



PRESTON TUNNEL LONG SECTION PIPELINE, PRESTON, Lancashire

Watching Brief



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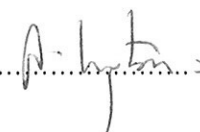
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Prepared by: Alastair Vannan
Position: Supervisor
Date: December 2010

Checked by: Alison Plummer
Position: Senior Project Manager
Date: December 2010

Signed.....

Approved by: Alan Lupton
Position: Operations Manager
Date: December 2010

Signed.....

Oxford Archaeology North
Mill 3, Moor Lane Mills
Moor Lane
Lancaster
LA1 1GF
t: (0044) 01524 541000
f: (0044) 01524 848606

w: www.oxfordarch.co.uk
e: info@oxfordarch.co.uk

© Oxford Archaeology Ltd (2010)
Janus House
Osney Mead
Oxford
OX2 0EA
t: (0044) 01865 263800
f: (0044) 01865 793496

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SUMMARY

Following proposals by United Utilities for the construction of a new main sewer from the western side of Preston Dock (NGR SD 52679 29470) to the Clifton Marsh Wastewater Treatment Works (NGR SD 45801 28150), the Planning Archaeologist at Lancashire County Archaeological Service (LCAS) recommended that rapid archaeological desk-based research and an archaeological watching brief should be undertaken for those sections of the sewer route that had not been subject to previous ground disturbance.

During the watching brief, which was undertaken between March and September 2010, several features and finds of archaeological interest were encountered. The earliest of these was an unstratified aurochs scapula, which is the shoulder blade of a type of cattle that is thought to have been extinct in Britain since at least as early as the fourth century AD, and possibly as early as the Bronze Age. The bone exhibited cut marks consistent with butchery.

Two structures consisting of settings of upright stakes were also encountered in fields immediately adjacent to the south bank of the River Ribble. These structures represented the remains of fish traps that had been located to exploit stream channels flowing into the River Ribble, by trapping fish that were carried towards the shore during high tides behind barriers of stakes, wattle or walling, and nets as the tide ebbed. Radiocarbon dating suggested the structure located at Mill Brook might have been in use for a prolonged period, including phases between the date ranges of 1610 to 1670 and 1730 to 1810. Additional finds of unstratified stakes and wood might also have been associated with former fish traps.

Two ditches were also encountered during the watching brief. These are likely to have been associated with post-medieval drainage.

The excavation for the pipeline is complete and, therefore, no further work is recommended.

ACKNOWLEDGEMENTS

Oxford Archaeology North (OA North) would like to thank United Utilities for commissioning the project. Thanks are due to Doug Moir of LCAS and to the staff of the Lancashire Record Office (LRO) in Preston. The radiocarbon dating was undertaken by Scottish Universities Environmental Research Centre (SUERC).

For OA North, Jeremy Bradley, Tim Christian, Kelly Clapperton, Nate Jepson, Michal Kempski, John Onraet, Christina Robinson, Peter Schofield, Lewis Stitt, and Alastair Vannan undertook the watching brief, Denise Druce undertook sampling of timbers and provided palaeoenvironmental advice, and Sean McPhillips assessed the finds. The report was compiled by Alastair Vannan and Mark Tidmarsh produced the drawings. Alison Plummer managed the project and also edited the report.

1. INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

- 1.1.1 United Utilities proposed the construction of a new main sewer from the western side of Preston Dock (NGR SD 52679 29470), in Lancashire, to the Clifton Marsh Wastewater Treatment Works (NGR SD 45801 28150), in Lancashire (Fig 1). The total length of the proposed pipeline was approximately 8.5km. As the scheme would affect areas of archaeological potential, the Planning Archaeologist at Lancashire County Archaeological Service (LCAS) recommended that rapid archaeological desk-based research and an archaeological watching brief (Fig 2) should be undertaken for those sections of the sewer route that had not been subject to previous ground disturbance. The watching brief was undertaken between March and September 2010.

1.2 LOCATION, TOPOGRAPHY AND GEOLOGY

- 1.2.1 For the most part, the pipeline (Plate 1) was situated along the southern bank of the western end of the River Ribble (Fig 1: Plates 2 and 3), which lies within the Lancashire and Amounderness Plain countryside character area (Countryside Commission 1998, 86). The Plain is primarily composed of flat and rolling agricultural land consisting of a patchwork of arable and pasture fields (*ibid*). The Ribble estuary bisects the plain, which, following the last glacial retreat, constituted marshland and until recently, when it was drained and improved, was dominated by mosses and meres (*op cit*, 86–9). The underlying solid geology comprises Permian and Triassic New Red Sandstones, including Bunter and Keuper sandstones (British Geological Survey 1979) which are overlain by reddish clayey till (Soil Survey of England and Wales 1983).
- 1.2.2 The eastern extent of the pipeline lay at the western side of Preston, to the north of the River Ribble, and the central portion, and much of the western portion, of the pipeline lay to the south of the river, running through the County Parishes of Penwortham and Hutton. The far western extent of the pipeline re-crossed the River Ribble in order to reach the Clifton Marsh Wastewater Treatment Works, in Freckleton County Parish.

2. METHODOLOGY

2.1 WATCHING BRIEF

- 2.1.1 During the course of all ground works associated with the construction of the pipeline, a programme of field observation recorded the location, extent, and character of all surviving features and deposits of archaeological interest. The ground works included large open area topsoil stripping, the stripping of topsoil associated with the pipeline easement, and the excavation of the pipe trench to a depth of approximately 2m. The excavation of shafts associated with extending the pipeline beneath the River Ribble was also subject to watching brief. The work was carried out using bulldozers, or by 13, 20, or 30 ton 360° mechanical excavators fitted with toothless ditching buckets. Where bulldozers were used to strip topsoil, 360° mechanical excavators and dumpers were utilised for the removal and storage of spoil.

2.2 ARCHAEOLOGICAL RECORDING

- 2.2.1 The ‘preservation by record’ of all features of archaeological interest was achieved by the generation of a comprehensive archive, in accordance with the standard and guidance for archaeological excavations produced by the Institute of Field Archaeologists (2001). All of the features identified during the watching brief were recorded stratigraphically, using a system adapted from that used by the Centre for Archaeology Service of English Heritage, with accompanying graphic documentation (plans, sections, and digital photographs and black and white print photographs, both of individual contexts and overall site shots from standard view points). Photography was undertaken with 35mm cameras on archivable black-and-white print film, all frames including a visible, graduated metric scale. Digital photography was used extensively throughout the course of the fieldwork for presentation purposes. Photographic records were also maintained on photographic *pro-forma* sheets.

2.3 FINDS

- 2.3.1 Finds’ recovery and sampling programmes were carried out in accordance with best practice (following current Institute of Field Archaeologists guidelines), and subject to expert advice in order to minimise deterioration.

2.4 ARCHIVE

- 2.4.1 The results of all archaeological work carried out will form the basis for a full archive to professional standards, in accordance with current English Heritage guidelines (*Management of Research Projects in the Historic Environment*, 2006). The original record archive of the project will be deposited with the County Record Office in Preston. It is likely that the Aurochs bone will be deposited with the Harris Museum and Art gallery, also in Preston.
- 2.4.2 The Arts and Humanities Data Service (AHDS) online database *Online Access to index of Archaeological Investigations* (OASIS) will be completed as part of the archiving phase of the project.

3. HISTORICAL BACKGROUND

3.1 INTRODUCTION

- 3.1.1 The following section presents a summary of the historical and archaeological background of the general area. This is presented by historical period, and has been compiled in order to place the study area into a wider archaeological context.

Period	Date Range
Palaeolithic	30,000 – 10,000 BC
Mesolithic	10,000 – 3,500 BC
Neolithic	3,500 – 2,200 BC
Bronze Age	2,200 – 700 BC
Iron Age	700 BC – AD 43
Romano-British	AD 43 – AD 410
Early Medieval	AD 410 – AD 1066
Late Medieval	AD 1066 – AD 1540
Post-medieval	AD 1540 – c1750
Industrial Period	cAD1750 – 1901
Modern	Post-1901

Table 1: Summary of British archaeological periods and date ranges

3.2 THE PREHISTORIC PERIOD

- 3.2.1 From c 6000 BC Mesolithic hunter-gatherer activity in the North West is increasingly evident in the pollen and artefact record. Direct evidence from Preston includes a mattock, fashioned from red deer antler, found on the bank of the Ribble and dated to c 5400 BC (LHER 13247). Finds of Mesolithic and Neolithic date from Walton-le-Dale are suggestive of the importance of the River Ribble as a communication route during the prehistoric period (Lancashire County Council 2006, 17). A Neolithic polished stone axe was found in Penwortham (Middleton 1996, 44), and a possible worked stone knife, of unknown date, was found at the site of Penwortham Priory, immediately south of the study area, in 1942 (*ibid*).
- 3.2.2 A large multi-period assemblage of artefacts was recovered during the nineteenth-century construction of Preston Dock, approximately 400m to the north of the eastern section of the pipeline route. These included 24 human skulls, the antlers of around 100 red deer, auroch (*bos primigenius*) crania, the bones of several horses, cattle, sheep, and wild fauna, two dugout canoes, a Bronze Age socketed spearhead, and a perforated shafthole axe (Crosby 2000, 10–11; Fishwick 1900, 3ff; Hunt 2003, 16-7; Middleton 1996, 46; Turner *et al* 2002, 423). There may also have been a wooden structure associated with some of these finds, consisting of a brushwood platform supported by a series of pile-driven stakes (Crosby 2000, 10–11). Most of the animal bones appear to have been recovered from coarse sand and gravel at depths of 3-5m below the surface level, and at a height of 1.2-1.8m OD (Turner *et al*, 2002, 424). Recent radiocarbon dates of selected faunal remains and human skulls range between c 3820 BC to AD 810 (*op cit*, 2002, 425). Three of the aurochs skulls were dated to either the late Neolithic or Early Bronze Age periods, with dates of 3040-2880 cal BC (4320 \pm 45 BP; OxA-7413), 2930-2660 cal BC (3235 \pm 45 BP; OxA-7414), and 1940-1700 cal BC (3495 \pm 40 BP; OxA-7412). It has been suggested that elements of the Preston Dock assemblage may represent the deliberate deposition of artefacts within a riverine context (Middleton 1996, 46), but it might equally represent material of disparate origin that had washed

downstream and collected at a slow moving section of the river (*ibid*; Turner *et al* 2002, 430-2).

3.3 THE HISTORIC PERIOD

- 3.3.1 ***The Romano-British Period:*** the postulated route of the Roman road that ran between Wigan and Preston lies within 4km of the eastern extent of the pipeline and crosses the River Ribble to the north of Walton-le-Dale, close to the position of the current A6 (Philpott 2006, 60). Walton-le-Dale was a significant industrial centre during the Romano-British period and may have functioned as a part of a network of supply bases. The settlement was well-situated to exploit the navigable River Ribble and the overland road network (*op cit*, 70; 75), particularly that following the northern side of the River Ribble, running westwards towards the forts at Kirkham, and eastwards to Ribchester before continuing across the Pennines to York (*op cit*, 60; 87). It has also been suggested that the A59, which runs between Liverpool and Preston, might be based on a Roman route (Ratledge 2010). Part of this road runs within 0.5km to the south of the pipeline route. The main east/west land route in this part of Lancashire was located on the northern side of the River Ribble, running eastwards from Kirkham towards Ribchester, before continuing to York (Philpott 2006, 60, 87; Margary 1973, road 703, 106–7).
- 3.3.2 Direct evidence of Roman occupation from Preston itself is very limited, but includes part of a *mortarium* vessel found in a pit on New Hall Lane (Hunt 2003, 16) and a number of coin finds, including the Beech Street hoard (LHER 10289), discovered in 1939, and those found at the Ladywell Shrine, Fernyhalgh Lane (Fishwick 1900, 7-8; Hunt 2003, 18; OA North 2004).
- 3.3.3 ***Early medieval period (c AD 409 – AD 1066):*** evidence for activity during the early post-Roman period is scarce in Lancashire. The etymology of waterways in the region, including the Savick Brook and River Ribble, suggest occupation by indigenous British populations (Lancashire County Council 2006, 18). Subsequent Anglo-Saxon cultural influence in the sixth-ninth century AD, if not actual population displacement, is suggested by place-names, including Preston, ‘the town of the priest’ and Fishwick, ‘fish market’ (Hunt 2003, 31). The name Howick is derived from Old English, meaning the dwelling place of a person named *Hoc* (Wyld and Oakes Hirst 1911, 155; 397), while Hutton has an Old English root denoting a settlement on a spur of land (Crosby 2000, 1).
- 3.3.4 Scandinavian influence in the local area is also suggested by place-name evidence. Part of the area to the south of the eastern end of the pipeline route was formerly an island within the River Ribble, and was depicted as such as late as George Hennef’s map of 1830. This area was named as ‘The Holme’ on the first edition map of 1848, which is a place-name of Old Norse origin, meaning an island or a piece of land that is separated from the surrounding area, such as dry land defined by a stream or wetland (*eg* Armstrong *et al* 1950, 478; Gelling 1993, 50).
- 3.3.5 It should be remembered, however, that linguistic continuity, including otherwise incongruous colloquialisms, might be responsible for the introduction of certain place-names in much later periods than their linguistic root suggests (Newman 2006, 95). For example, although the placename ‘Penwortham’ appears to include the Celtic-British element *Penn*, denoting a hill (Mills 1991, 257), this could reflect the linguistic survival of this spoken word well into the Anglo-Saxon period, rather than providing definite evidence that *Penn* had been applied as a local placename during the Romano-British period. Indeed, the *worth* and *ham* elements of Penwortham are Old English in origin

and mean an enclosed homestead (*ibid*), and an alternative analysis suggests *Penn* as an Old English element denoting an enclosure (Smith 1956, 61). It is also possible that the *ham* element might derive from the Old English meaning dry land surrounded by water (see Gelling 1993, 285), rather than the common form meaning a village. This would correspond, both topographically and linguistically, with the area known as 'The Holme'. Penwortham was recorded in the Domesday Book, demonstrating that the etymological elements were at least pre-Conquest in origin, and it is thought that there may have been a pre-Norman ecclesiastic foundation, perhaps on the site of St Mary's church (Crosby 2000, 4).

