogged)	IDs	Notes including modern contaminants (waterlogged)	A	D	Other notes
										mm)
2442	393	fill of N-S ditch 2631	3/1	100 ml	mostly decayed roots/rootlets and unidentifiable plant fibres, with a few slightly orange-coloured fragments of charcoal (to 10 mm), a moderate number of decayed waterlogged seeds and fruits – see Table 7 for detailed list of plant taxa	No	-	Yes	No	a few invertebrate remains (earthworm egg capsules, beetle sclerites) – see Table 9
2465	405	fill of N-S ditch 2413	3/2.5	140 ml	very decayed organic material (mostly roots/rootlets and wood fragments; including one large waterlogged wood piece – length 19 cm and diameter to 5 cm – quite decayed dark brown to black coloured and silt encrusted 'spongy' wood piece, showing cut marks on surface), some twig fragments (to 15 mm), a few buds, a very small number of waterlogged decayed seeds and fruits – see Table 7 detailed list of plant taxa	-	-	Yes	No	traces of invertebrate remains (earthworm egg capsules, beetle sclerites
2484	417	fill of N-S ditch 2485	3/1.75	250 ml	mostly decayed organic material (roots/rootlets and unidentifiable plant fibres), a small number of decayed waterlogged seeds and fruits – see Table 7 for detailed list of plant taxa	-	-	Yes	No	a few invertebrate remains (earthworm egg capsules, beetle

Con	Sam	Context description	kg/l	w/o	Identifiable ancient plant remains (charred and waterlogged)	IDs	Notes including modern contaminants (waterlogged)	A	D	Other notes
										sclerites)
2491	423	basal fill of ditch 2492	3/1	125 ml	mostly decayed organic material (roots/rootlets and unidentifiable plant fibres), a small number of decayed waterlogged seeds and fruits – see Table 7 for detailed list of plant taxa	-	-	Yes	No	small sediment lumps, a few invertebrate remains (earthworm egg capsules, beetle sclerites) – see Table 9
2509	412	fill of pit 2576	3/1.5	250 ml	mostly decayed organic material (roots/rootlets and unidentifiable plant fibres), some twig fragments (including one larger fragment – to 120 mm), a little charcoal (to 15 mm), a few charred fragments of rhizome/root/rootlet (to 15 mm), a small number of decayed waterlogged seeds and fruits – see Table 7 for detailed list of plant taxa	alder/hazel (*Alnus*/ *Corylus*)	-	Yes	No	a few sediment lumps, a small number of invertebrate remains (earthworm egg capsules, beetle sclerites)
2517	411	fill of ?LBA pit (cut by N-S ditch 2405)	3/1	250 ml	mostly decayed organic material (roots/rootlets and unidentifiable plant fibres), with some twig fragments (to 20 mm) and charcoal (to 12 mm), a few 'stems' and 'leaves' of mosses (Bryophyta) and leaf fragments, several charred fragments of rhizome/root/rootlets, a	No	-	Yes	Yes	some sediment lumps, a little sand, a few bone fragments (to 10 mm), invertebrate remains

Con	Sam	Context description	kg/l	w/o	Identifiable ancient plant remains (charred and waterlogged)	IDs	Notes including modern contaminants (waterlogged)	A	D	Other notes
					moderate to large number of rather well preserved waterlogged seeds and fruits – see Table 7 for detailed list of plant taxa					(earthworm egg capsules, beetle sclerites, water flea ephippia) – see Table 9
2571	430	fill of pit 2655	3/1.75	50 ml	decayed 'woody' matrix (mostly wood and bark fragments), a few fragments of charcoal (to 10 mm), a few decayed seeds and fruits in waterlogged preservation – see Table 7 for detailed list of plant taxa	No	traces of rootlets	Yes	No	a small number of invertebrate remains (earthworm egg capsules, fly puparia, beetle sclerites) – see Table 9
2594	434	fill of pit 2655	3/2	250 ml	mostly 'woody' matrix (including several larger decayed pieces; spongy, no visible cut marks on the surface), with roots/rootlets, unidentifiable plant fibres, some twig fragments (to 20 mm), a few fragments of charcoal (to 10 mm) and buds, a small number of decayed waterlogged seeds and fruits (mostly hazelnut tshell fragments) – see Table 7 for detailed list of plant taxa	No	-	Yes	No	a few sediment lumps, a small number of invertebrate remains (earthworm egg capsules, beetle sclerites), a few sclerotia (resting bodies) of the soil-dwelling fungus

Con	Sam	Context description	kg/l	w/o	Identifiable ancient plant remains (charred and waterlogged)	IDs	Notes including modern contaminants (waterlogged)	A	D	Other notes
										Cenococcum geophilum – see Table 9
2624	440	fill of pit 2625	3/3	350 ml	mostly decayed wood (including larger pieces of wood with bark – to 4 mm and twig fragments – to 15 mm), a few fragments of charcoal (to 5 mm), a small number of decayed seeds and fruits in waterlogged preservation – see Table 7 for detailed list of plant taxa	No	-	Yes	No	a few invertebrate remains (beetle sclerites)
2632	441	levelling/build-up on cobble surface 2656	3/1.75	6 g	charcoal (to 5mm), one charred caryopsis of foxtail/cat's-tail (*Alopecurus*/*Phleum*)	No	a few rootlets, three fruit stones of blackberry/raspberry (*Rubus fruticosus* L. agg./*R. idaeus* L.), one achene of common fumitory (*Fumaria officinalis* L.), one seed of elder (*Sambucus nigra* L.), one nut of sedge (*Carex*)	No	No	one earthworm egg capsule, sand, some coal (to 3 mm), a few bone fragments (to 5 mm)
2643	444	fill of pit 2644	3/2	500 ml	decayed 'woody' matrix (mostly twig fragments - to 40 mm; probably alder – *Alnus*), with other plant fibres, buds and root epidermis, a moderate number of decayed waterlogged seeds and fruits –	No		Yes	No	some sediment lumps, a little sand, a moderate number of

Con	Sam	Context description	kg/l	w/o	Identifiable ancient plant remains (charred and waterlogged)	IDs	Notes including modern contaminants (waterlogged)	A	D	Other notes
					see Table 7 for detailed list of plant taxa					invertebrate remains (earthworm egg capsules, beetle sclerites) – see Table 9
2662	446	fill of E-W ditch 2671	2/1	60 ml	organic detritus (mostly fine rootlets, with some larger twig pieces – to 4 mm and wood fragments – to 7 mm), traces of charcoal (to 5 mm), a moderate number of slightly decayed seeds and fruits (slightly orange-coloured) in waterlogged preservation – see Table 7 for detailed list of plant taxa	No	-	Yes	?Yes	some invertebrate remains (earthworm egg capsules, beetle sclerites) – see Table 9
2674	449	fill of ?pit 2836	3/2.5	700 ml	decayed 'woody' (to 65 mm) and 'twiggy' (to 50 mm) matrix, with traces of charcoal (to 5 mm), a small number of seeds and fruits in waterlogged preservation (predominantly hazelnut shell fragments) – see Table 7 for detailed list of plant taxa	No	-	Yes	No	a few beetle sclerites
2687	473	fill of ?pit	3/1.25	250 ml	mostly decayed wood (to 70 mm; with bark) and twig (to 45 mm) fragments, with some rootlets, a small number of decayed seeds and fruits in waterlogged preservation – see Table 7 for detailed list of plant taxa	No	-	No	No	a little sand

Con	Sam	Context description	kg/l	w/o	Identifiable ancient plant remains (charred and waterlogged)	IDs	Notes including modern contaminants (waterlogged)	A	D	Other notes
2688	454	fill of ?pit/levelling/ build-up deposit (?charcoal-rich)	3/2.5	1 g	mostly slightly orange-coloured charcoal (to 10 mm)	No	some rootlets	No	No	traces of sand
2703	458	fill of pit 2716 (truncated by N-S ditch 2671)	3/2	8 g	mostly yellow- to orange-coloured charcoal (to 10 mm)	No	a few rootlets, one achene of common fumitory (*Fumaria officinalis* L.), one seed of elder (*Sambucus nigra* L.), one seed of orache/goosefoot (*Atriplex*/*Chenopodium*)	No	No	some sand
2718	461	deposit immediately above wooden ?well shaft linings/trough (EBA?)	3/2	100 ml	mostly decayed roots/rootlets and some unidentifiable plant fibres, a very small number of seeds and fruits in waterlogged preservation – see Table 7 for detailed list of plant taxa	-	-	?Yes	No	traces of sand, coal (to 2 mm) and cinder (to 2 mm)
2723	467	fill of pit 2712	3/1.75	12 g	slightly silted orange-coloured charcoal (to 6 mm)	oak (*Quercus*)	one fruit stone of raspberry (*Rubus idaeus* L.), two achenes of common fumitory (*Fumaria officinalis* L.), one seed of orache/goosefoot	No	No	sand, traces of coal (to 4 mm), cinder (to 5 mm) and a few 'iron-rich' mineral

Con	Sam	Context description	kg/l	w/o	Identifiable ancient plant remains (charred and waterlogged)	IDs	Notes including modern contaminants (waterlogged)	A	D	Other notes
							(*Atriplex*/*Chenopodium*)			concretions
2770	482	fill of pit 2778	3/2	20 ml	mostly decayed fine roots/rootlets, with some charcoal (to 5 mm), a few 'stems' and 'leaves' of mosses (Bryophyta), a very small number of heavily decayed seeds and fruits in waterlogged preservation – see Table 7 for detailed list of plant taxa	-	-	?Yes	No	some coal (to 3 mm), a few sclerotia (resting bodies) of the soil-dwelling fungus *Cenococcum geophilum* and insect remains – see Table 9
2782	483	dump/levelling/ build-up deposit	3/1.5	375 ml	mostly decayed dark-brown to black-coloured wood (to 50 mm) and twig (to 25 mm) fragments, with some rootlets, a few unidentifiable plant fibres and mosses (Bryophyta), a small number of decayed seeds and fruits in waterlogged preservation – see Table 7 for detailed list of plant taxa	No	-	Yes	No	traces of invertebrate remains (earthworm egg capsules, beetle sclerites)
2811	511	dump/build-up deposit	3/1.5	200 ml	decayed organic matrix (mostly roots/rootlets and wood fragments), a very small number of decayed seeds and fruits in waterlogged preservation – see Table 7 for detailed list of plant taxa	No	-	Yes	No	a few stones (to 5 mm), traces of invertebrate remains (beetle sclerites) – see Table 9

Table 4 *Area 1: Summary of the biological remains recovered in the washovers from the 48 assessed sediment samples, with notes on any material suitable for submission for radiocarbon dating.*

Key: 'Con' = Context number; 'Sam' = Sample number; ''kg/l' = amount of sediment processed in kilograms and litres; 'w/o' = washover in grammes or millilitres; 'IDs' = identifiable charcoal; 'A' = suitable material for radiocarbon dating via AMS present (NB: in most cases charcoal fragments are not considered as suitable material for this purpose); 'D' = further detailed recording recommended.

Con	Sam	Context description	kg/l	w/o	Identifiable ancient plant remains (charred and waterlogged)	IDs	Notes including modern contaminants (waterlogged)	A	D	Other notes
3005	650	fill of a ring ditch (southern end of the site)	3/2	1 g	some charcoal (to 5 mm)	No	rootlets, a few leaf fragments, several seeds of orache/goosefoot (*Atriplex*/*Chenopodium*)	No	No	sand, some coal (to 5 mm) and cinder (to 6 mm)
3011	662	deposit within A2 enclosure	3/2	4 g	silt encrusted deformed charcoal (to 13 mm)	No	a few rootlets	No	No	undisaggregated sediment lumps, traces of coal (to 3 mm)
3062	738	deposit within A2 enclosure	3/2	67 g	mostly silt encrusted deformed orange-coloured charcoal (to 20 mm), a few charred fragments of rhizome/root/rootlet (to 10 mm), three charred grains of barley (*Hordeum distichon* L./*H. vulgare* L.; one of them hulled variety), one charred caryopsis of fescue/rye-grass (*Festuca*/*Lolium*)	No	one earthworm egg capsules, one achene of black-bindweed (*Fallopia convolvulus* (L.) Á. Löve), one achene of knotweed (*Persicaria*), two seeds of orache/goosefoot (*Atriplex*/*Chenopodium*)	Yes	No	some sand and undisaggregated sediment lumps
3332	706	from an arc shaped gully to the south of the enclosure	3/2	<1 g	a few fragments of charcoal (to 3 mm)	No	mostly rootlets, one earthworm egg capsule, seven seeds of orache/goosefoot (*Atriplex*/*Chenopodium*)	No	No	a little coal (to 2 mm)
3334	707	from an arc shaped gully to the south of the enclosure	3/2	1 g	some charcoal (to 3 mm)	No	mostly roots/rootlets, two seeds of orache/goosefoot (*Atriplex*/*Chenopodium*)	No	No	coal (to 7 mm), a little sand

Con	Sam	Context description	kg/l	w/o	Identifiable ancient plant remains (charred and waterlogged)	IDs	Notes including modern contaminants (waterlogged)	A	D	Other notes
3416	713	fill of curvilinear ditch predating the enclosure and related ditches	3/2	1 g	-	-	mostly roots/rootlets, several seeds of orache/goosefoot (*Atriplex*/*Chenopodium*)	No	No	some coal (to 4 mm), a little cinder/slag (to 3 mm)
4096	607	fill of northern boundary ditch	3/2	1 g	traces of charcoal (to 2 mm)	No	mostly rootlets	No	No	some sand
4097	608	fill of northern boundary ditch	3/1	60 ml	decayed 'woody' and 'twiggy' material (to 25 mm; including one larger piece of roundwood – length 140 mm and diameter to 25 mm), with a little charcoal (to 10 mm), a small number of decayed waterlogged seeds and fruits – see Table 8 for detailed list of plant taxa	No	-	Yes	No	some coal (to 8 mm), sand and undisaggregated sediment lumps, a small number of invertebrate remains (earthworm egg capsules, beetle sclerites, water flea ephippia) – see Table 10
4242	617	fill of L-shaped field boundary	3/1.5	4 g	orange-coloured charcoal (to 10 mm)	No	one seed of orache/goosefoot (*Atriplex*/*Chenopodium*)	No	No	sand, some coal (to 5 mm) and cinder (to 4 mm)
4343	620	fill of curvilinear ditch predating the enclosure	3/2	6 g	traces of deformed orange-coloured charcoal (to 8 mm)	No	a few rootlets, two seeds of orache/goosefoot (*Atriplex*/*Chenopodium*)	No	No	mostly sand, some coal (to 5 mm) and cinder

Con	Sam	Context description	kg/l	w/o	Identifiable ancient plant remains (charred and waterlogged)	IDs	Notes including modern contaminants (waterlogged)	A	D	Other notes
		and related ditches								(to 5 mm)
4408	621	fill of a lattice like pattern of fields	3/1.2	5 g	some charcoal (to 8 mm)	No	one nut of silver/downy birch (*Betula pendula* Roth/*B. pubescens* Ehrh.)	No	No	mostly sand, some coal (to 5 mm), traces of slag/cinder (to 3 mm)
4525	654	no info	3/2	6 g	silt encrusted heavily deformed charcoal (to 10 mm), a few charred pieces of rhizome/root, one deformed grain of wheat (*Triticum*), one caryopsis of rye brome (*Bromus secalinus* L.), one caryopsis of fescue/rye-grass (*Festuca*/*Lolium*), three rachis segments of barley (*Hordeum distichon* L./*H. vulgare* L.), two glume bases and one spikelet fork of spelt wheat (*Triticum spelta* L.), one spikelet fork of ?emmer wheat (*Triticum dicoccum* Schübl.), seven glume bases and six spikelet forks of emmer/spelt wheat (*Triticum dicoccum* Schübl./*T. spelta* L.), one awn fragment of oat (*Avena*), one seed of fat-hen (*Chenopodium album* L.) – all charred	No	a few rootlets, two seeds of orache/goosefoot (*Atriplex*/*Chenopodium*)	Yes	No	mostly sand, some sediment lumps, traces of coal (to 4 mm) and cinder (to 5 mm), a few sclerotia (resting bodies) of the soil-dwelling fungus *Cenococcum geophilum*
4693	640	fill of northern boundary ditch	1/0.25	250 ml	well humified organic lumps (mostly of fine roots/rootlets), a few mosses (Bryophyta) and traces of charcoal (to 10 mm), a small number	No	-	Yes	No	a little sand, traces of invertebrate

Con	Sam	Context description	kg/l	w/o	Identifiable ancient plant remains (charred and waterlogged)	IDs	Notes including modern contaminants (waterlogged)	A	D	Other notes
					of slightly decayed seeds and fruits in waterlogged preservation – see Table 8 for detailed list of plant taxa					remains (beetle sclerites) – see Table 10

Table 5 *Area 2: Summary of the biological remains recovered in the washovers from the 13 assessed sediment samples, with notes on any material suitable for submission for radiocarbon dating.*

Key: 'Con' = Context number; 'Sam' = Sample number; ''kg/l' = amount of sediment processed in kilograms and litres; 'w/o' = washover in grammes or millilitres; 'IDs' = identifiable charcoal; 'A' = suitable material for radiocarbon dating via AMS present (NB: in most cases charcoal fragments are not considered as suitable material for this purpose); 'D' = further detailed recording recommended.

Con	Sam	Context description	kg/l	w/o	Identifiable ancient plant remains (charred and waterlogged)	IDs	Notes including modern contaminants (waterlogged)	A	D	Other notes
23002	812	fill of a hearth	3/2	1 g	some charcoal (to 5 mm), a few charred fragments of rhizome/root/rootlet, one nut of sedge (*Carex*)	No	mostly rootlets, one seed of orache/goosefoot (*Atriplex*/*Chenopodium*)	?Yes	No	some sand and coal (to 6 mm)
23003	813	fill of a hearth	3/2	<1 g	some charcoal (to 4 mm), one poorly preserved charred grain of ?barley (cf. *Hordeum distichon* L./*H. vulgare* L.)	No	mostly rootlets, one seed of black nightshade (*Solanum nigrum* L.) and two seeds of orache/goosefoot (*Atriplex*/*Chenopodium*)	Yes	No	some coal (to 6 mm), a little sand and cinder/slag (to 4 mm)

Table 6 *Evaluation Trench 12-17: Summary of the biological remains recovered in the washovers from the two assessed sediment samples, with notes on any material suitable for submission for radiocarbon dating.*

Key: 'Con' = Context number; 'Sam' = Sample number; ''kg/l' = amount of sediment processed in kilograms and litres; 'w/o' = washover in grammes or millilitres; 'IDs' = identifiable charcoal; 'A' = suitable material for radiocarbon dating via AMS present (NB: in most cases charcoal fragments are not considered as suitable material for this purpose); 'D' = further detailed recording recommended.

TABLE 7 A) CONTEXTS 1515 TO 2328

Context			**1515**	**1632**	**1642**	**1664**	**1669**	**1681**	**2128**	**2324**	**2328**
Sample			178	212	223	219	229	228	301	337	341
kg/l			3/2	3/2	3/2	3/1.75	3/1.5	3/1.75	3/2.5	3/2	3/1.5
washover			250 ml	30 ml	30 ml	60 ml	100 ml	60 ml	250 ml	135 ml	200 ml
Crops											
Grains											
Hordeum distichon L./*H. vulgare* L.	barley	caryopsis			c						
Triticum cf. *spelta* L.	spelt wheat	caryopsis									
Wetlands (e.g. bog, ditch, fen, heath, marsh, moorland, pond)											
Alisma	water-plantain	seed, fruit		w	w	w	w	w	w	w	
Alnus glutinosa (L.) Gaertn.	alder	twig	w								
Alnus glutinosa (L.) Gaertn.	alder	bud	w								
Alnus glutinosa (L.) Gaertn.	alder	nut		w							
Alnus glutinosa (L.) Gaertn.	alder	male catkin	w								
Betula pendula Roth	silver birch	nut									
Betula pendula Roth/*B. pubescens* Ehrh.	silver/downy birch	nut									
Calluna vulgaris (L.) Hull	heather	inflorescence		w							
Carex	sedge	caryopsis		w	w	w	w	w	w	w	w
Carex	sedge	utriculus							w		
Chara	muskgrass	oogonium		w							
Eleocharis	spike-rush	nut		w			w		w	w	w
Erica	heather	leaf									

Context			1515	1632	1642	1664	1669	1681	2128	2324	2328
Sample			178	212	223	219	229	228	301	337	341
Filipendula ulmaria (L.) Maxim.	meadowsweet	achene									
Glyceria	sweet-grass	caryopsis			w	w	w	w			
Hydrocotyle vulgaris L.	marsh pennywort	mericarp		w			w	w	w		
Iris pseudacorus L.	yellow Iris	seed				w				w	
Isolepis setacea (L.) R. Br.	bristle club-rush	nut				w	w				
Juncus	rush	seed		w	w	w		w	w		
Lycopus europaeus L.	gypsywort	nutlet		w						w	
Menyanthes trifoliata L.	bogbean	seed						w			
Mentha	mint	nutlet		w	w	w		w	w		
Montia fontana L. ssp. *chondrosperma* (Fenzl) Walters	blinks	seed		w		w	w			w	
Myrica	bog-myrtle	nut		w					w		
Oenanthe	water-dropwort	mericarp		w							
Persicaria hydropiper (L.) Spach	water-pepper	achene with perianth		w			w		w		
Potamogeton	pondweed	drupe				w					
Potentilla erecta (L.) Raeusch.	tormentil	achene		w	w		w		w		
Ranunculus subg. *Batrachium*	crowfoot	achene		w		w	w	w		w	
Ranunculus flammula L.	lesser spearwort	achene		w		w				w	
Rumex conglomeratus Murray	clustered dock	achene with perianth		w						w	
Tropaeolum	nasturtium	seed		w		w					
Zannichellia palustris L.	horned pondweed	achene		w	w	w	w	w		w	
Grassland (meadow and pasture											

Context			**1515**	**1632**	**1642**	**1664**	**1669**	**1681**	**2128**	**2324**	**2328**
Sample			178	212	223	219	229	228	301	337	341
habitats)											
Ajuga reptans L.	bugle	nutlet				w					
Prunella vulgaris L.	selfheal	nutlet		w							
Ranunculus subg. *Ranunculus*	buttercup	achene		w	w	w	w	w	w	w	w
Rumex acetosella L.	sheep's sorrel	achene				w					
Disturbed and rough ground											
Aethusa cynapium L.	fool's parsley	mericarp			w		w				w
Arctium	burdock	achene									
Atriplex/*Chenopodium*	orache/goosefoot	seed				w	w	w		w	w
Chenopodium album L.	fat-hen	seed		w							
Fallopia convolvulus (L.) Á. Löve	black-bindweed	achene		w					w	w	w
Fumaria officinalis L.	common fumitory	achene				w	w				w
Galeopsis speciosa Mill./*G. tetrahit* L.	large-flowered/common hemp-nettle	nutlet								w	w
Linum catharticum L.	fairy flax	seed								w	
Polygonum aviculare L.	knotgrass	achene		w		w	w			w	w
Raphanus raphanistrum L.	wild radish	mericarp			w						w
Solanum nigrum L.	black nightshade	seed		w							
Sonchus asper (L.) Hill	prickly sow-thistle	achene		w						w	
Stellaria media (L.) Vill.	chickweed	seed		w				w		w	w
Thlaspi arvense L.	field penny-cress	seed								w	
Urtica dioica L.	common nettle	achene	w	w		w		w		w	
Urtica urens L.	small nettle	achene		w							

