



EAVES GREEN LINK ROAD, CHORLEY, Lancashire

Archaeological Post- Excavation Analysis



Oxford Archaeology North

November 2008

Lancashire County Council

Issue No: 2007-8/772

OA North Job No: L9936

NGR: SD 5864 1584

Document Title: EAVES GREEN LINK ROAD, CHORLEY, LANCASHIRE

Document Type: Post-Excavation Analysis

Client Name: Lancashire County Council

Issue Number: 2007-8/772

OA North Job Number: L9936

National Grid Reference: SD 5864 1584

Prepared by: Chris Healey
Position: Project Officer
Date: November 2008

Checked by: Emily Mercer
Position: Senior Project Manager
Date: November 2008
Signed.....

Approved by: Rachel Newman
Position: Director
Date: November 2008
Signed.....

Oxford Archaeology North

Storey Institute
Meeting House Lane
Lancaster
LA1 1TF
t: (0044) 01524 848666
f: (0044) 01524 848606

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

© Oxford Archaeological Unit Ltd (2008)

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

Oxford Archaeological Unit Limited is a Registered Charity No: 285627

Disclaimer:

This document has been prepared for the titled project or named part thereof and should not be relied upon or used for any other project without an independent check being carried out as to its suitability and prior written authority of Oxford Archaeology being obtained. Oxford Archaeology accepts no responsibility or liability for the consequences of this document being used for a purpose other than the purposes for which it was commissioned. Any person/party using or relying on the document for such other purposes agrees, and will by such use or reliance be taken to confirm their agreement to indemnify Oxford Archaeology for all loss or damage resulting therefrom. Oxford Archaeology accepts no responsibility or liability for this document to any party other than the person/party by whom it was commissioned.

CONTENTS

SUMMARY	3
ACKNOWLEDGEMENTS	4
1. INTRODUCTION	5
1.1 Project Background.....	5
1.2 Location, Geology and Topographical Setting	5
1.3 Archaeological and Historical Background	6
1.4 Updated Research Aims and Objectives	6
2. EXCAVATION RESULTS	9
2.1 Introduction	9
2.2 Stratigraphic Results.....	9
2.3 Phase 1: Post-medieval Period (<i>c</i> 1540 - <i>c</i> 1750)	9
2.4 Phase 2: Industrial Period (<i>c</i> 1750 - 1901)	10
2.5 Phase 3: Modern Period (Post-1901)	11
3. ARTEFACT ANALYSIS	13
3.1 Introduction	13
3.2 The Pottery	13
3.3 Clay Tobacco Pipe	15
3.4 Ceramic Building Material.....	16
3.5 The Metalwork.....	16
3.6 Vessel and Window Glass.....	16
3.7 Organic and Other Related Materials	16
4. ENVIRONMENTAL ANALYSIS	19
4.1 Introduction and Quantification	19
4.2 Methodology.....	19
4.3 Results	21
4.4 Discussion.....	22
5. CONCLUSION	23
5.1 Discussion.....	23
6. BIBLIOGRAPHY	25
6.1 Primary and Cartographic Sources.....	25
6.2 Secondary Sources	25
ILLUSTRATIONS	27
List of Figures.....	27
List of Plates.....	27
APPENDIX 1: PROJECT BRIEF	29
APPENDIX 2: PROJECT DESIGN	40

SUMMARY

The line of a proposed new road, known as the Eaves Green Link Road, linking the A6 to Lower Burgh Way, on the southern fringe of the town of Chorley, Lancashire (centred on NGR SD 5864 1584), crosses an area to the immediate south of the historic town which is known to contain buried archaeological remains of post-medieval date, from the period at which the town underwent rapid industrial expansion. Whilst Chorley's industrial heritage is widely acknowledged, the background and the more immediate circumstances by which industry came to play such a prominent role in the town's history have remained more elusive. The archaeological remains were, therefore, perceived to be of importance in relation to the town's history and development.

Planning permission was granted for the development of the Eaves Green Link Road, but with an archaeological condition requiring the implementation of a programme of archaeological investigation. The first stage in this process was an archaeological desk-based assessment, undertaken by OA North (then Lancaster University Archaeological Unit) in 1996. This was followed by a geophysical survey, undertaken by Geoquest Associates (2000), and a programme of archaeological evaluation trenching undertaken by Earthworks Archaeological Services (2000). The results obtained from these assessments identified two areas in particular where significant *in situ* archaeological remains could potentially survive. In mitigation of the development, it was recommended that these areas merited further, more detailed, investigation in advance of construction work.

The two areas outlined were targeted by the excavation programme during September and October 2006. The first area examined the northern end of an earthwork thought to be a head-race associated with Duxbury Mill, near to where it was diverted via a weir from the western bank of the River Yarrow. Excavation revealed that the feature had been obscured beneath significant levels of backfilling dating to the late nineteenth and twentieth centuries, below which waterlogged silt deposits survived. A second trench examined the same head-race as it travelled downhill towards the site of the mill, in an area where the feature appeared to survive in a condition easily recognisable as an earthwork above ground. Excavation in this area showed that the race had been consolidated along its southern side with a low stone wall, and that nineteenth-century upcast from maintenance of the race formed a bank on the southern side.

A post-excavation assessment (OA North 2007) examined the results of the excavations, and assessed the potential for further analysis of each category of data in accordance with the project's research aims. The process was designed to correspond to the objectives laid out in the guidance document *Management of Archaeological Projects*, second edition (MAP 2; English Heritage 1991). The assessment demonstrated that the dataset had some potential for further analysis, and this document presents the results of this programme of analysis.

ACKNOWLEDGEMENTS

Oxford Archaeology North (OA North) wishes to thank Wai Kee Leung of Lancashire County Council for commissioning the work, and Peter Iles of Lancashire County Archaeology Service (LCAS) for advice and support during the programme of archaeological investigation associated with the Eaves Green Link Road Project.

The specialist work was undertaken in-house by Christine Howard-Davis (finds specialist) and Sandra Bonsall (environmentalist). This report was prepared by Chris Healey, and the illustrations were produced by Anne Stewardson. The project was managed by Emily Mercer and Mark Brennand. This report was edited by Emily Mercer.

1. INTRODUCTION

1.1 PROJECT BACKGROUND

- 1.1.1 The development of residential areas by Lancashire County Council (LCC), to the south and south-west of Chorley, Lancashire, necessitated the construction of a new link road through park- and woodland to join the A6, Bolton Road, to Lower Burgh Way (centred on NGR SD 5864 1584; Fig 1). From the results of earlier archaeological work, it was clear that the construction programme was likely to have a negative impact on buried remains. Consequently, LCC consulted with Lancashire County Archaeology Service (LCAS), which advised that an archaeological condition be attached to the planning consent for the development, and a formal brief (*Appendix 1*) detailing requisite archaeological works was issued.
- 1.1.2 In the first instance, a desk-based assessment of the development area was undertaken by the Lancaster University Archaeological Unit (LUAU 1996), now OA North. Subsequent evaluation trenching (Earthworks Archaeological Services 2000) and geophysical survey (Geoquest Associates 2000) concluded that significant archaeological remains were likely to be present within two areas of the development (Areas 1 and 2, Fig 1). Therefore, in mitigation of the development, the areas required archaeological excavation in order to preserve any archaeological remains by record, in accordance with PPG 16 (DoE 1990). The work was intended to allow the recovery of a full record of the deposits identified within the millrace. However, excavation revealed that archaeological deposits had largely been removed by nineteenth- and twentieth-century activity over much of the site, and although environmental samples potentially representing earlier material were recovered, these did not produce any dating evidence (OA North 2007).
- 1.1.3 Post-excavation assessment of the primary stratigraphic records established a relatively brief and uncomplicated sequence of activity on the site from the post-medieval period (1540-1750) onwards (*ibid*). Assessment of the artefactual assemblages recovered from stratified deposits on the site further concluded that these were relatively modern (1900-present) in character. Whilst the archaeological and historical background to the project is covered in the post-excavation assessment (OA North 2007), a summary is provided in this report (*Section 1.3*) to contextualise the results of the analytical phase of the project.

1.2 LOCATION, GEOLOGY AND TOPOGRAPHICAL SETTING

- 1.2.1 The town of Chorley lies close to the southern boundary of the modern county of Lancashire, and is situated on the western bank of the River Yarrow, a tributary of the River Ribble. The development site, in an area known as Eaves Green, covered a ribbon of land some 1.35km long, on the southern fringe of the town (Fig 1). Eaves Green occupies part of the former township of Duxbury, in the parish of Standish (Farrer and Brownbill 1911, 182-3; 208-13).

In 1911 the township contained no village or hamlet, and a third of the area was occupied by the parks of Duxbury and Ellerbeck (*op cit*, 208).

- 1.2.2 The geology forms part of the Lancashire Coal Measures, with prevalent coal seams in the area exploited by the Duxbury Colliery (LUAU 1996, 7). Overlying drift geology consists predominantly of boulder clay, with glaciofluvial deposits along the course of the River Yarrow (Ordnance Survey Geological Survey 1971; Countryside Commission 1998, 128).
- 1.2.3 The environs of the excavation areas are dominated by the River Yarrow, which is enclosed by an ancient deciduous woodland. The course of the river was altered by at least the eighteenth century, with the introduction of a sluice and weir arrangement. Away from the riverside to the west, ground levels may also have been altered during the late nineteenth and twentieth centuries by industrial coal exploitation (Earthworks Archaeological Services 2000, 10). Further to the north and north-west, the ground rises steeply from the former river bank, although this natural slope is also suggested to have been altered substantially in places since the Second World War (*ibid*).

1.3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

- 1.3.1 A corn mill in Duxbury is first mentioned in 1354 (*op cit*, 28), although some sources believe it to have been much earlier (*ibid*). A cluster of houses shown around the old Yarrow Bridge on an estate map of 1757 (LRO DDRf 11/1), and then Yates's map of 1786, were not depicted in 1843 (LRO DRB/1/68). The mill itself appears to be shown on Yates's map with a water-wheel symbol, and had passed from the Duxbury to the Standish families, the local estate owners, in the early 1700s (Farrer and Brownbill 1911, 209). Management of the mill and race was operated by various lessees and owners throughout the eighteenth and nineteenth centuries, until its conversion to steam power early in the twentieth century, and it continued to be shown on maps throughout the nineteenth century (Fig 2). The mill buildings and race fell into disuse shortly afterwards, and the mill had become ruinous by 1910 (Earthworks Archaeological Services 2000, 32; Fig 3).

1.4 UPDATED RESEARCH AIMS AND OBJECTIVES

- 1.4.1 Following the guidance of English Heritage (nd, 2-3), the original project aims were updated in light of the post-excavation assessment (OA North 2007). Although the majority of the original aims of the fieldwork were still valid, they were updated, with new aims and objectives derived from the statement of potential set out in the post-excavation assessment (*ibid*). The analysis outlined in the updated project design (*Appendix 2*), included as part of the post-excavation assessment, has two primary objectives: to add to the archaeological knowledge in the areas prioritised by the original fieldwork aims; and to understand how people lived in Lancashire in the past.
- 1.4.2 The updated research aims considered the following:
 - chronological and morphological development of the site;

- daily life on the site in the post-medieval period, including diet, pastimes, costume and personal adornment;
- processes of change, particularly in terms of water-powered industry, and changes brought about by the advent of new industry into the area;
- the economy of the industrialised later post-medieval period in this part of Chorley, including the development of industries, and especially the use and management of the millrace;
- the character of occupation during industrialisation, particularly the pollution of watercourses.