- 3.3.6 Archaeological evidence for early medieval activity in the wider locale is not particularly widespread, but is extremely significant: the largest Scandinavian hoard in north-west Europe was found at Cuerdale, around 6km to the east of the study area (Newman 1996, 103). The 40kg hoard, dated to AD 905, comprised 75% hack silver together with over 7250 coins, many minted in York (*ibid*; Newman 2006, 111). It has been suggested that the hoard, located so close to the Ribble, may have represented funds being gathered to fund a reinvasion of Ireland, following the expulsion of the Norsemen in AD 902 from the settlements they had founded (Newman 2006, 112). The find supports the view that the River Ribble may have formed an important communication route for tenth century Scandinavian communities in Dublin and York (Lancashire County Council 2006, 17).
- 3.3.7 There is little direct evidence for activity in the immediate vicinity of the pipeline route during the early medieval period, although it is possible to infer the presence of settled lands in the area from historical references made immediately after the Norman Conquest. Much of the western part of the pipeline route falls within land that formed part of the southern extent of the River Ribble until the course was consolidated in the nineteenth century.
- 3.3.8 The Domesday survey of 1086 states that Penwortham (*Peneuerdant*) was held by King Edward (Farrer and Brownbill 1906, 287) and, as Edward died in January 1066, this suggests that the area constituted a demesne holding prior to the Norman Conquest. The survey notes that half a fishery, woodland, and eyries of hawks were present in the area in 1086, and that these had been present during the reign of King Edward (*ibid*). It was also implied that, prior to the Conquest, there were two carucates of land in the area rendering ten pence, although the antiquity of these holdings is somewhat ambiguous. The holdings certainly originated prior to 1086 and it has been suggested that the two carucates, or ploughlands, might relate to Penwortham and Howick (Farrer and Brownbill 1911, 56-61). The presence of a castle at Penwortham, prior to the Norman Conquest, was not mentioned in the survey, although excavations at the site of the Castle Hill motte, to the north of St Mary's Church, in 1856 revealed that at least three phases of use were represented within the fabric of the mound (Farrer and Brownbill 1908, 533-6). It remains a possibility that the earlier occupation of the mound might pre-date the Norman Conquest, suggesting the continuity of the site as a power centre between the early medieval period and medieval periods. The hypothesis that the Norman motte was preceded by an earlier site has, however, been disputed by Crosby (1988, 30-1).
- 3.3.9 **Medieval period:** the medieval settlement at Preston appears to have been centred around the church of St John the Divine, which was not recorded in the Domesday survey but may predate the Norman Conquest (Lancashire County Council 2006, 18). Preston was granted Royal Borough status in a charter of the early twelfth century, issued by Roger de Poitou (Lancashire County Council 2006, 19), and was a free borough governed by an elected body drawn from the burgesses, rather than falling under manorial control (*ibid*).

Following de Poitou's part in a rebellion against Henry I, the borough, part of the Honour of Lancaster, was forfeited to the Crown. The Honour remained under royal control until its alienation during the Wars of the Roses in the fifteenth century. Documentary evidence shows that in the thirteenth and fourteenth centuries the town hosted numerous traders and craftsmen, and the wealth of the borough was also augmented by the import and export of goods. This was facilitated by the growth of the port on the River Ribble, which appears to have been a recognised asset by the fourteenth century (*ibid*).

- 3.3.10 By the time of the Domesday survey in 1086 a castle had been established in Penwortham and the demesne included two ploughs. Six burgesses, three radmans, eight villains, and four oxherds were also listed, holding a combined total of four ploughs. The presence of burgesses implies that the castle once formed a centre of power within the administrative unit of a borough (Farrer and Brownbill 1911, 56-61). This suggests that during the earlier part of the medieval period Penwortham might have been more prominent as an administrative centre than it was during the later historical periods, with a royal charter providing the area with status, and accompanying privileges, equivalent to a town. These privileges would include the rights to buy, sell, inherit, lease, and bequeath land without the obligation to refer to the manorial lord, which were rights that were not shared by many other rural manors (Crosby 1988, 33). Despite these urban privileges, Penwortham remained as a rural township, with no nucleus of settlement, throughout the medieval period and did not evolve into a town, although neighbouring Preston did (*op cit*, 33, 36).
- 3.3.11 The location of the motte at Penwortham would have formed an important strategic position during the eleventh century, with the River Ribble marking a frontier zone between Norman-controlled England and the kingdom of Strathclyde (Crosby 1988, 30-1). In addition to being sited on this linear boundary zone, Penwortham also marked points of fordable crossing of the River Ribble. The strategic value of this area is also suggested by the presence of an opposing motte and bailey castle on the northern side of the River Ribble, at Tulketh, and it is possible that the pair of castles provided protection for both the lower Ribble valley and the borough of Preston (*ibid*).
- 3.3.12 In 1140, Warine Bussel transferred extensive lands in Penwortham, including the church of Penwortham, to the Benedictine abbey of Evesham, which facilitated the establishment of the priory of Penwortham (Farrer and Brownbill 1911, 52-6; Farrer and Brownbill 1908, 104-6). Profit was made available to the Abbey of Evesham as a result of the fisheries located at the Penwortham estate and managed by the priory (Crosby 1988, 47).
- 3.3.13 The presence of the precursor to the A59, and associated river crossings, in addition to a second ford to the north of Castle Hill, which has been suggested to have been accessed via a sunken track leading along the western side of Penwortham church (Farrer and Brownbill 1908, 553-4; Crosby 1988, 44), will have conferred a degree of significance on Penwortham during the medieval period, as a point of access northwards and westwards across the River Ribble. However, much of the land lying immediately to the south of the River Ribble, to the west of Penwortham village, comprised areas that were seasonally or permanently inundated by the river.
- 3.3.14 The townships of Howick and Hutton were each associated with medieval manors. Prior to AD 1100, Roger de Poitou gave the manor of Howick to Evesham Abbey, and it is clear that at this time Howick was considered part of the Farrington township (Farrer and

Brownbill 1911, 65). Soon after AD 1200, Howick manor was divided and, by 1523, the main part of the manor was held by Thomas Hesketh of Evesham Abbey (*op cit*, 65–6). Hutton manor was a member of the fee of Penwortham and was sold by Roger, son of Orm, to the canons of Cockersand between 1201 and 1210 (*op cit*, 67). As with Howick Manor, the thirteenth century was also a time of division and sub-division of the land holdings within Hutton Manor (Crosby 2000, 25).

- 3.3.15 There is a great deal of historical evidence to demonstrate the occupation of land in the Howick and Hutton townships throughout the medieval period. Leases and land grants show that there was continuous ownership and tenancy of land in these areas from at least AD 1216 into the post-medieval period (LRO: DDF 524–543). The mention of ditches, dikes, and sikes as early as AD 1216 in Howick (*ibid*) and AD 1225 in Hutton (Crosby 2000, 21) shows that this land was not only subject to saturation at this time, but that there were early attempts to drain it, in order to gain and maintain productive agricultural land. The fact that this area was actively exploited as a resource base during the medieval period is also demonstrated by analysis of the Cockersand cartulary (*op cit*, 12). This shows that the land in the Hutton area was utilised for common arable and grazing lands, turf moor, settled farm land, and salt marsh grazing. Further industries are suggested by the mention of Bradford Greaves in medieval deeds, which may relate to coppicing (*op cit*, 32), and fisheries also existed in the area (*op cit*, 81).
- 3.3.16 Fisheries were an extremely important resource and, during the medieval period, those in the vicinity of Penwortham were the most valuable on the River Ribble (Crosby 1988, 47). Indeed, when Henry, lord of Penwortham died in 1311, his share of the Penwortham fishery was worth more than any category of agricultural land or woodland and was the most valuable part of his estate (*ibid*). The earliest references to fisheries in this area occur in the Domesday survey of 1086, which described a half share of a fishery on the Ribble being owned by the manor of Penwortham (*ibid*). Historical references to fisheries in Howick and Hutton include details relating to fishing strategies. A document datable to between 1200 and 1236 recorded the quitclaim of three stakenets within the bounds of Hutton to Cockersand Abbey by Abel of Hutton (*op cit*, 16). A document dated to between 1268 and 1279 recorded that Robert the Scrivener (scribe) held from Cockersand Abbey the right to place nets, including four stakenets, in the River Ribble between Howick and Clifton (*ibid*). As these townships lay on either side of the river, it is possible that this reference relates to the practice of fishing across the whole width of the river, which was a practice that was recorded in this area during the post-medieval period (*eg* DDF 929).
- 3.3.17 It is clear from the roles of Evesham and Cockersand Abbeys, as major landowners in the area, that ecclesiastic institutions exerted a strong local economic influence in the medieval period. Indeed, as well as owning lands and industries, Cockersand Abbey also eventually let the large Hutton Grange estate to Ralph Blackburn in 1451, demonstrating the role of the abbeys as landlords (*op cit*, 25). Following the Dissolution of the Monasteries in the late 1530s, however, the influence of the abbeys diminished. At this time, Hutton Manor passed into the hands of Lawrence Rawstorne, whose family remained influential in the area throughout the post-medieval period (Farrer and Brownbill 1911, 68), and the manor and rectory of Penwortham were leased to John Fleetwood in 1539 (Farrer and Brownbill 1908, 104–6).
- 3.3.18 **Post-medieval period:** in the seventeenth and eighteenth centuries Preston emerged as a prosperous legal and administrative centre, but it was also a focus for conflict; during the

English Civil War, two battles were fought in and around the town. (Hunt 2003, 35-6). The town saw further conflict during the Jacobite Rebellion of 1715 (Hunt 2003, 36-7).

- 3.3.19 In 1628, Charles I sold the royal manor of Penwortham to buyers including Edward Ditchfield, and it was subsequently acquired by the Farrington family (Farrer and Brownbill 1911, 56-61). The portion of the manor previously owned by the Abbey of Evesham was leased by John Fleetwood from 1539 until 1543, when he purchased the land from the Crown (*ibid*). The Fleetwoods were a Protestant family and maintained a stipendiary minister at St Mary's Church, Penwortham, whilst converting the former priory buildings into a residential house (*op cit* 52-61). The estate remained in the possession of the Fleetwood family until 1748, after which the accumulation of debt forced the sale of the land (*ibid*). Penwortham Priory estate was acquired by Lawrence Rawstorne in around 1810 and was subsequently retained by the Rawstorne family into the twentieth century (Farrer and Brownbill 1911, 52-61).
- 3.3.20 Penwortham Moss was owned by the lords of the manor, but was a valuable resource for both local freehold inhabitants of the area and those who lived at a distance but were able to acquire rights to exploit the area (Crosby 1988, 62). The mosses were used for peat, brushwood and reed thatch, and rushes for making candles (*ibid*). However, between the sixteenth and eighteenth centuries these areas began to be reclaimed and by the mid-eighteenth century almost all of the local mosses and wastes had been enclosed as farmland (*op cit*, 77). Approximately 1000 acres of land with common rights passed into private ownership, with all of the enclosure occurring as the result of private endeavours, in contrast to the large-scale parliamentary enclosure that characterised wastes in many other areas (*ibid*). The enclosure of the mosses helped to create a growth in yeoman farmers in the local area during the sixteenth and seventeenth centuries, who held both tenancies and freehold property (*op cit*, 78).
- 3.3.21 In addition to the reclamation of the inland mosses, the salt marshes fringing the shores of the River Ribble were also subject to piecemeal enclosure from the sixteenth century onwards (Crosby 2000, 73). The salt marshes of Hutton, for example, were owned by the Rawstorne family from 1530 (Farrer and Brownbill 1911, 68), although they were exploited collectively by numerous manorial tenants who were also responsible for the provision of labour and materials associated with the upkeep of the marsh (Crosby 2000, 73). In addition to maintaining the embankments that prevented flooding of enclosed agricultural lands, new fields were also created by the construction of banks reinforced with alder piles around temporarily dry areas of marsh (*op cit*, 77). The banks, and associated drainage ditches, would be intended to prevent the regular inundation of these new fields at higher tides, particularly at the Autumn and Spring equinoxes, although changes in river levels meant that reclaimed land could return to marsh (*op cit*, 73).
- 3.3.22 Although Preston did not expand greatly in the seventeenth and early eighteenth centuries, development considerably altered its medieval character (Lancashire County Council 2006, 22). Burgage plots were subdivided and poorer dwellings were often situated behind the facades that fronted Fishergate and Church Street (*ibid*). The development of Preston during the seventeenth and eighteenth centuries included the construction of well-built and fashionable brick and stone houses to cater for middle class and wealthy occupants (*ibid*). Despite the status of the town as a provincial capital and the installation of civic amenities, such as a public water supply and oil-fuelled street lighting, the town suffered from problems of waste disposal (*ibid*). This problem was presumably both compounded and alleviated by the presence of privately-owned roaming pigs that scavenged the middens in the streets (*ibid*).

- 3.3.23 The Industrial Revolution brought dramatic change to Preston. The town had become a principal corn-milling centre by the late eighteenth century (*ibid*) but by 1857 was a centre for cotton production, with 75 textile mills having been constructed in the vicinity. Many burgesses were also involved with other aspects of the textile industry, beyond the cotton industry, through their interests in wool, flax, and linen, and the trade in Irish linen had been a factor in the local economy since at least 1543 (*ibid*). The role of handloom weaving was so vital to the textile industry that by 1830 around a quarter of the houses in Preston (over 1000) was used for weaving (Lancashire County Council 2006, 29). By the eighteenth century many occupants of the rural areas of Penwortham, Howick, and Hutton were also supported as a result of the weaving industry, with numerous others engaging in weaving as a sideline to their main occupations in milling, cobbling, farming, and carpentry (*op cit* 85). The success of the handloom weaving industry was largely responsible for the population growth in these areas during the later eighteenth and nineteenth centuries.
- 3.3.24 The late eighteenth century saw further developments in the textile industry with the mode of power generation graduating from wind power, to horse power and finally steam (Lancashire County Council 2006, 24). As well as the availability of machinery, the adoption of steam power in Preston was also enabled by the supply of coal from Wigan, which became available with the opening of the Douglas Navigation (*op cit*, 29) and, subsequently, by the development of the railway system and the docks. The local dependence upon hand-weaving resulted in a dramatic decline in the local economy following the introduction of steam-powered mills in the early nineteenth century (Crosby 1988, 88). The American Civil War of 1861-65 caused a cotton famine in Lancashire when imports of cotton were halted (Spinning The Web 2010). By the 1850s, local handloom weaving had become extinct (Crosby 1988, 88).
- 3.3.25 To meet the new demand for labour instigated by nineteenth century industrial growth, the population of Preston expanded from 10,000 in 1800 to 70,000 in 1850, and to 110,000 in 1900 (Hunt 2003, 50). This necessitated unprecedented urban expansion, with housing built to accommodate both the workers and their families, and the middle classes.
- 3.3.26 The boundaries of Penwortham shifted slightly during the late nineteenth century, when a new channel of the River Ribble was cut, in association with the construction of the Albert Edward Dock, in Preston, in 1884-1888 (*op cit* 128). This channel, consequently, transferred a narrow band of land that had formerly been part of Penwortham to Preston (*ibid*).
- 3.3.27 **Fisheries:** rights to catch fish from the River Ribble in the vicinity of Preston, Penwortham, Howick, and Hutton were associated with land ownership and were strictly controlled by local landowners during the post-medieval period, either through the provision of formal leases (eg DDF 909) and licenses (eg DDF 904) or by the exclusive retention of these rights by landowners. In the vicinity of the pipeline route, the ownership of fishing rights, and associated fisheries during the post-medieval period, were held by several people or groups, as a result of the river passing through several land holdings. Fisheries in the Ribble were documented in association with the Borough of Preston in 1614 (CBP 71/27/1), 1720 (CBP 71/27/4), and throughout the nineteenth century (eg CBP 71/27/10); the manor of Howick (or Houghwick) in 1746 (DDF 909), the manors of Lea and Hutton in 1757 (DDF 912), the manor of Ashton and also that of Walton Maines in 1750 (DDF 932; DDF 911), and the manor of Penwortham in 1693

(DDF 929) and throughout the eighteenth century and into the early nineteenth century (eg DDF 923; DDF 932; DDX/61/7; DDX/61/9).