Context			1515	1632	1642	1664	1669	1681	2128	2324	2328
Sample			178	212	223	219	229	228	301	337	341
Scrub and hedgerows											
Corylus avellana L.	hazel	nut shell	w			c	c	c			
Corylus avellana L.	hazel	twig	w								
Corylus avellana L.	hazel	bud	w								
Crataegus	hawthorns	fruit stone									
Crataegus/Prunus	hawthorn/cherry	thorn									
Ilex aquifolium L.	holly	seed									
Prunus avium (L.) L./*P. cerasus* L./*P. spinosa* L.	wild/dwarf cherry/sloe	fruit stone									
Prunus spinosa L.	sloe	fruit stone									
Rosa/Rubus	rose/bramble	prickle		w							
Rubus fruticosus L. agg.	blackberry	fruit stone				w		w			
Rubus fruticosus L. agg./*R. idaeus* L.	blackberry/raspberry	fruit stone					w			w	w
Rubus idaeus L.	raspberry	fruit stone	w	w	w			w	w		
Sambucus nigra L.	elder	seed			w	w		w	w	w	
Other wild plant taxa											
Alnus/*Corylus*	alder/hazel	twig									
Apiaceae	carrot family	mericarp									
Asteraceae	daisy family	achene					w				
Carduus/Cirsium	thistle	achene		w	w	w	w		w	w	w
Centaurea	knapweed	achene				w					
Cerastium	mouse-ear	seed		w						w	
Lamiaceae	dead-nettle family	nutlet			w						
Persicaria	knotweed	achene		w	w	w	w	w		w	

Context			1515	1632	1642	1664	1669	1681	2128	2324	2328
Sample			178	212	223	219	229	228	301	337	341
Polygonum	knotgrass	achene		w							
Polygonum	knotgrass	achene		c							
Rumex	dock	achene		w		w	w	w	w	w	w
Silene dioica (L.) Clairv./*S. vulgaris* Garcke	red/bladder campion	seed				w					
Torilis	hedge-parsley	mericarp								w	
Viola	violet	seed				w		w			
Other botanical remains											
bark											
buds/bud scales			x								
charcoal			x	x	x	x		x	x	x	x
charred fragments of rhizome/root/rootlet				x		x				x	
leaf fragments											
waterlogged roots/rootlets				x	x			x	x	x	
mosses (Bryophyta)										x	
unidentifiable plant fibres			x	x		x		x	x	x	x
unidentifiable fruit stone fragments											
twig fragments				x	x	x					
wood fragments			x		x	x				x	x
Invertebrate remains											
beetle and other insect remains			x	x		x		x	x	x	x
earthworm egg capsules			x	x		x		x	x	x	x
fly puparia								x			

Context			**1515**	**1632**	**1642**	**1664**	**1669**	**1681**	**2128**	**2324**	**2328**
Sample			178	212	223	219	229	228	301	337	341
cladoceran (water flea) ephippia								x	x		
Vertebrate remains											
bone fragments								x			
fish bone				x							
Other biological remains											
Cenococcum geophilum	soil-dwelling fungus	sclerotia									
Inorganic/artefactual remains											
cinder						x			x		
coal									x		
leather fragment										x	
sand										x	
sediment lumps				x					x		

TABLE 7 B) CONTEXTS 2375 TO 2571

Context			2375	2423	2428	2442	2465	2484	2491	2509	2517	2571
Sample			363	524	389	393	405	417	423	412	411	430
kg/l			3/2	3/1	3/1.5	3/1	3/2.5	3/1.75	3/1	3/1.5	3/1	3/1.75
washover			125 ml	350 ml	100 ml	100 ml	140 ml	250 ml	125 ml	250 ml	250 ml	50 ml
Crops												
Grains												
Hordeum distichon L./*H. vulgare* L.	barley	caryopsis				c						
Triticum cf. *spelta* L.	spelt wheat	caryopsis	c									
Wetlands (e.g. bog, ditch, fen, heath, marsh, moorland, pond)												
Alisma	water-plantain	seed, fruit			w	w			w			
Alnus glutinosa (L.) Gaertn.	alder	twig										
Alnus glutinosa (L.) Gaertn.	alder	bud		w								
Alnus glutinosa (L.) Gaertn.	alder	nut	w	w		w					w	
Alnus glutinosa (L.) Gaertn.	alder	male catkin	w									
Betula pendula Roth	silver birch	nut										
Betula pendula Roth/*B. pubescens* Ehrh.	silver/downy birch	nut										
Calluna vulgaris (L.) Hull	heather	inflorescence										
Carex	sedge	caryopsis	w			w	w	w	w	w	w	w

Context			2375	2423	2428	2442	2465	2484	2491	2509	2517	2571
Sample			363	524	389	393	405	417	423	412	411	430
Carex	sedge	utriculus										
Chara	muskgrass	oogonium										
Eleocharis	spike-rush	nut	w					w			w	
Erica	heather	leaf									w	
Filipendula ulmaria (L.) Maxim.	meadowsweet	achene										
Glyceria	sweet-grass	caryopsis			w							
Hydrocotyle vulgaris L.	marsh pennywort	mericarp						w				
Iris pseudacorus L.	yellow Iris	seed										
Isolepis setacea (L.) R. Br.	bristle club-rush	nut										
Juncus	rush	seed	w		w			w			w	
Lycopus europaeus L.	gypsywort	nutlet			w							
Menyanthes trifoliata L.	bogbean	seed				w						
Mentha	mint	nutlet							w			
Montia fontana L. ssp. *chondrosperma* (Fenzl) Walters	blinks	seed									w	
Myrica	bog-myrtle	nut	w		w			w		w		
Oenanthe	water-dropwort	mericarp								w		
Persicaria hydropiper (L.) Spach	water-pepper	achene with perianth					w	w	w		w	
Potamogeton	pondweed	drupe	w									
Potentilla erecta (L.) Raeusch.	tormentil	achene	w						w	w		
Ranunculus subg. *Batrachium*	crowfoot	achene	w		w			w		w	w	
Ranunculus flammula L.	lesser spearwort	achene	w					w			w	
Rumex conglomeratus Murray	clustered dock	achene					w					

Context			2375	2423	2428	2442	2465	2484	2491	2509	2517	2571
Sample			363	524	389	393	405	417	423	412	411	430
		with perianth										
Tropaeolum	nasturtium	seed	w								w	
Zannichellia palustris L.	horned pondweed	achene										
Grassland (meadow and pasture habitats)												
Ajuga reptans L.	bugle	nutlet	w	w								
Prunella vulgaris L.	selfheal	nutlet										
Ranunculus subg. *Ranunculus*	buttercup	achene	w		w		w	w	w	w	w	
Rumex acetosella L.	sheep's sorrel	achene	w									
Disturbed and rough ground												
Aethusa cynapium L.	fool's parsley	mericarp										
Arctium	burdock	achene						w				
Atriplex/*Chenopodium*	orache/goosefoot	seed	w		w		w	w	w	w	w	
Chenopodium album L.	fat-hen	seed										
Fallopia convolvulus (L.) Á. Löve	black-bindweed	achene						w				
Fumaria officinalis L.	common fumitory	achene				w					w	
Galeopsis speciosa Mill./*G. tetrahit* L.	large-flowered/common hemp-nettle	nutlet	w		w						w	
Linum catharticum L.	fairy flax	seed										
Polygonum aviculare L.	knotgrass	achene	w						w	w		
Raphanus raphanistrum L.	wild radish	mericarp			w							
Solanum nigrum L.	black nightshade	seed	w		w		w		w	w		

Context			2375	2423	2428	2442	2465	2484	2491	2509	2517	2571
Sample			363	524	389	393	405	417	423	412	411	430
Sonchus asper (L.) Hill	prickly sow-thistle	achene	w							w	w	
Stellaria media (L.) Vill.	chickweed	seed	w				w	w	w	w	w	
Thlaspi arvense L.	field penny-cress	seed										
Urtica dioica L.	common nettle	achene	w		w	w			w	w	w	
Urtica urens L.	small nettle	achene	w						w	w	w	
Scrub and hedgerows												
Corylus avellana L.	hazel	nut shell	w	w	w						w	w
Corylus avellana L.	hazel	twig										
Corylus avellana L.	hazel	bud		w								
Crataegus	hawthorns	fruit stone					w			w		
Crataegus/Prunus	hawthorn/cherry	thorn										
Ilex aquifolium L.	holly	seed										
Prunus avium (L.) L./*P. cerasus* L./*P. spinosa* L.	wild/dwarf cherry/sloe	fruit stone				w						
Prunus spinosa L.	sloe	fruit stone										
Rosa/Rubus	rose/bramble	prickle				w						
Rubus fruticosus L. agg.	blackberry	fruit stone										
Rubus fruticosus L. agg./*R. idaeus* L.	blackberry/raspberry	fruit stone		w	w		w	w				w
Rubus idaeus L.	raspberry	fruit stone	w			w		w	w		w	w
Sambucus nigra L.	elder	seed	w			w			w	w	w	w
Other wild plant taxa												
Alnus/*Corylus*	alder/hazel	twig	w									
Apiaceae	carrot family	mericarp										

Context			**2375**	**2423**	**2428**	**2442**	**2465**	**2484**	**2491**	**2509**	**2517**	**2571**
Sample			363	524	389	393	405	417	423	412	411	430
Asteraceae	daisy family	achene										
Carduus/Cirsium	thistle	achene	w		w					w	w	
Centaurea	knapweed	achene							w			
Cerastium	mouse-ear	seed										
Lamiaceae	dead-nettle family	nutlet				w						
Persicaria	knotweed	achene	w				w	w	w	w	w	
Polygonum	knotgrass	achene										
Polygonum	knotgrass	achene										
Rumex	dock	achene	w				w		w		w	
Silene dioica (L.) Clairv./*S. vulgaris* Garcke	red/bladder campion	seed	w									
Torilis	hedge-parsley	mericarp	w								w	
Viola	violet	seed	w									
Other botanical remains												
bark												x
buds/bud scales				x			x				x	
charcoal			x	x		x				x	x	x
charred fragments of rhizome/root/rootlet			x							x	x	
leaf fragments											x	
waterlogged roots/rootlets			x	x		x	x	x	x	x	x	x
mosses (Bryophyta)											x	
unidentifiable plant fibres			x			x		x	x	x	x	
unidentifiable fruit stone fragments												

Context			2375	2423	2428	2442	2465	2484	2491	2509	2517	2571
Sample			363	524	389	393	405	417	423	412	411	430
twig fragments			x	x			x			x	x	
wood fragments							x					x
Invertebrate remains												
beetle and other insect remains			x	x		x	x	x	x	x	x	x
earthworm egg capsules			x	x		x	x	x	x	x	x	x
fly puparia			x									x
cladoceran (water flea) ephippia											x	
Vertebrate remains												
bone fragments											x	
fish bone												
Other biological remains												
Cenococcum geophilum	soil-dwelling fungus	sclerotia		x								
Inorganic/artefactual remains												
cinder												
coal												
leather fragment												
sand											x	
sediment lumps									x	x	x	

TABLE 7 C) CONTEXTS 2594 TO 2811

Context			**2594**	**2624**	**2643**	**2662**	**2674**	**2687**	**2718**	**2770**	**2782**	**2811**
Sample			434	440	444	446	449	473	461	482	483	511
kg/l			3/2	3/3	3/2	2/1	3/2.5	3/1.25	3/2	3/2	3/1.5	3/1.5
washover			250 ml	350 ml	500 ml	60 ml	700 ml	250 ml	100 ml	20 ml	375 ml	200 ml
Crops												
Grains												
Hordeum distichon L./*H. vulgare* L.	barley	caryopsis										
Triticum cf. *spelta* L.	spelt wheat	caryopsis										
Wetlands (e.g. bog, ditch, fen, heath, marsh, moorland, pond)												
Alisma	water-plantain	seed, fruit				w						
Alnus glutinosa (L.) Gaertn.	alder	twig			w							
Alnus glutinosa (L.) Gaertn.	alder	bud					w					
Alnus glutinosa (L.) Gaertn.	alder	nut	w		w		w					
Alnus glutinosa (L.) Gaertn.	alder	male catkin		w	w		w				w	
Betula pendula Roth	silver birch	nut							w			
Betula pendula Roth/*B. pubescens* Ehrh.	silver/downy birch	nut			w					w		
Calluna vulgaris (L.) Hull	heather	inflorescence										
Carex	sedge	caryopsis		w	w	w						
Carex	sedge	utriculus										
Chara	muskgrass	oogonium										

Context			2594	2624	2643	2662	2674	2687	2718	2770	2782	2811
Sample			434	440	444	446	449	473	461	482	483	511
Eleocharis	spike-rush	nut										
Erica	heather	leaf										
Filipendula ulmaria (L.) Maxim.	meadowsweet	achene				w						
Glyceria	sweet-grass	caryopsis				w						
Hydrocotyle vulgaris L.	marsh pennywort	mericarp		w								
Iris pseudacorus L.	yellow Iris	seed										
Isolepis setacea (L.) R. Br.	bristle club-rush	nut										
Juncus	rush	seed				w						w
Lycopus europaeus L.	gypsywort	nutlet		w	w			w				
Menyanthes trifoliata L.	bogbean	seed										
Mentha	mint	nutlet										
Montia fontana L. ssp. *chondrosperma* (Fenzl) Walters	blinks	seed										
Myrica	bog-myrtle	nut										
Oenanthe	water-dropwort	mericarp									w	
Persicaria hydropiper (L.) Spach	water-pepper	achene with perianth										
Potamogeton	pondweed	drupe										
Potentilla erecta (L.) Raeusch.	tormentil	achene			w							
Ranunculus subg. *Batrachium*	crowfoot	achene			w	w					w	w
Ranunculus flammula L.	lesser spearwort	achene										
Rumex conglomeratus Murray	clustered dock	achene with perianth										
Tropaeolum	nasturtium	seed										
Zannichellia palustris L.	horned pondweed	achene				w						

Context			2594	2624	2643	2662	2674	2687	2718	2770	2782	2811
Sample			434	440	444	446	449	473	461	482	483	511
Grassland (meadow and pasture habitats)												
Ajuga reptans L.	bugle	nutlet				w				w		
Prunella vulgaris L.	selfheal	nutlet			w							
Ranunculus subg. *Ranunculus*	buttercup	achene	w	w	w	w					w	w
Rumex acetosella L.	sheep's sorrel	achene										
Disturbed and rough ground												
Aethusa cynapium L.	fool's parsley	mericarp				w						
Arctium	burdock	achene										
Atriplex/*Chenopodium*	orache/goosefoot	seed				w						
Chenopodium album L.	fat-hen	seed		w	w							
Fallopia convolvulus (L.) Á. Löve	black-bindweed	achene			w							
Fumaria officinalis L.	common fumitory	achene	w									
Galeopsis speciosa Mill./*G. tetrahit* L.	large-flowered/common hemp-nettle	nutlet		w								
Linum catharticum L.	fairy flax	seed										
Polygonum aviculare L.	knotgrass	achene		w	w							
Raphanus raphanistrum L.	wild radish	mericarp		w								
Solanum nigrum L.	black nightshade	seed		w	w	w						
Sonchus asper (L.) Hill	prickly sow-thistle	achene		w		w					w	w
Stellaria media (L.) Vill.	chickweed	seed		w	w						w	
Thlaspi arvense L.	field penny-cress	seed										
Urtica dioica L.	common nettle	achene			w	w		w			w	

Context			2594	2624	2643	2662	2674	2687	2718	2770	2782	2811
Sample			434	440	444	446	449	473	461	482	483	511
Urtica urens L.	small nettle	achene		w								
Scrub and hedgerows												
Corylus avellana L.	hazel	nut shell	w				w	w		w		
Corylus avellana L.	hazel	twig									w	
Corylus avellana L.	hazel	bud					w					
Crataegus	hawthorns	fruit stone										
Crataegus/Prunus	hawthorn/cherry	thorn		w								
Ilex aquifolium L.	holly	seed					w					
Prunus avium (L.) L./*P. cerasus* L./*P. spinosa* L.	wild/dwarf cherry/sloe	fruit stone									w	
Prunus spinosa L.	sloe	fruit stone		w								
Rosa/Rubus	rose/bramble	prickle										
Rubus fruticosus L. agg.	blackberry	fruit stone										
Rubus fruticosus L. agg./*R. idaeus* L.	blackberry/raspberry	fruit stone				w		w		w	w	w
Rubus idaeus L.	raspberry	fruit stone	w	w			w	w				
Sambucus nigra L.	elder	seed	w			w	w	w	w			
Other wild plant taxa												
Alnus/*Corylus*	alder/hazel	twig		w				w			w	
Apiaceae	carrot family	mericarp		w								
Asteraceae	daisy family	achene										
Carduus/Cirsium	thistle	achene		w	w	w						
Centaurea	knapweed	achene										
Cerastium	mouse-ear	seed										

Context			2594	2624	2643	2662	2674	2687	2718	2770	2782	2811
Sample			434	440	444	446	449	473	461	482	483	511
Lamiaceae	dead-nettle family	nutlet										
Persicaria	knotweed	achene	w	w		w						
Polygonum	knotgrass	achene										
Polygonum	knotgrass	achene										
Rumex	dock	achene		w		w						
Silene dioica (L.) Clairv./*S. vulgaris* Garcke	red/bladder campion	seed										
Torilis	hedge-parsley	mericarp										
Viola	violet	seed		w	w		w				w	
Other botanical remains												
bark				x				x				
buds/bud scales			x				x					
charcoal			x			x	x	x	x	x		
charred fragments of rhizome/root/rootlet												
leaf fragments												
waterlogged roots/rootlets			x	x		x			x	x		x
mosses (Bryophyta)										x	x	
unidentifiable plant fibres			x		x				x		x	
unidentifiable fruit stone fragments												
twig fragments			x	x	x	x	x	x			x	
wood fragments			x	x	x	x	x	x			x	x
Invertebrate remains												

Context			2594	2624	2643	2662	2674	2687	2718	2770	2782	2811
Sample			434	440	444	446	449	473	461	482	483	511
beetle and other insect remains			x	x	x	x	x	x		x	x	x
earthworm egg capsules			x	x	x	x					x	
fly puparia												
cladoceran (water flea) ephippia												
Vertebrate remains												
bone fragments												
fish bone												
Other biological remains												
Cenococcum geophilum	soil-dwelling fungus	sclerotia	x							x		
Inorganic/artefactual remains												
cinder									x			
coal										x		
leather fragment												
sand					x				x			
sediment lumps			x									

Table 7 *Area 1: Waterlogged plant remains recovered from 29 deposits, with notes on other biological and inorganic components.*

Key: w = waterlogged; c = charred (carbonised); x = present.

Context			**4097**	**4693**
Sample			608	640
kg/l			3/1	1/0.25
washover			60 ml	250 ml
Crops				
Grains				
Cerealia indet.	cereal	caryopsis	c	
Wetlands (e.g. bog, ditch, fen, heath, marsh, moorland, pond)				
Alnus glutinosa (L.) Gaertn.	alder	male catkin	w	w
Carex	sedge	caryopsis	w	w
Eleocharis	spike-rush	nut		w
Myrica	bog-myrtle	nut	w	w
Potamogeton	pondweed	drupe		w
Ranunculus subg. *Batrachium*	crowfoot	achene	w	w
Ranunculus flammula L.	lesser spearwort	achene	w	
Grassland (meadow and pasture habitats)				
Ranunculus subg. *Ranunculus*	buttercup	achene		w
Disturbed and rough ground				
Conium maculatum L.	hemlock	mericarp		w
Lapsana communis L.	nipplewort	achene		w
Persicaria	knotweed	achene		w
Stellaria media (L.) Vill.	chickweed	seeds	w	

Context			**4097**	**4693**
Sample			608	640
Urtica dioica L.	common nettle	achene	w	w
Scrubs and hedgerows				
Prunus spinosa L.	sloe	fruit stone		w
Rubus idaeus L.	raspberry	fruit stone	w	
Sambucus nigra L.	elder	seed		w
Other wild plant taxa				
Carduus/Cirsium	thistle	achene		w
Rumex	dock	achene		w
Invertebrate remains				
beetle and other insect remains			x	x
earthworm egg capsules			x	
water flea ephippia			x	
Other botanical remains				
charcoal			x	x
modern rootlets			x	x
mosses (Bryophyta)				x
twig fragments			x	
wood fragments			x	
Inorganic/artefactual remains				

Context			4097	4693
Sample			608	640
cinder				
coal			x	
sand			x	x
sediment lumps			x	
slag				

Table 8 *Area 2: Waterlogged plant remains recovered from two deposits, with notes on other biological and inorganic components.*

Key: w = waterlogged; c =charred (carbonised); x = present.

Con	Sam	Context description	kg/l	w/o	Additional notes on invertebrate remains	D
1515	178	wood rich fill of N-S aligned ?palaeochannel	3/2	250 ml	Mostly just 'scraps' of insect cuticle but including occasional much better preserved remains of beetle sclerites (typically elytra) some at least of which would be identifiable given additional time for study	Yes
1632	212	fill of ditch 1666 (south end)	3/2	30 ml	A small number of well preserved (erosion and fragmentation both low) beetle sclerites including a ?*Carabus* sp. elytron	Yes
1664	219	fill of linear pit cut 1665	3/1.75	60 ml	Small numbers of quite well preserved beetle remains – fragmentation and chemical erosion both low. Remains included a weevil (*Ceutorhynchus* sp.) elytron	Yes
1669	229	fill of ditch 1766	3/1.5	100 ml	Occasional 'scraps' of unidentified insect (including beetle) cuticle only	No
1681	228	fill of ditch 1774	3/1.75	60 ml	Small numbers of 'scraps' of unidentified insect (including beetle) cuticle only	No
2128	301	fill of N-S ditch 2138	3/2.5	250 ml	Many mites (Acarina) and large numbers of small unidentified pieces of highly fragmented beetle sclerites. There were occasional more complete beetle sclerites but these were usually rather pale (heavily eroded)	Yes
2328	341	fill of N-S ditch 2364	3/1.5	200 ml	Some beetle sclerite fragments – mostly unidentified 'scraps' but including occasional better preserved remains (e.g. two undersides – ?*Micropeplus*) and some staphylinid and other beetle taxa elytra. Also a few mites (Acarina)	Yes
2375	363	fill of LBA pit, below N-S ditch 2405	3/2	125 ml	Some quite well preserved (erosion fairly high but fragmentation relatively low) beetle sclerites including elytra of *Cercyon analis* (Paykull), ?*Megasternum obscurum* (Marsham) and several staphylinid species	Yes
2442	393	fill of N-S ditch 2631	3/1	100 ml	Occasional small fragments of unidentified beetle sclerite – chemical erosion only light but fragmentation very high	No
2491	423	basal fill of ditch 2492	3/1	125 ml	Few but quite well preserved beetle remains (fragmentation fairly light and erosion low to medium) including ground and rove beetle (Carabidae and Staphylinidae, respectively) elytra representing several species of each family	Yes

Con	Sam	Context description	kg/l	w/o	Additional notes on invertebrate remains	D
2517	411	fill of ?LBA pit (cut by N-S ditch 2405)	3/1	250 ml	Rather few beetle sclerites mostly present as small unidentified fragments exhibiting variable erosion. There were occasional better preserved remains including a few elytra	No
2571	430	fill of pit 2655	3/1.75	50 ml	A few fly puparia – rather fragmentary	No
2594	434	fill of pit 2655	3/2	250 ml	Small numbers of 'scraps' of unidentified insect cuticle only	No
2643	444	fill of pit 2644	3/2	500 ml	Some very variably preserved beetle remains – some well preserved and others no more than 'scraps' of cuticle – including *Cercyon analis* (Paykull) elytra and pronota and other elytra of unidentified ?aquatic beetle taxa	Yes
2662	446	fill of E-W ditch 2671	2/1	60 ml	Small numbers of variable preserved beetle sclerites – fragmentation generally heavy and degree of chemical erosion variable. Some ground beetle (Carabidae) elytral fragments noted and other remains of ?aquatic taxa present	Yes
2770	482	fill of pit 2778	3/2	20 ml	Occasional 'scraps' of unidentified insect cuticle only	No
2811	511	dump/build-up deposit	3/1.5	200 ml	Small numbers of 'scraps' of unidentified insect (including beetle) cuticle only	No

Table 9 *Area 1: Additional notes on invertebrate macrofossils and their preservation in washover fractions from selected samples with waterlogged preservation.*

Key: 'Con' = Context number; 'Sam' = Sample number; 'kg/l' = amount of sediment processed in kilograms and litres; 'w/o' = washover in grammes or millilitres; 'D' = further detailed recording recommended.