1.4.3 The data from the excavation were potentially capable of addressing a number of issues raised by the regional *Research Agenda* for the post-medieval period, including the urgent need to recover good palaeoenvironmental data from features of late eighteenth- to nineteenth-century date, in order to study agricultural advances and contemporary crop cultivation, with particular reference to the type of species (Newman and McNeil 2007a; 2007b). The excavation of the silt deposit at the lowest levels of the millrace channel in Area 1 allowed this issue to be addressed during the course of the analytical phase of the post-excavation programme.

1.4.4 The *Research Agenda* also highlights the need to retain and analyse collections of artefacts from features and deposits of this date (Newman and McNeil 2007b). The development of watermill sites, such as that at Duxbury, is also poorly understood at present, with mills dating from before the Industrial Revolution (the late eighteenth century onwards) thus far only having been subject to documentary and standing building investigation (*op cit*, 11). The sequence of deposits and the artefactual and environmental datasets recovered from both excavation areas have the potential to contribute to the understanding of the use and development of water power from the eighteenth to the twentieth centuries.

2. EXCAVATION RESULTS

2.1 INTRODUCTION

- 2.1.1 The stratigraphic data recovered from the excavation were not complex. The broad stratigraphic framework identified during the assessment was refined to form a descriptive text which was further refined in the light of the artefactual analysis (see *Section 3*). A site database was compiled, and in the course of this analysis, the site matrices were redrawn to conform to the amended phasing. Similarly, phase plans and sections were slightly revised in the light of full analysis.
- 2.1.2 The results from the analysis of post-medieval and later features from the site are discussed and interpreted within their historical and archaeological context. The discussion also incorporates the reports on the various classes of finds within the stratigraphic analysis.

2.2 STRATIGRAPHIC RESULTS

- 2.2.1 The earliest strata encountered during excavation were geologically natural deposits. These comprised compact glaciofluvial drift deposits of sands of the Newport 1 Association, above scree and bare rock belonging to the Belmont Association (Hall and Folland 1970, 44-7).
- 2.2.2 Archaeological remains from the medieval period (*c* 1066-*c* 1540) and earlier were not represented within either the artefactual assemblage or the environmental data (see *Sections 3* and *4*). Indeed, the remains of the millrace recorded during the excavation appeared to represent activity that was post-medieval (*c* 1540-*c* 1750) in date at the earliest. The creation of the millrace seems to have involved the cutting of a channel and construction of revetments and banks on either side of that channel. It appears that this activity did not occur uniformly, and there were as many contrasts as comparisons between the two areas excavated. In Area 1, a stony surface and part of an associated wooden sluice were located at the base of a deeply stratified sequence of silts and dumped backfill deposits within a wide channel (Fig 4). In Area 2, however, a stone revetment was recorded on one side of a relatively shallow and narrow channel (Fig 5). The source of much of the dumped and silt deposits appears to have been an early twentieth-century filter-bed, the effluent channel for which cut into the side of the millrace in Area 1. The present-day above-ground appearance of a relatively level ground surface concealed the varied natural topography beneath a series of dumped deposits, backfill deposits, silting and collapsed earthwork features.

2.3 PHASE 1: POST-MEDIEVAL PERIOD (C 1540 - C 1750)

- 2.3.1 The excavation of the extant channel appears to have occurred no later than the early eighteenth century. However, it was not possible to date either the deposits or the structural components closely within this phase.

2.3.2 A channel (**103**), presumably the head-race, was recorded cutting through the natural geology (**110**) in Area 1 (Figs 6 and 7). It was aligned approximately north-west/south-east, with an approximate width of 6.25m, an approximate depth of 2.03m, and a length exceeding 3.5m. Sandstone blocks and pebbles (**109**), showing no evidence of having been worked, formed a rudimentary surface across the base of the channel (Plate 1). A single preserved wooden post (**126**) on the southern side of the channel may have formed part of a sluice across the channel or race, although no further traces of such a structure were recorded. The primary fill within the channel comprised an 0.45m deep layer of silt (**106**; Fig 4), which did not contain any artefacts.

2.3.3 Within Area 2, the millrace was represented by a channel (**208**) on an approximate east/west alignment, cut into natural sandy-loam (**230**; Fig 7). Beneath this was a layer of weathered sands and gravels (**229**), which in turn overlay a natural sand and gravel deposit (**228**). This feature was approximately 3.4m wide, approximately 0.21m deep and at least 2m in length, and thus differed in dimensions from that found in Area 1. Its correlation with cartographic evidence for the millrace makes this interpretation fairly certain, however.

2.4 PHASE 2: INDUSTRIAL PERIOD (C 1750 - 1901)

2.4.1 In Area 2, a stretch of irregularly coursed, unbonded, stone revetment wall (**204**) was recorded along the southern side of channel **208** (Fig 5, Plate 2), comprising rough-cut blocks and thin slabs of sandstone. The wall survived to a height of 0.27m, a width of 0.2m and a minimum length of 1m.

2.4.2 On the southern side of channel **208**, a series of deposits (from the top, **205**, **206**, **207**, **210**, **215** and **216**) formed an earthen bank (**209**), which contained nineteenth-century artefacts (Fig 5). A similar earthwork was not visible on the northern side of the channel, and it would appear that either there was never a bank on this side, or that it had been entirely eroded or deliberately removed. The latter scenario would seem unlikely given the survival of the southern bank (**209**). The material overlying the base of channel **208** (**220**, **221** and **222**) appeared to be waterborne silt deposits. These were overlain by layers that appeared to have formed by erosion of the soils from the northern side of the channel (**223** and **225**, and then **213** and **224**).

2.4.3 Prior to the excavation, along the eastern side of Area 1, an earthen bank (**105**) could clearly be seen, on an approximate north/south alignment (Fig 4). Excavation revealed that this earthwork comprised a 1.45m deep sequence of five gravel-rich sand deposits (**113**, **121**, **122**, **123** and **124**), over which was a single sandy-clay deposit (**107**). These overlay the silt deposit (**106**) which filled the lower part of the channel (**103**), and artefactual evidence would indicate a mid-nineteenth-century date for the latest of the deposits (**107**). This earthen bank did not appear to have been contemporary with the cut for channel **103**, and it may have represented activity associated with the construction, or subsequent decommissioning, of the culvert shown on the 1849 Ordnance Survey map (Fig 2). In the centre of the channel (**103**), a

sequence of brightly coloured gravel-rich deposits (**102**, **118**, **119**, and **120**) and slumped sandy loam (**117**) were recorded, overlain by topsoil (**101**).

2.5 PHASE 3: MODERN PERIOD (POST-1901)

- 2.5.1 An irregularly shaped channel (**116**) was recorded in Area 1 (Fig 4), cutting the deposit of slumped sandy-loam (**117**). This channel followed an approximately east/west alignment, and was filled with a series of mixed gravel-rich deposits (from the top, **114**, **112**, **111** and **115**). Investigation of the ground surface to the west of Area 1 revealed a linear depression, lying on an approximate westward alignment from the point at which this channel entered the Area 1 excavation, turning towards the north-west and then disappearing. The position of this depression seemed to correspond to the surveyed position of a channel leading to 'filter beds', or a coal-wash (K Sweeney *pers comm*), and the basal fill (**115**) of the channel, a compact coal-rich deposit, also suggests this use. The two deposits (**111** and **112**) above deposit **115** were likely to represent deliberate backfilling of this channel, whilst the uppermost deposit (**114**) appeared to be redeposited natural sandy-loam (Fig 4).
- 2.5.2 In Area 2, a succession of lenses and more substantial fills appeared to have accumulated in the uppermost part of channel **208**. In order of deposition, the recorded fills were **219**, **218**, **217**, **212**, **211**, **203** and **202** (Fig 5), and only one of these (**217**) appeared to represent a slump of bank material into channel **208**, the rest representing gradual sedimentation of the millrace after maintenance ceased.
- 2.5.3 Layers of topsoil were recorded in both excavation areas (**101** in Area 1, and **201** in Area 2), sealing the archaeological features and deposits. These topsoil layers appeared to have been laid down in the last 50 years, and while deposit **101** was approximately 0.4m thick, in Area 2 the topsoil was only 0.1m thick.

3. ARTEFACT ANALYSIS

3.1 INTRODUCTION

- 3.1.1 Based on the assessment of the individual groups of artefacts retrieved from the excavation (OA North 2007), it was possible to analyse each group further in light of the updated research aims and objectives (see *Section 1.4*).

3.2 THE POTTERY

- 3.2.1 A small assemblage of pottery (100 fragments) was recovered from post-medieval or later deposits, comprising the millrace bank (**107**, **121**, **205**, **206**, **210** and **216**), nineteenth- or twentieth-century silt/dump deposits (**102**, **114**, **117**, **118**, **203** and **212**), topsoil **101**, as well as unstratified material. The complete assemblage was examined (Table 1), being sorted by fabric, and, where possible, vessel-types were identified. Fabrics were defined using the usual terminology for post-medieval and modern pottery (see, for instance, Cotter 2000). As the assemblage was small and, on taphonomic grounds, most likely to have been redeposited, the sherds were not weighed, and no estimate was made of the minimum numbers of vessels represented. None of the material was illustrated.
- 3.2.2 The amounts from each individual context varied from single fragments (**121**, **205** and **216**) to 15 sherds (**118**), and the sherd size varied considerably. Many of the sherds were small and some were badly abraded, with rounded breaks, or were spalled, discoloured and, on occasion, heat-affected. This perhaps suggests that they had entered the archaeological record via an ash-midden, or at least as domestic waste dumped from elsewhere. In general terms, the pottery comprises a relatively homogeneous group of nineteenth- and twentieth-century kitchen and tablewares, with only a few sherds pre-dating this period.
- 3.2.3 The earliest vessel, from the millrace bank in Area 2 (**216**), is part of the narrow base of a beaker or relatively small jar in a fine oxidised fabric, and appears to be of Roman date, possibly of the second or third century AD. Its stratigraphic position, in a bank of dumped material, means that it is not only residual, but need not have originated at this site.
- 3.2.4 The remainder of the pottery is post-medieval in date, with the earliest a small fragment of late seventeenth- to early eighteenth-century Blackware (probably from a drinking vessel) from Phase 3 fill **212**. There were several very small and abraded fragments of typically eighteenth-century fabrics; tin-glazed ware, slip-decorated ware, white salt-glazed stoneware, manganese-speckled ware, and creamware were all noted. All were from deposits associated either with the millrace bank, or with the late dumps/silts, and thus all could be imported from elsewhere.

Context no	Romano-British oxidised fabric	Tin-glazed ware	Manganese-speckled ware	White salt-glazed stoneware (later stoneware fabrics*)	Creamware	White earthenware	Transfer-printed white earthenware	Black-glazed redware	Slip-decorated redware	White china	Late slipware
100						1	5	1	1		
101		1				2	3	2			1
102			1	1		3	4			1	1
107						3			1		
117						2		1			1
118			2			6	3	3			1
121		1									
123		1		1		2	2	6		1	1
203						1	1				
205						1					
206						2	1				
210							1				
212					1		5	3			
216	1										
u/s				2		3	2	7			3
Totals	1	3	3	4	1	26	27	23	2	2	8

Table 1: Distribution of pottery fabrics between contexts ('u/s' is unstratified). The fabrics are listed in broadly chronological order

3.2.5 The later fabrics are dominated by plain white-glazed earthenware (introduced in the early nineteenth century and still widely produced), along with blue and white transfer-printed earthenwares, again most likely to date to the nineteenth

century or later. Together, these accounted for *c* 60% of the assemblage. In most cases the fragments were too small to allow the identification of vessel forms, but transfer-printed teawares were noted, and one large serving plate with a discoloured and crazed glaze suggesting that it had seen considerable use before discard. The rim of a chamber pot was also noted (from Phase 2 deposit **102**), its rim painted in imitation of the 'scratch blue' decoration popular in the eighteenth century (Cotter 2000, 252), but itself probably later in date. A miniature china teacup, from Phase 2 backfill deposit **123**, is presumably a toy.