- 3.3.28 The owners of fisheries and fishing rights in these areas included the Rawstorne family, the Chetwynd family, the Farrington family, the Hoghton family, Catherine Worthington, and the mayor, bailiffs, and burgesses of Preston. In addition to the ownership and leasing of fishing rights and fisheries, agreements were made between parties for the joint ownership of fisheries, such as one in Penwortham that was partly owned by Walter Chetwynd in 1746 (DDF 909), and one in Walton-le-Dale that was partly owned by Sir Henry Hoghton in 1750 (DDF 911).
- 3.3.29 An agreement was mentioned in several records between 1691 and 1757, in relation to the custom of fishing across the River Ribble between the fisheries of the Hoghtons at Ashton and Lea, and of the Farringtons and Rawstornes at Penwortham and Hutton (DDF 896; DDF 912; DDF 929; DDF 932). This agreement included details of the employed fishing strategy, which comprised the setting of balks, stakes, piles, and nets across the whole width of the river (eg DDF 896; DDF 912; DDF 929), which appears to have constituted a temporary stake-built weir, referred to as calls or garths from the medieval period, and consolidated with hurdles of woven branches or bundles of brushwood (Crosby 1988, 47-8). These weirs could be fished with nets from the shore or from boats, and nets could also be hung from the stakes (*ibid*). These fisheries would be utilised by the holders of the fishing rights on either side of the river on consecutive days, from sunrise to sunset, giving each party equal access to the resource at all times of the year. The agreements, such as that of 1757 (DDF 912) refer to ‘ancient, just, and rightful method’ of fishing across the river and it might be speculated that a similar scheme was in effect from as early as the medieval period, when the manor of Penwortham was recorded as owning a half share of a fishery (Crosby 1988, 47).
- 3.3.30 The fishery owned by the Borough of Preston in 1614 included fish yards, caules, weirs, and locks (CBP 71/27/1). The lease of the fishery and fishing rights to William Farrington of Worden included the condition that if he or Richard Fleetwood set up weirs that they should repair them or face a fine of £13. 6s. 8d (CBP 71/27/1). The lease of Sir Henry Hoghton’s fishery at Walton Maines to William Farrington of Worden in 1750 included the condition that the leasee would provide Hoghton with a good fishing boat and a set of stakes at the end of the term (DDF 911). These fisheries, once again, appear to have been associated with weirs that spanned the river, rather than localised tidal fish traps at the edges of the estuary or within tributaries of the river. This type of weir is likely to have been referred to in the accounts of the manorial steward of Hutton, known as the Hutton Marsh callings (Crosby 2000, 77). These documents provide an insight into the lives and activities of fishermen in Hutton during the eighteenth century and include records of the rafting of timber down the River Ribble from Tunbrook (Redscar) to Hutton in 1731-2 (*ibid*). In addition to being responsible for the rafting of the timber, fishermen in Hutton also landed the resource when it arrived. There are also records of compensation being paid to fishermen as a result of damage to nets and stakes as a result of the transport of the timber (*ibid*), and these references are more likely to relate to the weirs that spanned the river, rather than discrete traps situated at intervals along the river shore.
- 3.3.31 The maintenance of the fisheries was an ongoing process, with the wooden stakes and hurdles being vulnerable to damage from tides and flooding (Crosby 1988, 48), as well as damage by goods or vessels using the river. Woodland was required to provide materials for the upkeep of the fisheries and, from 1547, Waddishaw Main Wood, which

lay to the north-west of Penwortham Priory, was fenced off for these purposes (*op cit*, 48-9).

- 3.3.32 Descriptions of fish traps that occupied the edges of the Ribble estuary in Hutton during the eighteenth and early-nineteenth centuries were recorded during the provision of evidence in relation to a dispute over fishing rights in c 1830 (Crosby 2000, 80-1). These notes recorded that fishing rights were leased from the Rawstornes to James Singleton, who then sub-let the rights to local men. Men who had lived in Hutton from the mid-eighteenth century, and who had worked at the fisheries, described the construction of temporary dams (baulks) of wood across channels on the sands and the outer edges of the marsh (*ibid*), which they said was the only method used by the men of Hutton. At high tide the dams were submerged and as the tide ebbed the fish were trapped in the channels and could be caught with nets (*ibid*). Two or three baulks would be set, depending upon the size of the channel, and William Burscough related that the traps were normally used for the fishing of flukes. It was said that there were more baulks in Longton, to the west of the current study area, than in Hutton, and that the trade was often passed on from father to son (*ibid*).
- 3.3.33 The local fisheries declined during the nineteenth century, as the cutting of a new channel in the River Ribble in 1807–9 aided the reclamation of the wetlands flanking the estuary and also led to the loss of the expanses of sands fringing the estuary (Crosby 2000, 81). The condition of the river deteriorated between 1811 and 1838, following a lack of funds within the Ribble Navigation Company and a new company was formed in 1838, which was responsible for cutting a new channel from Ashton Marsh to the Naze (*op cit*, 106). The OS map of 1848 (Fig 3) recorded a broken and slightly irregular line extending from the edge of Lea Marsh, on the northern side of the Ribble, to the northern edge of the artificial river cutting. This was not annotated but might have represented the remains of one of the former weirs that had run across the full width of the river prior to the modification of the channel.
- 3.3.34 By 1850, embanked flood defences had been constructed from Ashton to Freckleton and Hutton and further substantial areas of land had been reclaimed. A third company was formed by an Act of Parliament in 1850, which undertook works that increased river navigability and led to the growth of Preston as a port. This facilitated the construction of Preston Docks and the cutting of a new course for the River Ribble across the northern side of Penwortham in 1885-92 (*op cit*, 107), as depicted on the OS map of 1892-3 (Figs 4-5). These works resulted in the reclamation of further substantial tracts of land and the final loss of the local fisheries.

4. RESULTS

4.1 WATCHING BRIEF

- 4.1.1 **Introduction:** the watching brief was effective throughout the duration of the stripping of topsoil from the portion of the pipeline easement, and associated compound areas, that lay to the south of the River Ribble (Fig 2). The excavation of the pipe trench within the easement was also subject to the watching brief, as was the excavation of shafts associated with extending the pipeline beneath the river. Much of the pipeline route in this area ran through agricultural fields that were established on drained land that was reclaimed from the River Ribble during the early nineteenth century. To the east of the centre of the eastern compound (Fig 2), the pipeline route ran through field systems and a golf course that occupied part of the former agricultural landscape of Penwortham that predated the nineteenth land reclamation.
- 4.1.2 **Results:** as a result of the reclaimed character of much of the land through which the pipeline ran, the deposits exposed during the watching brief that underlay the topsoil mainly comprised archaeologically sterile whitish-brown, brownish-grey, and orange-grey sandy alluvium. In some areas, these deposits will have directly represented former river beds of the Ribble, whereas some of the deposits will have resulted from the seasonal, or occasional, inundation of the flood plains that fringed the river. In areas of relatively deep excavation along the pipeline route, for example where test pits had been excavated by ground works contractors in the western compound area, the laminated nature of the sandy deposits attested to their gradual, water-borne, accumulation. In some areas, fluvial/estuarine deposits of gravel that contained marine shells were observed underlying the sandy deposits, whilst grey silty-clay was observed underlying the sand in other areas.
- 4.1.3 Pieces of unstratified animal bone, sherds of post-medieval pottery and glass, and fragments of brick were discovered at various locations along the pipeline route. None of these finds were associated with any discernible man-made features and it is likely that most of them will have represented the accumulation of detritus as a result of the spreading of waste onto fields in association with manuring practices. However, one of the animal bones included the scapula of an aurochs (*Section 4.3*; Fig 2; Plate 4), which is a long-extinct type of cattle and will not have occurred within medieval or post-medieval waste deposits. Although found within alluvial sands at a depth of between 1.5m and 2m, post-medieval pot was found in close proximity to the bone and the degree of mixing of deposits, as a result of the removal of large quantities of material by machine, means that the bone was essentially unstratified and not attributable to a secure context.
- 4.1.4 As the pipe trench was being excavated through the field lying to the west of the Mill Brook (Fig 2), which lies within the Hutton County Parish, a series of vertical wooden stakes was revealed. The stakes measured between 57mm and 130mm in diameter and between 0.36m and 3.03m in length (Figs 5, 6 and 7: Plates 5-7). Many of the stakes were, however, truncated by machine action, and their fragile nature meant that they could not all be removed in single pieces, and so a definite figure for their maximum former lengths was not established. The overall length of the setting of stakes, as exposed, was approximately 25m and their maximum exposed width was 4.2m. The stakes featured sharpened ends and had been pile driven into the sands and silts (Plate 8).

- 4.1.5 Oak, ash, alder, and hazel were identified amongst a selection of stakes that were retained for radiocarbon dating (D Druce *pers comm*: Section 4.4). The stakes occupied part of an area where an accumulation of deposits of brown and grey sands and silts was observable (**102**, **108-113**), which markedly contrasted with the yellow sands (**100** and **101**) that were exposed to each side (Plate 5). These deposits appeared to have accumulated naturally within a palaeochannel that would formerly have been fed by Mill Brook, prior to the straightening and rationalisation of this stream. In total, 221 stakes were recorded that formed a complex pattern, although numerous deliberate linear settings were evident (Fig 5). The group of stakes extended beyond the northern and southern edges of the pipe trench, with some stakes being partially revealed within the trench edges, and, it was, therefore, not possible to discern the full extent of the group or the overall pattern, or patterns, that were formed by the stakes. The stakes extended to the eastern edge of the palaeochannel but did not extend to the western edge of this former channel. The pattern of the stakes, and their location within the palaeochannel, suggested that they represented a former fish trap.
- 4.1.6 In addition to the upright stakes, the remains of wooden hurdles, some of which were identified as oak, alder, and malvoideae, which include hawthorne, apple, pear, and whitebeam, (D Druce *pers comm*), were also encountered (Fig 5; Plate 9). These comprised pieces of wood with a narrower diameter than the stakes (between approximately 6mm and 53mm) that lay horizontally between the upright stakes. Some of these horizontal pieces were exposed as individual items within the base of the trench and portions of hurdle panels were also revealed in upright positions within the edges of the trench (Fig 7). Some of the hurdle components appeared to comprise largely unmodified branches, some with numerous small twigs remaining attached to the main branch, and some had been sharpened at one end.
- 4.1.7 A band of large stones was observed along the northern edge of the feature. These extended from the edge of pit **114** (see Section 4.1.8) in an easterly direction, and were seen in the trench section only (Fig 7). The linear arrangement suggests a deliberate association with this feature, in addition to which no further collections of stones were observed during the watching brief, other than with the wooden posts recorded further down river (Section 4.1.9)
- 4.1.8 A sub-rectangular pit (**114**) with a flat-bottomed V-shaped profile and measuring 2.25m long and 1.8m wide, as exposed, was observed at the eastern end of the fish trap. The pit was filled with a single deposit of mid brownish yellow loose fine alluvial sand (**115**). This pit had clearly truncated a portion of the fish trap and is likely to represent relatively modern attempts to encourage drainage within a portion of an agricultural field that would have been prone to waterlogging as a result of the underlying palaeochannel.
- 4.1.9 A series of 21 wooden posts associated with granite and sandstone block walling was discovered immediately to the north of the hamlet of Bottom of Hutton and to the north-west of Jenny's plantation (Plate 10; Fig 8). The posts formed two single lines that were aligned approximately north-west/south-east and were spaced a maximum of 2.05m apart. The maximum exposed length of the primarily timber post line was 12.95m and the maximum exposed dimensions of the stone walling were 8.95m long and 1.05m wide. The line of granite and sandstone blocks followed, and reinforced, the alignment of the north-easternmost line of posts, continuing this line to the south-east where timber posts were no longer visible. Stones were also observed in direct association with the westernmost line of posts, although there were fewer such blocks associated with this line. Although the two lines were similarly aligned, they did not appear to have been

parallel and formed a tight closed angle at their south-eastern ends. This might, however, have been an illusory product of the differential survival of stonework and timbers and the original form of the structure might have comprised a single stretch of walling that was reinforced at each side by piles. In addition to the stake fragments found within this area, a shaped block of wood of uncertain purpose that had had holes drilled into it was also discovered. This might have formed part of a pulley system.

- 4.1.10 In the area between Mill Brook and the Penwortham Golf Course, palaeochannels aligned roughly north/south were observed running through gravel-rich sandy deposits. Unstratified pieces of wood were discovered at several locations within this general area, although they could not be demonstrated to have formerly occupied any of the encountered channels. The wood included wooden posts or stakes that were up to 2.35m long, some of which featured sharpened ends. It was not possible to discern whether this material had originally been placed in the immediate vicinity of its discovery or if it represented driftwood that might have been water-borne from disparate locations.
- 4.1.11 Post-medieval ceramic-piped land drains were revealed at several locations along the course of the pipeline and two segments of ditches were encountered that are also likely to represent post-medieval drainage channels (Fig 2). These ditches were to the north of Howick electricity substation, and were each roughly aligned north/south and, therefore, ran between the fields to the south and the river to the north. Each ditch ran perpendicularly across the pipeline easement and, therefore, approximately 5m lengths of the features were exposed. Ditch **01** measured 1m wide and 0.29m deep and featured quite shallow sides and an approximately flat base. The ditch was filled by a single deposit of light grey compact silt and a piece of plastic was found within the fill. Ditch **02** measured approximately 2.3m wide and 0.18m deep and was filled by a single deposit of mid-grey sandy-silt. The sides of the ditch were extremely shallow and the profile was irregular, and it is possible that this might have represented a former stream channel that ran into the river.

4.2 THE FINDS

- 4.2.1 **Introduction:** in total, 108 artefacts were collected from essentially disturbed deposits and were recovered either from the upper or lower levels of topsoil, or from river silts. Of these, the assemblage is dominated by 93 small fragments of ceramic, with lesser amounts glass (six fragments), shells (five), wood (including two objects and a number of unworked fragments), animal bone and a piece of clay tobacco pipe. The material generally dated between the seventeenth and twentieth century, although the timber stakes and the aurochs bone derived from earlier activity (*Sections 4.3 and 4.4 below*). A catalogue summarising the finds is shown in *Appendix 3*.
- 4.2.2 **Ceramic:** in total, 93 fragments of pottery dating between the seventeenth and nineteenth centuries were recovered from across the site. The assemblage was dominated by domestic wares, such as transfer-printed wares, and utilitarian glazed white earthenwares. Lesser amounts of utilitarian stonewares and glazed red earthenware, such as bottles, pancheons and storage jars, were also present. Many of the pottery sherds showed fresh breaks, or evidence for being water-worn.
- 4.2.3 The earliest pottery included a probable imported German blue-grey stoneware body sherd, and a badly abraded fragment of hand-trailed slipware dish. This may have been produced in Stafford, although its provenance was difficult to ascertain. These sherds could be dated to the latter half of the seventeenth century. The eighteenth century is

represented by stonewares of the type produced in Nottingham, Staffordshire salt-glazed ware, and a green fragment which could be another German import. Other sherds from this period included dark brown, yellow and black-glazed red earthenwares, all of which were hard-fired, and several early blue transfer and hand-painted glazed white earthenwares.