Con	Sam	Context description	kg/l	w/o	Additional notes on invertebrate remains	D
4097	608	fill of northern boundary ditch	3/1	60 ml	Small numbers of quite well preserved beetle sclerites were noted. Larger sclerites were generally fragmented but chemical erosion of the remains was typically low. Remains included ground beetle (Carabidae) and rove beetle (Staphylinidae) elytra. Cladoceran ephippia included some of *Daphnia*	Yes
4693	640	fill of northern boundary ditch	1/0.25	250 ml	A few 'scraps' of unidentified insect (including beetle) cuticle only	No

Table 10 *Area 2: Additional notes on invertebrate macrofossils (principally beetles) in washover fractions from selected samples with waterlogged preservation.*

Key: 'Con' = Context number; 'Sam' = Sample number; ''kg/l' = amount of sediment processed in kilograms and litres; 'w/o' = washover in grammes or millilitres; 'D' = further detailed recording recommended.

Con	Sam	Context description	Microfossil 'squash' subsample notes
1515	178	wood rich fill of N-S aligned ?palaeochannel	Approximately three-quarters inorganic and one-quarter organic detritus, with a few fungal spores, plant tissue fragments and mostly poorly preserved (crumpled) unidentified pollen grains/spores
1632	212	fill of ditch 1666 (south end)	Approximately three-quarters inorganic and one-quarter organic detritus, with many well preserved pollen grains/spores including birch (*Betula*), trilete spores (?*Sphagnum*), alder (*Alnus*) and ?lime (cf. *Tilia*) and numerous remains from other unidentified taxa
1664	219	fill of linear pit cut 1665	Approximately three-quarters inorganic and one-quarter organic detritus, with a few fungal hyphae and some pollen grains/spores. Preservation of the last was generally poor (the remains being crumpled and/or broken) but some could be tentatively identified as hazel (*Corylus*) and grass-family (Poaceae) and there were also remains representing other taxa
1669	229	fill of ditch 1766	Predominantly inorganic, with a little organic detritus and some fungal spores. There were also some pollen grains/spores but these were mostly poorly preserved (crumpled/broken/eroded) – they included a few trilete spores
1681	228	fill of ditch 1774	Approximately three-quarters inorganic and one-quarter organic detritus, with a few fungal spores and plant tissue fragments, and two live soil nematodes. There were also some variably preserved (some good others broken/crumpled) unidentified pollen grains/spores
2128	301	fill of N-S ditch 2138	Approximately three-quarters inorganic and one-quarter organic detritus, with some plant tissue fragments and pollen grains/spores the last poorly preserved (crumpled/broken/eroded) but probably including alder (*Alnus*)
2328	341	fill of N-S ditch 2364	Approximately three-quarters inorganic and one-quarter organic detritus, with a few fragments of plant tissue and fungal spores. No pollen grains/spores were seen
2375	363	fill of LBA pit, below N-S ditch 2405	Approximately three-quarters inorganic and one-quarter organic detritus, with some plant tissue fragments and generally poorly preserved (crumpled/broken) unidentified pollen grains/spores
2442	393	fill of N-S ditch 2631	Approximately three-quarters inorganic and one-quarter organic detritus, with a few poorly preserved (broken/crumpled) unidentified pollen grains/spores and single *Capillaria* sp. parasite egg (lacking both polar plugs)
2491	423	basal fill of ditch 2492	Predominantly inorganic, with a little organic detritus. No identifiable microfossil remains were seen

Con	Sam	Context description	Microfossil 'squash' subsample notes
2517	411	fill of ?LBA pit (cut by N-S ditch 2405)	Approximately three-quarters inorganic and one-quarter organic detritus. No identifiable microfossils seen
2571	430	fill of pit 2655	Approximately three-quarters inorganic and one-quarter organic detritus, with some poorly preserved (crumpled/broken) unidentified pollen grains/spores
2594	434	fill of pit 2655	Approximately three-quarters inorganic and one-quarter organic detritus, with a few fragments of plant tissue and micro-invertebrate. No pollen grains/spores were seen
2643	444	fill of pit 2644	Approximately three-quarters organic detritus and one-quarter inorganic, with some plant tissue fragments and a few fungal spores and pollen grains/spores – the last well preserved but not identified (of unfamiliar taxa)
2662	446	fill of E-W ditch 2671	Approximately three-quarters inorganic and one-quarter organic detritus, with many plant tissue fragments and pollen grains/spores, some fungal hyphae and a few fungal spores. Preservation of the pollen grains/spores was highly variable but some at least were quite well preserved and included hazel (*Corylus*) and ?plum/cherry family (cf. *Prunus*). A live soil nematode and other live organisms were seen on the assessment slide
2770	482	fill of pit 2778	Predominantly inorganic, with a little organic detritus and a few possible very poorly preserved ?pollen grains/spores
2811	511	dump/build-up deposit	Almost entirely inorganic, with just a trace of organic detritus a few plant tissue fragments and pollen grains/spores (well preserved but unfamiliar and unidentified)

Table 11 *Area 1: Notes on microfossil remains and preservation (principally regarding pollen grains/spores) from selected samples with waterlogged preservation.*

Key: 'Con' = Context number; 'Sam' = Sample number.

Con	Sam	Context description	Microfossil 'squash' subsample notes
4097	608	fill of northern boundary ditch	Mostly inorganic, with a trace of organic detritus. Occasional rather poorly preserved (crumpled/broken) pollen grains/spores were noted one perhaps of hazel (*Corylus*)
4693	640	fill of northern boundary ditch	Approximately equal parts inorganic material and organic detritus. Many pollen grains/spores of variable preservation (some crumpled/broken, others well preserved – identifiable remains included, but were not restricted to, trilete spores (perhaps *Sphagnum*), birch (*Betula*), alder (*Alnus*), lime (*Tilia*) and possibly hazel (?*Corylus*) and plum/cherry family (?*Prunus*)

Table 12 *Area 2: Notes on microfossil remains and preservation (principally regarding pollen grains/spores) from selected samples with waterlogged preservation.*

Key: 'Con' = Context number; 'Sam' = Sample number.

Species	Name	A1	A2	Total
Canid	dog family	1	-	1
Canis f. domestic	dog	3	24	27
Equus f. domestic	horse	51	73	124
Sus f. domestic	pig	15	6	21
Cervus elaphus L.	red deer	1	-	1
cf. *Cervus elaphus* L.	?red deer	1	-	1
cf. *Capreolus capreolus* (L.)	?roe deer	1	-	1
Bos f. domestic	cow	124	49	173
Caprovid	sheep/goat	74	11	85
Sub-total		*271*	*163*	*434*
Unidentified		1650	875	2525
Sub-total		*1650*	*875*	*2525*
Total		**1921**	**1038**	**2959**

Table 13 *Hand-collected vertebrate remains by excavation area.*

Context	Sample number	Species/groups	Frag count	Notes
1002		unid	11	includes 1 mp lm shaft frag
1029		unid	1	1 burnt fragment of shaft ?lm
1036		horse	1	upper M3 - fragile
1042		unid	1	burnt mm shaft frag
1048		unid	1	1 lm tooth fragment
1090		cow	1	sesamoid
1090		cow	5	3 upper molars, 1 lower molar, 1 carpal/tarsal. Burnt
1090		horse	1	lower tooth, ?leached or heat damaged
1090		sh/g	1	phal 1 burnt, white in places, and fawn
1090		sh/g	2	pelvis frag and prox rad
1090		unid	20	lm and mm shaft frags - mainly mm - fb extensive
1090		unid	36	includes mm1 dist hum (bt), part of atlas (bt), lm mand frags (both burnt and ?unburnt), lm and mm shaft (incl. mm tib), lm teeth frags - probably cow, mm cran
1090	SA15	unid	1	bt frag
1094		cow	1	upper molar
1094		pig	1	1 fragment of very large pig male canine (2 frags but fit together - fb damage) - probably wild boar
1098		unid	1	1 lm shaft fragment with rounded edges and eroded surface
1114		canid	1	small mandible (P2-P4)- fox-sized
1114		cow	9	m/c, m/t x 2, pelv, prox rad, 3 x M1/M2, 1 x M3 (heavily worn - elderly)
1114		horse	9	includes upper molar, a pair of canines, 2 matching incisors, mand has 2 molars, 2 premolars, mc (m), scrap rather frag. Incisors quite well worn ?20 +, canines little wear

1114		sh/g	1	m/t - mainly shaft, ?dg
1114		unid	76	includes lm rib, horse cran and mand fragments, mm shaft burnt and not burnt, lm shaft. Burnt remains blue/white
1115		?roe	1	tib shaft
1115		cow	2	2 hum shafts - cow, dog gnawed
1115		horse	3	scap (meas), tib, fem shaft (dog gnawed)
1115		sh/g	1	mand P4 (not erupted), M1, M2
1115		unid	1	1 lm frag
1115	SA53	unid	1	1 lm ?scap frag
1116		unid	3	2 burnt frags, 1 unid
1116		unid	10	8 burnt frags white, mm. 1 lm tooth frag, 1 lm ?pelv frag
1116	SA38	sh/g	1	M1/M2 poor pres
1118		cow	1	upper molar
1118		sh/g	1	1 tib shaft burnt
1139		unid	1	fb damage, mm shaft frag
1153		cow	1	juv individual represented - scap
1173		cow	1	upper molar, eroded enamel
1173		unid	1	burnt shaft frag, black, brown blue
1198		cow	1	cow astrag, burnt white/blue, traces of black
1198		unid	23	mostly lm shaft frags,burnt white/black, also some tooth enamel frags, also lm
1206		unid	1	1 mm burnt shaft fragment, mainly black in colour
1208	SA70	unid	23	mm fragments, some of which are shaft - to 27.5 mm but most less than 15 mm
1222	SA77	unid	7	mm fragments, incl shaft
1228		cow	7	6 lower teeth - 2 M3, 4 M1/M2 - some clearly from same tooth row and some lm mand frags in unid are probably related. 1 burnt distal tibia (black/white)
1228		horse	1	very eroded, prox shaft fragment
1228		sh/g	7	all burnt - some white/blue, others brown/black. astrag and m/ps seem to represent juv individuals
1228		unid	80	many fragments of mand, tooth enamel - lm, lm shaft frags - very fb, probablybelong to horse m/c or at least some
1228	SA82	unid	7	few burnt fragments, mm, to 14 mm
1266		cow	1	cow mand with unworm P3, probably erupted but very poor pres
1266		unid	12	poorly preserved shaft fragments, 1 burnt distal hum mm size
1266	SA95	unid	1	1 tooth enamel fragment, lm, fb damage
1271		unid	4	1 mm shaft burnt black,1 lm shaft (texture suggests could just be mand?), 2 unid mm shaft frags burnt white
1275		sh/g	1	astrag
1275	SA97	unid	18	mainly mm shaft frags
1277		cow	1	deciduous upper premolar
1277		sh/g	2	M3 and M1/M
1277		unid	50	mainly mm shaft frags, some are part of a tib (also very small dist tib fused frag), few lm tooth enamel frags, juv mm rib frags
1281		unid	5	5 mm tooth enamel frags
1296		unid	2	lm tooth frags, very poor pres
1312		unid	1	burnt mm shaft frag
1324		unid	2	1 unid, 1 shaft frag, mm, burnt
1327		unid	1	lm shaft

1361		unid	57	includes large mammal scapula and shaft fragments, extremely fragile and probably don't represent very many bones
1378		cow	8	upper P4-M3 x 2 left and right side, although isolated probably represent same animal
1389		unid	4	2 burnt lm tooth frags, 2 mm burnt shaft frags
1404		unid	1	1 mm shaft frags
1408		unid	1	1 lm enamel fragment
1414	SA129	unid	2	2 lm shaft frags, burnt white
1418	SA131	unid	12	medium-sized mammal fragments, incl shaft
1433		horse	2	poorly preserved phalnax fragment, lower tooth
1436	SA151	unid	35	tiny fragments of burnt bone and a collection of eroded fragments, including shaft and mand frags
1440		unid	4	2 lm tooth enamel, 1 lm shaft, 1 mm shaft
1454		cow	1	tooth fragment - poor pres
1464	SA156	unid	1	1 burnt fragment to 10 mm
1469		horse	1	upper tooth, fragile and broken
1486		unid	7	lm ?mand
1492		cow	1	pelvis frag
1492		unid	2	shaft fragments
1492	SA173	unid	9	
1497		unid	6	
1505		cow	2	dist hum fused frag, lower M1/M2
1505		pig	1	incisor fragment
1505		unid	35	lm scap frags, lm vert frags.
1507		sh/g	3	3 mandibular teeth M1-M3, probably same tooth row
1507		unid	2	mand frag, mm shaft
1513		cow	1	poor pres, very eroded surfaces
1518		unid	48	lm shaft frags, some probably same bone,ext fb, bones splitting into layers
1534		cow	1	lower M1/M2
1534		unid	20	lm shaft, including humerus. 1 burnt frag, white split/chopped down shaft, lm vert
1538		horse	1	eroded and broken first phalanx
1538		sh/g	1	sh/g tib burnt white/blue
1546		unid	10	burnt white fragments
1561		unid	5	at least 2 lm mand frags, 2 other frags may also be mand, 1 burnt mm ?tib shaft
1588		cow	1	cattle rad eroded surface and sort of 'leached' appearance
1599		cow	3	cattle 2 x upper molars, 1 x P3/P4
1603		unid	9	lm shaft frags - probably just one bone
1609		cow	1	1 upper molar
1609		unid	1	lm shaft
1621		sh/g	1	upper molar
1621		unid	1	lm shaft
1623		horse	2	upper teeth, 1 left, one right
1629		cow	1	M3, fragile and broken
1638		unid	15	
1642		horse	1	upper tooth
1642		unid	2	lm tib shaft and hum shaft
1669		cow	1	upper molar
1670		cow	5	4 upper molars, 1 mc

1670		sh/g	1	M1/M2 lower
1670		unid	76	mainly lm shaft fragments in appalling preservatoin, clearly some fragments represent same bones. Some prox rad frags, cran
1677		cow	2	upper molar, cal frag
1682		unid	5	burnt frags
1686		unid	1	1 frag lm unid
1730		unid	2	lm shafts - ?juv tib shaft with kns - fragile
1732		cow	1	fb damage - mand but bone in pieces. P4-M3
1738		unid	1	1 lm hum shaft, bone splitting into layers
1741		pig	1	lower male canine
1745		sh/g	1	m/t burnt shaft - juv
1745		unid	1	burnt frag
1746		horse	1	upper tooth
1752		unid	5	5 small frags, fb damage, to 30 mm
1759		unid	9	probably all from same bone ?lm m/p shaft
1761		unid	1	mm shaft frag
1764		sh/g	1	upper molar
1764		unid	4	lm shaft frags
1772		unid	1	lm shaft frag, quite robust
1851		horse	1	scapula
1854		unid	1	eroded lm hum shaft, probably cow
1857		unid	2	2 lm shaft
1866		horse	3	3 horse teeth, two uppers incl M3, 1 lower
1866		unid	3	
1873		cow	1	prox rad
1888		unid	1	1 frag lm tooth enamel
1922		unid	2	2 mm shaft frags, burnt white
1938		unid	4	burnt mm shaft frags, f damage
1977		unid	2	2 unid frags, ?lm vert
1981		unid	40	few burnt frags. Mainly lm shaft frags, and 1 ?scap frag. 1 shaft may be m/c, 1 may be horse m/p???
1987		horse	1	upper tooth
1987		unid	4	1 lm tib shaft, 2 lm shaft frags, 1 mm shaft frag burnjt
1998		unid	1	mm shaft frag
2005		horse	1	upper tooth
2011		unid	1	lm shaft
2015		cow	1	upper cow molar
2015		horse	1	upper horse tooth
2015		unid	7	lm shaft fragments
2016		unid	1	lm shaft, ? chopped/shaped
2134		unid	14	1 lm shaft, rest frags of a mm shaft
2139		sh/g	2	mand (burnt) and M3 frag
2139		unid	4	all burnt, white, black, pale brown, blue
2143		unid	27	some frags from same one - f damage, mm shaft burnt
2146		cow	3	cow skull, fragile but of fair preservation, slightly rounded edges, fresh breakage damage. Back of skull, orbits, nasal and premax are few frags of, incl upper premolar and molar. Horncores (short) and hole in the head. 1 scap frag (?dog gnawing)
2152		unid	1	lm shaft frag, burnt
2154		unid	1	mm shaft frag
2166		horse	1	incisor, fragmentary

2170		unid	1	
2190		dog	1	mand frag M1-M3
2191		cow	1	upper molar
2194		cow	1	mand frag
2194		unid	1	
2209		cow	7	4 upper molars and some enamel fragments
2231		cow	2	M1/2 and P4 lower
2231		unid	11	tooth fragments lm, probably cow
2301		cow	1	upper molar
2301		unid	1	mm shaft
2324		unid	1	lm mand frag
2328		horse	1	distal tib
2335		unid	1	burnt shaft frag
2337		unid	1	lm shaft
2343		cow	1	upper molar
2345		horse	1	1 upper horse tooth, bit fragmented
2347		cow	6	M1/2, dP4 x 3 unworn, P3, P2 - unerupted
2347		horse	1	lower tooth frag
2347		sh/g	9	dist tib, h/c, rad, uln, astrag frag, teeth (all bar teeth burnt)
2347		unid	73	includes burnt frags - mm and lm. Some frags very eroded. Frags lss than 10 mm not counted - quite numerous c. 40
2348		cow	1	astrag
2348		unid	6	mm rad shaft, lm shaft
2355		cow	3	mand with M3, 2 isolated teeth M1 and M2 - probably associated
2355		unid	8	some lm mand frags, lm shaft
2362		cow	1	split longitudinally distal tib
2362		horse	3	pelvis, 2 upper teeth
2362		sh/g	20	fragmented burnt remains, including phals and m/ps astrag and calc, 2 x uln and a pelvis frag. Also 2 dist hum appear to be unburnt
2362		unid	94	many burnt fragments - mm shaft, incl m/p, tib, rad, scap. Also vert, cran, sliver of h/c Some unburnt lm frags, shaft, 2?ulna, one of which ?eroded or worked?
2363		unid	3	lm shaft frags
2367		unid	1	lm shaft frag
2383		horse	1	ulna
2383		unid	27	includes lm mand and scap, ext fb damage
2384		horse	1	m/t
2384		unid	52	lm tib shaft, and lots of unid poorly pres frags - some is lm cran - preservation awful
2394		unid	11	lm shaft frags, incl tib, hum, m/c, rad - tib and rad probably split longitudinally
2396		unid	12	lm shaft and few mm burnt frags
2403		cow	1	m/c
2403		sh/g	1	M1/M2
2410		unid	28	
2414		unid	28	mostly lm shaft - m/t, hum, tib
2422		cow	1	M1/M2 (lower)
2422		unid	46	lm shaft frags
2428		horse	1	upper tooth
2432		cow	1	rad

2432		unid	31	lm shaft frags incl tib, m/t, mand frags. 1 fragment part of long bone - could be worked - very rounded edges
2434		unid	1	lm shaft frag, eroded surface
2435		horse	1	radio/uln
2438		unid	5	lm shaft frags
2440		unid	15	mainly lm, 1 mm shaft frag
2442		horse	1	dist m/p frag
2442		sh/g	3	M1/M2, rad, m/t
2442		unid	3	lm m/t shaft
2452		cow	1	mand frag
2452		horse	2	pelvis, upper tooth
2452		unid	3	
2453		cow	1	scap - hook damage
2453		sh/g	3	m/t shaft, calc, astrag - part burnt - brown, blue/black/grey
2453		unid	15	13 burnt mm frags- white and bluish frags - shaft and rib, lm tib shaft
2459		?red	1	phal1
2459		pig	1	hum shaft
2459		sh/g	1	prox rad
2459		unid	9	incl juv cow fem
2466		cow	1	scap
2466		sh/g	2	prox m/c burnt white, phal 1
2466		unid	35	lm axis, lm shaft, 32 burnt mm frgas- shaft, rib and vert
2484		horse	1	lower tooth M3
2504		cow	1	upper tooth frag
2504		unid	4	4 enamel tooth fragment
2515		cow	1	cow upper molar
2515		unid	25	
2517		cow	1	cran - orbit
2517		horse	1	incisor - ?8-12 years
2519		cow	1	astrag
2519		horse	1	pelvis
2519		pig	7	iso teeth = lower P4, M1, M2, M3 in crt and upper M1, M2, hum
2519		sh/g	3	P4, M1, m/p
2519		unid	22	includes lm tib and hum shaft, pig mand frags, lm cran
2523		unid	8	
2532		dog	1	canine frag
2549		cow	1	femur caput
2549		unid	35	lm shaft and femur frags, most frags probably the same bone, lm rib frags
2550		sh/g	1	radius, distal unfused
2550		unid	17	
2551		cow	1	calc
2551		pig	1	female canine, lower
2557		sh/g	1	rad
2557		unid	1	1 lm shaft frag
2577		cow	1	lower M3
2577		unid	31	lm shaft frags
2580		cow	1	cow m/t prox - chopped across shaft
2580		unid	2	lm hum shaft, mm tib shaft
2587		cow	2	calc, dist rad unfused