- 3.2.6 Other fabrics were restricted to a narrow range of kitchenwares, predominantly black-glazed redware vessels, including storage jars and large bowls. A flat-rimmed chamber pot in a similar fabric was heavily sooted, suggesting that it had been put to some other use, or had been included in midden rubbish (from topsoil **101**). The few fragments of late slip-decorated redwares are also likely to have been kitchenwares, most probably serving dishes and bowls. These redwares are difficult to date with precision, being practical vessels, and thus less susceptible to changing fashion. They were widely made, usually by local potters, and in many cases production continued into the twentieth century.

3.3 CLAY TOBACCO PIPE

- 3.3.1 There were 27 fragments of clay tobacco pipe, recovered from topsoil **101**, several of the millrace fills (Phase 2: **102**, **213**, **221**; Phase 3: **203**, **212**), the south side of bank **105** (**107**, **123**, **210**, **215**), and unstratified (**100**). In all, 15 of the fragments were from bowls, and thus datable to some degree. The remainder were short stem fragments, of which none were stamped, and thus they are effectively undatable.
- 3.3.2 The earliest bowl came from a late deposit (Phase 2, **213**) within the millrace. Dating probably to the period 1600-40, this bowl is from what is clearly a secondary deposit, and thus cannot be regarded as secure dating for the feature concerned. Its dating does, however, reflect that of the earliest fragment of Blackware from the site (from Phase 3, **212**), and might point to some activity in the vicinity at this date. Fill **102**, also within the millrace, produced later nineteenth-century forms, the latest, a plain pipe without spur, probably dating to *c* 1880-1900.
- 3.3.3 Bank **105** (Phase 2, deposit **123**) produced eighteenth- and nineteenth-century bowl forms, again suggesting a mixed deposit, presumably brought in when the bank was under construction, and thus pointing to a nineteenth-century date for its genesis. In the same feature, deposit **210** also produced a late eighteenth-century example, decorated with foliage along the line of the mould seam, although pottery from the same context points to a later date. A single bowl from **107**, the latest in the sequence of deposits forming bank **105**, can be dated to 1810-40, and possibly represents the approximate date of its completion. Unstratified material reflected the same nineteenth-century date-range.

3.4 CERAMIC BUILDING MATERIAL

3.4.1 Of the five fragments of ceramic building material recovered, two fragments, from topsoil **101** and millrace fill **102**, were small, abraded and undiagnostic. The remaining three fragments were from handmade bricks, and cannot be dated with precision, except to note that they are likely to be post-medieval or more recent in date. Two fragments are from bank **209** (deposits **205** and **206**) on the south side of the millrace, and are likely to have been deposited during its construction, possibly having been brought in from elsewhere, as there was no obvious brick structure associated with the bank. The final fragment of handmade brick was from **114**, a fill of Phase 3 channel **108**, and again is likely to have been introduced from elsewhere.

3.5 THE METALWORK

3.5.1 Very little metalwork came from the site, and as X-ray radiography was not recommended for the two ferrous objects recovered, on the grounds that they were likely to be recent in date (OA North 2007), neither has been further identified. The metal fittings of a bayonet-fitting electric light bulb have been noted, and are a firm indicator that the millrace was still receiving fills in the twentieth century.

3.6 VESSEL AND WINDOW GLASS

3.6.1 All of the small assemblage of glass (17 fragments), bar one piece, was recovered from the fills of the millrace. In Area 1, fills **102** and **117** (which together produced 14 fragments) were attributed to Phase 2. In Area 2, fill **212** (one fragment) was dated to Phase 3, but in terms of the vessels represented there is little difference in date. There are several fragments from mould-blown embossed mineral water bottles, including an almost complete Codd bottle, bearing the name of a Chorley mineral-water producer (Tanner and Co), and a St Helen's manufacturer (Carrington Shaw and Co). Embossed bottles were in widespread production from the late nineteenth century and, by 1895, approximately 75% of all glass bottles produced were embossed (Hedges 1975, 23). The advent of the printed label in the early twentieth century meant that the production of ornately embossed vessels soon fell into decline and it is unlikely that any of the fragments is more recent than about 1930. A group of small, very thin, colourless fragments from Phase 2 fill **102** are likely to be from a twentieth-century light bulb, an identification reinforced by the presence of a typical bayonet bulb fitting from the same context (see *Section 3.2.11*).

3.7 ORGANIC AND OTHER RELATED MATERIALS

3.7.1 In all, 89 fragments of leather were recorded. Most were in excellent condition, being thick straps and loops, and shoe soles. Uppers, being thinner leather, possibly tanned using a different process, were less well preserved. The distribution of leather is shown in Table 2.

Context no	Straps	Loops	Shoe fragments	Other scraps	Total
<i>100</i>	1		4		5
<i>102</i>	4	6	6	1	17
<i>118</i>		3			3
<i>120</i>	1	3			4
<i>121</i>	1		5	8	14
<i>123</i>	1		1	3	5
<i>203</i>	4	2	3	6	15
<i>212</i>	1	10	3	7	21
<i>225</i>	3	1		1	5
<i>Totals</i>	<i>16</i>	<i>25</i>	<i>22</i>	<i>26</i>	<i>89</i>

Table 2: Distribution of leather between contexts

- 3.7.2 Perhaps the most notable element of the leather assemblage was the large group of strap and loop fragments. All were substantially made, with either several thicknesses of leather or a single thickness, as much as 5mm thick. Often, the short lengths of strap were joined by looping, or had rows of centrally-placed holes, suggesting that they had been joined by buckles. Their thickness, far in excess of that normal for a belt, led to their identification as belonging to a horse harness. It is likely that the assemblage represents small groups of dumped irreparable leather, with both broken and worn fragments and unused surplus items. Although too small for the style of harness to be reconstructed, that of working horses seems to be most likely, and pottery from the same contexts gives no reason to suggest that the material is any earlier than the beginning of the twentieth century.
- 3.7.3 The 26 fragments of shoe leather probably represent no more than four shoes, all of simple style, and again almost impossible to date. One clearly has the high quarters of a work boot, lacing above the ankle, and two of the others have simple, plain, one-piece uppers, which suggest work shoes, probably locally made. Where surviving, the soles are heavily worn and repaired, with one example, from Phase 2 backfill deposit *102*, heavily nailed. The size suggests a small foot, presumably a youth or adult female.
- 3.7.4 Three fragments of wood were recovered, all from late deposits (*114*, *118*, *123*). That from backfill deposit *114* was a small and featureless riven fragment, a possible barrel stave came from backfill deposit *118*, and a dowelled handle from backfill deposit *123*. All three fragments are of late date, and add little to the interpretation of the site.

3.7.5 The organic material also included a rubber or composition ball from late silt/dump deposit **212**, which is of twentieth-century date, as were two fragments of textile-backed (tyre) rubber from backfill deposit **120**, again a late deposit.

4. ENVIRONMENTAL ANALYSIS

4.1 INTRODUCTION AND QUANTIFICATION

4.1.1 Following the assessment of a single bulk sample taken from the primary fill (**106**) of the millrace, it was recommended that further analysis of the plant remains should take place, to investigate the economy of the site and the local environment. One ten litre bulk sample from silt deposit **106** was therefore processed for the analysis of waterlogged and charred plant remains.

4.2 METHODOLOGY

4.2.1 The sample was processed by hand-flotation and the flots collected on a 250 micron mesh and air-dried. The flots were examined with a Leica MZ6 binocular microscope, and charred and waterlogged remains were identified and quantified. Identification was aided by Stace (2001), Cappers *et al* (2006), and by comparison with the modern reference collection held at OA North (some modern seeds were supplied by the Hohenheim Botanic Gardens, Stuttgart). Plant nomenclature follows Stace (2001).

4.2.2 The results of the analysis are shown in Table 3, where the charred plant remains are given as actual counts. Waterlogged and other remains are recorded on a scale of 1-5, where 1 is rare (less than five items in ten litres of sample), and 5 is abundant (more than 100 items in one litre of sample). All the waterlogged and charred plant remains were extracted from the coarse fraction of the flot, with 50% being extracted from the medium and fine fractions, and where possible these were identified.

4.2.3 The waterlogged plant remains have been ordered into ecological groupings as follows:

- cereal grains and chaff;
- arable and cultivated weeds (annual plants found in arable fields, cultivated and waste ground);
- ruderal communities (plant communities found growing on waste or fallow ground, usually perennials or biennials, and inhibit the growth of annuals);
- grassland plants (to be found growing in open grassland or meadows);
- heathland/mire plants (to be found on dry heaths and blanket or raised mires (bogs));
- wet ground and aquatic plants (found growing on wet marshy ground, water meadows, on river, ditch and pond banks and in water meadows);
- woodland/scrub;
- broad ecological types.

Millrace: Silt deposit 106, Sample <1>

Volume processed 10 litres; Flot size 330ml			
Amorphous plant remains	3	Grassland plants:	
Wood	5	<i>Prunella vulgaris</i> - selfheal	3
Bracken frond	1	<i>Stellaria graminea</i> - common stitchwort	4
Leaf fragments	1	<i>Rumex acetosa</i> - common sorrel	2
Bryophyte fragments	2	<i>Rumex acetosella</i> - sheep's sorrel	3
Insect remains	3		
Fish bone	1	Ruderals:	
Coal	3	<i>Lapsana communis</i> - nipplewort	1
Industrial waste	1	<i>Urtica dioica</i> - stinging nettle	4
Clinker/cinder	3		
		Wet ground and aquatic plants:	
Arable and cultivated weeds:		<i>Caltha palustris</i> - marsh-marigold	1
<i>Agrostemma githago</i> - corn cockle	3	<i>Carex lenticular-type</i> - sedges	3
<i>Chenopodium album</i> - fat-hen	1	<i>Carex trigynous-type</i> - sedges	2
<i>Chrysanthemum segetum</i> - corn marigold	1	<i>Filipendula</i> sp - meadowsweet	1
<i>Persicaria lapathifolia</i> - pale persicaria	2	<i>Isolepis setacea</i> - bristle club-rush	2
<i>Persicaria maculosa</i> - redshank	2	<i>Juncus</i> sp - rushes	3
<i>Persicaria lapathifolia/ maculosa</i>	2	<i>Potentilla palustris</i> - marsh cinquefoil	3
<i>Reseda luteola</i> - weld	4	<i>Ranunculus flammula</i> - lesser spearwort	1
Broad ecological types:		Woodland/Scrub:	
<i>Cirsium</i> sp - thistles	2	<i>Alnus glutinosa</i> - Alder seeds	2
<i>Galeopsis tetrahit</i> - common hemp-nettle	1	<i>Alnus glutinosa</i> - Alder cones	1
<i>Hypericum</i> sp - St John's wort	1	Buds	2

<i>Lamium</i> sp - deadnettle sp	1	<i>Luzula</i> sp - wood-rushes	1
<i>Polygonum aviculare</i> - knotgrass	2	<i>Rosaceae</i> - thorns	2
<i>Potentilla erecta</i> -type - tormentil-type	3		
<i>Ranunculus repens</i> -type - buttercups	4	Food and economic taxa:	
<i>Reseda luteola</i> - weld	4	<i>Prunus cerasifera</i> - cherry	1
<i>Rumex obtusifolius</i> - broad-leaved dock	3	<i>Rubus fruticosus</i> - blackberries	5
<i>Sonchus asper</i> - prickly sow thistle	2		
<i>Veronica</i> sp - speedwells	1	Charred Plant Remains:	
<i>Viola</i> sp - violets/pansies	2	<i>Avena sativa</i> - oats	2
Indeterminate	3	<i>Poaceae</i> 2-4mm	2