- 4.2.4 The remainder of the assemblage is dominated by nineteenth-century fabrics, such as light brown bodied stoneware jugs and jars. Other stonewares included a small fragment from a wide-necked bottle that contained charcoal dust used for cleaning moulds in foundries. Other pottery from this period included yellow-glazed white earthenware, and several black and blue transfer-printed wares in a variety of patterns and press moulds, including Asiatic Pheasant, Willow and Broseley, in addition to several commemorative plates. Other fine tablewares included lesser amounts of English porcelain, and late nineteenth century factory made slipwares. Turn of the century products included abundant glazed white earthenware tablewares, including several annular-type wares, such as mugs and serving bowls.
- 4.2.5 **Glass:** in total, there were six fragments of glass, including five bottles and a small bowl of types that generally date between the seventeenth and twentieth centuries. Of these, there are two blown and pitted, natural green coloured wine bottles, each having a cylindrical neck, with slightly sloping shoulders, and uneven collars set below the rims. Bottles of this type date to the mid-eighteenth century. The remainder of the glass included two pieces of clear mineral water bottles each dating to earlier than the late nineteenth century, and a piece from cut crystal fruit bowl of likely twentieth century manufacture.
- 4.2.6 **Clay Tobacco Pipe:** this category is represented by a single plain incomplete spurless burnished stem. Spurless pipes are unusual (Oswald 1975), although nineteenth century examples such as plain 'cutty'-type pipes have been identified in Manchester and Wigan. The lack of a bowl on this example makes it impossible to date accurately.
- 4.2.7 **Shell:** the shells were not subject to specialist inspection, but included three large marine gastropod shells and two cockles.
- 4.2.8 **Wood:** the wood assemblage included two objects and at least 60 small twig fragments. In addition, a small assemblage of wood samples was retained for the selection of samples for radiocarbon dating (*Section 4.4*).
- 4.2.9 An interesting dome-shaped object was recovered, which featured two small holes that had been drilled through its upper surface, and a semi-circular-shaped notch along one edge. The object measured 200mm in diameter and 50mm thick, and weighed approximately 1kg. The surfaces were entirely finished, which prohibited the identification of the species without damaging the object. It is possible that it may have been used as a weight or as part of a pulley system.
- 4.2.10 The remaining worked fragment comprised a 160mm long by 10mm diameter stake cut from a piece of an ash twig. This was retrieved from a collection of 60 fragments recovered from deposit **110** (sample 1005). None of the other fragments appeared to have been worked.
- 4.2.11 **Summary:** due to the unstratified nature of the deposits, the finds offer little to further our understanding of the site.

4.3 ANIMAL BONE

4.3.1 **Introduction:** a small number of animal bones were recovered during the archaeological watching brief. All of the bone was scanned for potential for analysis and was unstratified, and generally of no archaeological value, with the exception of a single aurochs scapula (object record no. 1009: Plate 4) excavated from fluvial deposits. Aurochs are thought to have become extinct in Britain by the end of the Bronze Age (Davis 1987, 179), although some workers have suggested it survived in parts of the British Isles into the fourth century AD (Noddle 1993, 98-103).

4.3.2 **Results:** the aurochs scapula is slightly larger than the two mesolithic aurochs scapulae recovered from Star Carr in North Yorkshire (Legge and Rowley-Conwy 1988; Table 2 below). One small cut mark is present on the medial side of the scapula, near the glenoid fossa, cutting across the bone (transverse) from the dismemberment of the animal. A second possible cut mark was observed on the medial side of the blade of the scapula.

Measurement	Preston Tunnel	Star Carr	
		Bos 11 (R)	Bos 13 (R)
SLC	82.26	76.9	-
GLP	103.54	91.7	97.2
LG	86.52	-	-
BG	72.34	67.1	78.1

Key : SLC = smallest length of collum scapulae, GLP = greatest length of processus articularis, LG = length of the glenoid cavity, BG = breadth of the glenoid cavity

Table 2: Table of Aurochs scapula measurements (mm)

4.3.3 **Discussion:** although twenty-one aurochs crania and two post-cranial bones were recovered from the nearby Preston Docks excavation (Turner *et al* 2002), there were no scapulae. Neither were there any butchery marks on the aurochs bones, although marks were observed on horse and red deer bones. Likewise, there was little evidence of excessive transportation damage. It is thought that the majority of this material represents parts of the carcass of animals caught in seasonal flooding, subsequently deposited in this stretch of the River Ribble after putrefaction and disarticulation whilst in the water. A rate of around one deposit every 200 years was estimated (*ibid*). The radiocarbon dating of three of the aurochs bones from this site dates them to the Neolithic and Bronze Age period, with the red deer being of similar date (*ibid*).

4.3.4 There is little evidence of excessive transportation damage upon the scapula from the Preston Tunnel site, after its initial burial in riverine deposits the scapulae appears to have been undisturbed, without further disturbance from fluvial activity. The limited number of bones with butchery marks from Preston Docks and the scapula from Preston Tunnel does demonstrate some human intervention, but this activity probably did not take place at the site of the recovery of the bones.

4.4 RADIOCARBON DATING

4.4.1 Two samples of oak from stakes forming elements of the Mill Brook fish trap material were submitted to Scottish Universities Environmental Research Centre (SUERC) for radiocarbon dating. The resulting radiocarbon date ranges produced for both of the samples suggested that they were post-medieval in origin, with most of the date ranges falling between the seventeenth and twentieth centuries.

- 4.4.2 The uncalibrated radiocarbon determinations coincide with a complex section of the calibration curve. Therefore, three and four individual portions of the calibration curve correspond with each of the uncalibrated determinations. The selection of a probable date range represented by each sample is, therefore, dependent upon the statistical probability that each of the possible date ranges is accurate.
- 4.4.3 At a probability of accuracy of 95.4%, four date ranges were produced for Sample 101. Of these four ranges, the highest probability (52.8%) was that the most accurate date range was 1610 to 1670. At a probability of accuracy of 95.4%, three date ranges were produced for Sample 89. Of these three ranges, the highest probability (50.04%) was that the most accurate date range was 1730 to 1810.

Sample	Feature	BP Date	Calibrated Dates (95.4%)	Lab Code
89	Oak Stake	205±30BP	AD 1640-1690 (27.4%) AD 1730-1810 (50.4%) AD 1920-1960 (17.6%)	SUERC-31502
101	Oak Stake	260±30BP	AD 1510-1600 (27.5%) AD 1610-1670 (52.8%) AD 1770-1800 (12.7%) AD 1940-1960 (2.3%)	SUERC-31503

Table 3: The results of assessment-stage radiocarbon assay

5. DISCUSSION

5.1 INTRODUCTION

- 5.1.1 The watching brief was undertaken in relation to four distinct types of groundwork: topsoil stripping in the easement and site compound areas, and the excavation of the pipe trench and shafts necessary to extend the pipeline beneath the River Ribble. All of the works were undertaken to the south of the river and revealed remains that can be grouped into several broad categories, independent of the types of ground work that led to their exposure and their precise location along the pipeline route. The remains will, therefore, be discussed in terms of these thematic groupings.

5.2 AUROCHS BONE

- 5.2.1 Due to the unstratified nature of the bone, it is not possible to attribute it to a specific formation horizon within the alluvial strata. Given the dated examples of aurochs bones from Preston Dock, and the widely held belief that these animals became extinct during the Bronze Age (*Section 4.3*), it is highly likely that this represents the remains of an animal that died during the prehistoric period; potentially the Neolithic or Bronze Age periods. The presence of a cut mark on the bone demonstrates that this animal was certainly butchered, although it can not be stated with certainty whether the animal was slaughtered or had died naturally, and then opportunistically butchered. It is not possible to determine how far the site of butchery was from the site of deposition.

5.3 FISH TRAPS

- 5.3.1 Three different sources of data suggestive of the former presence of fish traps became apparent during the watching brief. Two sets of structural remains were discovered, one of which comprised upright stakes and associated hurdles, and the other of which comprised upright stakes and associated stone wall. Numerous fragments of timber and recognisable stakes were also encountered within a closely defined area.
- 5.3.2 **Mill Brook Fish Trap:** the first encountered structure within the area comprised the setting of 221 upright stakes that formed the Mill Brook Fish Trap (Plates 5-7; Figs 5, 6 and 7). The location of the stakes within a conspicuous palaeochannel, which represented the former egress of Mill Brook (Fig 2), and the overall pattern exhibited by them, was definitively recognisable as a fish trap. The location of the fish trap fell just within the eastern limit of the Hutton township. Although some localised portions of the pattern are quite complicated, a rationalised overview, with the horizontal timbers removed, gives a clear indication of regularity and portions of two conjoined V-shapes are recognisable (Fig 6). The overall setting extended as far as the eastern edge of the palaeochannel, but did not extend quite to the western edge of this channel. If the discernible patterns of stakes are extended as extrapolated lines to the north and south of the exposed area, an M or W shaped-structure becomes apparent.
- 5.3.3 Evidence from other parts of the British Isles has demonstrated that different techniques were employed in order to facilitate the setting of the upright stakes. The posts were sometimes driven in using elaborate systems of rams, pulleys, and weights (Dawson 2004, 22). More usually, the posts would be driven by the use of a specific type of mall

or mell, which comprised a section of tree trunk with two handles that would be wielded by two men (*ibid*).

- 5.3.4 In some areas it was possible to discern the remains of horizontal sticks and branches that would have been fixed between the stakes in order to create a solid barrier (Plate 9). Some of the wood used to form the hurdles comprised unmodified branches, whilst other pieces exhibited sharpened ends. The function of these sharpened ends was presumably to enable the cross-members to be fitted into the upright stakes, or a hurdle framework. The unmodified branches would then have been woven between the more sturdy elements. However, as many of the hurdle cross-members were sharpened by way of a single cut to the end of the branch, it is possible that the cuts were an artefact of their removal from larger branches or trunks and that well-constructed hurdles were not utilised. In such an instance, the branches would have been woven directly between the upright posts, as appears to have been the case in one of the examples that was visible within the trench edge (Plate 9). This method of weaving unmodified branches directly between upright posts is identical to the traditional woodland craft technique of creating 'dead hedges', which was once common in parts of the British Isles but had become scarce by the 1940s (*see* Edlin 1949, 62).
- 5.3.5 This M or W-shaped form of the trap is characteristic of a recognised category of fish trap named in the typology established by Bannerman and Jones in 1999 as a Type 6 Double-V-shaped trap (Dawson 2004, 7-9; Plate 11). This was one of several different types of trap that were once common throughout Britain, although the use of traps is now restricted to creels and pots (*op cit*, 3). Like most fish traps, these structures were designed to exploit transitional tidal zones at the edges of rivers or estuaries. At high tide, the structures would be submerged and the fish would move towards the banks to feed. As the tide ebbed the fish would become partitioned from the main portion of the river or estuary and the structure would cause them to be funnelled towards the two apexes, which terminated in open sluices across which nets were strung. In addition to the main funnels, nets could also be hung from other parts of the structure in order to supplement the primary catch (*op cit*, 3; 7-9; 20). The example at Mill Brook combined the form of the Type 6 double-V-shaped trap with some characteristics of the Type 3 modified natural feature-type trap (*op cit*, 4). This type of trap exploited natural hollows, or channels formed by natural ridges of sand or stone, which presented naturally constricted water spaces that could be modified by the provision of stakes or nets to form enclosed pools (*ibid*). The Mill Brook fish trap exploited the terminal end of the brook and, as the tide ebbed, cut off the route that fish would take between the southerly part of the channel and the River Ribble. The trap lay just within the area designated as the ordinary high water mark on the OS map of 1848 (Fig 2), demonstrating that this trap was established to exploit the regularly shifting tides, rather than the extreme tidal range of less frequent tides, such as the Spring tide.
- 5.3.6 As well as the use of fixed nets, the areas defined by the traps could also be fished by individuals with nets (*op cit*, 3). This was a technique that has been described in association with Type 3 modified natural feature-type traps (*op cit*, 4) and historical documents record the use of stake-built weirs on the River Ribble that would be fished with nets from boats (*eg* DDF 896; DDF 912; DDF 929; Crosby 1988, 47-8). Although these weirs spanned the whole of the river, this was a practice that was undertaken within the Hutton and Penwortham Townships and, therefore, in the immediate vicinity of the Mill Brook Fish Trap. Indeed, it is highly likely that individuals or groups of fishermen were at times responsible for the maintenance and use of both of the different fishery elements, and that any valid skills or techniques would be employed at either fish trap.

- 5.3.7 There was no discernible pattern in the distribution of stakes of differing wood types within the large fish trap. Indeed, some well-defined lines of stakes that clearly contributed in the formation of single structural elements featured both ash and alder/hazel stakes, with oak and alder stakes being located nearby. This appears to be in conflict with the historical evidence for the management of specific woodlands in association with the construction and maintenance of fish traps in the local area (*see Sections 3.3.30-1*). However, a consideration of the potential longevity of the structure might provide an explanation for this apparent indiscriminate use of timber.
- 5.3.8 Examinations of records relating to fish traps from other parts of the British Isles demonstrate that many of them were used over a long period, were often subject to modifications, and that it should be considered that any absolute dates might relate only to the latest phases of use of the structure (Dawson 2004, 13). This general analysis is supported by the historical records in the Hutton and Penwortham areas, which demonstrate that stakes were set for fishing from at least as early as 1200 (Crosby 1988, 16) and that the stake-built weir or weirs that spanned the Ribble between Ashton and Lea and Penwortham and Hutton were in use for a minimum of 66 years and were referred to as a component of an ancient custom of fishing (DDF 896; DDF 912; DDF 929; DDF 932). Indeed, such weirs in this area appear to have been mentioned as early as between 1268 and 1279 (Crosby 1988, 16). It is also of relevance that the trap was located at the end of Mill Brook, which represented the township boundary between Hutton and Howick and was, therefore, a long standing element of the landscape, rather than an ephemeral and shifting channel. This channel would, therefore, have presented a conspicuous target for the provision of tributary-based fish traps throughout the medieval and post-medieval periods, and prior to this.
- 5.3.9 Although both of the sets of radiocarbon dates for Mill Brook fish trap were consistent with a broad post-medieval date for the structure, the date ranges with the highest probability of being accurate presented two distinct date ranges of 1610-1670 (260±30BP - SUERC-31503) and 1730-1810 (205±30BP - SUERC-31502). Both of these stakes were located within a single line of stakes and were made of oak. However the difference in date ranges might represent modifications or repairs to the structure at different times, suggesting continuous use of the structure over a prolonged period. Indeed, the confusing array of individual posts that were recorded, within the overall W-shaped area that they defined, suggests that numerous phases of construction and modification were represented by the posts. Indeed, wattling was recorded that had become subsequently subsumed within an accumulation of alluvial sand (**110**; Plate 9). A stake associated with the fish trap (Plate 8) driven into the upper portion of this alluvial sand (**110**), therefore, definitely post-dated the use of the wattling, and so must have been associated with a structure built when that represented by the wattling had become entirely silted and obsolete. Therefore, although we can establish that the trap was likely to have been in use during the seventeenth and eighteenth centuries, it is not currently possible to establish confidently at which date a trap might first have been constructed in this area. However, this might feasibly have occurred as early as the medieval period. If such repairs and reconstruction were undertaken over long periods it is likely that, even if preferred wood sources existed, some variability in wood types might be expected as differing sources were utilised at different times.
- 5.3.10 In addition to general shifts in the availability of wood resources over time, individual leases, such as that provided by Sir Henry Hoghton to William Farrington in 1750 for rights in Ashton and Lea (DDF 911), included the obligation for the leasee to provide sets of stakes at the end of the term of the lease. Therefore, different individuals charged

with maintaining the traps over time might have utilised different sources and types of wood.