2587		sh/g	2	dist hum, calc
2587		unid	55	included mm shaft frags, lm shaft frags, many pieces of bone - layering
2592		cow	3	mand dp4 (P2, P3 and P4 below), M1-M3, scap, prox calc
2592		dog	1	?dog tooth frag
2592		unid	56	lots fb, lots lm rib frag, few lm mand and shaft frag
2617		pig	1	pelvis frag
2617		unid	5	incl. split m/p shaft
2619		unid	1	lm hum shaft
2645		cow	1	rad shaft
2645		horse	1	upper horse tooth
2645		sh/g	1	lower M3
2645		unid	7	lm scap frags etc
2656		unid	8	lm shaft frags incl hum, tib. Some chopped
2661		cow	3	pel, m/t, lower molar
2661		horse	1	upper tooth
2661		unid	11	lm scap, shaft, rib, ulna, mm shaft
2662		unid	3	mm mand frag, mm shaft, 1 burnt frag mm
2685		pig	2	fragmented remains of pig mand and large male canine - ?wild boar?. Bone concreted - awful
2689		unid	4	lm shaft frags
2706		cow	1	mandible - P3 (unerupted), dp2-dp4, M1-M3 (last probably not erupted)
2706		unid	10	lm rib, vert - very fragle
2717		horse	1	pelvis
2720		cow	1	m/t
2729		cow	3	occip condyle, m/t shaft - very eroded, pelvis
2751		cow	1	m/c
2762		unid	4	lm rib
2767		unid	4	lm rib frags
2770		unid	3	lm shaft
2804		cow	1	tib shaft
2804		horse	1	phal 1
2804		unid	3	lm hum (?horse), rad (?cow), lm ?scap
2807		cow	3	mand with P3 erupting, isolated M1, M2
2807		unid	2	lm mand, shaft
2808		unid	1	lm tib shaft - rodent gnawing and dog gnawing
2810		cow	2	mand, no teeth, isolated M3
2810		unid	1	lm tib shaft - gnawed
2828		red	1	fragment of antler ?worked
2828		sh/g	1	rad shaft, juv
2828		unid	4	lm pelv, lm scap, cran
2830		unid	2	rib frags
2856		unid	2	lm scap, lm rib
2857		unid	1	lm scap poss same bone and same as 2856
3001		unid	5	tooth enamel frags, prob mm
3006		sh/g	2	carpal and phal 1
3006		unid	6	mm shaft frags burnt
3011		sh/g	2	burnt - distal tib shaft unfused, distal m/p epiphysis unfused
3011		unid	35	incl bt mm atlas and other shaft and vert frags - all burnt, 10 tooth enamel fragments - fb damage

3015		cow	1	calc
3016		unid	2	
3027		unid	1	burnt mm shaft frag
3028		pig	1	ulna
3045		pig	1	scapula frag
3045		unid	9	mm m/p shaft, lm shaft - most frags probably from this bone
3046		cow	2	cow lower M1/M2 x 2
3046		pig	1	astragalus, eroded and concreted but ?kns across bone
3046		sh/g	1	astragalus burnt white
3046		unid	20	includes frags of mm mand (?pig and ?sh/g), burnt mm shaft frags and unburnt frags
3062		sh/g	1	prox rad (in a few pieces)
3073		dog	1	distal tib
3083		horse	15	horse teeth and tooth fragments, probably all the same animal, both sides represented, incisors unworn/unerupted
3083		unid	2	2 mm shaft frags burnt
3085		horse	1	femur shaft
3085		unid	14	some frags possibly from horse femur
3086		unid	16	some mm, some lm
3091		unid	7	very poorly preserved ones, fb damage, probably all the same bone. Lm shaft
3097		sh/g	2	burnt astrag and calcaneum
3097		unid	18	17 of frags burnt, prob sh/g tib, scap, hum frags
3183		horse	2	horse teeth and fragments, lower, 2 more complete possibly left and right P2
3183		unid	21	horse tooth enamel frags
3196		horse	1	incisor unworn/unerupted
3214		unid	72	45 burnt bone - lm and mm bone, 27 unburnt bone probably only one bone represented
3217		unid	6	
3218		cow	1	prox rad frag
3246		horse	2	pelvis frags, could be the same bone
3263		horse	1	m/t complete
3281		unid	1	1 mm rad shaft burnt black/brown
3283		cow	1	1 cow M1/M2 - leached appearance
3332		unid	12	fb damage, burnt white fragments, 1 mm shaft frag
3452		cow	4	4 teeth, probably a tooth row, rather fragmented. P4-M3
3552		unid	1	
3572		cow	1	phal 2
3592		cow	2	mand frag and M3
3592		horse	26	23 teeth or fragments of teeth, representing both sides of jaw incl. 5 decid premolars and 4 molars animal of circa 2 to 2.5 yrs, 1 pelvis, 2 def. horse mand frags
3592		unid	91	includes many fragments from horse mandible which could be put together?
3595		unid	16	lm shaft frags
3604		cow	1	M1/M2 lower
3604		horse	1	pelvis frag
3604		unid	25	incl. lm rib, mm rib, lm vert, mand
3614		cow	1	calc

3614		dog	6	mandible with M1 and M2 - similar size to ref spec. 3 m/ps (proably m/cs), distal scap
3614		unid	1	lm vert
3694		cow	5	max+ (M1-M3), m/c, astrag, carp, phal1
3694		horse	1	mand with P2-P4
3694		unid	2	lm fem, mm ti shaft
3715		unid	1	lm shaft
4067		unid	29	mm burnt frags, shaft, vert, rib
4082		dog	1	dog tib shaft, slightly larger than fox
4101		cow	1	pelvis frag
4101		dog	2	small shaft frags of ulna and rad
4101		unid	16	5 burnt mm shaft frags - white. unburnt shaft frags
4103		cow	1	rad shaft
4122		unid	16	1 lm enamel frag, rest burnt frags, mm shaft and lm shaft
4123		unid	1	lm shaft, ?tib
4152		unid	8	
4304		unid	3	lm tooth enamel fragments
4310		horse	15	set of upper teeth plus three incisors, one not worn. Horse ?4-5 yrs
4310		unid	8	concreted and unrecognisable ?cran
4489		cow	1	upper molar
4502		cow	1	upper molar
4502		unid	3	2 lm tooth enamel frags, 1 mm shaft frag burnt
4504		unid	19	18 burnt frags, white, 1 unburnt mand
4520		unid	1	1 lm tooth enamel
4525		cow	5	2 upper molars, 1 lower M3, mand frag, horncore
4525		horse	1	lower horse tooth
4525		pig	2	1 cran frag, 1 lateral phal
4525		unid	110	many lm (prob) cow cran frags, mand frags, lm rib
4544		cow	3	mand frag, iso P3, M3 - last very fragile
4544		unid	5	mainly lm frags
4547		cow	5	M1/M2, mand, isolated dp3, 4 and M1 - probably from mand
4547		unid	28	incl. lm rib, shaft
4563		unid	1	1 burnt bone fragment, lm shaft
4633		cow	1	lower premolar
4633		sh/g	1	m/p epiph fused - dist
4633		unid	1	2 burnt frags, 1 lm
4638		horse	2	fragments of two teeth
4676		cow	2	upper P3/4, broken dp4 lower broken
4676		pig	1	M3 possibly upper as has splayed roots
4676		sh/g	1	lower M3
4676		unid	44	small collection of burnt fragments, mainly mm, and some unburnt shaft frags - rather broken and layering
4690		cow	3	2 pelvis frags (pro same one), upper molar
4691		horse	1	horse mand, P2-M2
4695		cow	1	1 cow calc frag
4706		unid	8	very poor, lm
4743		unid	2	burnt mm shaft frags
4768		cow	2	upper molar, mand - no teeth and made up of quite a few fragments
4768		sh/g	1	lower M1/M2
4768		unid	10	some bits probably from mandible

4774		cow	1	mand - P3-M3
5031		horse	1	1 horse upper tooth
24001		dog	14	fragments of mandible and maxilla and isolated teeth, all part of same animal
24001		horse	2	1 incisor, 1 canine
24001		unid	140	many frags of lm cran, also probably dog
24003		unid	11	incl. lm rib, scap, mm shaft
24005		cow	1	dist m/t
24005		unid	9	lm shaft and rib
24007		cow	1	distal rad
24007		horse	1	humerus, ?dg of distal artic and prox
24007		unid	10	incl lm rad, pel
24033		cow	1	M1/2 lower
24039		unid	8	lm shaft frags, some of which probably represent same bone

Table 14 *Hand collected vertebrate remains by context*

APPENDIX 7: CONSERVATION ASSESSMENT

By M. Felter

1. AIMS AND OBJECTIVES

This report aims to meet the requirements of MAP2 (English Heritage, 1991) to produce a stable site archive (Phase2: Fieldwork). This has involved X-radiography and an assessment of the condition, stability and packaging of the finds. Urgent first-aid treatments have been undertaken as required, to enable safe storage for the long term.

The potential of the assemblage for further analysis and research is also discussed (MAP2 Phase 3: Assessment). The condition of the various classes of material is summarised and indicators of unusual preservation are noted. There are recommendations for investigative conservation, for additional specialist support, and topics for further research are raised.

2. PROCEDURES

All metal finds were X-rayed using standard Y.A.T. procedures and equipment. One sheet of film were used and given a reference number in the YAT Conservation Laboratory series. The X-ray number was written on the packaging for each object X-rayed. Each image on the X-ray was labelled with its small find number. The plates were packaged in acid-free archival envelopes. The plate number was added to the YAT Online Photo Archive and linked to the IADB find record for each object.

All finds were examined under a binocular microscope at X20 magnification as well as viewing the X-rays were they existed. The material identifications were checked and observations made about the condition and stability of the finds. Remedial conservation treatments were carried out where appropriate in order to stabilise the material for long term storage. Assessment and treatment details were recorded in the Conservation Work Record area on IADB, the information can be printed out through SQL Query.

3. QUANTIFICATION

A total of 67 small finds were assessed and 11 X-rays produced (X6971-77, X7094-96 and X7100). The number of objects in each material category is listed below:
Antler 3
Bone 2

Copper alloy 14
Glass 3
Iron 16
Jet-like 18
Lead alloy 6
Silver 5

4. ASSESSMENT

4.1 IRON

Of the sixteen iron objects, all but two were found to be in good condition with no active corrosion recorded on any of the objects. This is due to the fact that the metal cores were mineralised, all the corrosion having already taken place. Small find 304 was found to be plated with copper alloy and with a copper alloy band showing evidence of solder/brazing. There were no mineral preserved organic material detected.

4.2 NON-FERROUS METALS INCLUDING COINS

Copper Alloy The copper alloy objects ranged in condition from good to poor with some pitting and damage to the metal cores being visible, however there was no correlation between the amount of metal left in the core to the condition of the objects. Six objects from the group were coins or possible coins. One object, Sf59 had active bronze disease and so desiccated storage is essential to avoid further deterioration.

Lead Alloy There were six lead alloy objects and only one of these was found to be in poor condition, the other five being in good to fair condition. Two objects, Sf77 and 78, had traces of active corrosion, again desiccated storage is essential as well as storage away from sources of organic acids such as paper and card.

Silver All of the silver small finds were coins and all were in good condition apart from one, Sf56, which was in fair condition. There was no evidence of active corrosion although Sf56 was in a fragile state with areas of cracking.

4.3 ORGANIC MATERIALS

There were three antler small finds and two of bone. The antler was generally in fair condition, with slight wear, though none were found to be unstable. All were dry packed. The two bone objects were in good and fair condition respectively, Sf321 being found to be

charred at the ends. Sf321 was wet packed, Sf22 dry packed. All bone and antler was positively identified in terms of material.

4.4 GLASS

There were three glass objects, two of which were dry packed (Sf138 and 401) and one was wet packed (Sf108). The wet packed piece was put through acetone dehydration and consolidation as a hydrated silica surface was noted when the object started to dry. The two dry pieces were in good condition despite some cracking which are now stable.

4.5 JET-LIKE

There were eighteen jet small finds but of those, only four were actual manufactured objects. All four of the manufactured shale and jet objects were found to be in good condition with very smooth surfaces and are stable. There was a whole series of un-worked jet-like material pieces and these were X-rayed to determine material identification and this information has been filled in on the individual IADB records.

4.6 CONCRETION/IRON PAN

A sample of the large quantity of concretion/iron pan was X-rayed to determine if any had slag structures or contained objects. Samples from 9 contexts were X-rayed in all, 7 of those being from specific sample numbers (C1410, C3046, C1116 SA038, C1324 SA106, C1404 SA118, C1341 SA109, C1412 SA125, C1202 SA69 and C1222 SA77). None of the concretions examined showed signs of slag structure or object shape. Further objects can be X-rayed if the archaeometallurgist requires it.

4.7 STATEMENT OF POTENTIAL

Indicators of preservation

There were no indicators of specific preservation conditions.

Dating evidence

There were two coins (Sf56 and Sf54) which could be readily identified as being from the reign of Magnentius (AD350-353) and Sf54 also had a clear mint mark (TRPS) which identified it as coming from Treveri (Trier, Germany). There were several other coins which may also be from this date.

Sf62 was a silver long cross penny from the reign of Henry III, the 'Long Cross' coinage was used between 1216 and 1272 (Seaby, 1974, 75).

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APPENDIX 8: ASSESSMENT OF A BRONZE AGE CREMATION

By M. Holst

A Bronze Age cremation burial was uncovered during mechanical excavation of drainage trenches to the north-east of the York Archaeological Trust A1 Excavation Area. The bone was found within an inverted Bronze Age collared urn, probably dating to the early part of the second millennium BC. It is probable that only a proportion of the bone and vessel originally buried have been recovered.

Burial No	Urned	Bone State	Preservation	Weight (g)
U/S	In BA collared urn	White	Good	25.9g

The cremated bone was assessed following English Heritage guidelines (Mays 2002). The total weight of burnt bone was recorded and the amount of fragmentation was assessed. In addition a measurement was taken of the size of the largest fragment. The bone was scanned quickly for any immediately identifiable fragments of animal or human bone.

Osteological assessment confirmed that the bone is human. It is well-preserved and the fragmentation is moderate, with the majority of fragments in the 10mm or larger category. The largest bone fragment is 50.5 mm in size.

This find is clearly of significance, considering it is the first collared urn recovered from York. Other probable Bronze Age activity at East Heslington includes large pits, flint tools and a probable gully (Mark Johnson, *pers. comm.* 08/07/2009*).* Considering the large size of the recovered bone fragments, the cremated bone ought to be analysed in full according to standards set out by McKinley (2004). This would include recording the degree of fragmentation, cataloguing any identifiable fragments of bone and recording the colour of the bone fragments. The latter can contribute information on the conditions in which the body was burnt, including pyre temperature. It is expected that the material will yield an approximate age, but doubtful that the sex and evidence for pathology can be identified.

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APPENDIX 9: ASSESSMENT OF METALWORKING WASTE

By C. Mortimer

1. INTRODUCTION

Heslington East is a large area of field systems with ring ditches, mainly of Iron Age date, with occasional Roman evidence. The metalworking evidence comes from area A1, with none excavated from the equally-large area A2. The material is mostly concentrated in a small number of contexts, notably a cluster of Iron Age contexts towards the western edge of A1 described as a large spread of cobbles with iron slag and smithing hearth bottom fragments, being the waste or hard standing from a 'kiln' (furnace). The furnace itself may have been just to the west of the excavated limit.

More than 200kg of material relating to metalworking was investigated, comprising a selection which was small-finded (totalling nearly 30kg) and bulk samples in large buckets (totalling more than 175kg). Due to the assessment nature of this investigation, the small-find samples were each identified individually, but the larger samples were only briefly assessed, without unpacking the whole sample bucket.

2. FERROUS METALWORKING

The majority of the metalworking evidence on the site relates to ferrous metalworking.

The largest group of material came from the area of 'possible kiln remnants' in the west of A1, comprising about 92kg. One very large slag block (sf88, context 1995) weighed about 10kg and came from a context away from this concentration; this could be a furnace bottom from iron smelting. Two other large blocks were found in the bulk samples (419 from context 2542). None of these very large blocks were found in contexts from the key area of concentration.

The small-find pieces include several examples of smithing hearth bottom (shb). These are large plano-convex blocks of slag formed at the base of a smithing hearth, as components from the furnace, fuel and the iron objects themselves combined in the heat of the hearth. The examples weighed here ranged from 303g to 2008g.

Amongst the bulk samples, 73kg was identified as being mainly concretion (samples 109, 403 and 408) Areas of iron concretion or iron panning were briefly examined during

excavation. These mainly occurred in the north-western areas of A1, but also as a scatter elsewhere. This material could have acted as a source for iron smelting. Amongst the bulk samples 132.5kg was identified as being mainly iron slag. A smaller sample, 38 from context 1116, had pipe-like runs of slag, which may be an indicator of smelting. Three of the bulk samples (358, 376 and 420) were mainly soil, but had occasional pieces of charcoal and small pieces of iron concretion or slag, although they were not instantly diagnostic of intense metalworking. One sample, 376 from context 1670, contained thin (<1mm) stick-like material, which was passed on for environmental study.

Only small quantities of vitrified furnace lining (vfl) or other highly-fired clay was found on its own, although there were several pieces of iron slag connected to furnace lining (slag/vfl).

Very few iron artefacts were reported at the site, apart from nails and one 'tapering bar' (not seen), so this does not help explain the nature of the operation at the site.

Hammerscale was sought, using a magnet, but not found very frequently; where it was found, it was in the form of flake hammerscale. This low recovery rate may partly be because the bulk samples were quite damp at the time of assessment.

3. NON-FERROUS METALWORKING

Context 1198 yielded a small collection of crucible fragments weighing 83g, including one originally identified as a tuyère (sf14). The fragments are too small to make a thorough reconstruction, although one fragment may be from the area of a lip and sf14 could be from a bowl shaped vessel, perhaps about 50 to 60mm in diameter at the rim. Traces of vitrification on the inside but not the outside indicates that heating was from above, which has often been noted on Iron Age crucibles, for example at the classic sites of Gusssage All Saints and Glastonbury Lake Village (Spratling 1979; Mortimer and Starley 1995). The Heslington fragments have a grey fabric (Fabric 11) with some areas of purplish deposits, which could mean that they were used for melting silver alloys, although this should be checked, eg by using X-ray fluorescence analysis. Apart from these crucible fragments, there is very little other evidence for non-ferrous metalworking at the site, with the exceptions of sf48 (context 1534) which seems to be lead casting waste, and sf305 (context 3062) which may be a rather roughly-formed copper alloy ingot. A very small dark piece of fired clay (sf342) could possibly be a piece of mould, or just a well-fired fragment of clay. A piece of stone (sf85) was initially identified as copper ore, but it does not have a classic form, and a geologist might be better placed to give an identification.

4. OTHER MATERIAL

Six samples (total weight 850g) of soft, red stone thought to be an iron compound (haematite or red ochre) were examined. Although some of it is roughly block-shaped, there are no clear signs of how it was used; some surface detail may have been lost during burial and after excavation. Ochre may have been rubbed on stone sample sf136 to give the surfaces their red colour, perhaps as a type of test. Haematite can be used as a source of iron in smelting, but other specialists may have ideas on the possible use or uses of ochre at the site, including in pigments or pottery manufacture.

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6. TABLE

Context	SF	Sample	ID	Weight	Comments	Note
1198	14		crucible	83	several pieces. Grey fabric, purple-ish deposits.	repackage. SF14 is only one frag, originally id as tuyere
5065	309		FC and slag	26		
2645	240		Fe conc	215	2x lumps	
1070	21		Fe slag	536	Part shb, in the shape of a 'slice'. Depth about 50mm, radius c. 120mm	
1277	74		Fe slag	10		
1312	73		Fe slag	73		
1327	330		Fe slag	2206	Single large chunk, irregular	
1406	327		Fe slag	45	2x lump	
1537	25		Fe slag	654	Large block, broken but max extant diameter = 160mm. Very dense, dark, flatter on one side.	
1543	26		Fe slag	213	2x lumps, vesicular inside	

1584	63		Fe slag	827	x4 lumps. Two are shb. Wt= 303g, diameter = 90.5, depth = 40.5. Wt=376g, d = 105, depth = 46	
1995	88		Fe slag	10000	Single huge slag block, irregular shape. Occasional stones within matrix. About 240mm in largest dimension, but not particularly diagnostic form.	
2220	336		Fe slag	270	1x part SHB wt=270, d=81, depth = 32.5	
2221	337		Fe slag	1280	Part shb, wt=793, depth = 68.5	
2355	334		Fe slag	1658	large collection, dark chunks, irregular in form	
2373	143		Fe slag	59	Dense	
2373	142		Fe slag	177	Rounded channel within it (stick impression?)	
2373	144		Fe slag	280	Shb wt=280, d = 78.5, depth = 57.2	
2373	145		Fe slag	400	Single piece	
2373	146		Fe slag	191	in rim shape, porous, orangey	
2373	168		Fe slag	74	x1, tiny shb?	
2373	169		Fe slag	24	blob	
2373	171		Fe slag	15	blob	
2377	160		Fe slag	334	x4 lumps. Two are shb. Wt= 303g, diameter = 90.5, depth = 40.5. Wt=376g, d = 105, depth = 46	
2399	141		Fe slag	642	Irregular but could be part shb	
2493	203		Fe slag	197	with flatter surface	
2516	210		Fe slag	501	shb, rather flat. Wt = 501, d = 121.5, depth= 30	
2516	205		Fe slag	10		
2516	211		Fe slag	145	crumbly	
2516	199		Fe slag	15		
4615	328		Fe slag	15	Single piece	
5052	310		Fe slag	35	3x lumps	
U/S A1	358		Fe slag	3352	About 100 small lumps	
U/S A1	331		Fe slag	2008	Wt=2008, d= 200, depth =73, dimple on top	
2461	198		Fe slag/vfl	10		
U/S A1	335		Fe slag/vfl	26	slag and vfl	
1670	117		fired clay	40	oxidised clay blobs	
1793	342		fired clay	1	very dark, could be piece of mould	
1440	19		haematite	422	block	
1534	349		haematite	13	rounded at back	
2691	252		haematite	69		
2804	350		haematite	64		
2825	276		haematite	12		
U/S	348		haematite	270	block and frags	
2373	170		Slag	1		
2510	206		Slag	4	run	
2542	214		slag	102	Dark, quite heavy	
2555	355		slag	937		
U/S A1	351		Slag	286	very dense, dark, vesicular, ?post-med	

1102	40		slag/vfl	45	dark but not dense	
4768	329		slag/vfl	37	very pale, white-ish, flat with runnels	
1987	85		Stone	665	Labelled as 'copper ore', but not obvious. Layered effect within.	
2345	136		stone	71	smeared or rubbed with red	
1202	13		vfl	12	x6 lumps	
1208	35		vfl	2		
1271	72		vfl	21	x3 lumps. Dark and dense inside	
1355	354		vfl	4		
1579	338		vfl	1	dribble/drop	
				40		
				29685		
Bulk				**(wt in kg)**		
1116		38	slag		pipes' of slag	
1341		109	concretion	5.5		
1670		376	soil		dusty soil, some ?fl hs	strange ?envi sample, thin sticks
1670		358	soil		clean, sandy, occasional stone, charcoal	
1721		409	Fe slag	7	1x large lump (2kg)	
2361		357	Fe slag	23	medium sized lumps, some concretion, 'kiln area', 2 or 4 boxes (only seen 2)	
2372		408	concretion	15.5		
2373		381	Fe slag	55.5	occ fl hs	
2440		403	concretion	11		
2461		400	Fe slag	1	small lumps	
2504		413	fe slag	5	medium sized lumps	
2516		415	Fe slag	11	fe slag and concretion	
2542		419	Fe slag	30	2x really large lumps (7 and 8kg) but not distinctive shape	
5112		420	soil	10.5	small bits of concretion, slag	
section 373			sample		spot sample, hammerscale' checked but no sign of hs, still damp, appears to be sandy soil; also 5kg of small samples, similar, some concretion possibly slag?	
				175		

APPENDIX 10: COINS

By C. Barclay

AE radiate; Gallienus; AD 253-68
Sf24; Context 1563

AE sestertius; C2nd AD
Sf45; Context 1554

AE sestertius; C2nd AD
Sf46; Context 1554

AE illegible; poss. mid C4th
Sf50; Context 1534

AE reduced maiorina; Constantius II(?); c. AD 350s
Rev.) FEL TEMP REPARATIO; falling horseman
Sf51; Context 1534

AE Centenionalis; Magnentius; AD 350-53
Rev.) Christogram
Sf53; Context 1534

AE Centenionalis; Magnentius; AD 350-53
Rev.) Christogram
Sf54; Context 1534

AE reduced maiorina; Constantius II(?); c. AD 350s
Rev.) FEL TEMP REPARATIO; falling horseman
Sf55; Context 1534

AE Centenionalis; Magnentius; AD 350-53
Rev.) Christogram
Sf56; Context 1534

Barbarous imitation of maiorina; “Constantius II”; c. AD 350s
Rev.) FEL TEMP REPARATIO; Emperor in galley

Sf57; Context 1534

AE; Constantius II(?); c. AD 350s
Sf59; Context 1534

Henry III; voided long-cross penny; Class III; 1247-72
Sf62; U/S

Barbarous imitation of radiate; “Tetricus I/ II”; c. AD 270s
Rev.) Spes adv. left
Sf93; Context 1911

George III; halfpenny; 1st issue; 1770-75
U/S; Sf409

Most coins need to be cleaned.