Table 3: Waterlogged plant remains

4.3 RESULTS

- 4.3.1 **Charred Plant Remains:** although the overall charred assemblage from this feature was small (four items from ten litres of sample), the sample contained two *Avena* (oat) grains, one of which had started to germinate. The sample contained no chaff fragments or charred arable weed seeds, which suggests that the limited assemblage represents fully processed grain. Two grass seeds were also recorded.
- 4.3.2 **Waterlogged Plant Remains:** the primary silts within the millrace contained abundant waterlogged plant remains. Arable weeds, including several characteristic of corn fields, for example corn cockle (*Agrostemma githago*) and corn marigold (*Chrysanthemum segetum*), were represented. Weld (*Reseda luteola*) was also abundant in the sample. Grassland plants, such as common stitchwort (*Stellaria gramineae*), and both common and sheep's sorrell (*Rumex acetosa* and *R acetosella*) were recorded, along with ruderals, for example nipplewort (*Lapsana communis*) and selfheal (*Prunella vulgaris*). The surrounding environment was wet, and seeds of marsh marigold (*Caltha palustris*), sedges (*Carex lenticular* and *Carex trigynous*), bristle club-rush (*Isolepis*), rushes (*Juncus*) and marsh cinquefoil (*Potentilla palustris*) were abundant or frequent. Woodland and scrub plants included alder (*Alnus glutinosus*) seeds and cones, and wood-rushes (*Luzula* sp).
- 4.3.3 The sample contained abundant wood fragments, mosses stems and amorphous plant remains. It also contained coal, clinker, and a very small fish jaw, possibly from a small perch (*S Rowlands pers comm*).

4.4 DISCUSSION

- 4.4.1 **Charred Plant Remains:** these data are very limited. Therefore, no firm conclusions can be drawn, and any interpretation must be tentative. The charred plant remains from the millrace consisted of oat and medium (2-4mm) grass seeds. Although there is evidence for the cultivation of oats during earlier periods, their use appears to have increased during the medieval period in Britain (Greig 1991). One of the oat grains was partially germinated, which could suggest either spoilt grain or grain for brewing.
- 4.4.2 **Waterlogged Plant Remains:** this very well-preserved group provides evidence of the local environment in the post-medieval period. The abundance of arable weeds shows that corn was being grown close by, although the grassland plant remains suggest the presence nearby of pastureland or scrub. The appearance of ruderal species is interesting in that these are the first types to colonise disturbed ground. The marsh marigold, sedges, rushes and other damp-loving plant species indicate that the area was wet, although these are all species which would be characteristic of a river bank as well as a millrace.
- 4.4.3 **Arable weeds and plants of cultivated or waste ground:** there is little other than the occasional oat grain in the charred plant assemblage to suggest the cultivation or processing of crops or other food sources. However, the presence of seeds from arable weeds and those from cultivated or waste ground demonstrated that the site had been associated either with nearby cultivation, that areas of waste/cleared ground existed throughout the occupation of the site, or seeds were taken to the mill with cereals from further afield. Plants such as corn cockle and corn marigold are characteristic of corn fields, wayside verges or waste ground from the medieval period onwards and are non-specific in their ecological requirements (Greig 1991). Therefore, it is not possible to surmise the characteristics of the soils being cultivated. Weld was also abundant in the sample, which could be significant as it is used as a dye, but it is also common on disturbed ground (Hall and Huntley 2007). Weld seeds have been frequently recorded in Northern England from the Roman period onwards.
- 4.4.4 **Possible wild food plants:** the abundant blackberry seeds and the single cherry stone recorded in the waterlogged plant remains may reflect the use of these fruits in the diet. Alternatively, they may have been growing wild in the hedgerows and field margins, or on the banks of the river or millrace.
- 4.4.5 **Wet ground/woodland/scrub:** as would be expected from samples taken next to a river and millrace, many of the plants recorded are examples of those that live in damp conditions, including trees such as alder.

5. CONCLUSION

5.1 DISCUSSION

- 5.1.1 From the archaeological investigation and subsequent analysis, the millrace earthwork would appear to have been constructed during the post-medieval period and, whilst it is postulated that this may have evolved from an earlier medieval arrangement, there was no physical evidence of any medieval activity. The excavation established that the channel had been considerably deeper than expected at the weir end, although its alignment was as predicted. The potential fragmentary sluice was of interest, although there is not enough evidence to reconstruct any form for this putative structure.
- 5.1.2 The later post-medieval management of the millrace under Sir Thomas Standish and the lessees of Duxbury Mill (LUAU 1996) was confirmed by the construction of the stone revetment wall along the southern side of the channel. It is possible that any physical evidence for earlier activity may have been removed by rigorous management of the millrace. Maintenance of it seems to have become progressively less important to the lessees of the mill, perhaps due to the construction of the reservoir close to the wheel-pit by 1846, shown on the Ordnance Survey 1849 map, and certainly less so by the time of its conversion to steam power. The artefactual assemblage from Phase 2 would certainly seem to support abandonment, followed by a protracted period of silting and use of the channel for the disposal of rubbish.
- 5.1.3 The small assemblage of charred plant remains from the millrace perhaps could have resulted from a drying accident at the mill or in an associated building. In contrast to the small size of the assemblage of charred plant remains, the preservation of waterlogged plant remains in the silted-up millrace is excellent. The assemblage suggests areas of wet ground close to water, with arable land or waste ground close by. Although the chronology of the primary fill of the millrace is uncertain, the plant remains could pre-date the archaeological assemblage by a considerable period of time. There are no records of any other archaeobotanical records from millrace deposits in the north of England (Hall and Huntley 2007). Although corn mills were abundant from the medieval period onwards, few early buildings survive, and any related archaeobotanical evidence in Northern England and Southern Scotland comes from a small number of corn-drying ovens, at Hoddam in Dumfries and Galloway, Bishop Burton near Beverley, in North Humberside, and Addingham, in North Yorkshire (*ibid*). Evidence of crop cultivation and of farming regimes from the eighteenth century onwards is sparse in north-west England, because of a lack of excavation and bulk sampling (Brennand 2007), and the environmental sample from the Eaves Green Link Road excavation will help to establish a dataset relevant to agricultural research themes.

6. BIBLIOGRAPHY

6.1 PRIMARY AND CARTOGRAPHIC SOURCES

LRO DDRf 11/1 1757 *Survey of the lands belonging to Sir Frank Standish, Baronet*, by R Lang

LRO DRB/1/68 1843 *Plan of Duxbury in the parish of Standish*

Ordnance Survey, 1849 1st edition, 6" map; Lancashire Sheet 77 (surveyed 1844-7; contoured 1847)

Ordnance Survey Geological Survey 1971, Preston Sheet 75 Drift

Yates, W, 1786 *The County Palatine of Lancaster*

6.2 SECONDARY SOURCES

Brennand, M (ed), 2007 *Research and Archaeology in North West England: an Archaeological Research Framework for North West England Volume 2, Research Agenda and Strategy*, Archaeology North West, **9**, Manchester

Cappers, RTJ, Bekker, RM, and Jans, JEA, 2006 *Digital Seed Atlas of the Netherlands*, Groningen

Cotter, J, 2000 *Post-Roman Pottery From Excavations in Colchester, 1971-85*, Colchester Archaeol Rep, **7**, Colchester

Countryside Commission, 1998 *Countryside Character Volume 2: North West*, Cheltenham

Department of the Environment (DoE), 1990 *Planning Policy Guidance Note 16: Archaeology and Planning*, London

Earthworks Archaeological Services, 2000 *Proposed Construction of the Eaves Green Link Road, Chorley: A Programme of Archaeological Evaluation*, unpubl rep

English Heritage, 1991 *Management of Archaeological Projects*, 2nd edn, London

English Heritage, nd *Minimum Standards for MAP2 Project Designs and Assessments: Supplementary Guidance to MAP2, draft notes*, English Heritage Commissioned Archaeology Programme, London

Farrer, W, and Brownhill, J (eds), 1911 *The Victoria County History of Lancaster*, **6**, London

Geoquest Associates, 2000 *Geophysical Survey on the Route of the Eaves Green Link Road, Chorley*, unpubl rep

Greig, JRA, 1991 The British Isles, in W Van Zeist, K Wasylikowa, and F Behre (eds), *Progress in Old World Palaeoethnobotany*, Rotterdam, 299-332

Hall, BR, and Folland, CJ, 1970 *Soils of Lancashire*, Soil Survey of England and Wales, Bull **5**, Harpenden

Hall, AR, and Huntley, JP, 2007 *A Review of the Evidence for Macrofossil Plant Remains from Archaeological Deposits in Northern England*, Research Dept Rep Ser **87/2007**, English Heritage, unpubl rep

Hedges, AAC, 1975 *Bottles and Bottle Collecting*, Princes Risborough

LUAU, 1996 *Eaves Green Link Road, Chorley: Archaeological Assessment*, unpubl rep

Newman, R, and McNeil, R, 2007a The Post-Medieval Period Research Agenda, in Brenndand, 2007, 115-32

Newman, R, and McNeil, R, 2007b The Industrial and Modern Period Research Agenda, in Brenndand, 2007, 133-58

OA North, 2007 *Eaves Green Link Road, Chorley: Post-excavation Assessment*, unpubl rep

Stace, C, 2001 *New Flora of the British Isles*, 2nd edn, Cambridge

ILLUSTRATIONS

LIST OF FIGURES

Figure 1: Site location

Figure 2: Location of excavated areas superimposed onto the Ordnance Survey map of 1849

Figure 3: Location of excavated areas superimposed onto the Ordnance Survey map of 1910

Figure 4: Sections across millrace channel **103**, Area 1, facing north

Figure 5: Section across millrace channel **208**, Area 2, facing north

Figure 6: Post-excavation plan of Area 1: Phase 1 features

Figure 7: Post-excavation plan of Area 2: Phase 1 features

LIST OF PLATES

Plate 1: Stone dump **109**, forming rudimentary surface at the base of millrace **103**