- 5.3.11 It is not clear whether each different fishery structure within specific areas were constituent elements of a single fishery or represented distinct fisheries with different individuals holding the rights to their usage. Given that the overall fishing rights in Hutton were owned by the Rawstornes, it is likely that the usage of each fish trap might have varied slightly over time with fishing rights being leased to varying numbers of individuals and, therefore, the number of fish traps falling under the control of individuals also varying. Indeed, Crosby (2000, 80-1) describes fishing rights in Hutton in the eighteenth century being leased from the Rawstornes to James Singleton, who then sub-let the rights to local men. Therefore, even during a relatively short period these fisheries might have fallen under the direct control of a single individual, such as James Singleton, who at certain times might also have sub-let parts or all of his fishing privileges. The only certain constant was the overall retention of the ownership of the fishing rights in Hutton by the Rawstornes.
- 5.3.12 In addition to insights into the overall ownership of fishing rights in Hutton, and the subsequent systems of letting and sub-letting, there is also historical information relating to the men who worked at the fisheries. Evidence given by local men during a dispute in 1830 (*ibid*) included descriptions of local fish traps, including the setting of baulks of timber across channels at the edges of the marsh and suggestions that these were mainly used for catching flukes. It was also stated that the numbers of fish traps in Hutton were low and, therefore, it is possible that these statements included eye witness accounts of the Mill Brook Fish Trap (*ibid*). These accounts also relate that some men who had not 'joined the fishery' still worked on the fish traps with men who had leased fishing rights.
- 5.3.13 The records also provide the names of some of the men who leased and fished the traps. According to Richard Harrison, in c 1760s the fisheries were leased by three men named Blundell, Abrams, and Peter Houghton (*ibid*). According to William Knowles, by 1780 William Moss, Robert Franklin, and William Harrison, who was Richard Harrison's father, were the leasees (*ibid*). Given the likelihood that the span of use of the Mill Brook Fish Trap included portions of the seventeenth and eighteenth centuries, it is possible that these named individuals might have been responsible for the maintenance and use of the trap during the later eighteenth century.
- 5.3.14 **Jenny's Plantation Fish Trap:** a second fish trap was discovered that lay 650m down river of Jenny's Plantation, within the Hutton township (Fig 8). This trap lay within an area that was shown to have been occupied by a stream channel on the First Edition OS map of 1848 (Fig 8) and, like the Mill Brook fish trap lay just within the tidal range of the ordinary high water mark. This trap appears, therefore to have functioned in a very similar way to the Mill Brook trap, although it does not appear to have formed a V or double-V shape. Instead, this trap appeared to comprise two lines of posts that lay at a slightly oblique angle to each other (Fig 8; Plate 10). Twenty-one posts were exposed in total, and the north-easternmost of the two lines was reinforced with a stone wall. It is possible that the trap only utilised one of these barriers at any given time and that two phases of the fish trap were represented by the exposed remains. However, it is more likely that a single piece of stonework flanked by two lines of stakes is represented by the structure. Given the simplicity of this layout, this structure appears to be represent a Type 3 modified natural feature type trap (Dawson 2004, 4). It should be considered, however, that the full extent of the structure was not exposed and the overall layout might have been slightly different to the schema suggested by the revealed portion.

- 5.3.15 It is not clear whether either wattle hurdles, or woven branches, were incorporated into this fish trap. No evidence for such components were encountered and it is possible that the stone walling fulfilled the requirement for such a barrier.
- 5.3.16 **Unstratified Wood and Stakes:** the vast majority of the unstratified pieces of wood, some of which comprised recognisable stakes, that were encountered during the watching brief lay adjacent to, or to the west of, a former channel that formed the township boundary between the Howick and Penwortham townships (Fig 7). This wood, therefore, lay within the boundaries of the former township of Howick. As early as between 1268 and 1279, stake nets were recorded in the Howick portion of the River Ribble (Crosby 1988, 16), and it is possible that these fragments of wood represented the disturbed remains of such traps. As the stakes were not found *in situ*, it is not possible to discern whether they originated in the immediate vicinity of their place of discovery, or whether they might have been washed downstream and accumulated naturally at a slow moving section of the river, or deposited following a temporary inundation.
- 5.3.17 **Ditches:** the two segments of ditches that were encountered (Ditches **01** and **02**; Fig 7) were clearly associated with the general post-medieval drainage of land that has been occurring in this area throughout this period. Indeed, ditch **02** was sited very close to the former location of a straightened and rationalised channel that formed the township boundary between the Howick and Penwortham townships, and is likely to have represented a natural channel that both allowed the water from smaller streams to be discharged into the Ribble and aided in the drainage of the marshland at its periphery.

5.4 CONCLUSION

- 5.4.1 As the OS map of 1848 (Fig 2-3) showed the location of the fish traps to lie within the range of the ordinary high water mark, it appears that the modifications to the river channel of the Ribble that had been undertaken in 1807-9 would not have negated the functioning of the traps at this time. It is possible that when the channel was first cut there might have been an impact upon the traps, as a result of the consolidation of the river within a deeper channel and a subsequent reduction in the tidal range. However, the subsequent lack of maintenance of the cutting might have resulted in any such impacts being temporary. The additional works in the late 1840s and the 1850s, which followed the re-establishment of the Ribble Navigation Company in 1838 and 1850, had a greater permanent impact on the tidal and riverine extents, including the establishment of flood defences, and any potential for either trap to be used is likely to have been entirely negated during the third quarter of the nineteenth century. Indeed, a nineteenth-century plan (DDP 14/16) of reclaimed land suggests that the Mill Brook trap could not have functioned after 1858, and the same might be true of the Jenny's Plantation trap. The locations of both traps had certainly become entirely obsolete by the time of the production of the OS map of 1892-3 (Fig 4-5).

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7. ILLUSTRATIONS

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Figure 3: Sites and features identified during the watching brief superimposed upon an extract from the Ordnance Survey First Edition 6" to 1 mile map, 1848

Figure 4: Sites and features identified during the watching brief superimposed upon an extract from the Ordnance Survey First Edition 25" to 1 mile map, 1890

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Figure 6: Plan of Mill Brook fish trap with the horizontal timbers removed

Figure 7: North-facing section through Mill Brook fish trap

Figure 8: Plan of Jenny's Plantation fish trap, with inset superimposed upon the Ordnance Survey First Edition 6" to 1 mile map, 1848

7.2 LIST OF PLATES

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Plate 5: Mill Brook fish trap, looking west

Plate 6: Vertical view of Mill Brook fish trap (western half)

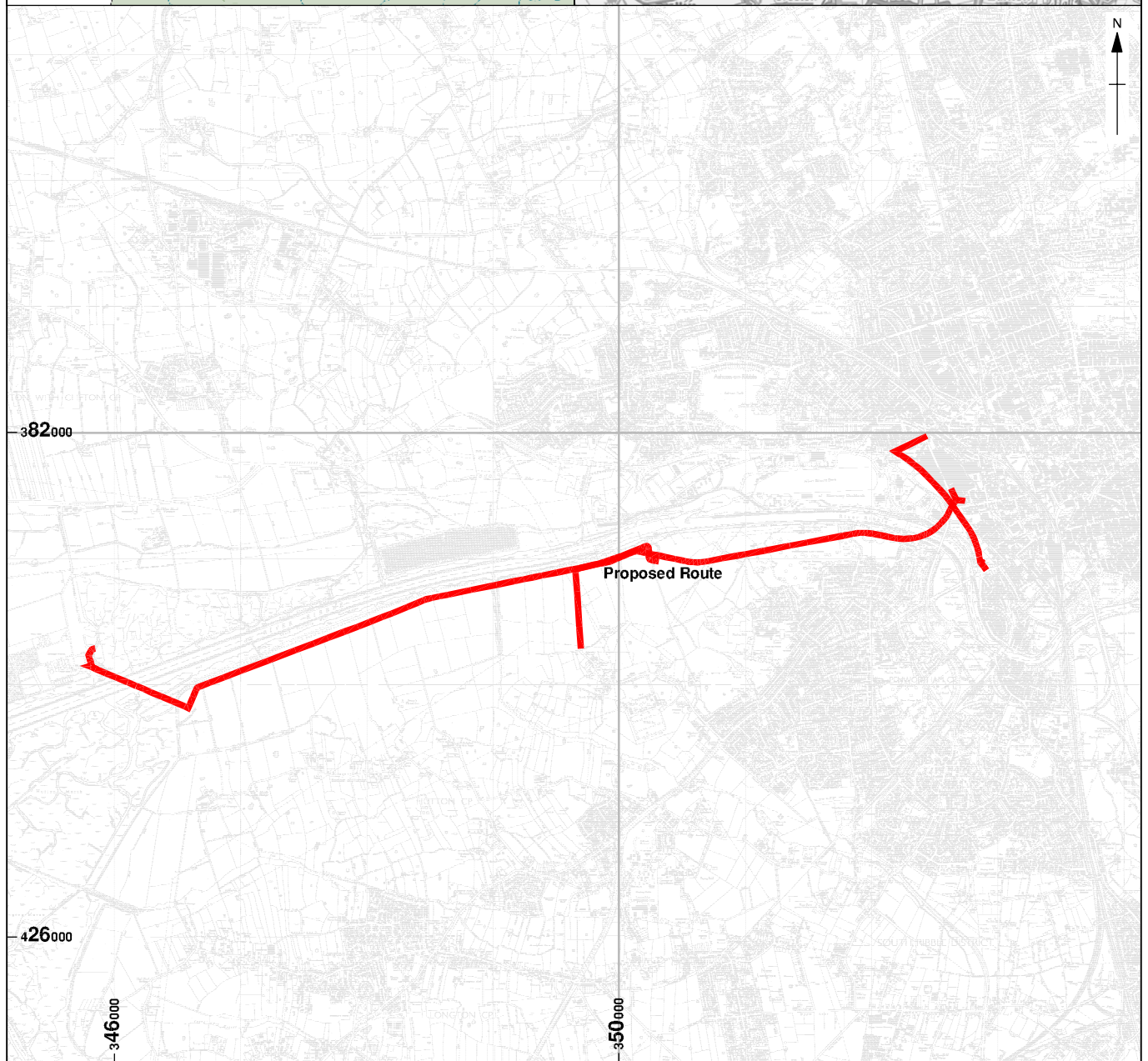
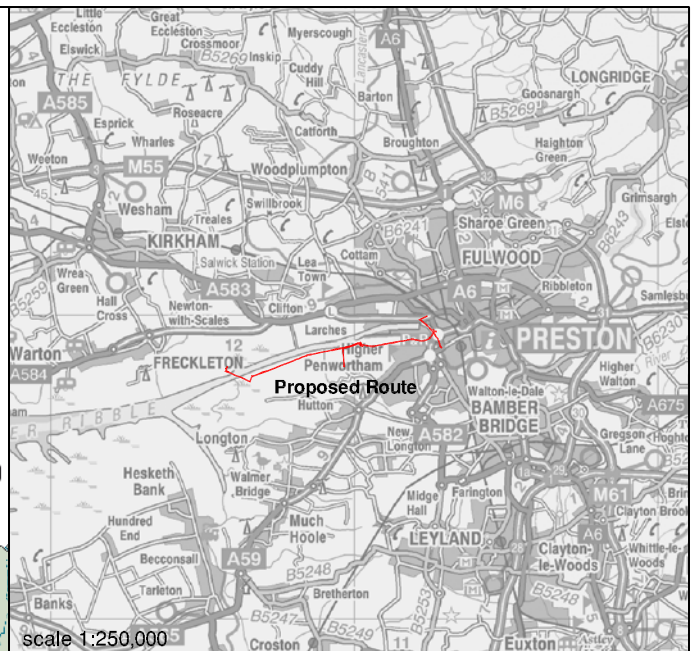
Plate 7: Vertical view of Mill Brook fish trap (eastern half)

Plate 8: Trench edge showing *in situ* fish trap stake

Plate 9: Trench edge showing *in situ* wattle barrier

Plate 10: Jenny's Plantation fish trap, looking west

Plate 11: Type 6 Double-V-shaped trap (Dawson 2004)