APPENDIX 11: MISCELLANEOUS OTHER FINDS

By A.J. Mainman

1. CHARCOAL

Small fragments of charcoal were retained from the following contexts:
1116, 1208, 1219, 1222, 1228, 1275, 1404, 1418, 1436, 1676, 3006, 3046, 3604, 4103, 4307, 4676, 4721, 3314, 24001

2. SHELL

Two pieces of oyster shell were retained from unstratified topsoil and from context 4768

3. TOBACCO PIPE: STEMS ONLY

A few sherds of tobacco pipe stem, two with fragments of bowls adhering were recovered from the following contexts 1686, 3144, 3175, 3992, 4233 11001, 20005

4. MORTAR

A few fragments of mortar were retained from contexts 1351, 1752

5. STONE

Burned and fractured pebbles and cobbles were retained from a number of contexts and are likely to include pot-boilers. These are listed below:
A2 u/s, odd shaped pebble, probably natural
1090, burned and fractured pebble
1094, burned and fractured pebble
1098, burned and fractured pebbles
1099, burned and fractured pebbles
1116, 2 pieces burned and fractures pebble
2422, fractured cobble

6. GLASS

A few sherds of post-medieval and mdern glass were recovered and are listed below.
1357, modern wine bottle base
1312, modern opaque glass fragment
1686, brown wine bottle sherd – post medieval

4615, modern window glass

2224, post medieval wine bottle base

4005, post medieval vessel sherd

20005, 19th century aqua utility bottle base

7. HUMAN BONE

In addition to the cremated human bone, two pieces of charnel were recovered.

US, possible human long bone fragment

2729, human rib bone

APPENDIX 13: GEOARCHAEOLOGICAL ASSESSMENT

By C. Carey & L. Stafford, Oxford Archaeological Unit Ltd.

1. INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 In 2007 outline planning permission was granted by York City Council for the development of University campus at Heslington East, following a public enquiry. The development will involve a combination of building construction and landscaping with a lake up to 1km in length on the southern side of the site

1.1.2 The development of the Heslington East campus required archaeological evaluation and subsequent mitigation. The archaeological project was managed by PJO Archaeological Consultants (Patrick Ottaway), with York Archaeological Trust undertaking the field investigations and post excavation analysis.

1.1.3 The initial archaeological evaluation revealed a wind blown sand to a depth of *c* 0.3m BGL. Below this a complex series of alluvial deposits were found intersecting a sequence of Pleistocene sediments, with well-preserved and deeply stratified (down to c. 2.5m BGL) Holocene archaeological deposits. The complexity of the evolution of the landforms at Heslington East necessitated a geoarchaeological study, which was undertaken in tandem with the archaeological site excavations during the summer and autumn of 2008. The geoarchaeological component of the investigation was undertaken by Oxford Archaeology, on behalf of York Archaeological Trust.

1.2 SITE LOCATION, TOPOGRAPHY AND GEOLOGY

1.2.1 The site of Heslington East campus is to the south of the city of York on the east side of the village of Heslington (Figure 1; NGR SE 4636 4505), occupying an area of c. 305ha of arable land.

1.2.2 The topography of the site slopes from c. 32m OD in the north before falling southwards to c 11m OD. It occupies, from north to south, an area described by the BGS 1:50000 drift geology as hummocky glacial into glaciolacustrine deposits dating from the late Pleistocene period (Devensian) (Figure 2). The underlying solid geology is Bunter and Keuper sandstones (BGS sheet 63). During the Devensian glaciation, the Vale of York was glaciated with ice moving south-eastwards and ending at the large proglacial lake, Lake Humber. Laminated clays forming the Hemingbrough Glaciolacustrine Formation were deposited within this lake. The ice overrode the lake deposits forming a terminal moraine at Escrick

which is now confirmed as the last glacial maximum limit (LGM). The ice then retreated north, forming another moraine complex at York, (with others further to the north-west). Long-lived drainage routes in the ice resulted in linear esker belts and the impounding of proglacial meltwater resulted in several glacial lakes in front, between and behind the moraines (Cooper *et. al* 2007).

1.2.3 Some Holocene alluvial deposits are mapped trending north - south, against the general trend of mapped Devensian deposits trending east - west. Major Holocene alluvial deposits in the area are associated with the river Ouse, flowing north – south, some 3.5km west of the Heslington East site.

1.2.4 Detailed archaeological excavation was carried out in two main areas (A1 and A2) within the development (Figure 3). Area A1 crossed the boundary between the hummocky glacial deposits and the glaciolacustrine deposits. Area A2 is located entirely within the mapped extent of the glaciolacustrine deposits.

1.2.5 Although no major river channels flow through the Heslington East site, there are a number of land drains visible on the surface draining from north to south. The presence of the drains highlights the high water table and a general hydrological movement of water southwards, draining from the glacial hummocky deposits into the Ouse Valley.

1.3 ARCHAEOLOGICAL CONTEXT

1.3.1 The original archaeological strategy for the site was to excavate two large areas (A1 and A2), both located on geomorphological units dated to the Devensian. Dealing with Holocene archaeology on this type of geology is usually relatively straightforward, with a simple strip, map and sample exercise normally sufficient.

1.3.2 However, during the course of the archaeological investigations at Heslington it became apparent that the Holocene sedimentary sequence was locally much more extensive and complex. In places stratified archaeological features were located within Holocene sediment units, extending down to 2-3m BGL. These features were all located in the northern area (A1), and were not visible on the interface of the machine cut surface.

1.3.3 The presence of archaeological features cut into the top of the sediments overlying the Pleistocene gravels meant that strategies for dealing with the archaeological remains at Heslington had to be modified. This became evident when it was observed that some areas of the site had stratified deposits dating to the Holocene above Pleistocene deposits. There was also the possibility that archaeological contexts, not visible from a surface strip, were

hidden within Holocene deposits. Therefore, any deposits formed during the Holocene had the potential to contain archaeological features. The depth and lateral extent of the Holocene deposits was poorly understood in relation to the archaeological site taphonomy setting.

2. AIMS AND OBJECTIVES

2.1 The principle aim of the geoarchaeological study was to produce a firm chronostratigraphy for the Heslington East site, providing a narrative on the evolution of the Holocene landscape in which the human activity took place. This would allow definition of the archaeological potential of different areas of the development site and provide data for informing the ongoing archaeological mitigation strategies. In particular definition of the Holocene-Plesitocene sedimentary boundary was a key issue.

2.2 The field investigation set out to achieve this through the following objectives:

2.2.1 Produce a geomorphological map of the development area.

2.2.2 Produce an understanding of the sediment stratigraphy in Areas A1 and A2 and provide a chronological bracket for the sediment sequence.

2.2.3 Identify deposits of high palaeoenvironmental potential within the site to aid landscape reconstruction.

2.2.4 Produce a descriptive narrative of the evolution of the landform throughout the Holocene.

2.2.5 Translate the results of this study into a wider regional context.

3. METHODOLOGY

3.1 In order to achieve the aims and objectives a series of field investigations were undertaken. Data capture was through the combined effort of staff from York Archaeological Trust and Oxford Archaeology.

3.2 The field investigations in areas A1 and A2 comprised recording of a series of excavated sections to log sediment stratigraphy, identify deposits of high palaeoenvironmental potential, identify materials suitable for radiocarbon dating and identify the intersection between the Holocene deposits and the Pleistocene sands and gravels;. In addition a series of gouge core transects was carried out across the wider development area (Figure 3; Table 1)

Geomorphic zone	Location	Method
1	Trench L6, Kettle hole transect	90m long, with hand auger samples logging sediment stratigraphy at 10m intervals
2	Trench 6	The trench was 30m long x 2m wide and was excavated to c. 1.5m BGL. Recorded sediment stratigraphy along south facing trench section.
	Transect 5	155m long, with hand auger samples logging sediment stratigraphy at 5m intervals
	Transect 1	220m long, with hand auger samples logging sediment stratigraphy at 20m intervals
	Geoarchaeological log, Palaeo 4 (Trench 4)	30m long x 2m wide, excavated to c. 2m BGL. Recorded sediment stratigraphy along south facing trench section
	Geoarchaeological log, Palaeo 5 (Trench 5)	30m long x 2m wide, excavated to c. 2m BGL. Recorded sediment stratigraphy along north facing trench section
3	Transect 4	130m long, with hand auger samples logging sediment stratigraphy at 20m intervals
	Area A2, Trench 1 North	50m long x 2m wide, excavated to c. 1.5m BGL. Recorded sediment stratigraphy along south facing trench section
	Area A2, Trench 2 South	80m long x 2m wide, excavated to c. 1.5m BGL. Recorded sediment stratigraphy along south facing trench section

Table 1 *Summary of geoarchaeological field investigations*

3.3 It should be noted that the geoarchaeological investigation was conducted part way through the archaeological excavation. The level of context recording by the archaeological investigation was extremely detailed, and covered a greater number of contexts than that required by the geoarchaeological investigation to log sediment units. Therefore, the sediment units recorded in this geoarchaeological investigation are unique to this investigation and do not translate to the archaeological contexts recorded during the excavations by YAT.

3.4 All sediment units were described according to Jones et. al, (1999). Details of sediment stratigraphy included colour, compaction, texture, sorting, structure, inclusions (including abundance, shape and material) and the nature of observable contacts/boundaries. General data sources included a Holocene topographic template, derived from Lidar data, BGS drift

geology maps and OS maps. YAT provided the coring teams, as well as the analysis of all excavation sections, including transect 5, Area A1.

4. RESULTS

4.1 GENERAL

4.1.1 From the initial field investigations and subsequent sediment logging it was clear that the site at Heslington East contained a complex sediment stratigraphy. Subtle variations in sediment units were observed both laterally and vertically, and many deposits exhibited internal bedding or fine laminated structures. In particular the colour and composition of the sediment units often did not differ substantially between deposits presumed to be of a late Devensian date and the Holocene sediment accumulations.

4.1.2 The archaeological investigations revealed clearly stratified Holocene sediments deposited within a defined channel network and extremely localised floodplain in Area A1, with a depth of Holocene deposits reaching down to 2-3m BGL. In Area A2 the depth of the Holocene deposits was substantially less, down to approximately 1-2m BGL, but also contained well defined palaeochannels. The Holocene palaeochannels fills in A1 were dominated by clays, silts and fine sands, whereas the Holocene fills of the palaeochannels in the southern area of A2 were dominated by coarse sands and silts.

4.2 LIDAR ANALYSIS

4.2.1 The Lidar topographic surface model for Area A1 (Figure 5) clearly shows the north-south topographic trend of the landform, with a kettlehole as the dominant landscape feature. The Lidar does, however, reveal what appears to be a negative surface feature at the southern extent of A1. This was trending towards the southwest and possibly represents a large palaeochannel. However, the form of this feature is difficult to define in Area A1 because of the dominant north – south aligned topographic trend.

4.2.2 There is no indication from surface topographic expression of the complexity of palaeochannel deposits encountered in Area A1 during archaeological excavation. In A2 there is a topographic high spot, which relates to boulder clay deposits. In this area, much of the complexity of the lower Holocene deposits was sealed by a top surface layer of aeolian derived sand, which masked much of the subtlety of the topographic variation. This sediment unit was removed by machine prior to the geoarchaeological study commencing.

4.3 GEOMORPHOLOGICAL ZONATION OF THE DEVELOPMENT AREA

4.3.1 A geomorphological map (Figure 4) was constructed on a local site level, based on the results of the geoarchaeological investigation. This is discussed here as it provides a conceptual framework on which description and discussion of the results can proceed. The map shows a substantial spread of clay and silt deposits formed on top of the Pleistocene deposits to the northwest of the site. Surrounding this are spreads of sand/silt deposits, presumably formed during the Holocene, although their date is unconfirmed. This effectively allows the site to be cut into three major geomorphic zones as follows:

GEOMORPHIC ZONE 1

Hummocky glacial deposits, shallow Holocene soil profiles on top of Devensian material.

GEOMORPHIC ZONE 2

Interface zone between geomorphic zones 1 and 3. Contains areas of locally eroded depressions, infilled with Holocene deposits. The Holocene deposits have the potential to extend down to c.3m BGL. Palaeochannel spring lines drain from geomorphic Zone 1, across Zone 2 and into Zone 3.

GEOMORPHIC ZONE 3

Glaciolacustrine deposits, with relatively shallow Holocene accumulations above boulder clay. Palaeochannel network interspersing boulder clays, with fills that are almost exclusively sand and silt dominated.

4.4 GEOMORPHIC ZONE 1

Kettle hole west transect (Figures 3 and 4)

4.4.1 The gouge core transect ran across the kettlehole to the northeast of the site (Figure 6). The transect revealed a thickening of the Holocene sediment sequence within the kettle hole, with accumulations of sediments with a high organic content, such as units 57 - 60 (a series of different peat units). The peat deposits were localised within the kettle hole, extending to a depth of c. 2.5m BGL at 30m west along the transect. The top of the transect comprised a relatively homogeneous brown grey clayey silt Ap (unit 13), underlain by unit 43 (grey orange silty clay with a trace of sand) to the east and west of the kettle hole. Below units 43 and 13 was unit 15 (grey orange clay trace of sand), which again extends for the length of the transect. It is only within the kettle hole that a deeper stratification is seen with the peat dominated units, underlain by a series of basal sand and silt dominated units.

4.4.2 It had been hoped that a substantial depth of organic infill would be preserved within the kettle hole, that would provide a more complete record of Holocene environmental change at

the site. Whilst this was not the case, the sequence still has the potential to provide substantial palaeoenvironmental evidence from some period during the Holocene.

4.4.3 Of this sequence the top units of 13 and 43 are unsuitable for palaeo-environmental analysis, due to soil respiration and mixing of the sediment sequence. Based on the results from this gouge core transect two trenches were dug across the kettle hole and the peats were sampled at their optimal locations using monolith tins (Trench L6, section 6). These sediments require sub-sampling for palaeoenvironmental analysis. Radiocarbon dating of key horizons will be required in order to provide a chronological framework for analysis and to understand how the sequence relates to the cultural evidence at Heslington East.

4.5 GEOMORPHIC ZONE 2

Area A1, Trench 6 (Figures 3 and 4)

4.5.1 The south facing section of trench 6 (Figure 7) provides a good overview of the stratigraphy of the Holocene deposits in Area A1. The section comprises a vertical stratigraphy of sand/silt deposits interspersed with clay/silt deposits. An example of this alternating stratigraphy from trench 6 is shown between sample points b' to c', at c. 3.5m east along this section as follows (from top to bottom):

Unit 43, brown yellow sand silt
Unit 24, mid brown grey silt clay
Unit 33, greyish orange silt clay
Unit 34, pinkish grey silt sand
Unit 29, light greyish orange silt clay
Unit 38, orange tinged grey brown silty clay
Unit 37, dark brown silty clay
Unit 36, light, pink tinged, brownish orange silt sand

4.5.2 Unit 36 was not the base of the Holocene sequence. A range of small clasts were recorded c. 0.1m below it, indicating the Holocene/Pleistocene intersection.

4.5.3 This major trend of alternating sand/silt deposits with silt/clay deposits is repeated throughout the transect, although there is some variation in the composition of the units.

4.5.4 Organic material from the basal sediments of the palaeochannel in Trench 2, located close by and just to the south-east of Trench 6 (not shown), were sampled and submitted for C14 dating (sample 339, Context 2326, unit 26 trench 2 south facing section, Column Sample 03). This provided a date of Cal BC1460 – 1310, suggesting that the sediment units observed in Trench 6 had also commenced accumulating around the middle Bronze Age

4.5.5In Trench 6, the alternating sand and clay deposits within the section clearly reveal a fluctuating depositional environment, relating to periods of higher flow (sand/silt dominated units) and periods of lower flow (clay/silt dominated units). The lateral extent of this Holocene accumulation is not defined in either an east or west direction by the trench. The periodicity of this fluctuation and the chronological timespan is not precisely defined. However, the recovery of a Bronze Age date from Trench 2, combined with Iron Age and Romano-British archaeology cutting into the top of the sequence, provides an upper and lower chronological bracket.

Area A1, Transect 5 (Figures 3 and 4)

4.5.6 Gouge core transect 5 was undertaken to assess the lateral stratigraphy of the deposits revealed in Trench 2, further north in Area A1. The resultant section revealed a complex stratigraphic diagram (Figure 8). Within the complexity of the stratigraphy there are two key units that extend across the majority of the transect (east to west); unit 241 (a blue grey sandy clay with organics) and unit 126 (a blue grey sandy clay). The same general pattern observed in Trench 6 was recorded in Transect 5, with the sequence comprising a series of intersecting sand/silt deposits and clay/silt deposits.

4.5.7 The sample point, 80m east along the transect, provides a good representative profile as follows (from top to bottom):
Unit 197, brown orange sand
Unit 092, yellow brown sand
Unit 107, yellow grey sand
Unit 156, a blue grey sandy clay
Unit 169, grey brown clayey sand
Unit 099, yellow brown silty clay
Unit 241, blue grey sandy clay with organics
Unit 092, yellow brown sand
Unit 141, brown blue grey sandy clay
Unit 092, yellow brown sand

4.5.8 Further east along the transect (at c. 105m) the general stratigraphic alternation between silt/sand and clay/silt dominated sediments changes. The stratigraphy becomes more complex, with a series of more finely bedded, but discontinuous sediment units. Clay facies are still present, but overall silt and sand facies predominate. The basal profile, comprising a surface of impenetrable gravel, varied across the transect, with the lowest elevations occurring at c. 37m, 105m and 145m east along the transect

4.5.9 This could indicate the location of a series of Late Pleistocene/Early Holocene channels draining off and incising into the glacial deposits. The channels may have been active at different times. The variation between the deposits on the west and east sides of the transect are suggestive of this.

4.5.10 The broad stratigraphy across the majority of the transect, moving east to c.100m, is in agreement with trench 6, with a series if alternating sand/silt dominated units and clay/silt dominated units. Again, this pattern represents an alternating depositional environment between times of higher and lower flow. The broad stratigraphy observed on the western edge of the transect, up to c.100m east, is suggestive of a relatively wide lateral extent of alluvial deposition. The eastern part of the transect could represent an early/later variant of the system, holding flow during a different period. The depth of the deposits is significant, representing a continuous depth, to c. 2m BGL, with a maximum vertical extent of c. 3m BGL at the eastern edge of the transect. All of these Holocene derived sediments have a potential to contain geoarchaeological resources, either cultural archaeological materials or, locally, areas of palaeoenvironmental remains.

Area A1 Transect 1 (Figures 3 and 4)

4.5.11 Transect 1 ran east - west from the western edge of Area A1. It was positioned with the intention of defining the lateral extent of the Holocene sediment accumulations.

The transect (Figure 9) demonstrates the same general pattern of alternating sand/silt and clay/silt dominated units to the east of the transect. A sample point 60m west along the transect provided the following representative profile (from top to bottom):

Unit 13, brown silty clay Ap
Unit 14, dark grey silty clay
Unit 15, grey clay with orange sand, Fe and Mn
Unit 12, orange grey clayey sand
Unit 05, dark grey clay
Unit 11, grey clayey sand with Mn (under unit 08, a dark grey clay with organics)
Unit 04, basal yellow grey sand

4.5.13 Westwards, the basal intersection, between the Holocene and Pleistocene deposits shelves upwards, representing a progressive reduction in the depth of the Holocene sediment body. The basal units to the west have thicker deposits of sand dominated facies (units 28 and 27), although these contained organic materials and are likely to be of Holocene date. However, the intersection between the Holocene deposits and Pleistocene deposits was not realised westward. In the east, the depth of the Holocene sequence shows a continual boundary with Pleistocene gravels below c.1.8m BGL, extending down to 2.3m BGL at the eastern edge of

the transect. The edge of the lateral extent of the Holocene deposits was not achieved with movement westwards along the transect. The major stratigraphic units of the dark grey clays were evident with movement westwards, with Unit 8 present along the length of the transect.

Geoarchaeological log palaeo 4 (Trench 4; Figure 3 - 5)

4.5.14 The results obtained from Transect 5 (Fig. 8) suggested further potential for the presence of Holocene deposits to the east of the area of complex, deeply stratified archaeology in Area A1. A further trench (trench 4) was dug to evaluate this potential. The results were as follows:

0.40m, machine cut top
0.40 - 0.76m, orange sand, trace of clay, Fe mottling
0.76 - 0.86m, orange silty sand, heavy Fe mottling
0.86 - 0.95m, mixed unit of light and dark grey clays interspersed with light grey fine silty sand
0.95 - 1.00m, light grey white silty sand
1.05m, red orange silty sand with trace of clay
1.05 - 1.17m, a series of horizontally banded sands, varying from light grey to yellow and orange
1.17 - 1.26m, red brown silty sand, trace of clay
1.26 - 1.33m, light yellow grey silty sand
1.33 - 1.50m, brown grey silty sand
>1.50m, impenetrable gravel

4.5.15 The sediment log in this trench suggests a low potential for preservation of archaeological remains, with reference to the silt and sand dominated sediments. Clay dominated units were recorded at 0.86 - 0.95m. No cultural materials were noted within the deposits during excavation. Eastwards, the pattern is similar to transect 5 (Fig. 8), where the sediment units become increasingly sand and silt dominated, producing a low potential for preservation of *in-situ* archaeological remains, due to higher energy flows and sediments with lower preservation potential.