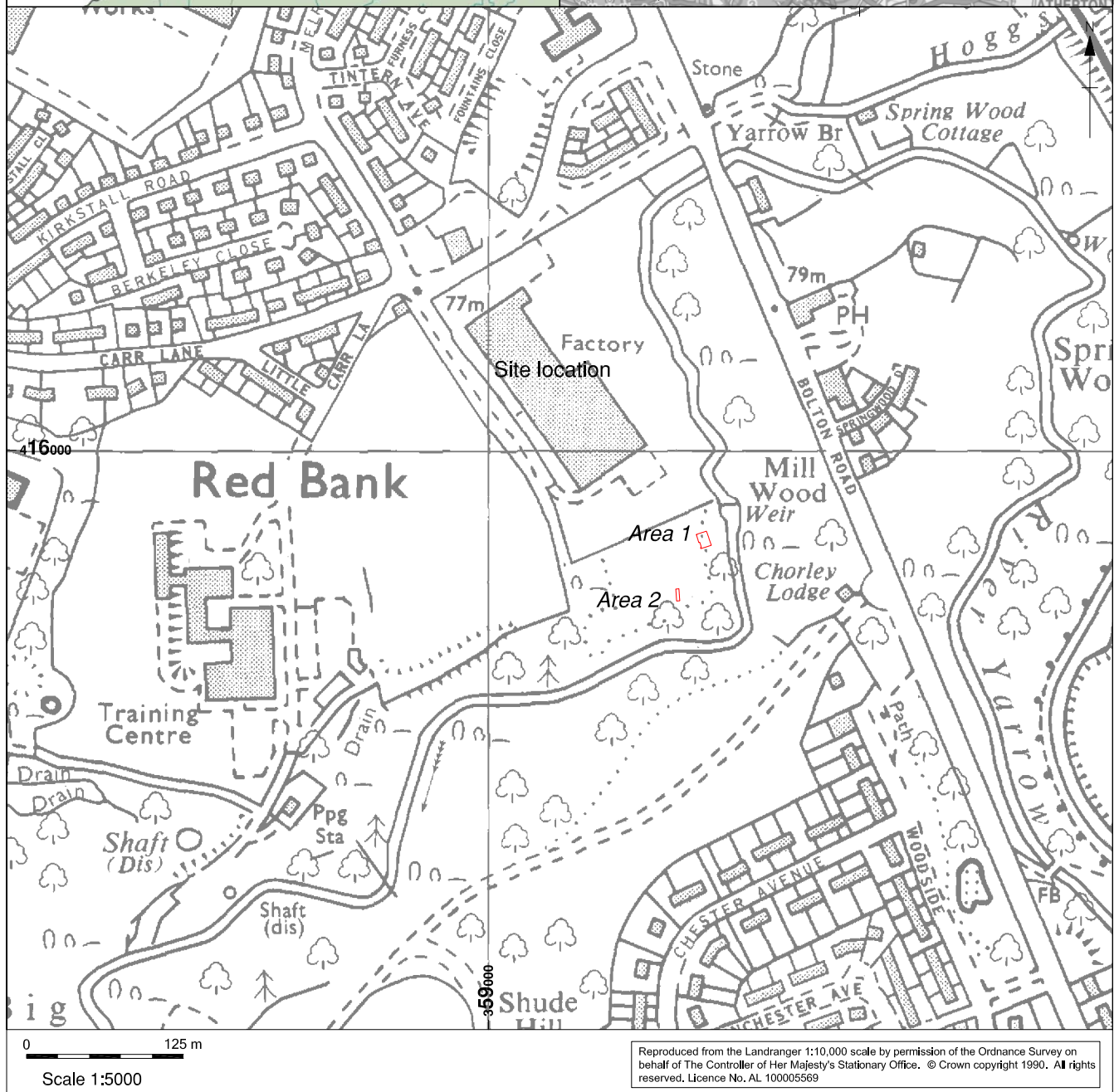
Plate 2: Revetment wall **204**, on south side of millrace **208**



Plate 1: Stone dump *109*, forming rudimentary surface at the base of millrace *103*



Plate 2: Revetment wall *204*, on south side of millrace *208*



Reproduced from the Landranger 1:10,000 scale by permission of the Ordnance Survey on behalf of The Controller of Her Majesty's Stationary Office. © Crown copyright 1990. All rights reserved. Licence No. AL 10000569