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Figure 1: Site location

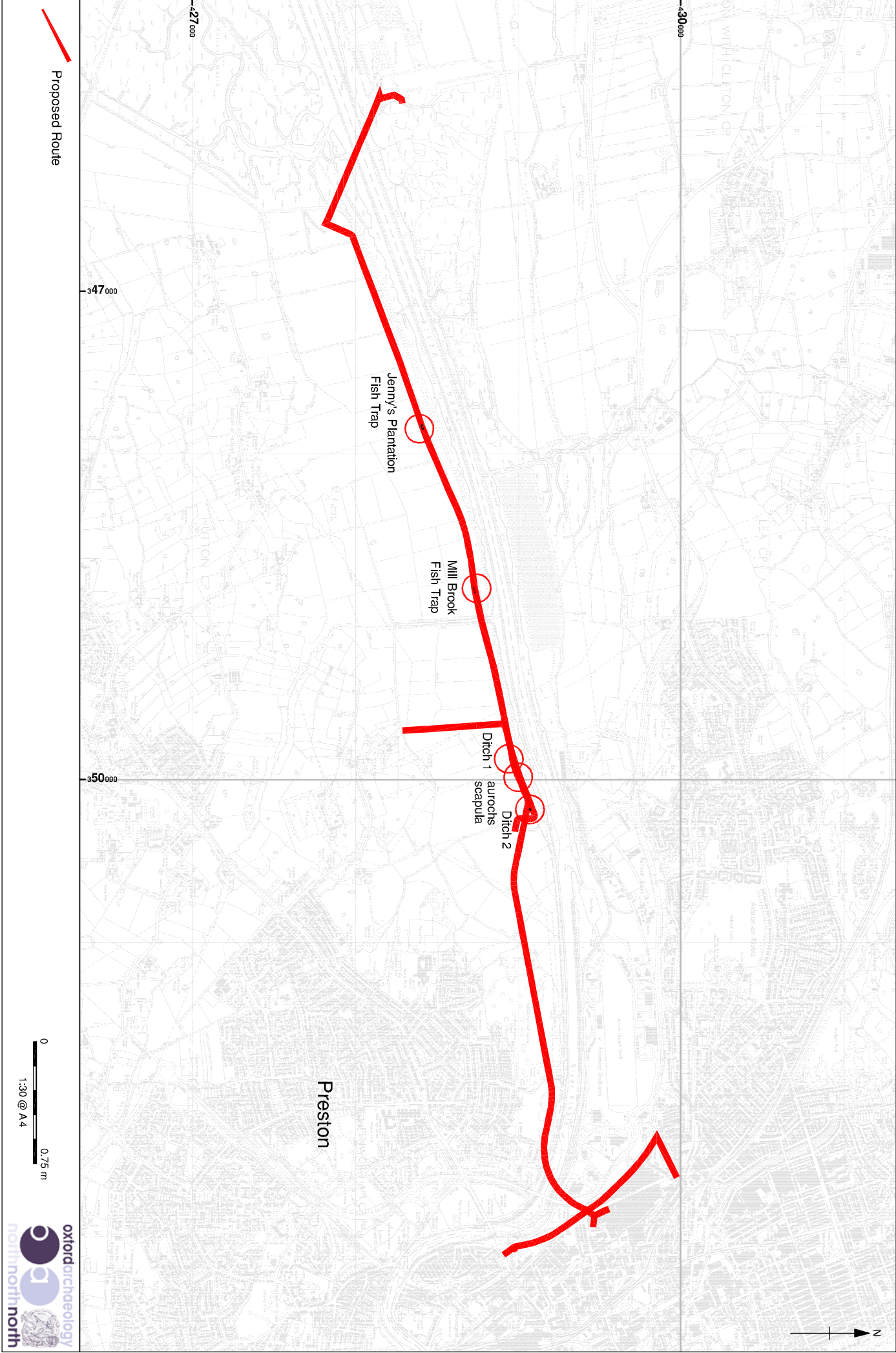


Figure 2: Location of sites and features identified during the watching brief

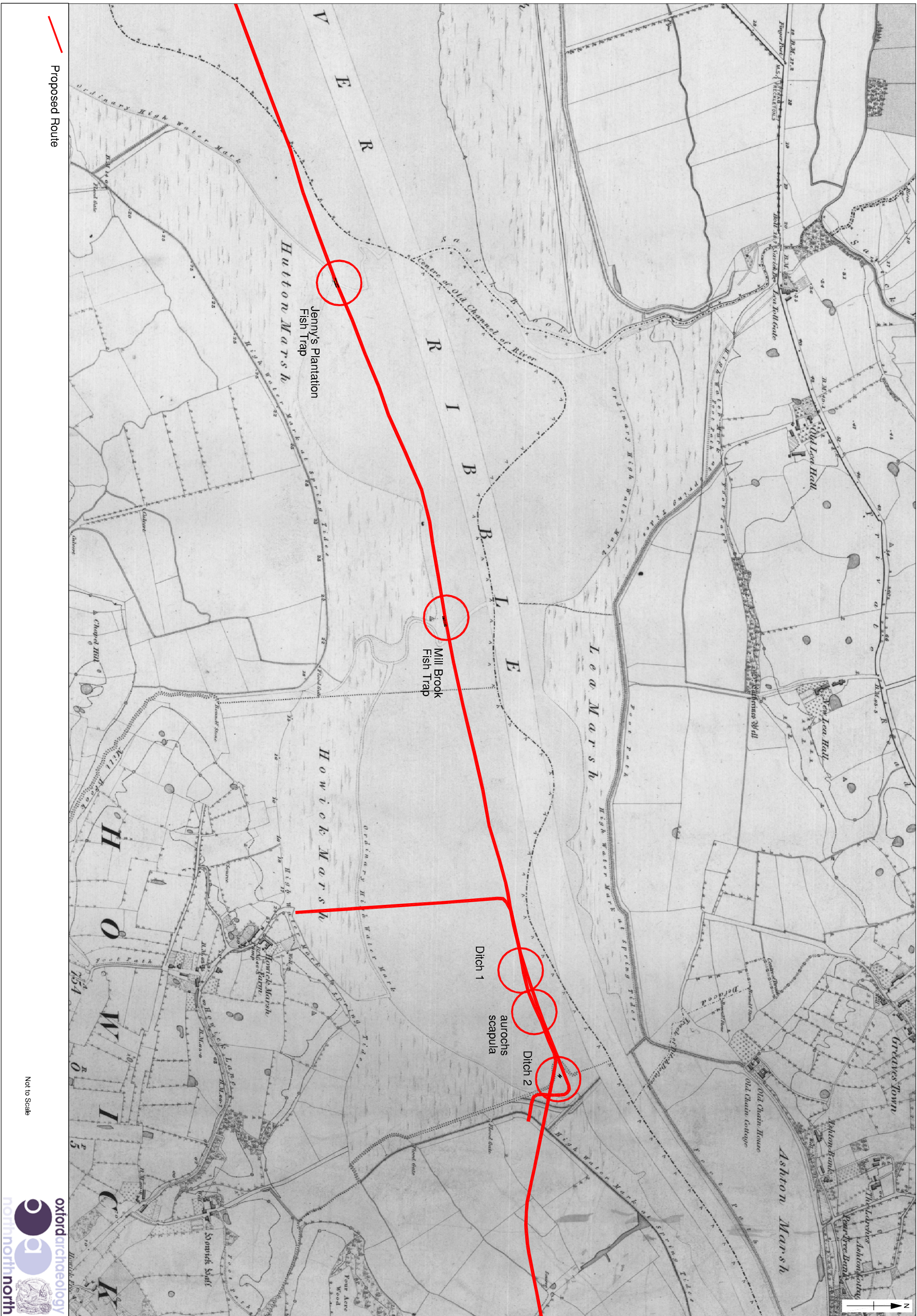


Figure 3: Sites and features identified during the watching brief superimposed upon extract from the Ordnance Survey First Edition 6" to 1 mile map, 1848

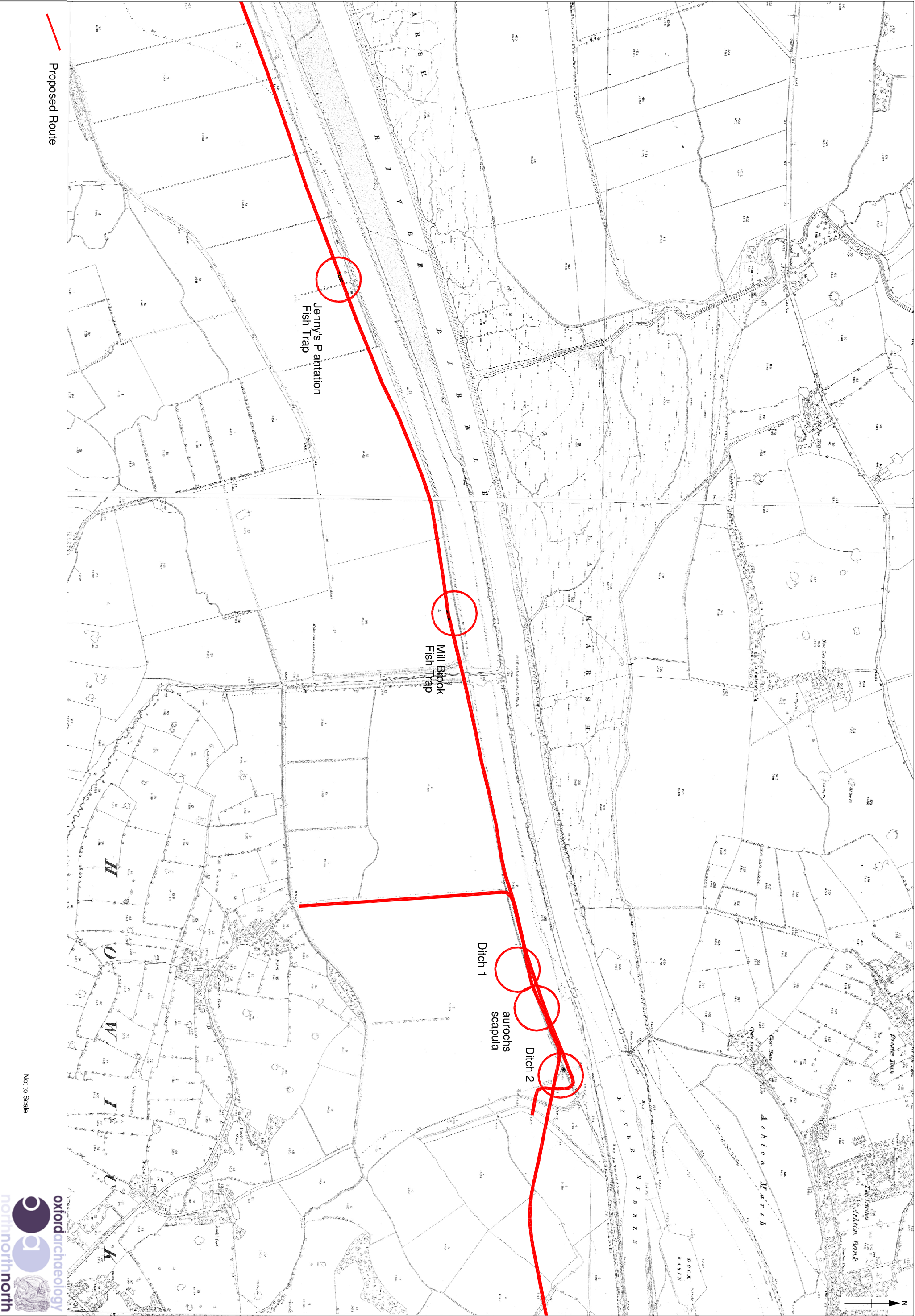


Figure 4: Sites and features identified during the watching brief superimposed upon extract from the Ordnance Survey First Edition 25" to 1 mile map, 1892-3

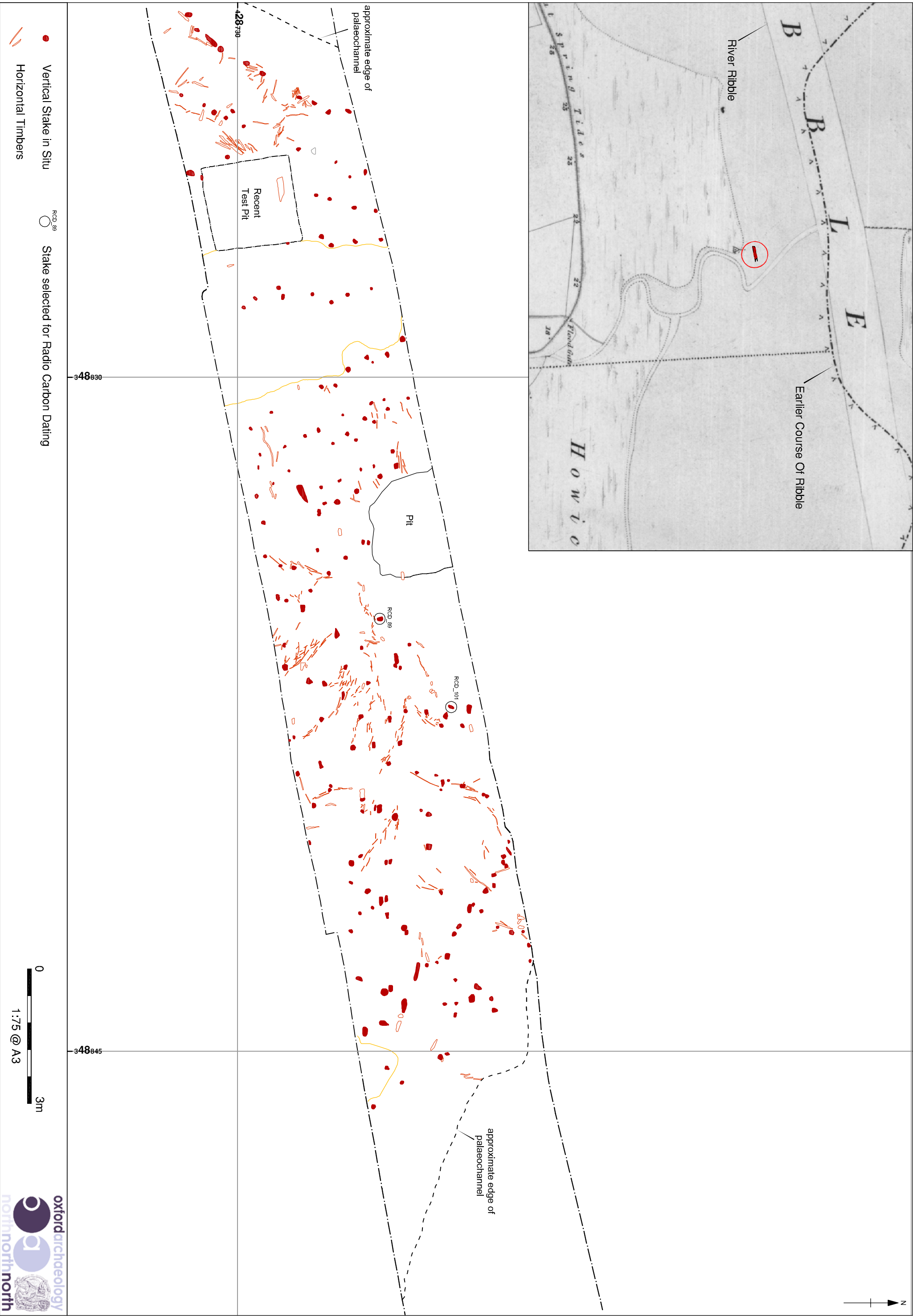


Figure 5: Plan of Mill Brook Fish Trap, with inset superimposed upon the OS First Edition "to 1 mile map, 1848