Geoarchaeological log palaeo 5 (trench 5; Figure 3 - 5)

4.5.16 The results from Transect 5 suggested further potential for Holocene deposits to the east of the complex, deeply stratified archaeology in Area A1. A further trench (trench 5) was excavated to evaluate this potential. The stratigraphy was as follows:

0 - 0.50m, machine cut top
0.50 - 0.77m, light grey yellow silty sand, trace of clay
0.77 - 0.89m, yellow orange brown sand, traces of silt, occasional Mn

0.89 - 0.91m, light grey yellow silty sand, trace of clay
0.91 - 1.07m, yellow orange brown sand, traces of silt, occasional Mn
1.07 - 1.10m, light grey yellow silty sand, trace of clay
1.10 - 1.20m, grey brown clay sand, with visible organics
1.20 - 1.30m, dark grey clay, trace of sand
1.30 - 1.40m, dark grey clay, trace of sand
1.40 - 1.50m, dark grey clay interspersed with fine lamina bands of orange yellow silty sand
1.50 - 1.69m, dark grey clay, trace of sand, visible organic material
1.69 - 1.91m, grey brown silty sand, interspersed by fine lamina of dark grey clay
1.91 - 1.98m, orange brown clay sand
1.98 - 2.18m, orange brown clayey sand, interspersed with dark grey clay bands of visible organics
2.10m, organic remains sample for radiocarbon dating (sample 368).

The results from geoarchaeological log palaeo 5 in Area A1 are interesting as they provide a correlation with the general Holocene stratigraphy recorded in trench 6 (Fig.7). Again organic materials were noted near the basal fill of the Holocene deposit sequence and this was sampled for radiocarbon dating (sample 368). Dating of the sequence could, potentially, provide a chronology for the Holocene sequence in A1, correlating trench 2, with trench 5 and the excavation area and is therefore considered a high priority. In the absence of absolute dating, by analogy with the other results obtained in A1, a Bronze Age date is speculated.

Zone 2 Summary

4.5.17 A Holocene sediment sequence is evident above the Pleistocene sand and gravel body, through the archaeological excavations in A1, trench 2 and trench 5. The Holocene sediments start to accumulate during the Bronze Age. Prior to this depositional phase there must have been an erosional phase where a channel, or series of channels, originating in the Late Pleistocene or Early Holocene incised into the sands and gravels and eroded a small floodplain that subsequently infilled with Holocene material.

4.5.18 There is a dominant lateral stratigraphy across much of A1 comprising alternating sediment units of clay/silt and silt/sand. This represents an alternating hydrological regime, with periods of active flow (sand/silt dominated units) and periods of inactivity/low flow (clay/silt dominated units). The periodicity of this change is undefined.

4.5.19 During the Iron Age and the Romano-British period the flow regime appears to have been greatly reduced. The evidence for this comes from the archaeological excavations, where

Iron Age and Romano-British ditches truncate the palaeochannel deposits, possibly to encourage water flow. These archaeological features, near the top of the sediment sequence, effectively define the end of the depositional sequence.

4.5.20 The sequences in A1 have a moderate potential for palaeoenvironmental analysis. Some local archaeological fills have well preserved organic remains. Plentiful material was observed in the excavations to provide a firm chronostratigraphy for the Holocene alluvial sequence in Area A1.

4.6 GEOMORPHIC ZONE 3

Transect 4 (Figures 3 and 4)

4.6.1 Transect 4 extended westwards from the edge of the excavation in A2. The transect revealed the Holocene sequences in area A2 were substantially thinner than in A1, extending to a maximum depth of *c* 1.5m BGL (Fig. 10). The transect also revealed the sediment units in the geomorphic Zone 3 were dominated by sand and silt, with no clay dominated units recorded. The sample point at 80m west along the transect aptly demonstrates the startigraphy as follows (from top to bottom):

Unit 12, orange grey clayey sand
Unit 29, grey brown orange sandy silty clay
Unit 48, light grey sandy clay with lenses of orange sand
Unit 47, dark grey clay sand
Unit 30, impenetrable sand

4.6.2 The higher levels of sand and silt dominated units demonstrate Zone 3 to have a different sedimentology to that of Zone 2, with a lower preservation potential. The sand and silt dominated sequences, which at times visually appeared to be heavily weathered, potentially date to the late Pleistocene or early Holocene.

Area A2, Trench 1 north (Figures 3 and 4)

4.6.3 Trench 1 north revealed a relatively shallow Holocene sequence, extending to a maximum depth of *c* 1.5m BGL (Figure 11). Within the section there are two clear palaeochannel incisions; one at the start of the transect, between 0m and 7m east, the other between 25m and 45m east. In between the two palaeochannels is shallower sequence above boulder clay extending to <0.5m BGL.

4.6.4 The sediment sequence above the boulder clay is illustrated well at 10m east, where Unit 07 (blue orange silty clay with sand) extends to a depth of 0.47m BGL. This can be compared to

a depth of c 1.40m BGL in the palaeochannel at 40m east. Here the stratigraphy was as follows:

4.6.5 Unit 8, orange blue loam, with Mn mottling

4.6.6 Unit 9B, yellow orange clay sand with Mn

4.6.7 Unit 10, blue, grey red clay with some limited organics

4.6.8 Unit 12, blue red sand, with trace of sand lying above boulder clay

4.6.9 The intersection between the palaeochannel and boulder clay is shown at the sample point 25m along the section (Fig. 11; Plate 1).

4.6.10 Within the section some limited traces of organic remains and charcoal were recorded in unit 09 (yellow light grey clay sand with Mn), unit 10 (blue grey red clay with some limited organics) and unit 11 (blue grey red clay, with small clasts and limited organics). These units (Fig.11) were bulk sampled to obtain materials suitable for radiocarbon dating the palaeochannels fills. Sample 751 sampled unit 09, sample 749,unit 10 and sample 750, unit 11.

4.6.11 Whilst geomorphic Zone 3 would be classically labelled as wet floodplain, swamp, wetland or marsh, it is clear that there was a well defined channel network running through it, between the outcrops of boulder clay. The date of the formation and use of this palaeochannel network is currently undefined. The palaeochannels were relatively shallow and provided poor preservation of organic materials, with sand and sandy clay dominated sediment units. The exposed palaeochannel had an extremely low palaeo-environmental potential. The archaeological potential of the palaeochannel is undefined, through poor understanding of chronology, although it is hypothesised this is an early Holocene palaeochannel with a low potential for buried archaeological remains (see below).

Area A2, trench 2 south (Figures 3 and 4)

4.6.12 Trench 2 south revealed a relatively shallow Holocene sediment sequence above the boulder clay deposits, varying between 0.1m and 1.0m below the machine cut top (Figure 13). The shallower parts of the Holocene sequence were located in the areas between palaeochannels, revealing relatively simple sediment sequences such as, at 10m east, unit 02 (blue grey orange sandy silt) above boulder clay.

4.6.13 The palaeochannels were well defined within the section and are clearly constrained. A very clear palaeochannel is visible between 20m and 70m east, with an area of deeper incision between 20m and 40m east. The Holocene sediment sequence was notably deeper in the palaeochannels, extending to c 1.5m BGL at its deepest point. The palaeochannels are dominated by sand and clayey sand deposits, with no visible organic remains, and often substantial Fe mottling.

4.6.14 The sediments at 23m east are relatively representative of the palaeochannel sediment sequence as follows:

4.6.15 Unit 2, blue grey orange sandy silt

4.6.16 Unit 7, orange grey sandy clay with heavy Fe and Mn mottling

4.6.17 Unit 6, red brown silty clay with a trace of sand, small gravel clasts, Fe and Mn mottling

4.6.18 Unit 5, light grey clay with sand and gravel, Mn and Fe mottling

4.6.19 Unit 3, orange grey clayey sand with Mn banding

4.6.20 Unit 4, boulder clay

4.6.21 The absence of visible organic remains within the palaeochannel fills limits the dating potential of this sequence. However, small quantities of charcoal were noted and bulk samples (752, 753 and 754) were retrieved for this purpose.

4.6.22 Whilst the geomorphic Unit 3 would be classically labelled as wet floodplain, swamp, wetland or marsh, etc, it is clear that there was a well defined channel network running through this zone, in between outcrops of boulder clay. The date of the formation and use of this palaeochannel network is currently undefined. The palaeochannels were relatively shallow and provided poor preservation of organic materials, with sand dominated sediment units, as clearly seen in this trench section. The exposed palaeochannel had an extremely low palaeo-environmental potential. The archaeological potential of the palaeochannel is undefined, through poor understanding of chronology, although it is hypothesised this is an early Holocene palaeochannel with a low potential for buried archaeological remains (see below).

Zone 3 Summary

4.6.23 No archaeological remains were found in association with the palaeochannel in either section. However, some archaeological features, thought to be Bronze Age or Iron Age were recorded in the archaeological investigation, cut into the top of some of the palaeochannel fills seen elsewhere in geomorphic Zone 3. This clearly demonstrates that these palaeochannels had already infilled by the Bronze Age/Iron Age. The sand dominated contents of the palaeochannel fills describe a relatively high energy depositional environment, which is potentially a product of meltwater enhanced flow, given the energy required for sand deposition within this area. Therefore, it is hypothesised that these palaeochannels held flow in the late Devensian or very early Holocene. However, this can only be confirmed through absolute dating of materials retrieved during excavation.

4.6.24 The archaeological remains recorded in Area A2 displayed a clear difference between those cut into the boulder clay and those cut into the palaeochannel fills. Any archaeological cut features on the boulder clays were relatively shallow, due to the compact and cohesive nature of the deposit. The archaeological features cut into the tops of the palaeochannel fills were much deeper, due to the less consolidated nature of the palaeochannel deposits.

5. DISCUSSION

5.1 TOWARDS A MODEL OF LANDFORM DEVELOPMENT

5.1.1 From the presentation of the results it is clear that there is a complex evolution of the landform at the Heslington East site. The following account is a developing model based on a limited number of dates and further research is required to substantiate this.

5.1.2 The hummocky glacial and glaciolacustrine deposits (Fig. 2) would have accumulated by the end of the Devensian glaciation. By this time there would have been a substantial flow of meltwater, flowing from the hummocky glacial deposits through geomorphic Zones 2 and 3, draining towards the Ouse floodplain.

5.1.3 This high flow of meltwater resulted in the incision of several channels across geomorphic Zones 2 and 3. The hydrological regime was relatively high-energy, eroding sands and gravels from the hummocky glacial deposits and redepositing sediment within the channels. In-channel accumulation is likely to have occurred from the early Holocene (c 10,000 - 5000BC), but this needs to be confirmed through absolute dating. Material for this purpose may be provided from bulk samples taken from the palaeochannel sediments in geomorphic Zone 3 (A2; Trench 2 south).

5.1.4 There was continual drainage from the glacial hummocky deposits of geomorphic Zone 1, which drained out across geomorphic Zones 2 and 3 throughout the Holocene. This drainage formed into defined channels/spring lines that flowed from north to south across geomorphic Zone 2.

5.1.5 The archaeology at Heslington East Area A1 is clustered around one of these spring lines, which appears to have become active during the middle Holocene. A channel flowing from geomorphic Zone 1 flowed down across geomorphic Zone 2 and drained into geomorphic Zone 3. The spring line was probably originally quite wide and shallow and incised into the sands and gravels, forming a localised depression c 100m wide.

5.1.6 At some point in the Holocene this spring line stopped incising and sediments began to accumulate in the depression. This change from a locally erosive system to a depositional system occurred around Cal BC1460 - 1310; the date obtained from the basal sediments in Trench 2 Area A1 (see Trench 6, above). This is consistent with the excavated archaeological remains in A1.

5.1.7 The reason for the change from a locally erosive system to a depositional one is interesting and may equally be related to human activity in the area as opposed to natural hydrological change. It is possible, although conjectural as present, that locally increased rates of sedimentation were the result of soil erosion caused through deforestation and arable practises. The causes of environmental change may be clarified further by a more detailed study of sedimentation rates coupled with palaeoenvironmental analysis (eg. pollen, diatoms)

5.1.8 From the middle Bronze Age (Cal BC1460 - 1310) this system continued to fill with sediment, producing more constrained and well-defined channels. The flow of water through the channels in geomorphic Zone 2 was periodic, alternating between periods of higher and lower flow. The episodic nature of this flow is chronological poorly defined, but overall accumulation postdates Cal BC1460 - 1310, and pre-dates the end of the Romano-British period, dated through archaeological remains cut into the top of the palaeochannel fills.

5.1.9 The pattern of alternating sand and clay deposits revealed in trench 6, Area A1, can have two possible interpretations. Firstly, it is suggestive that two or more palaeochannels were active at different times, with a switching mechanism between channels. Conversely, there may have been only one dominant channel, which had a fluctuating flow rate, causing the alternating clay sand deposits. Again further work is required to define which of these two hypotheses are correct.

5.1.10 Through the life span of the channel in Area A1, significant human activity occurred along the channel margins and within the channel. This included the cutting of ditches/channels on several occasions, potentially to encourage increased rates of flow.

5.1.11 The hydrological nature of this system is interesting, as it has clearly formed during the Bronze Age and was episodic in its activity. The fluctuating nature of the flow in this environment, may have been the focus for some forms of ritualistic human behaviour centred around the channels. Some of the spectacular archaeological remains at Heslington have ritualistic or religious connotations, and their location within the palaeochannel deposits is suggestive of a significant link between the active channel and human ritual.

5.1.12 During or shortly after the Romano-British period this palaeochannel and its localised floodplain had completely infilled with sediment. The spring line had switched location, possibly just to the west of the excavation area in A1, where the modern drainage ditch now runs, or to another undefined location. Additional evidence to support this model of spring lines coming into and out of use was evinced by the excavations undertaken by York University, c. 500m to the east of Area A1. Here a spring line was active throughout the Romano-British period, with human activity centred around a smaller spring line. It is hypothesised that such spring lines became active and fell out of use throughout the Holocene, at different locations, draining from the hummocky glacial deposits onto the glaciolacustrine deposits. It is probable that each of these spring lines will have archaeological remains associated with them, from the periods during which they were active. On top of this sequence a shallow soil profile developed, which was machine stripped at the start of the excavation.

5.1.13 The archaeological remains in geomorphic Zone 3, Area A2, were located on a relatively level ground surface during the Bronze Age to Romano-British period. As the palaeochannels had infilled, the archaeological remains comprised features cut into the ground surface. Some of the archaeological features, such as ditches, cut across both boulder clay deposits and palaeochannel fills. This suggests that a relatively level and infilled land unit had formed by the mid Holocene, providing further evidence that, in this area of archaeological excavation, the palaeochannels must have infilled prior to the Bronze Age.

5.2 ASSESSMENT OF GEOARCHAEOLOGICAL POTENTIAL

5.2.1 ***Geomorphic Zone 1***

There are numerous kettle holes spread over geomorphic Zone 1, at the top of the hummocky glacial deposits.

These kettle holes have a high potential for Holocene palaeoenvironmental remains.

The sequences are liable to represent only certain parts of the Holocene era.

The kettle holes have a high potential for associated archaeological remains, with the deliberate deposition of artefacts into them.

The soils across the rest of the geomorphic Zone 1 are thin (<0.5m).

These soils (outside the Kettle Holes) have a high potential to contain archaeological remains deposited throughout the Holocene.

Archaeological remains contained within these soils are liable to have a high surface visibility due to the shallow nature of the soil profiles.

Such archaeological remains are liable to have been damaged and/or truncated by recent agricultural activity.

Such archaeological remains have the potential to be detected through conventional methods of site prospection, such as aerial photography and shallow geophysical survey such as gradiometer survey.

5.2.2 ***Geomorphic Zone 2***

There are several palaeochannels trending north to south across this zone.

Some of these channels have formed during mid Holocene.

They have infilled with sediment sequences containing organics, clay, etc.

They have a moderate potential for palaeoenvironmental materials.

The presence of the spring lines and the associated palaeochannels have been a focus for human activity.

This provides a high potential for archaeological remains around palaeochannels in this zone.

The presence of the small palaeochannels/spring lines provides a relatively deep Holocene sequence (2-3m BGL).

The anaerobic nature of these palaeochannel fills favours the preservation of organic material culture.

Areas between the palaeochannels have a much lower archaeological potential due to shallower Holocene sequences with sediment architectures of lower preservation potential.

5.2.3 ***Geomorphic zone 3***

There are numerous palaeochannels in this zone.

They appear to have been infilled relatively early in the Holocene.

The palaeochannel fills are sand and silt dominated.

There is a low preservation potential for palaeoenvironmental materials within these palaeochannels.

There is a low potential for stratified archaeological remains within the palaeochannel fills, unless cut down from the top of the palaeochannel.

The zone has potential to contain archaeological materials, but these can be mapped in the first instance through a strip, map and sample strategy.

6. RECOMMENDATIONS

6.1 PALAEOENVIRONMENTAL AND CHRONOSTRATIGRAPHIC STRATEGY

6.1.1 During the archaeological excavations and geoarchaeological studies a series of palaeoenvironmental samples were collected. These samples were collected to address specific issues.

Sample No.	Location	Reason for collection	Further work
Column sample 05 S5, T1 – 0 - 50	NGR SE 463609.54 450694.65	Monolith of organic deposits taken from palaeochannel in A1 and, to date organic materials, a C14 sample was taken and then processed (Sample 348; Cal BC1300- 1020)	Palaeoenvironmental assessment of pollen, waterlogged plant and coleopteran remains. If sufficient material exists, full analysis along with Radio carbon dating of the top and bottom of the sequence
Column sample 04 S4, T1 - 0 - 50	NGR SE 463595.89 450712.10	Monolith sample taken from build – up of organics in 'water hole' C14 sample (347) taken and processed. Returned a date of Cal BC 190 – 10AD	Palaeoenvironmental assessment of pollen, waterlogged plant and coleopteran remains. If sufficient material exists, full analysis along with Radio carbon dating of the top and bottom of the sequence
Column sample 03 S3, T1 - 05 – 55 S3, T2 – 34 – 84 S3, T3 – 60 - 110	Area A1, Trench 2, south facing section	Three monolith samples taken to study sedimentology of palaeochannel deposits in A1, Geomorphic Zone 2	Analysis of sediment units present in alternating sequence of clay and sand deposits. Radiocarbon dating of these units and assessment of pollen grains, leading to full analysis, if preservation sufficient.
S1, T2 –38 –88 S1, T3 –68 – 118 S1, T4 - 91 – 141cm	Area A1, Trench 2, south facing section	Three monolith samples taken to study sedimentology of palaeochannel deposits in A1, Geomorphic Zone 2	Analysis of sediment units present in alternating sequence of clay and sand deposits. Radiocarbon dating of these units and assessment of pollen grains, leading to full analysis, if preservation sufficient.
800	Trench L6, Context 5069	Monolith sample of peat deposit within kettle hole.	Full palaeoenvironmental analysis of pollen grains, water

		For palaeoenvironmental analysis	logged plant remains, snails and coleopterans. Full description of key sediment units. Radiocarbon dates from top, middle and base of sequence
801	Trench L6, Context 5070	Monolith sample of peat deposit within kettle hole. For palaeoenvironmental analysis	Full palaeoenvironmental analysis of pollen grains, water logged plant remains, snails and coleopterans. Full description of key sediment units. Radiocarbon dates from top, middle and base of sequence
803	Trench L6, Context 5072	Monolith sample of peat deposit within kettle hole. Contains copious snail shells. Submit for palaeoenvironmental analysis	Full palaeoenvironmental analysis of pollen grains, water logged plant remains, snails and coleopterans. Full description of key sediment units. Radiocarbon dates from top, middle and base of sequence
804	Trench L6, Contexts 5069, 5070 and 5071	Monolith sample of peat deposit within kettle hole. For palaeoenvironmental analysis	Full palaeoenvironmental analysis of pollen grains, water logged plant remains, snails and coleopterans. Full description of key sediment units. Radiocarbon dates from top, middle and base of sequence
805	Trench L6, Contexts 5071, 5072, 5073, 5074, 5075 and 1003	Monolith sample of peat deposit within kettle hole. For palaeoenvironmental analysis	Full palaeoenvironmental analysis of pollen grains, water logged plant remains, snails and coleopterans. Full description of key sediment units. Radiocarbon dates from top, middle and base of sequence
808	Trench L6, Context 5078. Test pit in N arm of L6	Monolith sample of peat deposit within kettle hole. For palaeoenvironmental analysis	Full palaeoenvironmental analysis of pollen grains, water logged plant remains, snails and coleopterans. Full description of key sediment units. Radiocarbon dates from top, middle and base of sequence
809	Trench L6, Context 5079. Test pit in N arm of	Monolith sample of peat deposit within kettle hole. For palaeoenvironmental	Full palaeoenvironmental analysis of pollen grains, water logged plant remains, snails and

	L6	analysis	coleopterans. Full description of key sediment units. Radiocarbon dates from top, middle and base of sequence

Table 2 *Sample index*

6.1.2 The analysis of the monolith samples from trench 2 in Area A1 (geomorphic Zone 2) will provide information on the alternating sequence of sand and clay dominated units. This data, combined with a series of radiocarbon dates, will provide information on the periodicity and the nature of the hydrological regime, which is central to understanding the archaeology found in Area A1. If preservation is suitable, pollen analysis will provide some understanding of localised palaeoenvironments, at the same time as the human activity around the palaeochannel.

6.1.3 The analysis of column sample 04 will provide information on the deposits that have accumulated within the water hole post abandonment. This will provide data on human activity around the waterhole during this time.

6.1.4 The analysis of the monolith samples taken from the kettle hole, Trench L6, will provide a palaeoenvironmental context for the site. The date of these peat deposits is currently unknown and needs to be defined. These deposits provide the best material for understanding part of the Holocene palaeoenvironmental sequence within the immediate vicinity of the archaeological investigation.

6.1.5 The radiocarbon dating of the samples from palaeochannels in Area A2 (geomorphic zone 3) will provide a chronological understanding of their periods of formation and use. Again this is essential to provide a framework for the archaeological remains that have been excavated in this geomorphic zone.

6.2 PROSPECTING METHODOLOGIES AND THE WIDER REGIONAL PERSPECTIVE

6.2.1 The investigation of the archaeological remains at Heslington East has provided some interesting data regarding site prospection within this environment. Primarily, within this interface zone along the edge of these glacial deposits, moving into Holocene river valleys, remote sensing data, such as Lidar is of little use in identifying major geomorphic landforms such as palaeochannels. Likewise, aerial photographic analysis would not have detected the archaeological remains at Heslington.

6.2.2 The nature of the archaeological remains, centred around an incised and then infilled palaeochannel sequence, produced deeply stratified and well preserved archaeological materials, some of national significance. The fact that these features were not detectable using conventional methods of remote sensing such as aerial photographic transcription and topographic modelling, means other forms of site prospection are necessary to detect features within this interface zone.

6.2.3 It is suggested that any further work should be carried out using a combination of electrical resistivity survey and gouge coring, to assess whether these palaeochannels and associated landforms of high archaeological potential can be detected before excavation. Additionally, more extensive gradiometer data may have detected the location of the palaeochannel, due to higher concentrations of oxidised iron compounds present in the fills of the palaeochannels. This method should be explored in conjunction with an electrical resistivity survey to assess its effectiveness of detecting palaeochannels within this environment.