Figure 1: Site Location

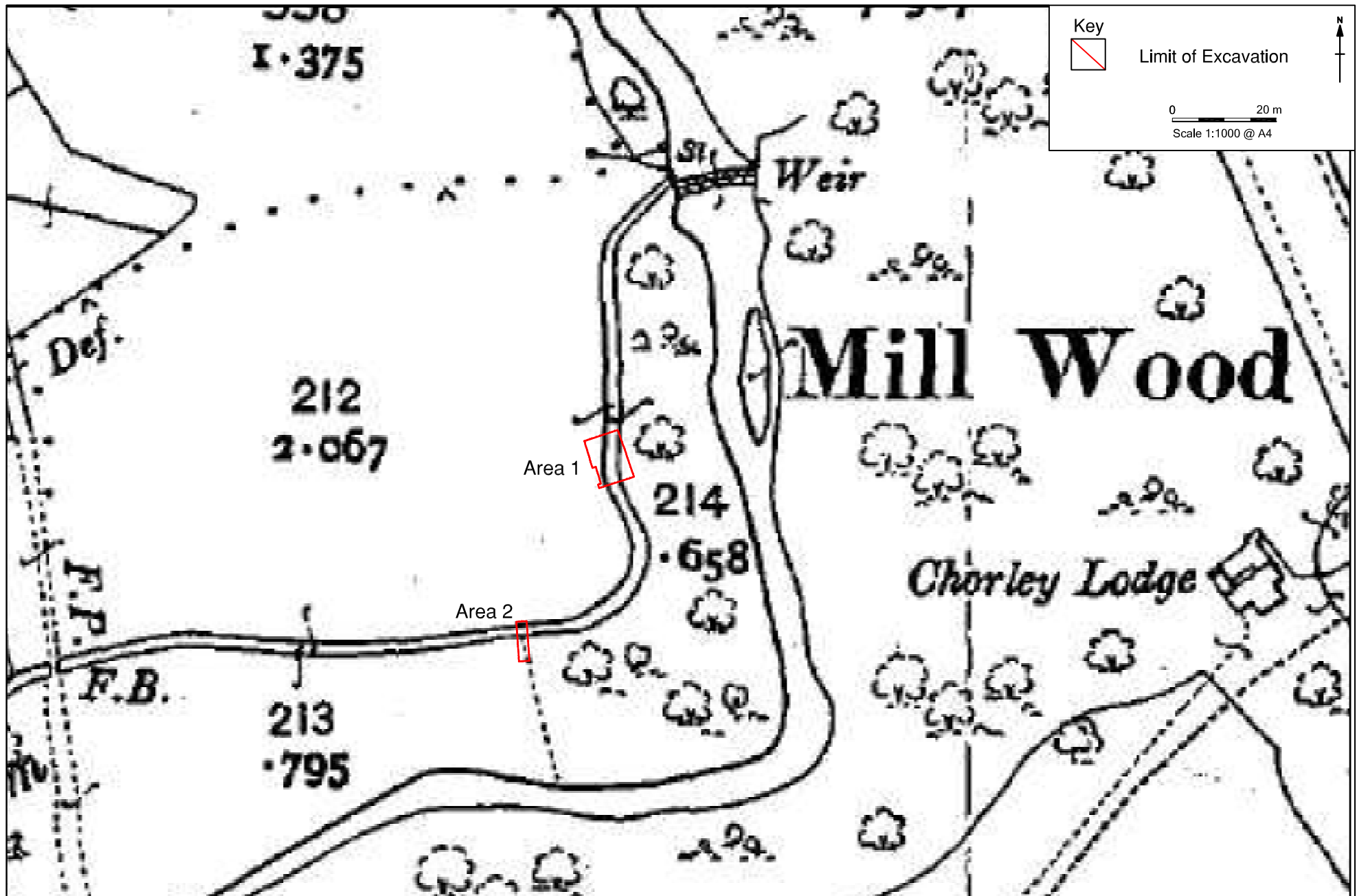


Figure 2: Location of Excavated Areas superimposed onto 1910 Ordnance Survey map



	Line of excavation		Uncertain edge
	Features		Levels
	Stone		Context numbers

Scale 1:75 @ A4

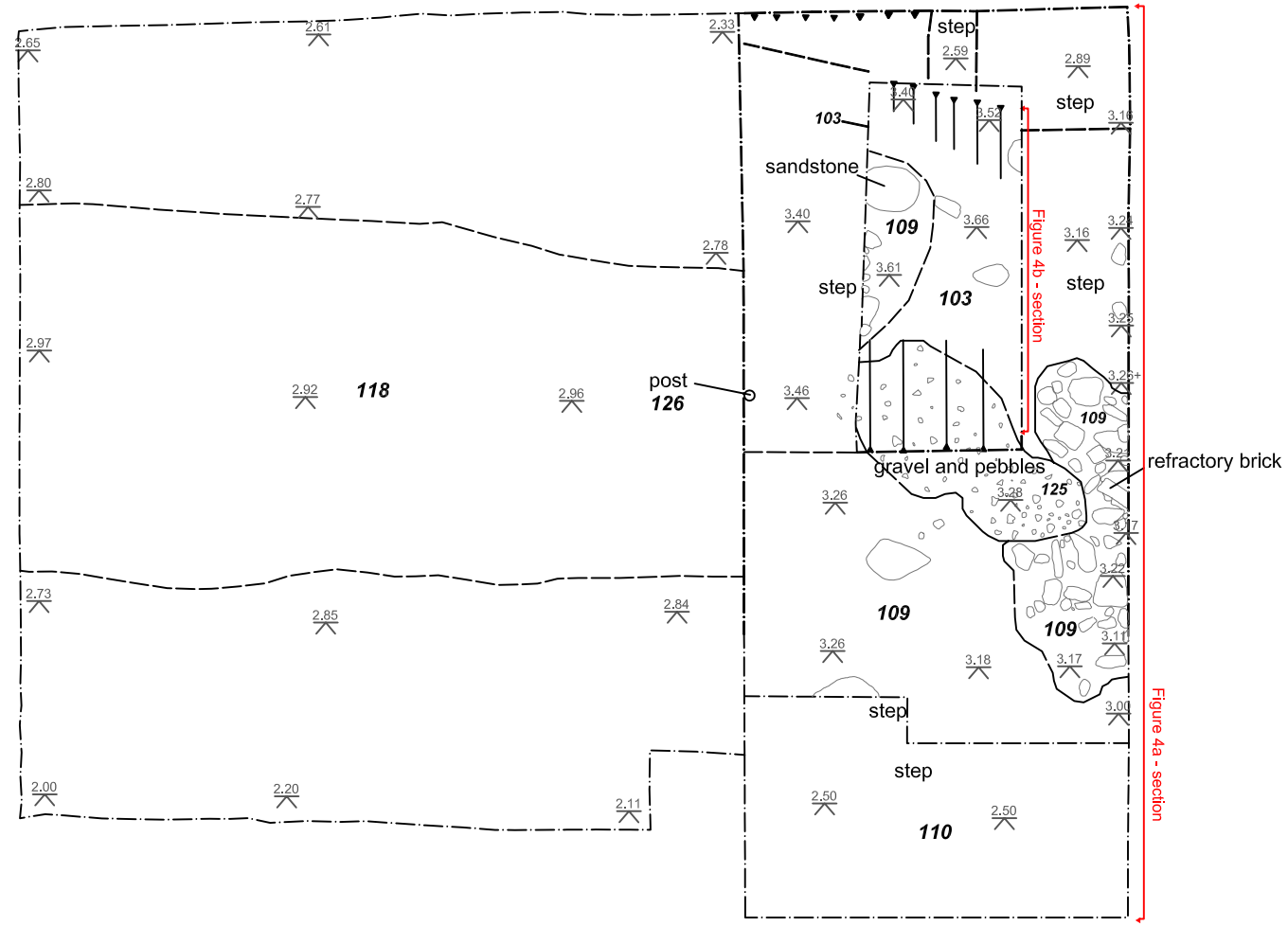


Figure 3: Post-excavation Plan of Area 1

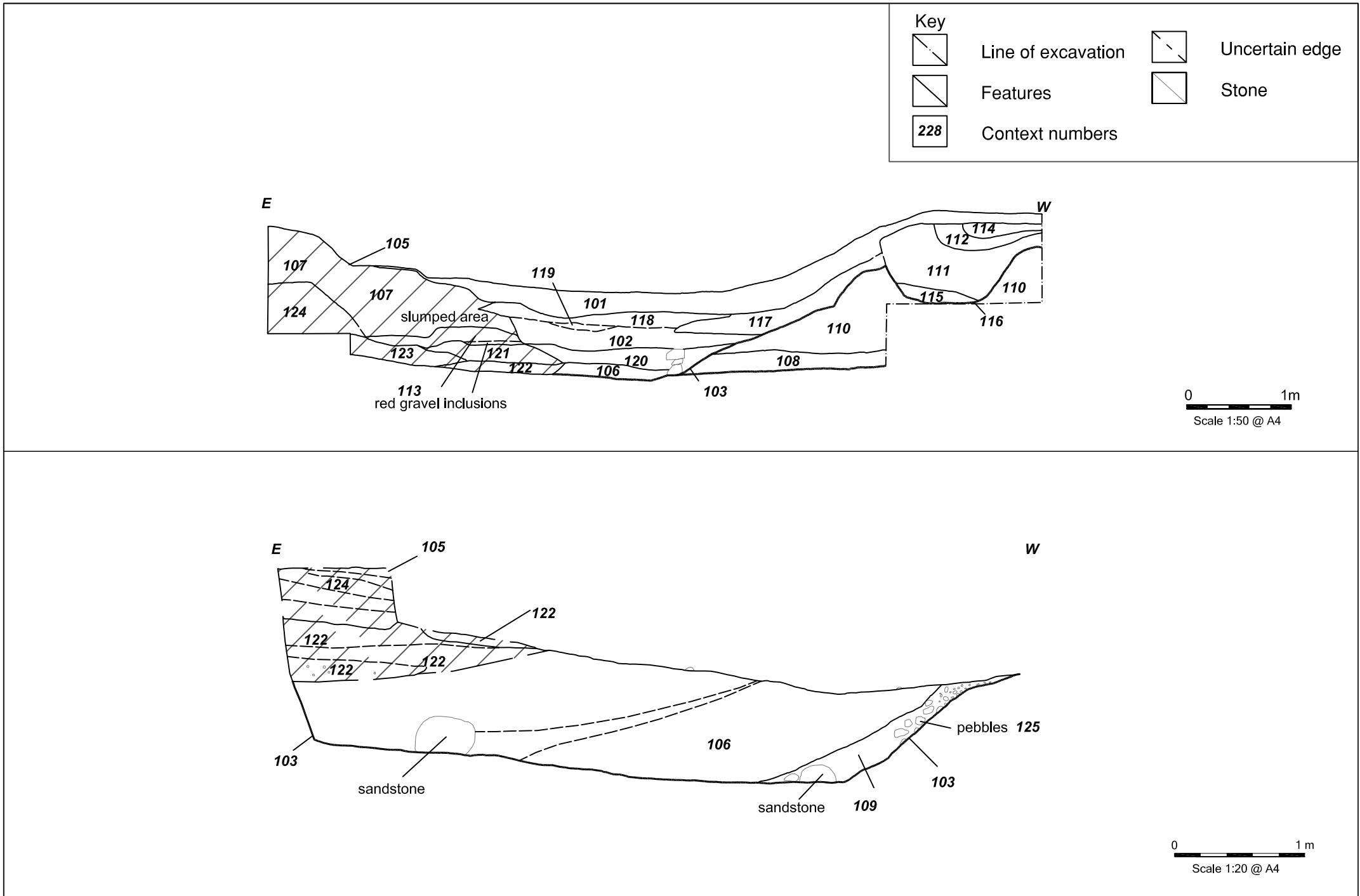


Figure 4: Sections across mill-race channel **103**, Area 1, facing north



Key



Line of excavation



Features



Context numbers



Levels



Uncertain edge



Stone



0 1m
Scale 1:50 @ A4

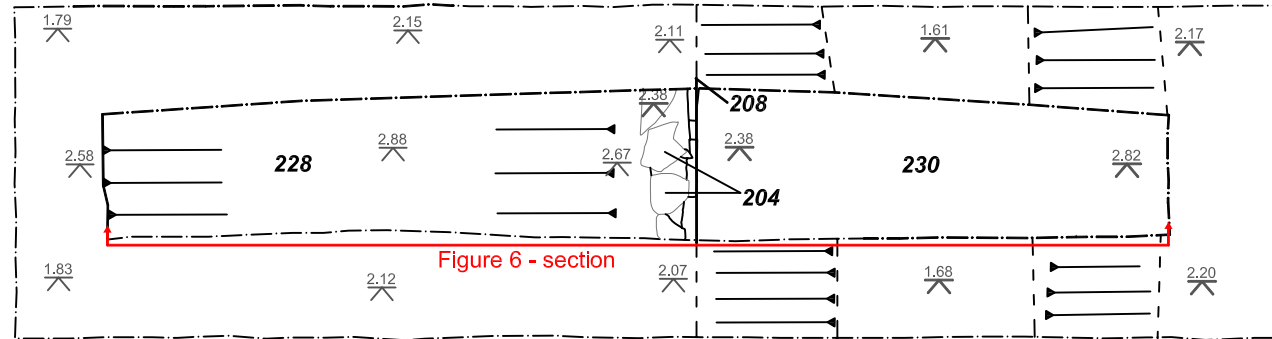


Figure 5: Post-excitation Plan of Area 2

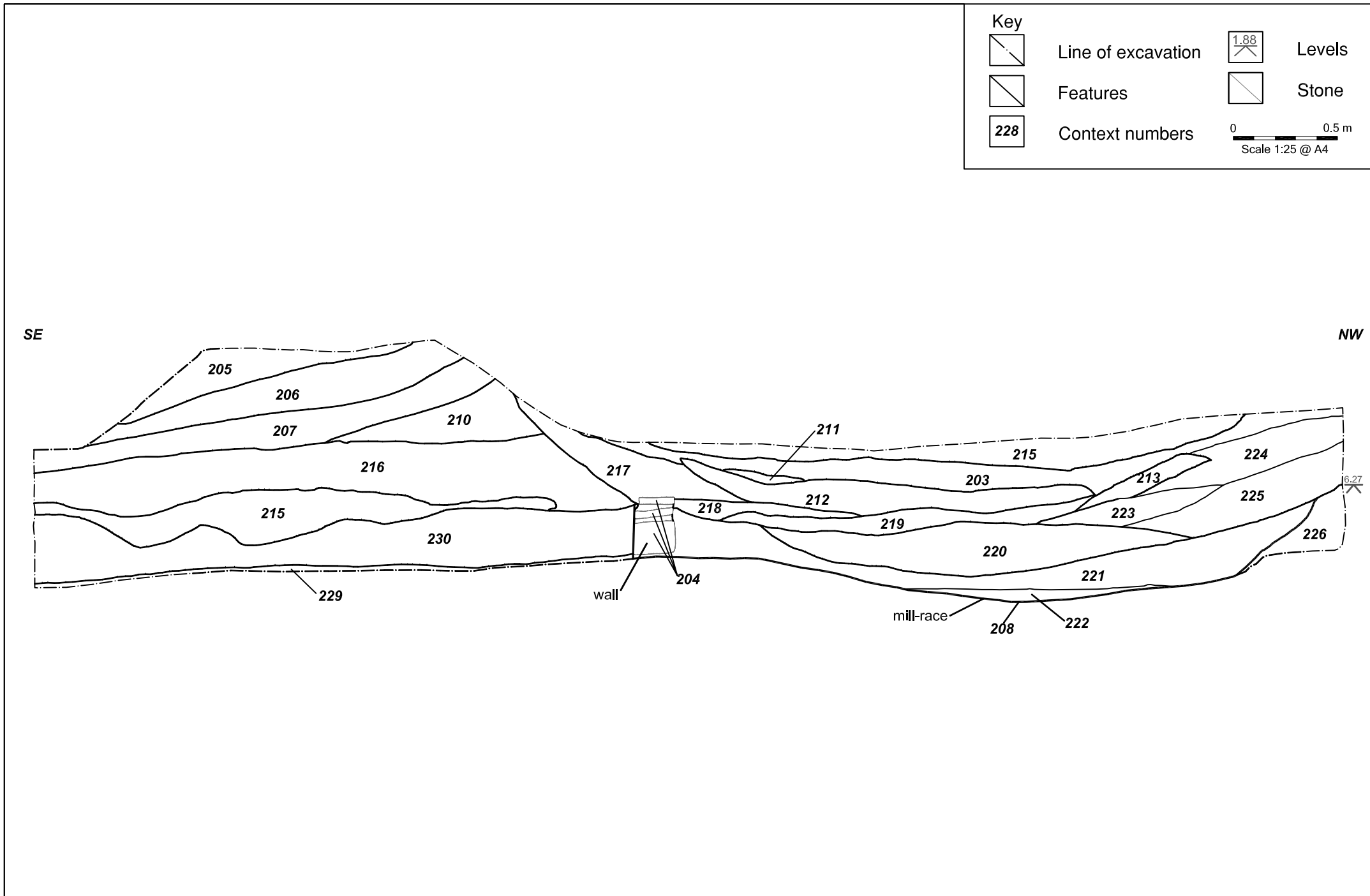
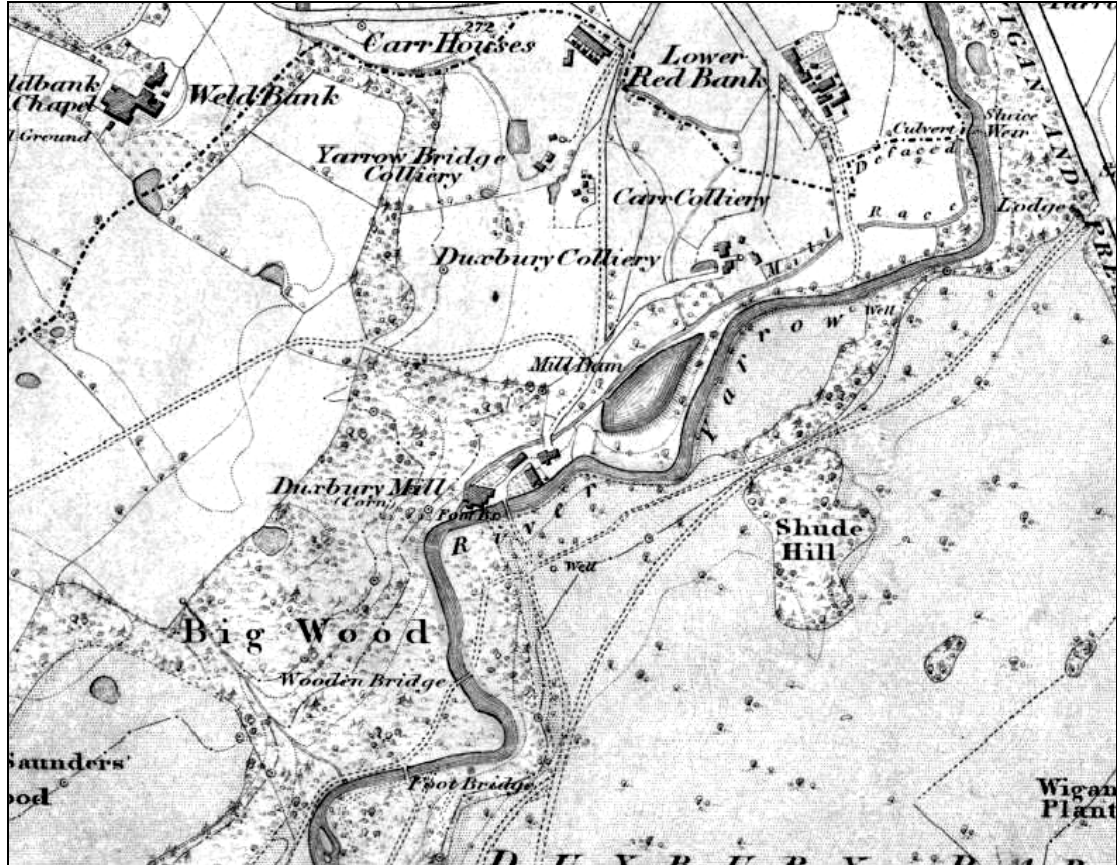


Figure 6: Section across mill-race channel **208**, Area 2, facing north, showing bank **209** and wall **204**

APPENDIX 1: PROJECT BRIEF

Brief for Archaeological Mitigation Works

Eaves Green Bypass, Chorley



Lancashire County Archaeology Service, June 2006

Brief for archaeological mitigation works required as part of the construction of the Eaves Green Link Road, Chorley. Prepared by P D Iles of Lancashire County Archaeology Service, June 2006.