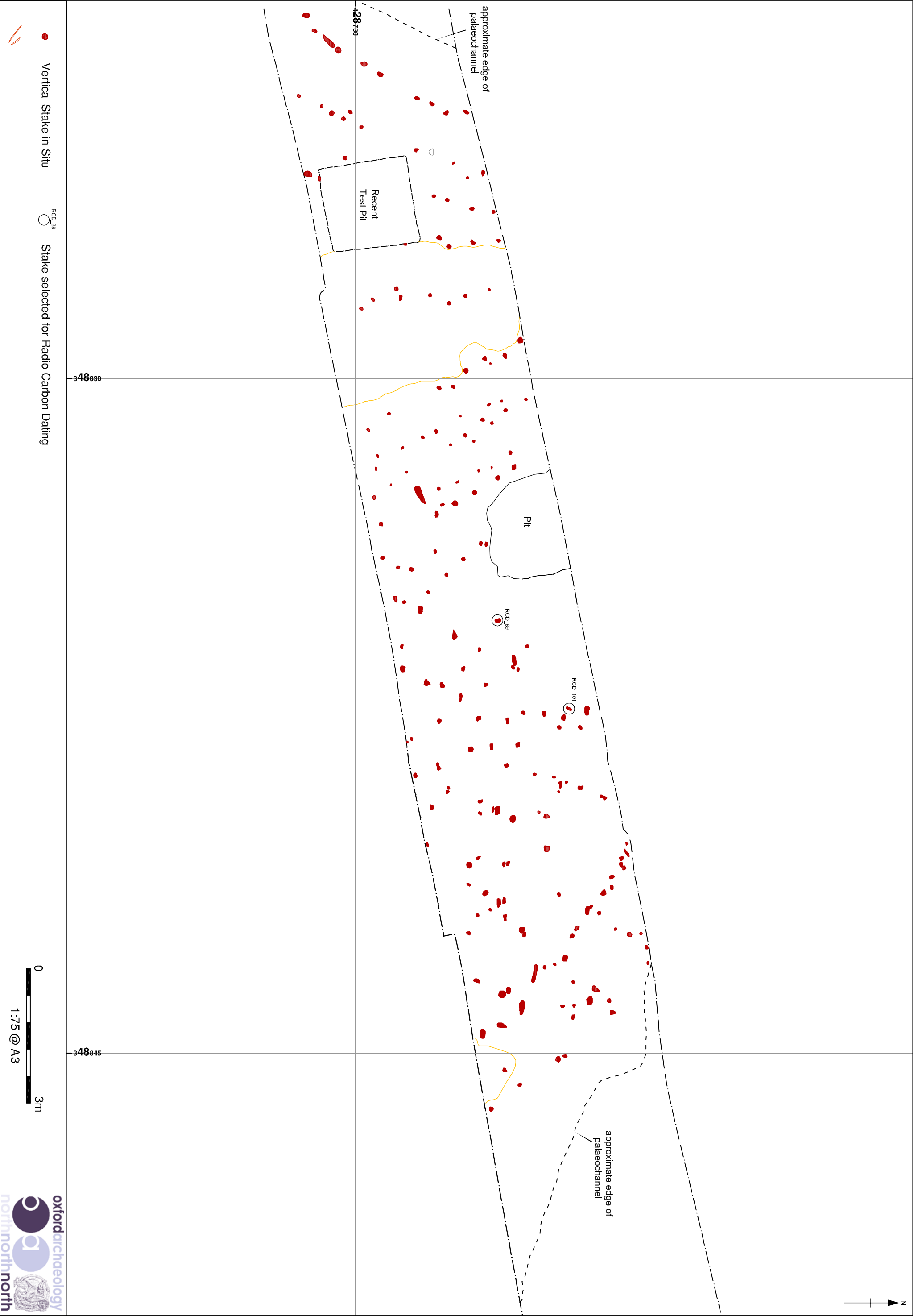


Figure 6: Plan of Mill Brook Fish Trap, with the horizontal timbers removed

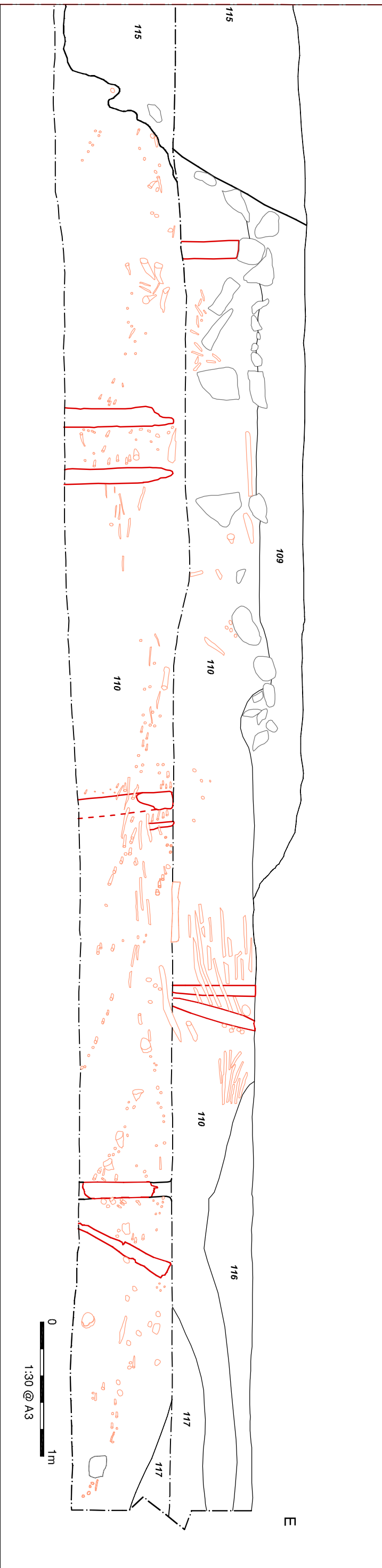
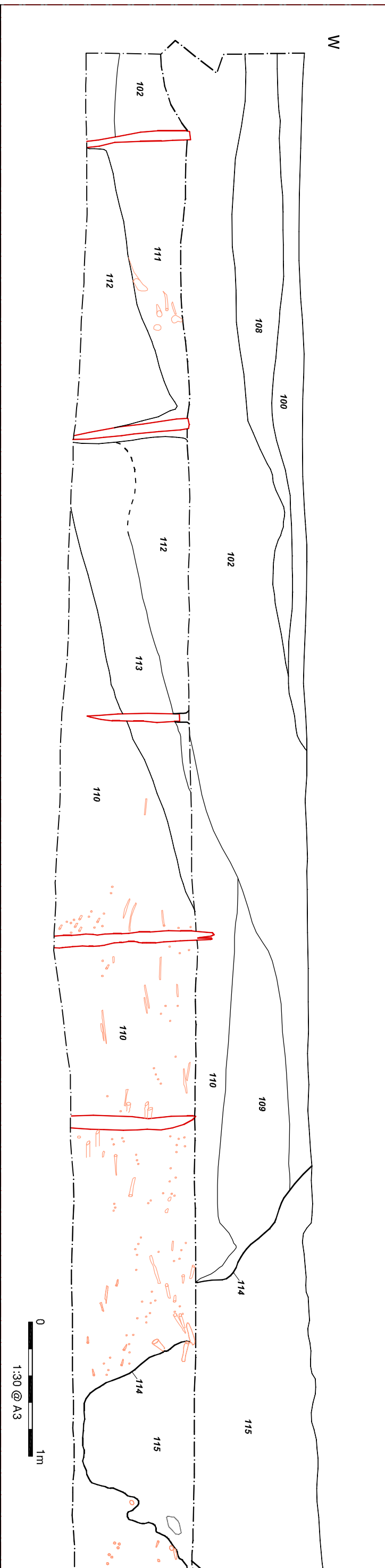
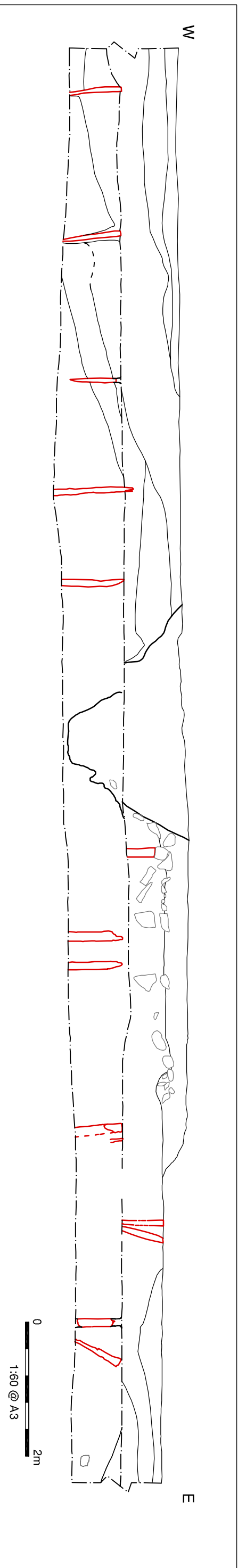


Figure 7: South-facing section through Mill Brook Fish Trap

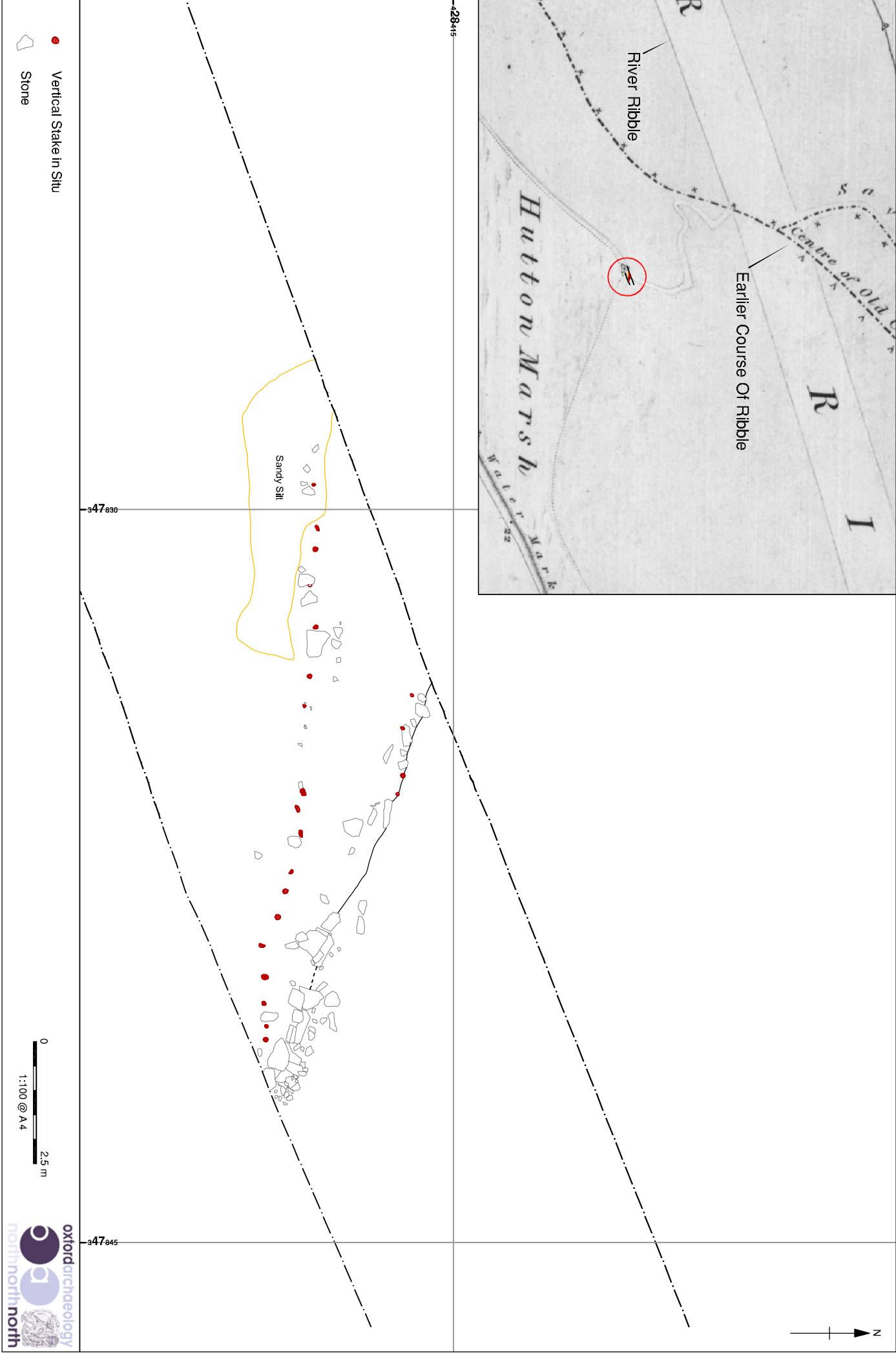


Figure 8: Plan of Jenny's Plantation Fish Trap, with inset superimposed upon the OS First Edition 6" to 1 mile map, 1848



Plate 1: View along the south bank of the River Ribble, looking downstream towards Freckleton (west)



Plate 2: View along the south bank of the River Ribble, looking upstream towards Preston (east)



Plate 3: General view of the pipeline easement, facing west. The River Ribble lies behind the trees.



Plate 4: Aurochs scapula
(with 15cm scale and upper image of modern domestic cattle scapula for comparison)



Plate 5: Mill Brook fish trap, looking west

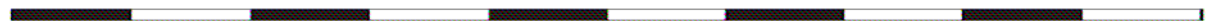


Plate 6: Vertical view of Mill Brook fish trap (western half; 10m scale)

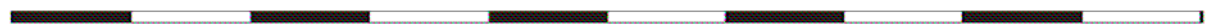


Plate 7: Vertical view of Mill Brook fish trap (eastern half; 10m scale)



Plate 8: Trench edge showing *in situ* fish trap stake



Plate 9: Trench edge showing *in situ* wattle barrier



Plate 10: Jenny's Plantation fish trap, looking west

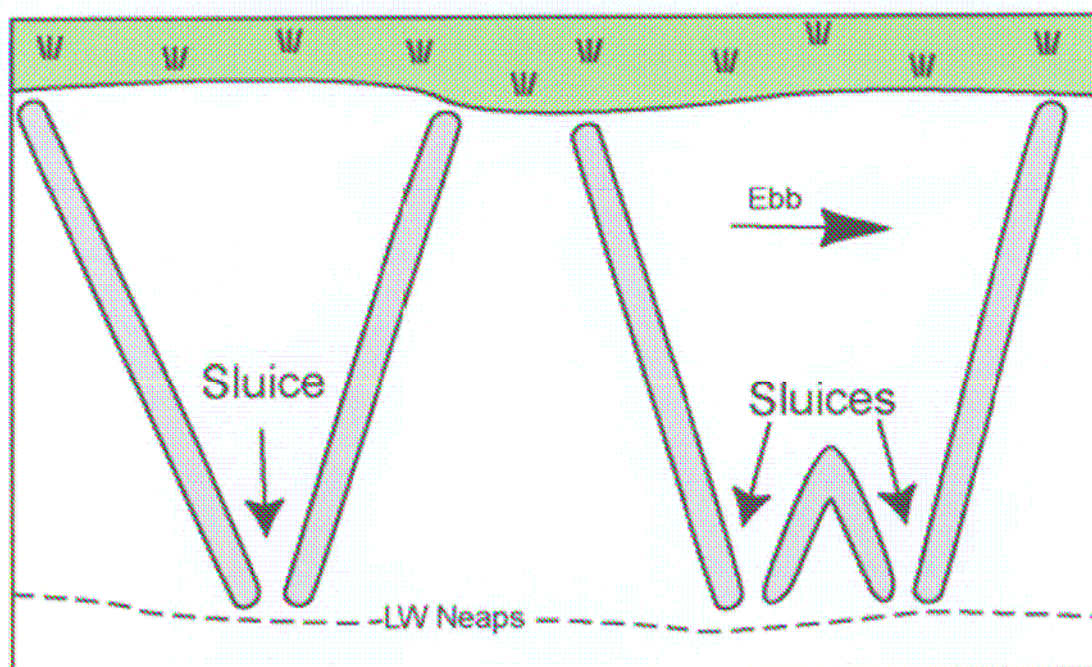


Plate 11: Type 6 Double-V-shaped trap (Dawson 2004)

APPENDIX 1: PROJECT DESIGN

**PRESTON BATHING
WATER UID,
LANCASHIRE**

**Archaeological Watching Brief
Project Design**

Oxford Archaeology North

April 2009

United Utilities

1. INTRODUCTION

- 1.1 United Utilities (hereafter the client) have proposed the construction of a new main sewer from the western side of Preston Dock to the Clifton Marsh Wastewater Treatment Works. As the scheme affects areas of archaeological potential the Planning Archaeologist at Lancashire County Archaeological Service (LCAS) has recommended that a formal watching brief should be undertaken for previously undisturbed sections of the pipeline.
- 1.2 It is likely that medieval and later sea defences lie in the proposed development area. In addition, the easement will pass close to the site of an earthwork at New Lea Hall, which may represent a moated site.
- 1.3 OA North has considerable experience of the assessment, evaluation and excavation of sites of all periods, having undertaken a great number of small and large-scale projects during the past 20 years. Watching briefs, evaluations and excavations have taken place within the planning process, to fulfil the requirements of clients and planning authorities, to very rigorous timetables.
- 1.4 OA North has the professional expertise and resources to undertake the project detailed below to a high level of quality and efficiency. OA North is an Institute of Field Archaeologists (IFA) registered organisation, registration number 17, and all its members of staff operate subject to the IFA Code of Conduct.