6.2.4 The location of these sites on this interface zone potentially opens a huge area of high archaeological potential across Yorkshire. More research is required to evaluate whether the archaeological remains and site formation at Heslington is anomalous, or whether it can be considered indicative of archaeological sites across this type of landform.

7. BIBLIOGRAPHY

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

Plate 1 *Intersection between boulder clay and palaeochannel, Geomorphic Zone 3, Area A2: Trench 1 North*

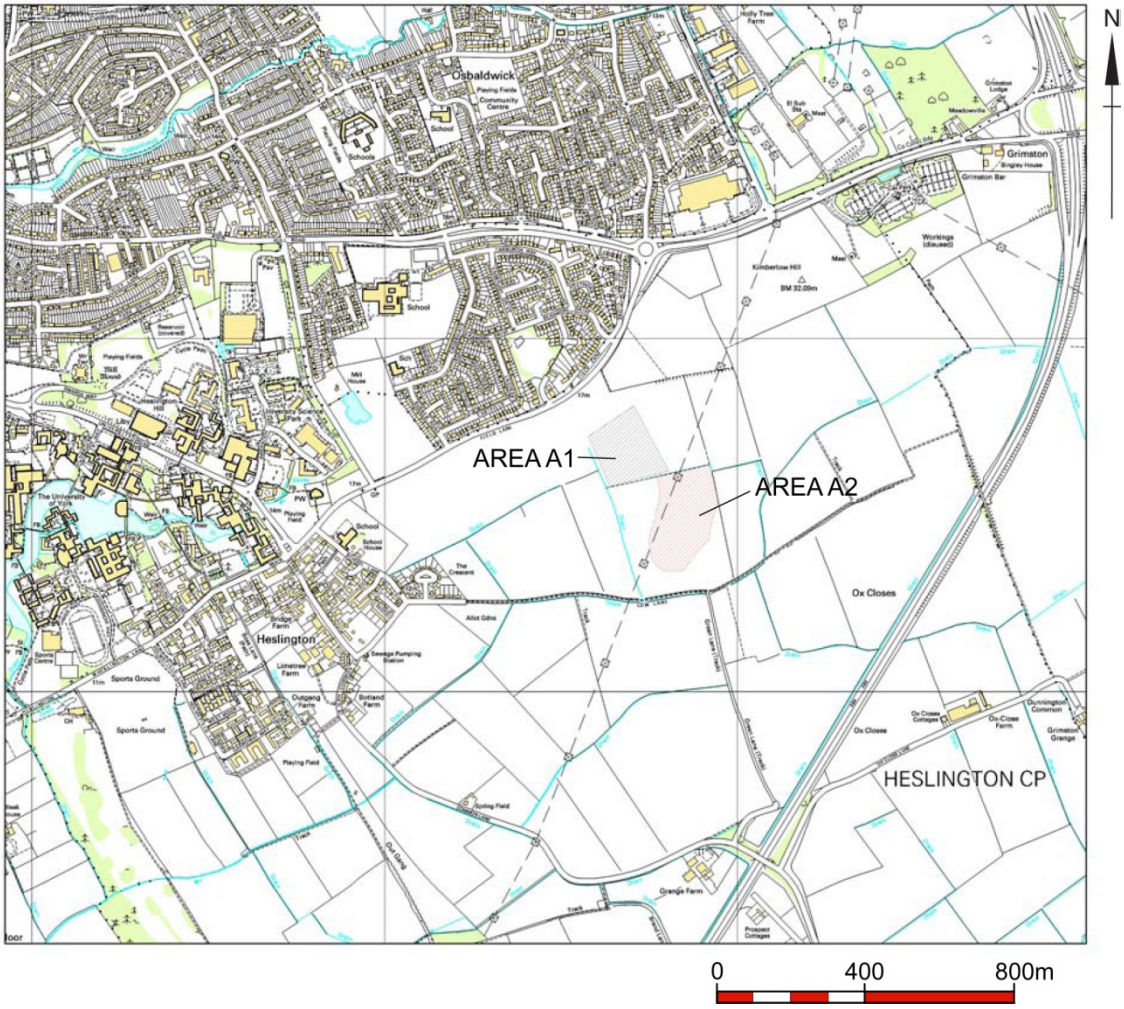

Figure 1 *Location of areas of excavation*

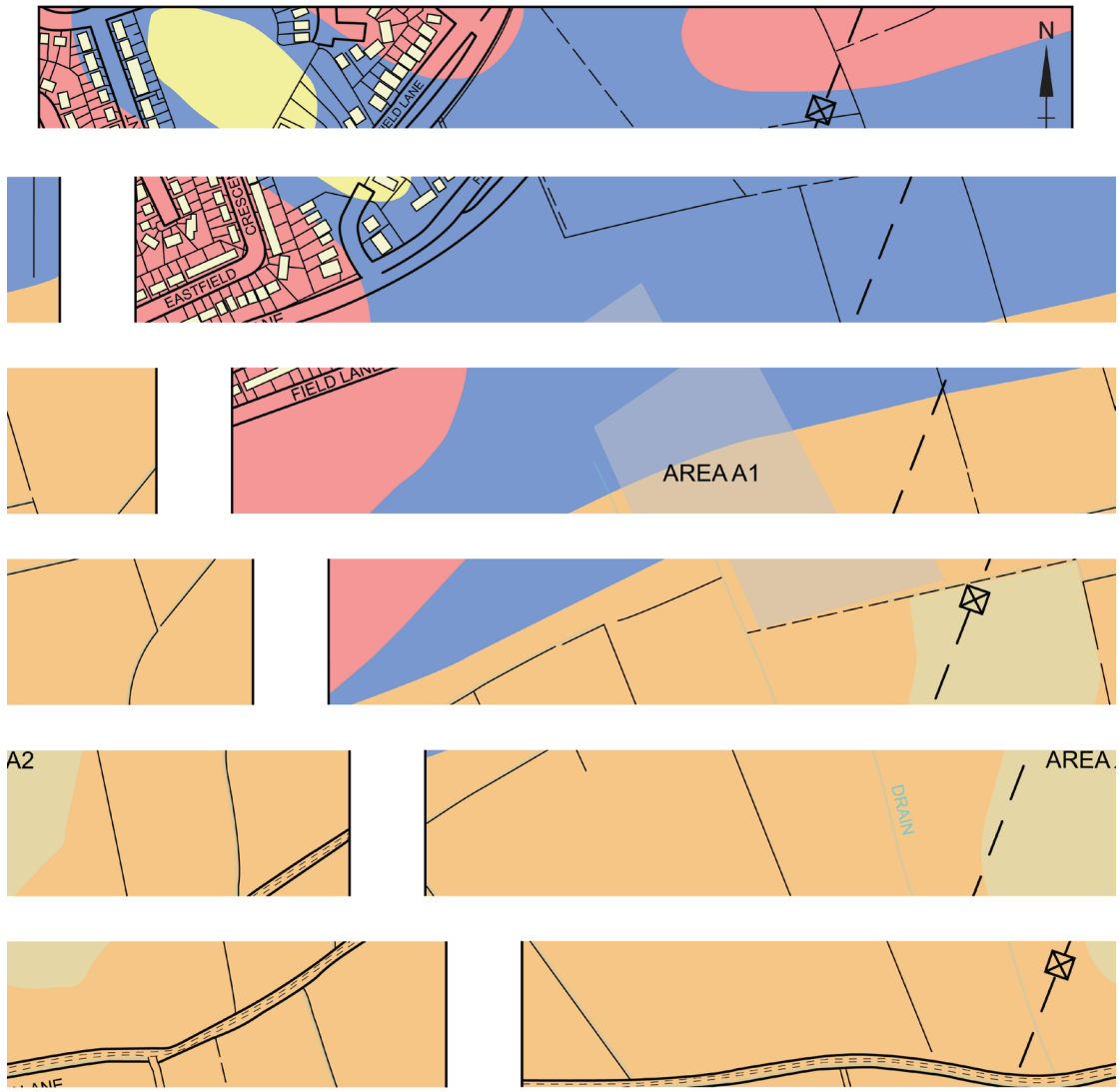

Figure 2 *The BGS drift geology*

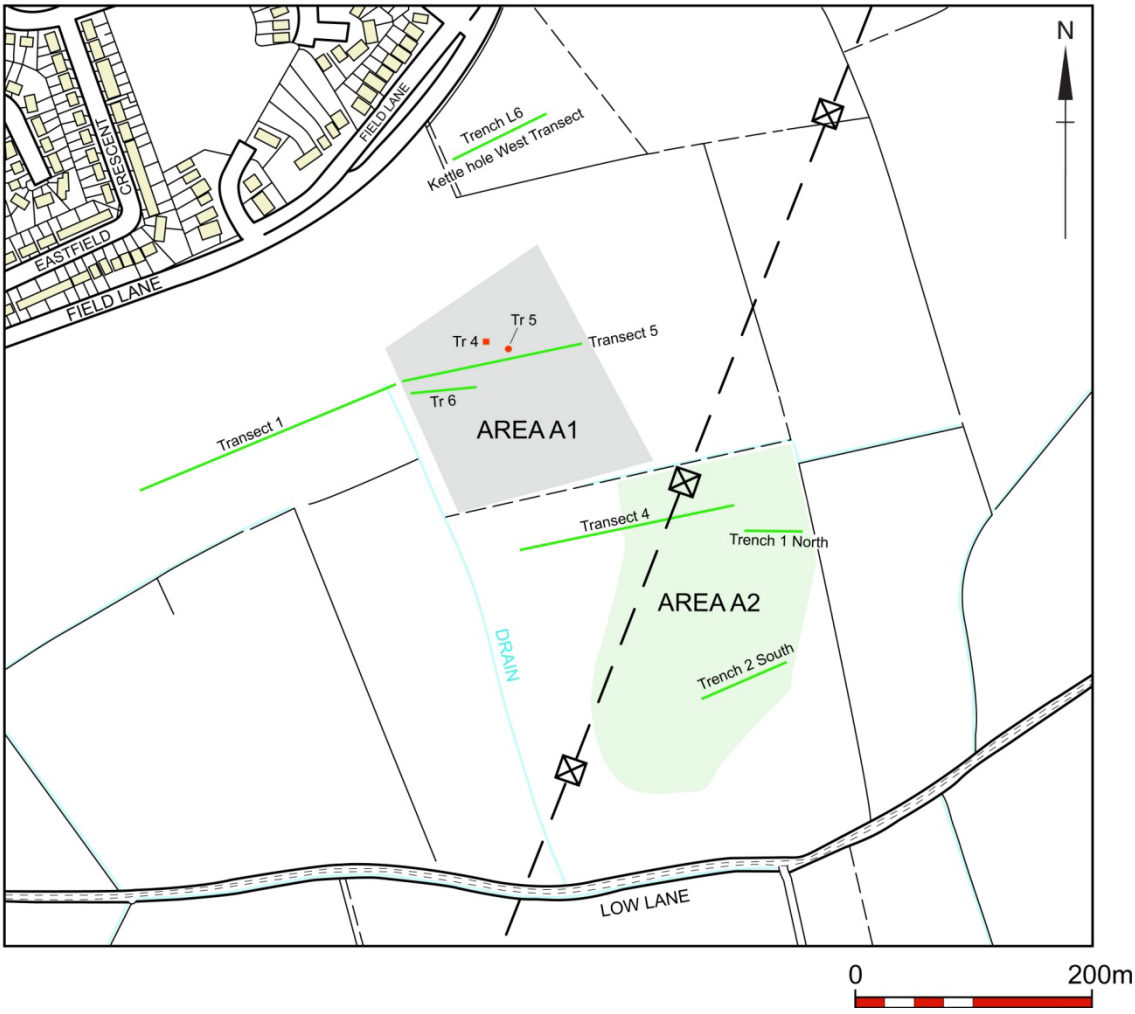

Figure 3 *Areas of geoarchaeological investigation*

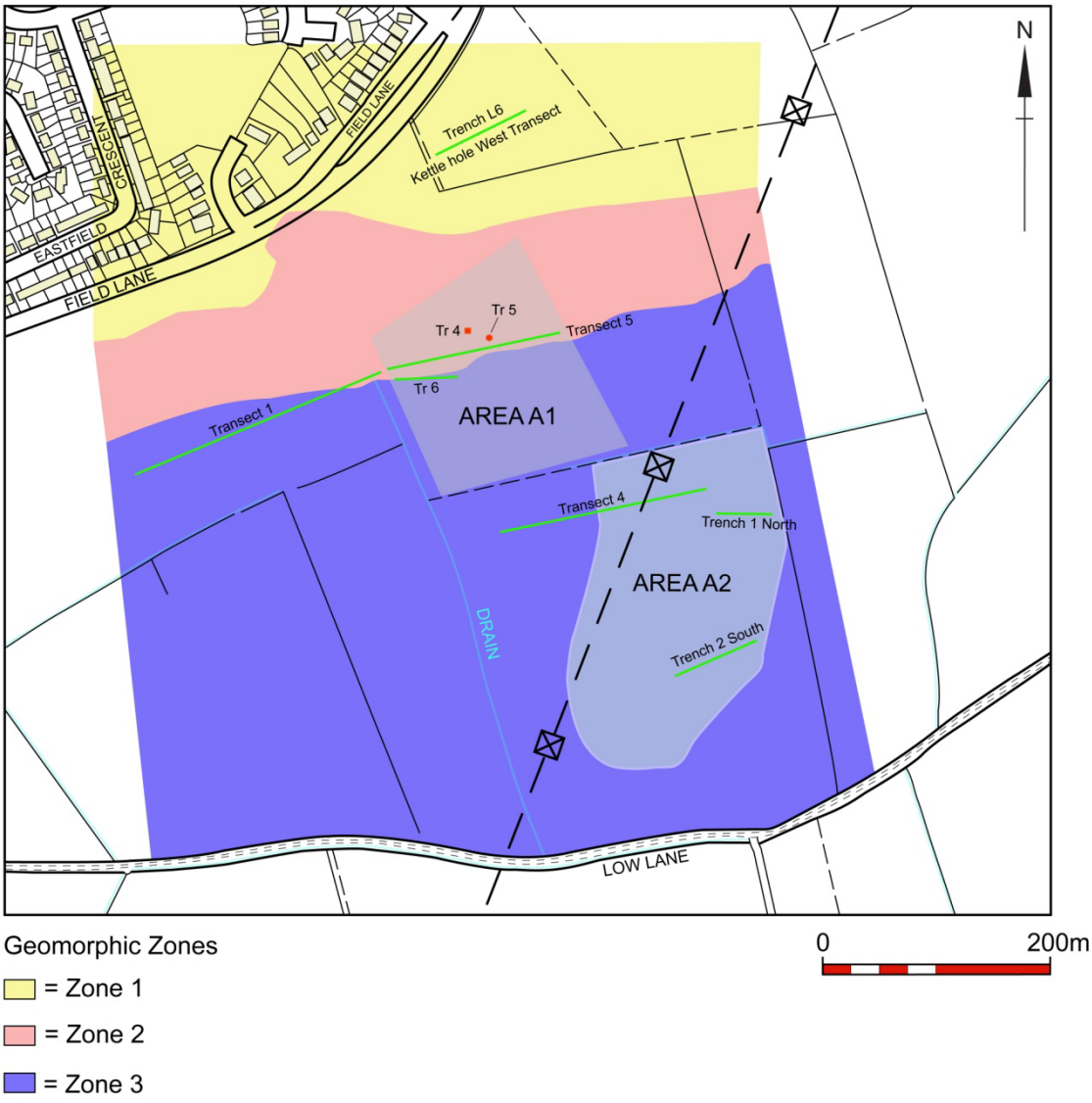

Figure 4 *Geoarchaeological field investigations and the relative geomorphic zones*