INTRODUCTION

As part of the development of the housing areas to the south and west of Chorley, a new link road is required from Lower Burgh Way at c. SD 58021568 to the A6 Bolton Road at c. SD 59261601. Environmental assessment of the route included archaeological investigations and a series of reports were commissioned. This includes an assessment by Lancaster University Archaeology Unit (LUAU 1996), geophysical survey by Geoquest Associates (Geoquest 2000) and evaluation works by Earthworks Archaeological Services (EAS 2000). Copies of these reports can be made available on request.

Examination of those reports and comparison with the proposed line of the road by the Lancashire County Archaeology Service (LCAS) has indicated that only one major site – the former mill race to Duxbury Corn Mill - is directly impacted and requires formal recording in advance of construction. The remainder of the sites are either not directly affected or can be adequately dealt with by a formal watching brief. This brief is consequently divided into two sections.

This brief should be read in conjunction with the appropriate drawings and specifications for the road, as prepared by Lancashire County Council Highways Consultancy.

Queries regarding the archaeological content of this brief may be addressed to Peter Iles, Specialist Advisor (Archaeology), Lancashire County Council Environment Directorate, PO Box 9 Guild House, Cross Street, Preston, Lancashire, PR1 8RD. Tel. 01772 531550, fax 01772 533423, e. peter.iles@env.lancscc.gov.uk

Queries regarding the road scheme or contractual matters should be addressed to the Lancashire County Council Highways Consultancy.

PART 1 – EXCAVATION

DUXBURY MILL AND RACE

Duxbury corn mill was, as far as is known, water-powered for all of its life, initially using a water wheel but later being re-equipped with a water turbine. The mill site is generally regarded as medieval, with the Victoria County History for the County of Lancaster (VCH) noting that the mill is mentioned in 1354 and local historian Mr Jack Smith suggesting an origin of c.1230. It is known to have been rebuilt in 1727 and was certainly still in use in the second half of the 19th century. It was closed and partially demolished at some time between 1900 and 1928, but considerable remains are still to be seen on site (Farrer and Brownbill 1992 p.208; LUAU 1996, p.9, sites 9,10,13; EAS 2000, pp.28-38).

The site of the mill is, however, not touched by the road proposals and it is the line of the millrace that will be impacted. On the OS first edition 1:10,560 map of 1849 (sheet Lancashire 77) the mill stream is taken off at a weir on the River Yarrow at SD 5919115957 and leads along the northern side of the river to the mill itself at SD 5872515620. A teardrop-shaped interim pond, probably a balance pond, annotated 'Mill Dam', is located at SD 5888615714.

Two main sections of the millrace will be affected, the first is where the new road crosses the River Yarrow and bridge construction demands mean that the mill stream will be cut across a working width of some 25m immediately west of the river at about SD 59181592. The second area affected is associated with the construction of two surface water runoff treatment lagoons a little further south and west at about SD 59101587. The elongated lagoons flank the former race, but will need to be linked across it by a small engineered water channel.

A single trench 1.2m by 8.7m was excavated across the line of the race by EAS in the spring of 2000 (EAS 2000, pp.34-36, figs. 3, 28-30) at approximately SD 59141587. This showed that the race comprised a pair of constructed banks, c.3.5m wide on the north and c.2.5m wide on the south side, flanking a channel c.1.5m wide that had formerly been stone-lined.

Flooding during the excavation meant that a full stratigraphic sequence could not be recovered from the channel - it also serves as a warning to future excavators. Datable finds were limited to a small number of 17th-19th century pottery sherds and clay pipe fragments.

PROPOSED TRENCHES

It is proposed that two sections of the race will be excavated and recorded in advance of works commencing. The main excavation will be sited at the proposed new bridge site, where a section of race up to 10m long will be required. A smaller trench, up to 5m long, will sample the proposed lagoon site. Both trenches will need to be wide enough to span the entire race at the sites selected, and a nominal width of 8m should be allocated for planning purposes. The contractor should bear in mind, however, that the millrace flooded badly during the excavation in 2000 and an allowance may need to be made for the excavation of interceptor trenches and sumps outside the area being recorded.

The exact locations of the two trenches should be decided on the site in consultation with the road design staff and LCAS, but as guidance it is expected that the larger trench will be at about SD 59181592 and the small will be at about SD 59101587. It is important that this latter trench does not fall within the area already excavated by EAS, although a site immediately adjacent could be selected. Both trenches should be sited to avoid other obvious disturbance or damage, including the presence of significant tree boles.

The trenches should be located and the excavation strategy designed to create a full record of the mill race and any associated archaeological features and deposits within the excavation area. The information gained is intended as a full record to mitigate the damage that will occur during the construction of the new road.

EXCAVATION METHODOLOGY

GENERAL INSTRUCTIONS

HEALTH AND SAFETY

The archaeologists on site will naturally operate with due regard for Health and Safety regulations, and the contractor must ensure that all relevant requirements are met with regard both to site personnel and to members of the public. This work may require the preparation of a Risk Assessment of the site, in accordance with the Health and Safety at Work Regulations prior to submission of the tender. The LCAS and its officers cannot be held responsible for any accidents that may occur to outside contractors engaged to undertake this work while attempting to conform to this specification.

CONFIRMATION OF ADHERENCE TO SPECIFICATION

Prior to the commencement of *any work*, the archaeological contractor must confirm adherence to this specification in writing to the LCAS, or state (with reasons) any proposals to vary the specification. Should the contractor wish to vary the specification, then written confirmation of the agreement of the LCAS to any variations is required prior to work commencing. Unauthorised variations are made at the sole risk of the contractor (see below). Modifications presented in the form of a re-written project brief will not be considered by the LCAS.

CONFIRMATION OF TIMETABLE AND CONTRACTORS' QUALIFICATIONS

Prior to the commencement of any work, the archaeological contractor should provide the LCAS in writing with a projected timetable for the site work, and with details regarding staff structure and numbers. The names and *curriculum vitae* of key project members (the project manager, site supervisor, any proposed specialists *etc.*), along with details of any specialist sub-contractors, should also be supplied to the LCAS (if C.V.s have not previously been supplied). All project staff provided by the archaeological contractor must be suitably qualified and experienced for their roles. The timetable should be adequate to allow the work to be undertaken to the appropriate professional standard, subject to the ultimate judgement of the LCAS.

DOCUMENTARY RESEARCH

A programme of documentary research has already been undertaken (LUAU 1996; EAS 2000) and the project manager or the site supervisor should review this data to gain an overview of the archaeological/historical background of the site and environs. The results of this work may be incorporated into the contractor's report where they are considered to contribute to that report, but appropriate acknowledgement should be made and unnecessary duplication avoided. Further research required to inform the final report should be quantified and set out in the post-excavation assessment (below).

TRENCHING METHODOLOGY

METHOD OF EXCAVATION

The trenches may be opened and the topsoil and recent overburden removed down to the first significant archaeological horizon in successive level spits of a maximum 0.2m. thickness, by the use of an appropriate machine using a wide toothless ditching blade. Under no circumstances should the machine be used to cut arbitrary trenches down to natural deposits. Any machine work must be carried out under direct archaeological supervision and the machine halted if significant archaeological deposits are encountered. The top of the first significant archaeological horizon (pre-20th century) may be exposed by the machine, but must then be cleaned by hand and inspected for features and then dug by hand.

METHOD OF RECORDING

The trenches are to be recorded according to the normal principles of stratigraphic excavation. The stratigraphy of each trench is to be recorded even where no archaeological deposits have been identified. As this is intended as a full record excavation in areas that will be heavily damaged by construction works, the complete removal of archaeological deposits is likely to be appropriate. Modern artefacts are to be noted but not retained (19th-century material and earlier should be retained.)

USE OF METAL DETECTORS ON SITE

Spoil heaps are to be scanned for non-ferrous metal artefacts using a metal detector capable of making this discrimination, operated by an experienced metal detector user (if necessary, operating under the supervision of the contracting archaeologist). Modern artefacts are to be noted but not retained (19th-century material and earlier should be retained.)

If a non-professional archaeologist is to be used to carry out the metal detecting, a formal agreement of their position as a sub-contractor working under direction must be agreed in advance of their use on site. This formal agreement will apply whether they are paid or not.

To avoid financial claims under the Treasure Act a suggested wording for this formal agreement with the metal detectorist is: "In the process of working on the archaeological investigation at [*location of site*] between the dates of [*insert dates*], [*name of person contributing to project*] is working under direction or permission of [*name of archaeological organisation*] and hereby waives all rights to rewards for objects discovered that could otherwise be payable under the Treasure Act 1996."

ENVIRONMENTAL SAMPLING STRATEGY

Deposits must be sampled for retrieval and assessment of the preservation conditions and potential for analysis of all bioarchaeological remains. A sampling strategy must be agreed with a recognised bioarchaeologist, and the sampling methods should follow the procedures outlined by the English Heritage's Centre for Archaeology Guidelines, *Environmental Archaeology: A guide to the theory and practice of methods, from sampling and recovery to post-excavation* (2002/01). Provision should also be made for the specialist to visit the site and discuss the sampling strategy, if necessary.

CONSERVATION STRATEGY

A conservation strategy must be developed in collaboration with a recognised laboratory. All finds must be assessed in order to recover information that will contribute to an

understanding of their deterioration and hence preservation potential, as well as identifying potential for further investigation. Furthermore, all finds must be stabilised and packaged in accordance with the requirements of the receiving museum. As a guiding principle only artefacts of a “displayable” quality would warrant full conservation, but metalwork and coinage from stratified contexts would be expected to be X-rayed if necessary, and conservation costs should also be included as a contingency.

DOCUMENTATION

The actual areas of trenching and any features of possible archaeological concern noted within the trenches, should be accurately located on a site plan and recorded by photographs, scale drawings and written descriptions sufficient to form a permanent record of the remains. The site grid is to be accurately tied into the National Grid and located on the largest scale map available of the area (either 1:2500 or 1:1250).

LOCATION OF SERVICES, ETC.

The archaeological contractors will be responsible for locating any drainage pipes, service pipes, cables *etc.* which may cross any of the trench lines, and for taking the necessary measures to avoid disturbing such services.

HUMAN REMAINS

Any human remains that are discovered must initially be left in-situ, covered and protected. If removal is necessary, this must comply with the relevant legislation, any Home Office and local environmental health regulations and English Heritage’s and The Church of England’s *Guidance for best practice for treatment of human remains excavated from Christian burial grounds in England* (2005) where relevant. Ethical guidance for burial grounds of non-Christian faiths should be sought from the appropriate religious authorities.

TREASURE ACT

The terms of the Treasure Act 1996 must be followed with regard to any finds that might fall within its purview. Any finds must be removed to a safe place and reported to the local coroner as required by the procedures as laid down in the DoNH 1996 Code of Practice. Where removal cannot be effected on the same working day as the discovery, suitable security measures must be taken to protect the finds from theft.