2 OBJECTIVES

- 2.1 The following programme has been designed to evaluate the archaeological resource of the proposed development area. The required stages to achieve this are as follows:
- 2.2 **Rapid Desk-Based Research:** a brief appraisal of the data held by the Historic Environment Record (HER) will be undertaken;
- 2.3 **Permanent Presence Watching Brief:** this will be undertaken during all ground disturbances associated with previously undisturbed sections of the pipeline;
- 2.4 **Report and Archive:** production of a report following the collation of data during Sections 2.2 and 2.3 above.

3 METHOD STATEMENT

3.1 WATCHING BRIEF

- 3.1.1 **Rapid Desk-Based Assessment:** an examination will be undertaken of HER data made available to the project in order to place the findings of the watching brief into a local and regional context.

- 3.1.2 A programme of field observation will record accurately the location, extent, and character of any surviving archaeological features and/or deposits within all topsoil stripping activities associated with the development works. This work will comprise observation during the excavation for these works, the systematic examination of any subsoil horizons exposed during the course of the groundworks, and the accurate recording of all archaeological features and horizons, and any artefacts, identified during observation.
- 3.1.3 Putative archaeological features and/or deposits identified by the machining process, together with the immediate vicinity of any such features, will be cleaned by hand, using either hoes, shovel scraping, and/or trowels depending on the subsoil conditions, and where appropriate sections will be studied and drawn. Any such features will be sample excavated (ie selected pits and postholes will normally only be half-sectioned, linear features will be subject to no more than a 10% sample, and extensive layers will, where possible, be sampled by partial rather than complete removal).
- 3.1.4 It is assumed that OA North will have the authority to stop the works for a sufficient time period to enable the recording of important deposits. It may also be necessary to call in additional archaeological support if a find of particular importance is identified or a high density of archaeology is discovered. This would only be called into effect in agreement with the Client and the County Archaeology Service and will require a variation to costing.
- 3.1.5 **Written Record:** during this phase of work, recording will comprise a full description and preliminary classification of features or materials revealed. All information identified in the course of the site works will be recorded stratigraphically utilising OA North pro-forma. Areas of excavation will be assigned trench numbers and context numbers will be applied to archaeological features.
- 3.1.6 **Site Drawings:** a large-scale plan (provided by the client) will be produced of the area of the groundworks showing the location and extent of the ground disturbance, appropriately labelled to correspond with the written record. Archaeological features will be recorded accurately (either on plan (1:20) and/or section (1:10), and as grid co-ordinates where appropriate).
- 3.1.7 The site drawings will be manipulated in an industry standard CAD package (AutoCAD release 2000) for the production of final drawings.
- 3.1.8 A photographic record will be undertaken simultaneously. This will utilise a 35mm camera for the production of both colour slides and monochrome contact prints. A photographic scale will appear in all images captured. The photographic index will describe and locate each area/feature photographed.
- 3.1.9 **Human Remains:** any human remains uncovered will be left *in situ*, covered and protected. No further investigation will continue beyond that required to establish the date and character of the burial. The LCAS HER and the local Coroner will be informed immediately. If removal is essential the exhumation of any funerary remains will require the provision of a Department of Constitutional Affairs license, under section 25 of the Burial Act of 1857. An

application will be made by OA North for the study area on discovery of any such remains and the removal will be carried out with due care and sensitivity under the environmental health regulations, and if appropriate, in compliance with the 'Disused Burial Grounds (Amendment) Act, 1981.

- 3.1.10 **Treatment of finds:** no sampling of finds will take place during fieldwork. All finds will be exposed, lifted, cleaned, conserved, marked, bagged and boxed in accordance with the United Kingdom Institute for Conservation (UKIC) *First Aid For Finds*, 1998 (new edition) and the recipient museum's guidelines (Stockport Museums Service).
- 3.1.11 All identified finds and artefacts will be retained, although certain classes of building material can sometimes be discarded after recording if an appropriate sample is retained on advice from the recipient museum's archive curator.
- 3.1.12 **Treasure:** any gold and silver artefacts recovered during the course of the excavations will be removed to a safe place and reported to the local Coroner according to the procedures relating to the Treasure Act, 1996. Where removal cannot take place on the same working day as discovery, suitable security will be employed to protect the finds from theft.
- 3.1.13 **Environmental Samples:** samples will also be collected for technological, pedological and chronological analysis as appropriate. If necessary, access to conservation advice and facilities can be made available. OA North maintains close relationships with Ancient Monuments Laboratory staff at the Universities of Durham and York and, in addition, employs artefact and palaeozoological specialists with considerable expertise in the investigation, excavation and finds management of sites of all periods and types, who are readily available for consultation.

3.2 REPORT AND ARCHIVE

- 3.2.1 **Interim Statement:** in the event that further work is recommended an interim statement will be issued. In this instance or in the event that the client specifically requests an interim statement it should be noted that all illustrations will be copies of field drawings and not finished CAD drawings.
- 3.2.2 **Final Report:** two copies of the final report will be submitted to the client and a further copy to the LCAS HER. Both paper and digital copies will be provided on CD-ROM in pdf format. The report will present the following information:
 - (i) **Summary:** a summary statement of the findings;
 - (ii) **Introduction:** the background to the project including location details;
 - (iii) **Methodology:** an outline of the methodology of all elements of the programme of work;
 - (iv) **Historical Background:** a brief historical background to the site;

- (v) **Results:** an account of the past and present land use of the study area;
An account of archaeological features identified during the course of the watching brief;
- (vi) **Discussion:** a description of the significance of the study area in its local and regional context;
- (vii) **Recommendations:** the identification of areas where further development will impact upon the archaeological resource in addition to the impacts of the current development;
- (viii) **Illustrations:** maps, plans, sections and copies of the site photographic archive;
- (ix) **Appendices:** a copy of the brief and this project design;

3.2.3 Provision will be made for a summary report to be submitted to a suitable regional or national archaeological journal within one year of completion of fieldwork, if relevant results are obtained.

3.2.4 **Confidentiality:** all internal reports to the client are designed as documents for the specific use of the Client, for the particular purpose as defined in the project brief and project design, and should be treated as such. They are not suitable for publication as academic documents or otherwise without amendment or revision.

3.2.5 **Archive:** the results of all archaeological work carried out will form the basis for a full archive to professional standards, in accordance with current English Heritage guidelines (*Management of Archaeological Projects*, 2nd edition, 1991). This archive, including a copy of the report, will be provided in the English Heritage Centre for Archaeology format. In this instance the archive will be submitted to the Stockport Local Studies Library.

3.2.6 The Arts and Humanities Data Service (AHDS) online database *Online Access to index of Archaeological Investigations* (OASIS) will be completed as part of the archiving phase of the project.

4 PROJECT MONITORING

4.1 Monitoring of this project will be undertaken through the auspices of the GMAUSMR Planning Archaeologist, who will be informed of the start and end dates of the work.

5 WORK TIMETABLE

5.1 The rapid desk-based research is expected to take in the region of one day to complete.

5.2 The duration of the watching brief will be dependent upon the progress of the contractor.

- 5.3 The client report will be completed within eight weeks following completion of the fieldwork.

6 STAFFING

- 6.1 The project will be under the direct management of **Alison Plummer BSc (Hons)** (OA North Senior Project Manager) to whom all correspondence should be addressed.
- 6.2 Present timetabling constraints preclude detailing at this stage exactly who will be undertaking the rapid desk-based research and watching brief, but both of these elements of the project are likely to be supervised by an OA North project supervisor experienced in these types of project. All OA North project officers and supervisors are experienced field archaeologists capable of carrying out projects of all sizes.

7 INSURANCE

- 7.1 OA North has a professional indemnity cover to a value of £2,000,000; proof of which can be supplied as required.

NB

Following current IFA guidelines it is recommended that a contingency sum equivalent to 10% of the total sum for the fieldwork costs is put aside for unseen delays caused by prolonged periods of bad weather, vandalism, discovery of unforeseen complex deposits and/or artefacts which require specialist removal, use of shoring to excavate important features close to the excavation sections etc. This sum would only be used following agreement with the client.

Normal OA North working hours are between 8.00am and 4.00pm, Monday to Friday, though adjustments hours maybe made to maximise daylight working time in winter and to meet travel requirements. It is not normal practice for OA North staff to be asked to work weekends or bank holidays and should the client require such time to be worked during the course of a project a contract variation to cover additional costs will be necessary. **Additional hours will be charged at an overtime rate.**

Notes:

1. Salaries and wages inclusive of NI, Superannuation and overheads
2. Total costs exclusive of VAT
3. All costs at 2009/2010 prices
4. ***Commercial and in Confidence***

APPENDIX 2: CONTEXT LIST

Context number	Site	Description
01	North of electricity sub station	Drainage ditch
02	North of electricity sub station	Former stream channel
100	Mill Brook Fish Trap	Mid to light yellowish brown loose fine alluvial sand
101	Mill Brook Fish Trap	Light grey loose fine alluvial sand
102	Mill Brook Fish Trap	Mid greyish black coarse-grained firm alluvial sandy-silt possibly derived from the Mill Brook palaeochannel
103	Mill Brook Fish Trap	Light greyish white loose fine sand from the Mill Brook palaeochannel
104	Mill Brook Fish Trap	Mid to dark black coarse-grained firm sandy-silt from the Mill Brook palaeochannel
105	Mill Brook Fish Trap	Light yellowish grey loose fine alluvial sand
106	Mill Brook Fish Trap	Light greyish white loose fine alluvial sand
107	Mill Brook Fish Trap	Light yellowish orange loose fine alluvial sand
108	Mill Brook Fish Trap	Light orangish grey loose fine alluvial sand
109	Mill Brook Fish Trap	Light orangish yellow loose fine alluvial sand
110	Mill Brook Fish Trap	Light to mid grey loose fine alluvial sand from the Mill Brook palaeochannel
111	Mill Brook Fish Trap	Light to mid grey loose sand with lenses of silt. Derived from the Mill Brook palaeochannel
112	Mill Brook Fish Trap	Mid brownish grey loose fine alluvial sand with dark grey laminations
113	Mill Brook Fish Trap	Yellowish brown loose fine alluvial sand
114	Mill Brook	Cut of recent pit. Probably associated with drainage

	Fish Trap	
115	Mill Brook Fish Trap	Mid brownish yellow loose fine alluvial sand. Fill of pit 114
116	Mill Brook Fish Trap	Light yellow loose fine alluvial sand
117	Mill Brook Fish Trap	Light yellowish brown loose fine alluvial sand with evident laminations
118	Mill Brook Fish Trap	Light yellow alluvial sand
119	Mill Brook Fish Trap	Light yellow alluvial sand

APPENDIX 3: FINDS CATALOGUE

Object no	Sample	Context	Quantity	Material	Description	Period
1000		Unstrat	1	Glass	Clear bottle fragment	19th/20 th century
1001		Unstrat	4	Ceramic	Glazed white earthenware (4); blue transfer-printed ware plate, porcelain bone china	18th-20 th century
1002		Unstrat	1	Glass	Dark green grooved flask body fragment	18th/19 th century
1003		Unstrat	18	Ceramic	Small fragments: stoneware x6; blue/grey possible import (16th/17 th C), Nottingham type (2), English brown (3), salt-glazed white, yellow and brown glazed red earthenware (including a coarse trail slip), glazed white earthenware (8); pearlware blue transfer printed ware x5, annular, porcelain, and a figurine foot	17th-19 th century
1004		Unstrat	1	Glass	Clear bottle body (embossed with letters PR (ESTON?))	19th/20 th century
1005		Unstrat	19	Ceramic	Small fragments; salt glazed stoneware (18th), annular (brown-white striped), hand-painted glazed white earthenware, black transfer printed ware x4 (commemorative plate fragment), blue transfer printed ware, press moulded glazed white earthenware, bone china x2,	18th-20 th century
1006		Unstrat	21	Ceramic	Feather trail slipware buff fabric jug (early form), yellow, green and brown glazed red earthenware (hard), stoneware (6); green and Nottingham types (18th), blacking jar (19th), English brown x3, annular (blue) chevron decorated industrial slipware, blue transfer printed ware x2, black transfer printed ware, porcelain x4 (late 19th/20th), green glaze earthenware (18th)	17th-19 th century
1007		Unstrat	22	Ceramic	Yellow ware (19th), yellow glazed red earthenware, black and brown glazed red earthenware, stoneware x2 (Nottingham type, salt glazed, grey), annular (blue/white), blue and black transfer printed wares x5 (press moulded), glazed white earthenware x 9	18th/19 th century
1008		Unstrat	1	Clay Tobacco Pipe	Smooth spurless stem with narrow bore	19 th century

1009		Unstrat	1	Animal Bone	Auroch Scpula	Bronze Age
1010		Unstrat	9	Animal Bone	Not identified	undated
1011		Unstrat	9	Ceramic	Semi complete brown and white striped annular bowl, water worn black glazed red earthenware jug base x4, green glazed buff, turquoise and brown square decorated industrial slipware, press moulded white earthenware with green and yellow and green hand painted over glaze	18th/19 th century
1012		Unstrat	2	Glass	Green wine bottle necks uneven thread	18 th century
1013		Unstrat	1	Wood	Desiccated bezel, stopper?	undated
1014		Unstrat	2	Shell	Mollusc; sea snail and cockle	Undated
1015		Unstrat	3	Coal	Unused	Undated
1016		Unstrat	1	Shell	Cockle	Undated
0		Unstrat	1	Glass	Clear frosted vessel body	19th/20 th century
1017		Unstrat	1	Wood	Burnt twig-unworked	Undated
1018		Unstrat	1	Animal Bone	Not identified	undated
1019		Unstrat	1	Shell	Sea snail	Undated
1020		Unstrat	1	Wood	Small unworked dried twig	Undated
1021		Unstrat	1	Shell	Sea snail	Undated
1022		Unstrat	1	Ceramic	Green glazed drain pipe fragment	20 th century
0	1005	110	50	Wood	Worked stake measuring (160mm by 10mm diameter), 31 unworked fragments of similar diameter and length (up to 10cm), 20 small fragments (less than 5cm)	undated
0	202		1	Wood	Circular dome shaped object (200mm in diameter and 50mm thick), perforated with two small (<5mm) on upper surface, and a 20mm wide hole along its edge (housing a rope?)	undated