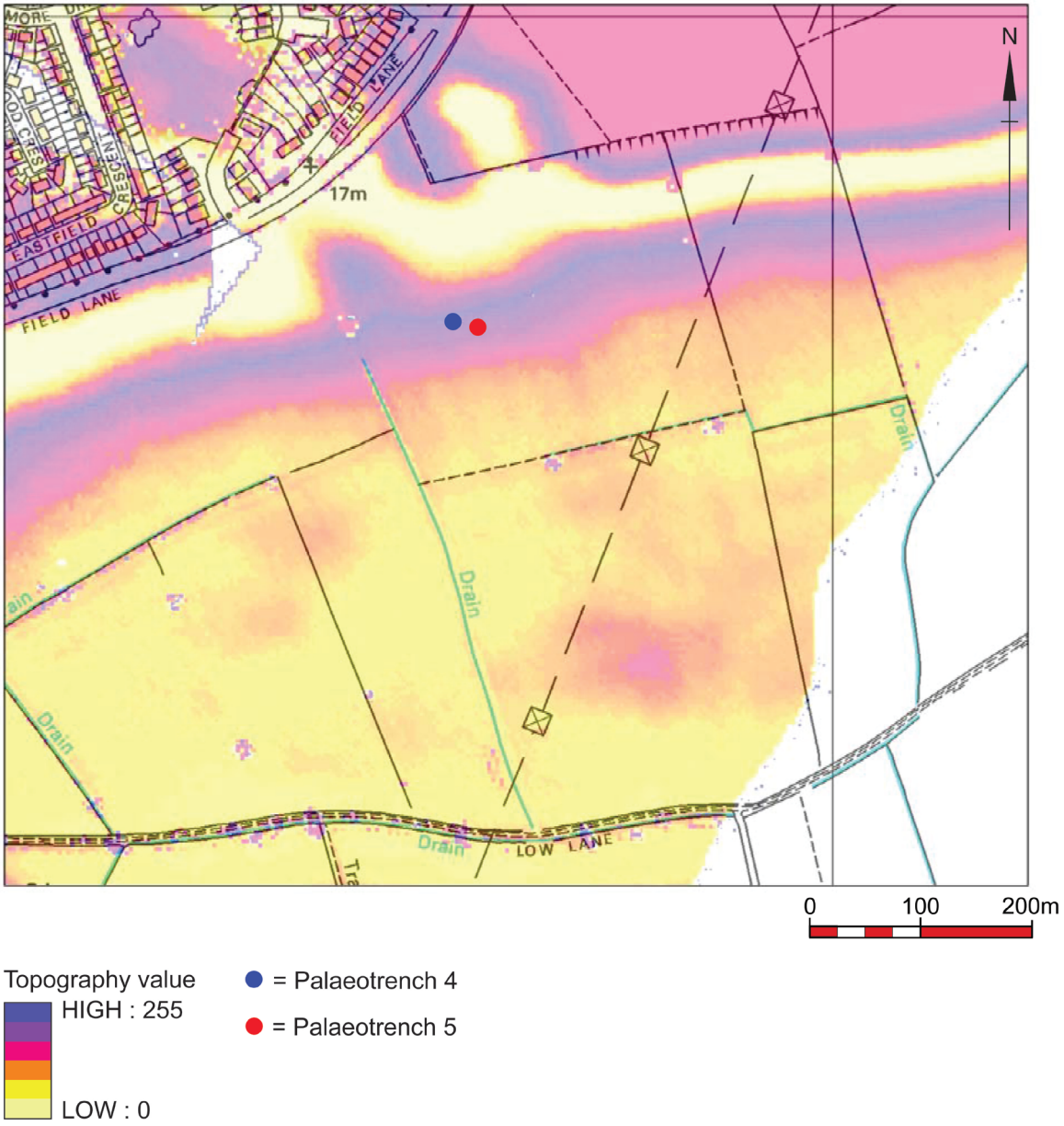

Figure 5 *Lidar topographic surface model of the study area*

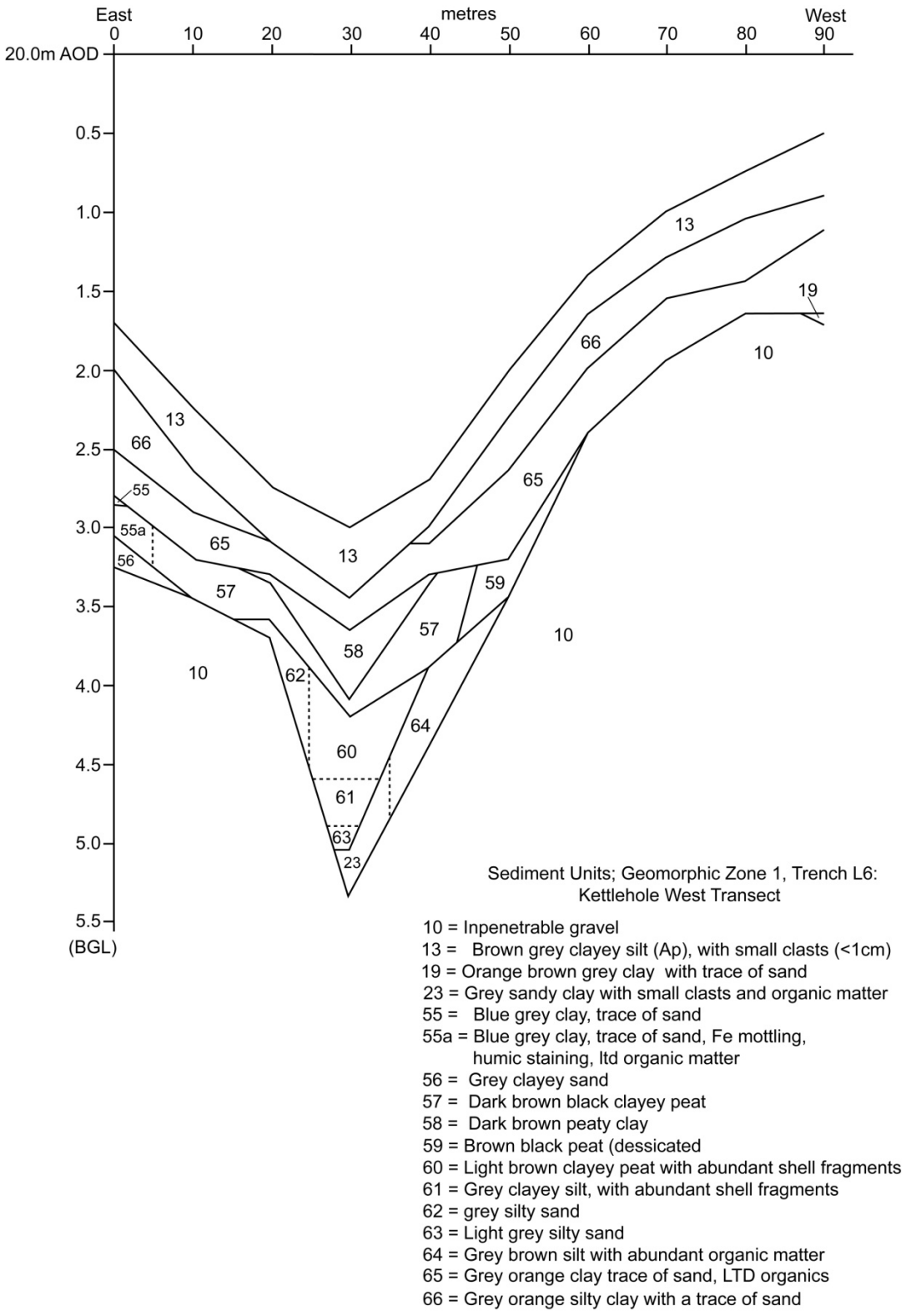

Figure 6 *Geomorphic Zone 1; Trench L6, Kettle hole west transect*

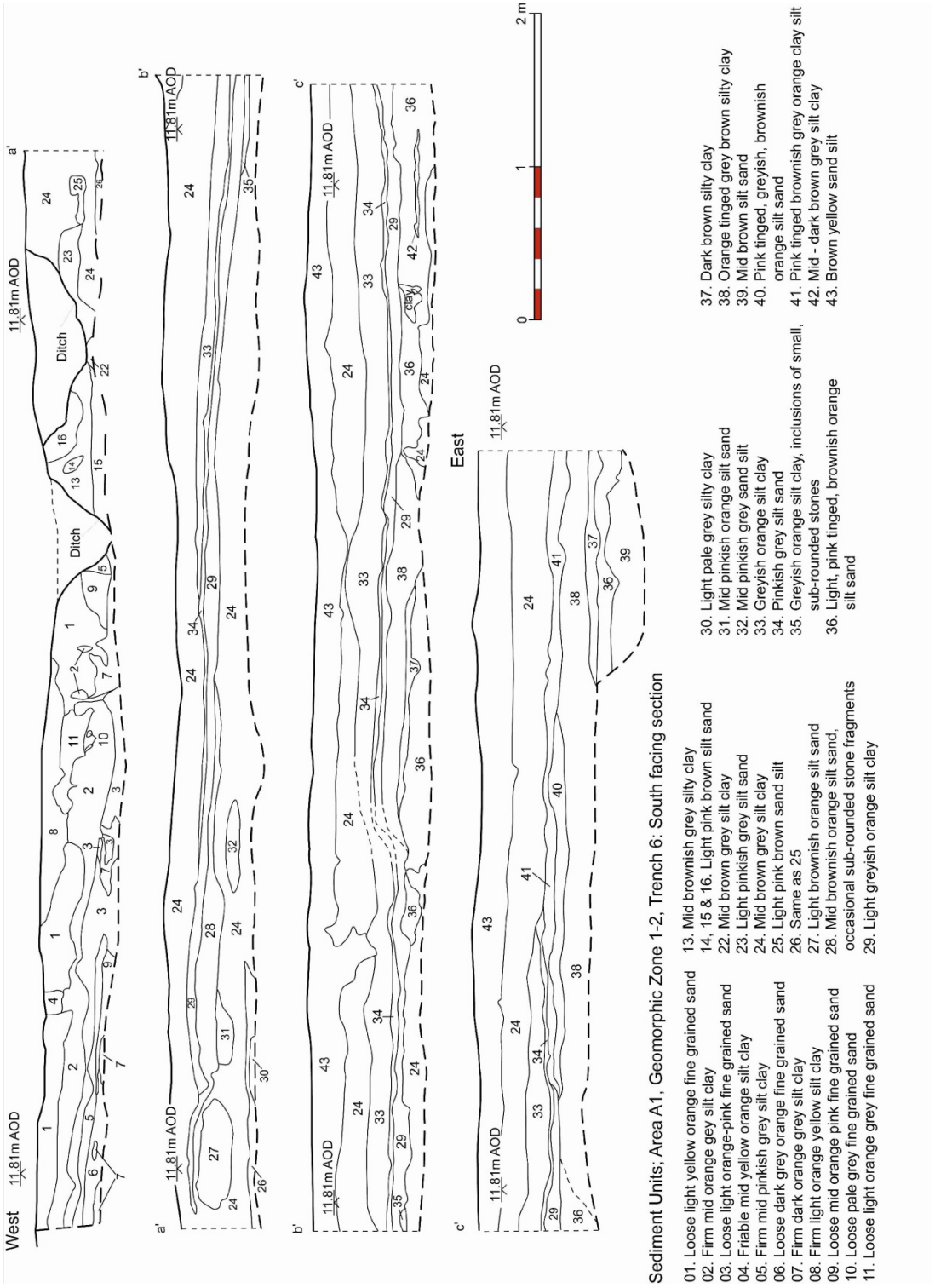

Figure 7 *Geomorphic Zone 2; Area A1, Trench 6, South facing section*

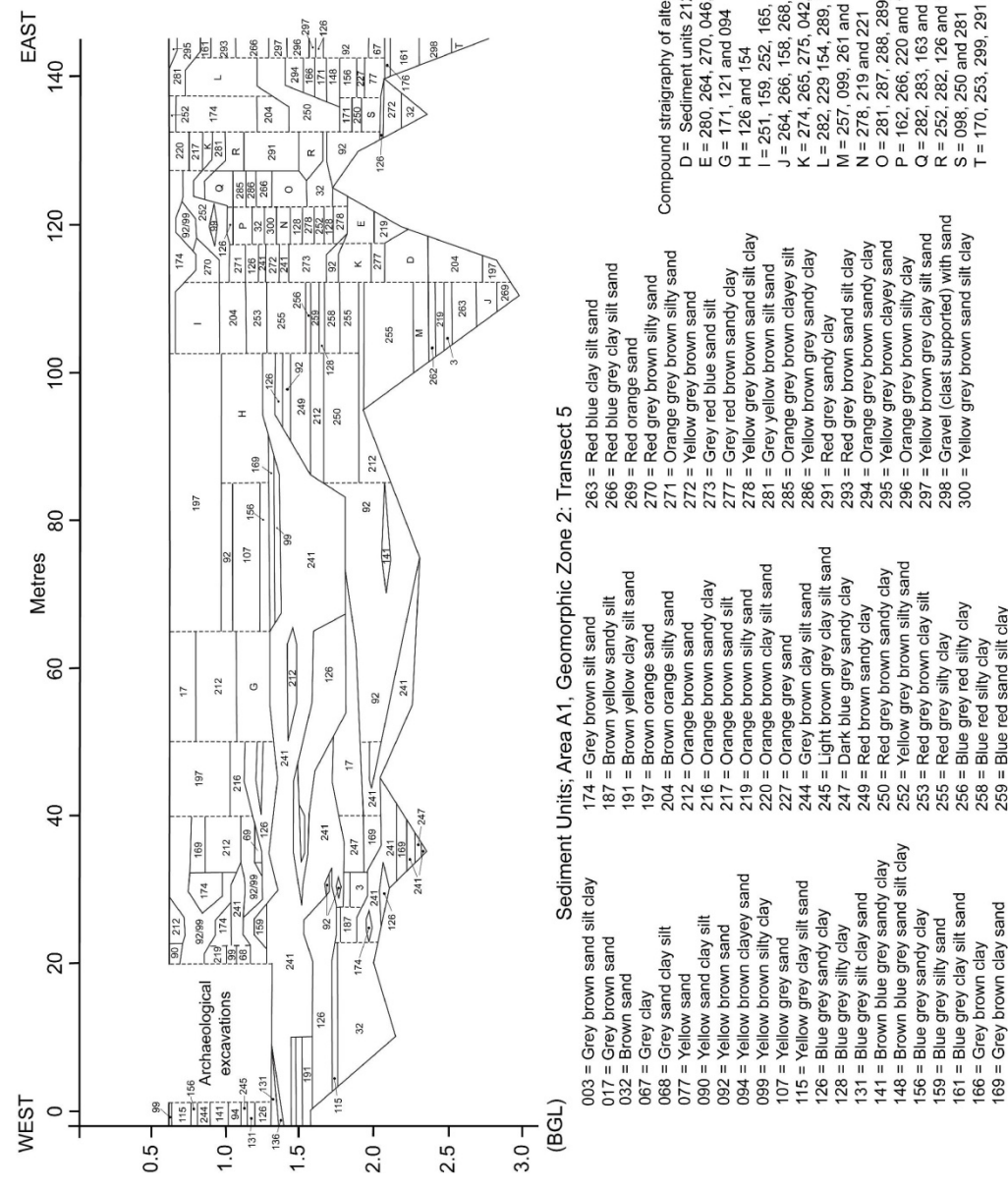

Figure 8 *Geomorphic Zone 2; Area A1, transect 5*

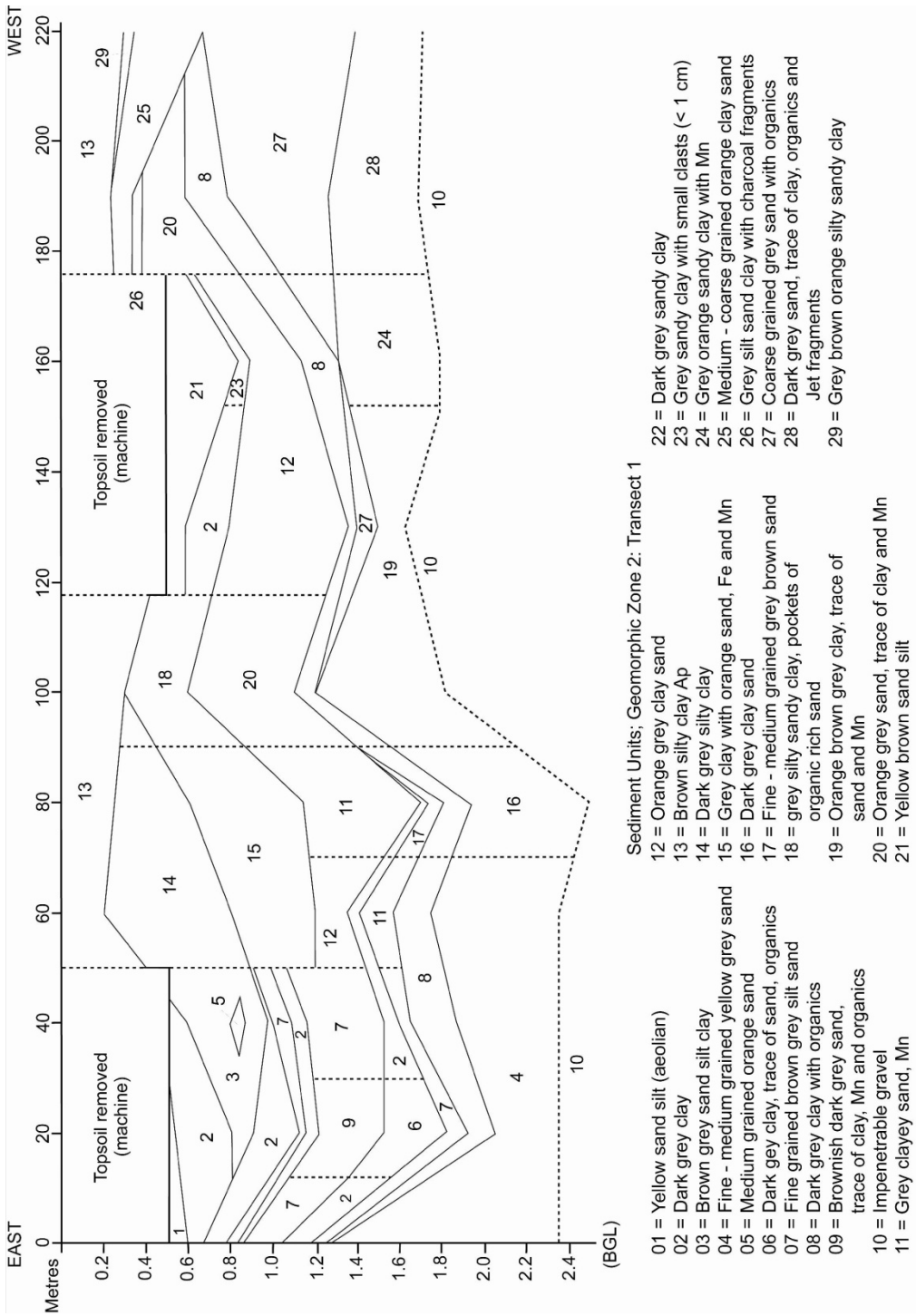

Figure 9 *Geomorphic Zone 2; transect 1*

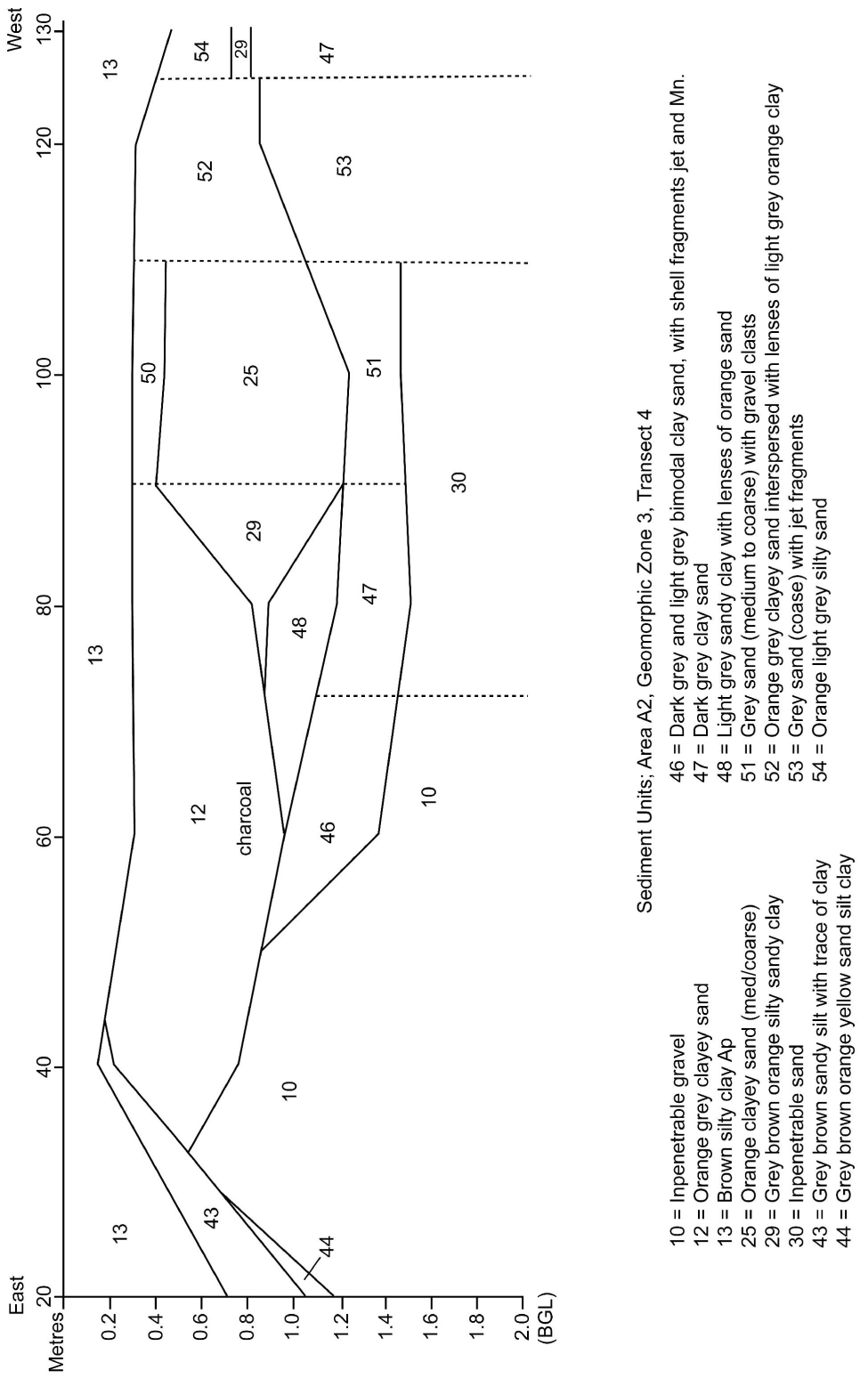

Figure 10 *Geomorphic Zone 3; transect 4*

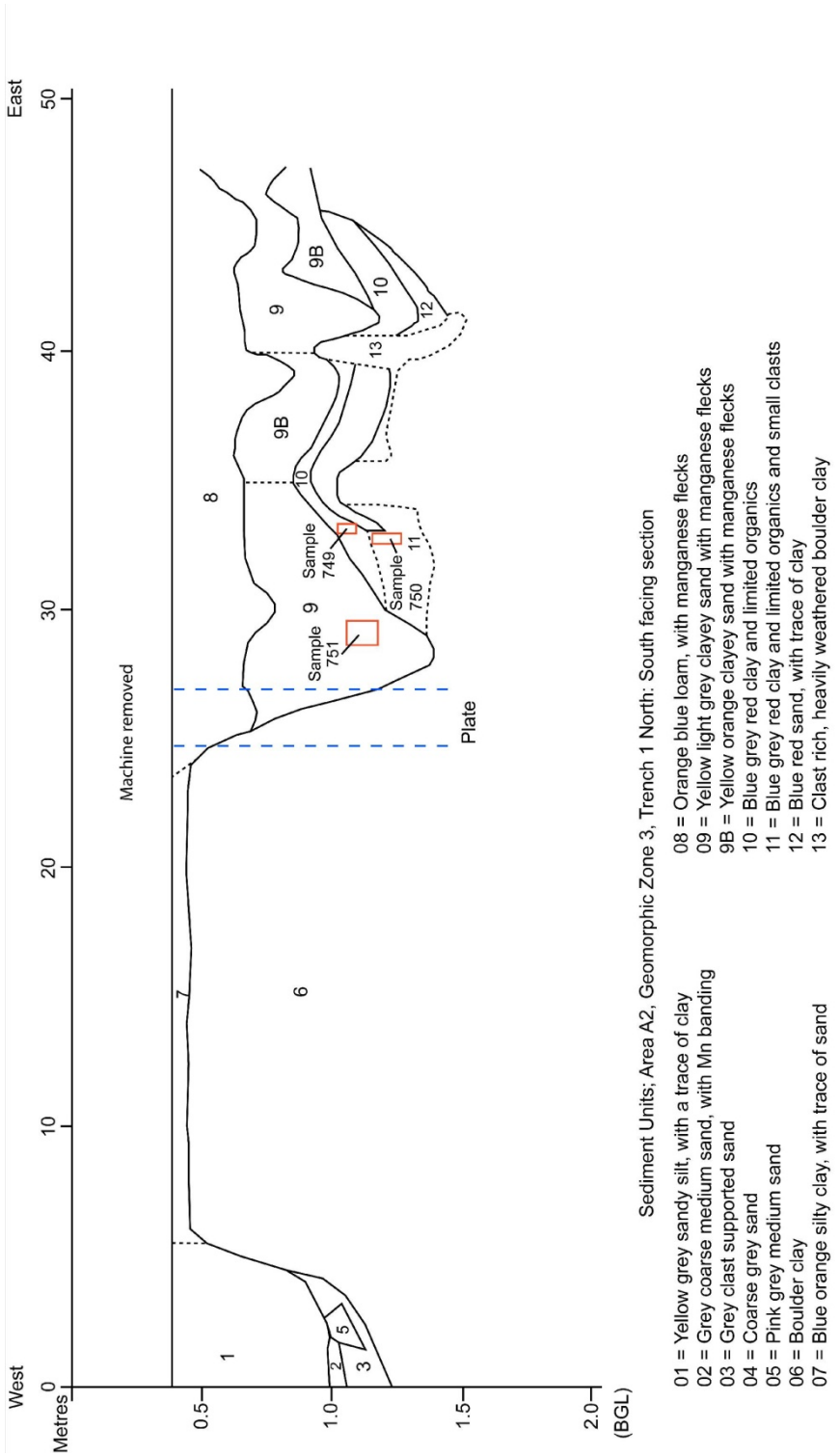

Figure 11 *Geomorphic Zone 3; Area A2, Trench 1 north*

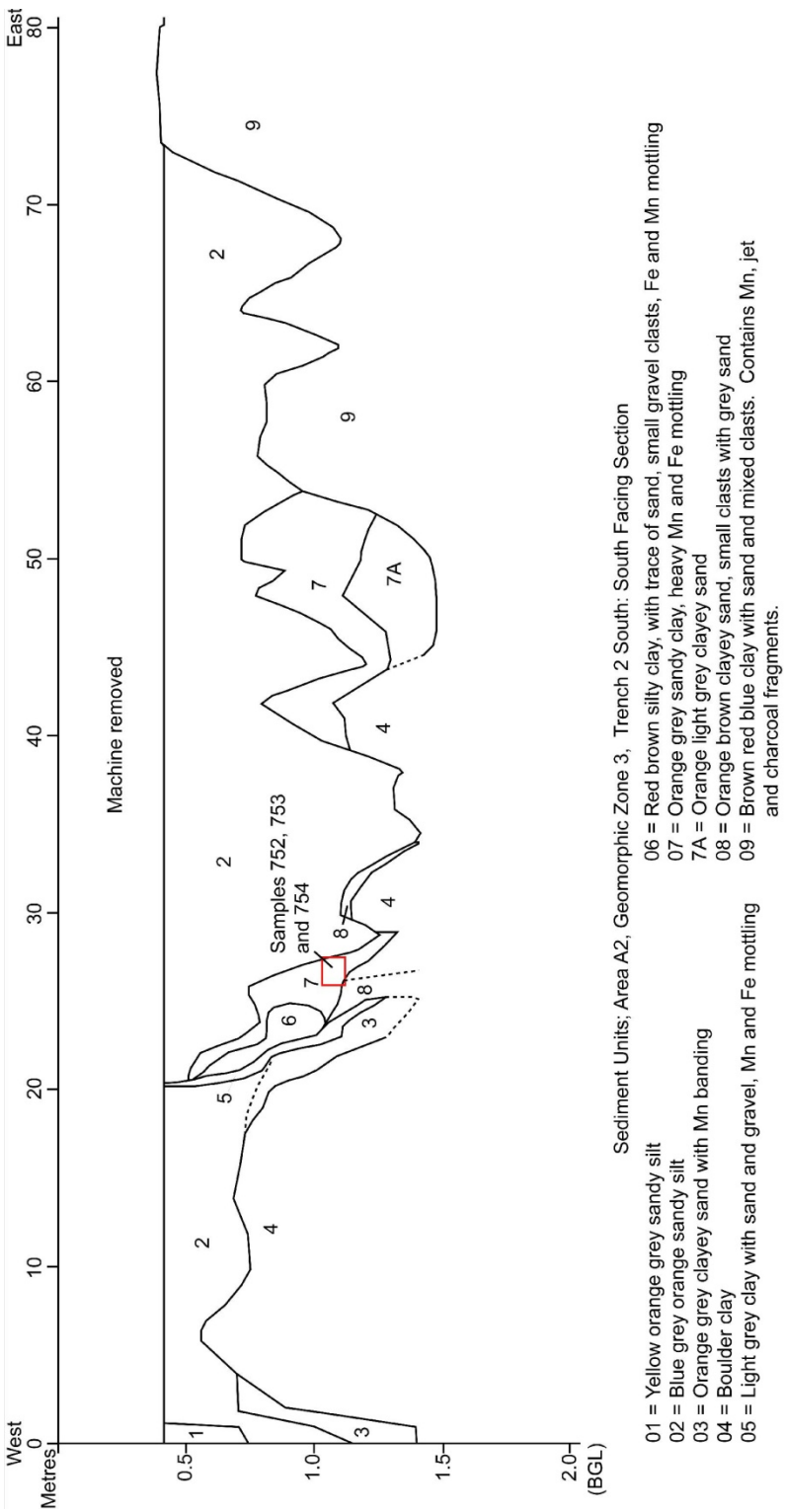

Figure 12 *Geomorphic Zone 3; Area A2, Trench 2 south*