COMMENCEMENT OF WORK

NOTIFICATION

The project will be monitored as necessary and practicable by the LCAS, in its role as “curator” of the county’s archaeology. The LCAS should receive as much notice as possible and certainly one week of the intention to start fieldwork. This notification is to be supplied in writing, and copied to the relevant Museum (see below). A copy of the contractor’s risk assessment should accompany notification of intention to commence work.

ACCESS/MONITORING METHODOLOGY

The representative of the LCAS will be afforded access to the site at any reasonable time. It is usual practice that the visit is arranged in advance, but this is not always feasible. The LCAS’s representative will be provided with a site tour and an overview of the site by the senior archaeologist present and should be afforded the opportunity to view all trenches; any finds made that are still on site, and any records not in immediate use. It is anticipated that the records of an exemplar context that has previously been fully recorded will be examined. Any observed deficiencies during the site visit are to be made good to the satisfaction of the LCAS’s representative, by the next agreed site meeting. Access is also to be afforded at any reasonable time to English Heritage’s Regional Archaeological Scientific Advisor.

EXCAVATION ARCHIVES DEPOSITION

Before commencing any fieldwork, the archaeological contractor must contact the relevant museum archaeological curator to determine the museum’s requirements for the deposition

of an excavation archive. In this case the contact is Edmund Southworth, Curator, Museum of Lancashire, Stanley Street, Preston, PR1 4YP; telephone 01772 534075, fax 01772 534079. Agreement for deposition should be confirmed in writing by the archaeological contractor; this correspondence is to be copied to the LCAS.

It is the policy of The Museum of Lancashire to accept complete excavation archives, including primary site records and research archives and finds, from all excavations carried out in Lancashire.

It is the responsibility of the archaeological contractor to endeavour to obtain consent of the landowner, in writing, to the deposition of finds in The Museum of Lancashire. It is also the responsibility of the archaeological contractor to meet the requirements of The Museum of Lancashire with regard to the preparation of excavation archives for deposition.

The museums officer named above should be notified in writing of the commencement of fieldwork at the same time as the LCAS.

UNEXPECTEDLY SIGNIFICANT OR COMPLEX DISCOVERIES

Should there be unexpectedly significant or complex discoveries made that warrant, in the professional judgement of the archaeologist on site, more detailed recording than is appropriate within the terms of this specification or more time that is allowed within the project design, then the archaeological contractor should urgently contact the LCAS with the relevant information to enable them to resolve the matter with the developer.

POST-EXCAVATION WORK

AFTER COMPLETION OF FIELDWORK

On completion of the fieldwork, any samples taken shall be processed and any finds shall be cleaned, identified, assessed, dated (if possible), marked (if appropriate) and properly packed and stored in accordance with the requirements of national guidelines. A fully indexed field archive shall be compiled consisting of all primary written documents, plans, sections, photographic negatives and a complete set of labelled photographic prints. An index to the field archive is to be deposited with the LCAS (preferably as an appendix in the report). The original archive is to accompany the deposition of any finds, providing the landowner agrees to the deposition of finds in a publicly accessible archive (see above). In the absence of this agreement the field archive (less finds) is to be deposited with the LCAS.

POST-EXCAVATION ASSESSMENT

The project design and costings should make it clear that a formal post-excavation assessment and costing of the final stage of the project, in line with the methodology set out in MAP2 (English Heritage 1991), will be undertaken and an appropriate report compiled. A copy of this report should be passed to LCAS for approval as well as to the developer.

FINAL REPORT

A discussion of the needs of the final report are included in General Considerations below, but it would be sensible to consider the needs of both the excavation work and the watching brief below when considering the final report.

A single report covering both exercises would be acceptable, but equally two individual reports with appropriate cross-referencing would be acceptable and may prove clearer.

PART 2 – WATCHING BRIEF

A variety of archaeological sites have been identified in the vicinity of the proposed link road (LJAU 1996; EAS 2000; Geoquest 2000) but with the exception noted above it is not considered that formal archaeological recording is required in advance of construction. These range from a medieval pele tower whose site has not been firmly located, to a series of 19th century coal mines. It is considered appropriate however for a formal archaeological watching brief to be undertaken during the ground disturbance phase of the development in order that any other remains encountered can be recorded.

REQUIREMENTS

An archaeologist should be present on site during the excavation of any area below a depth of 0.15m. (approximately six inches) in the area of development, whether this be for foundation trenches, service trenches or landscaping. The archaeologist should view the area as it is being dug and any trench sections after excavation has been completed. Where archaeology is judged to be present, the excavated area should be rapidly cleaned and the need for further work assessed. Where appropriate, any features and finds should then be quickly hand excavated, sampled and recorded, within the confines of the excavated trench.

Excavated soil should be searched as practicable for finds. The presence and nature of 20th century material should be noted (quantified and summarily described) but finds of this date need not be retained for processing. Finds judged to be 19th century in date or earlier should be retained.

The actual areas of ground disturbance, and any features of possible archaeological concern noted within these areas, should be accurately located on a site plan and recorded by photographs, scale drawings (including height above O.D.) and written description sufficient to permit the preparation of a report on the site.

The intention of the archaeological watching brief is not to unduly delay the work of other contractors on site. This work should not, therefore prejudice the progress of the main or subsidiary contractor's work, except by prior agreement and on-site co-operation.

The archaeologist on site will naturally operate with due regard for Health and Safety regulations. In this case, where archaeological work is carried out at the same time as the work of other contractors, regard should also be taken of any reasonable additional constraints that these contractors may impose. This work may require the preparation of a Risk Assessment of the site, in accordance with the Health and Safety at Work Regulations. The LCAS and its officers cannot be held responsible for any accidents that may occur to outside contractors engaged to undertake this survey while attempting to conform to this specification.

UNEXPECTEDLY SIGNIFICANT OR COMPLEX DISCOVERIES

Should there be, in the professional judgement of the archaeologist on site, unexpectedly significant or complex discoveries made that warrant more detailed recording than possible within the terms of this specification, then the archaeological contractor is to urgently contact the LCAS with the relevant information to enable the matter to be resolved with the developer.

Any human remains that are discovered must initially be left in-situ, covered and protected. If removal is necessary, this must comply with the relevant Home Office (include ref to recent EH guidelines) and any local environmental health regulations.

The terms of the Treasure Act, 1996 must be followed with regard to any finds, which might fall within its purview. Any such finds must be removed to a safe place and reported to the local coroner as required by the procedures laid down in the "Code of Practice". Where removal cannot be effected on the same working day as the discovery, suitable security measures must be taken to protect the finds from theft.

USE OF METAL DETECTORS ON SITE

Spoil heaps are to be scanned for non-ferrous metal artefacts using a metal detector capable of making this discrimination, operated by an experienced metal detector user (if necessary, operating under the supervision of the contracting archaeologist). Modern artefacts are to be noted but not retained (19th-century material and earlier should be retained.)

If a non-professional archaeologist is to be used to carry out the metal detecting, a formal agreement of their position as a sub-contractor working under direction must be agreed in advance of their use on site. This formal agreement will apply whether they are paid or not.

To avoid financial claims under the Treasure Act a suggested wording for this formal agreement with the metal detectorist is: "In the process of working on the archaeological investigation at [*location of site*] between the dates of [*insert dates*], [*name of person contributing to project*] is working under direction or permission of [*name of archaeological*

organisation] and hereby waives all rights to rewards for objects discovered that could otherwise be payable under the Treasure Act 1996."

FINAL REPORT

A discussion of the needs of the final report are included in General Considerations below, but it would be sensible to consider the needs of both the excavation work (above) and the watching brief when considering the final report.

A single report covering both exercises would be acceptable, but equally two individual reports with appropriate cross-referencing would be acceptable and may prove clearer.

GENERAL CONSIDERATIONS

FINAL REPORT FORMAT AND CONTENT

When the post-excavation assessment report has been approved by LCAS and the associated work completed, a final report should be produced, which should include background information on the need for the project, a description of the methodology employed, and a full description and interpretation of results produced.

It is not envisaged that the report is likely to be published, but it should be produced with sufficient care and attention to detail to be of academic use to future researchers. Location plans should be produced at a scale which enables easy site identification and which depicts the full extent of the site investigated (a scale of 1:50,000 is not regarded as appropriate unless accompanied by a more detailed plan or plans).

Site plans should be at an appropriate scale showing trench layout (as dug), features located and, where possible, predicted archaeological deposits. Upon completion of each trench all sections containing archaeological features will be drawn. Section drawings (at a minimum scale of 1:20) must include heights O.D. Plans (at a minimum scale of 1:50) must include O.D. spot heights for all principal strata and any features.

Where no archaeological deposits are encountered at least one long section of each trench will be drawn. Artefact analysis is to include the production of a descriptive catalogue with finds critical for dating and interpretation illustrated. Details of the style and format of the report are to be determined by the archaeological contractor, but should include a full bibliography, a quantified index to the site archive, and as an appendix, a copy of this specification.

SUMMARY FOR PUBLICATION

A brief summary report of fieldwork, to appear in the Council for British Archaeology North West *Archaeology North West* should be produced, even when the fieldwork encountered no archaeological deposits. This should be sent to the editor of *Archaeology North West* in accordance with the standard format for summary reporting, and in time for it to appear within a calendar year of the completion of fieldwork.

PUBLICITY

If the project is to be publicised in any way (including media releases, publications etc.), then it is expected that the LCAS will be given the opportunity to consider whether it wishes its collaborative role to be acknowledged, and if so, the form of words used will be at the LCAS' discretion.

REPORT DEPOSITION

An electronic copy of the report in Adobe Acrobat PDF format on CD-ROM is to be supplied to the Sites and Monuments Record held by the LCAS within a period of six months following completion of fieldwork unless specialist reports are awaited. In the latter case a revised date should be agreed with the LCAS. The report will be supplied on the understanding that it will

become a public document after an appropriate period of time (generally not exceeding six months, unless otherwise agreed). A copy shall also be supplied to English Heritage's Regional Science Adviser at the same time (Sue Stallibrass, University of Liverpool, School of Archaeology, Classics and Oriental Studies (SACOS), William Hartley Building, Brownlow Street, Liverpool, L69 3GS, tel: 0151 794 5046, e-mail: Sue.Stallibrass@liv.ac.uk)

AUTHORISED ALTERATIONS TO SPECIFICATION BY CONTRACTOR

It should be noted that this specification is based upon records available in the County Sites and Monuments Record and on an examination of the reports already compiled. Archaeological contractors submitting tenders should carry out an inspection of the site prior to submission. If, on first visiting the site or at any time during the course of the recording exercise, it appears in the archaeologist's professional judgement that

- i) a part or the whole of the site is not amenable to recording as detailed above, and/or
- ii) an alternative approach may be more appropriate or likely to produce more informative results, and/or
- iii) any features that should be recorded, as having a bearing on the interpretation of the structure, have been omitted from the specification,

then it is expected that the archaeologist will contact the LCAS as a matter of urgency. If contractors have not yet been appointed, any variations that the LCAS considers to be justifiable on archaeological grounds will be incorporated into a revised specification, which will then be re-issued to the developer for redistribution to the tendering contractors. If an appointment has already been made and site work is ongoing, the LCAS will resolve the matter in liaison with the developer and the Local Planning Authority.

UNAUTHORISED ALTERATIONS TO SPECIFICATION BY CONTRACTOR

It is the archaeological contractor's responsibility to ensure that they have obtained the LCAS's consent in writing to any variation of the specification prior to the commencement of on-site work or (where applicable) prior to the finalisation of the tender. Unauthorised variations may have negative results and are therefore made solely at the risk of the contractor.

VALID PERIOD OF SPECIFICATION

This specification is valid for a period of one year from date of issue. After that time it may need to be revised to take into account new discoveries, changes in policy or the introduction of new working practices or techniques.

References

- Earthworks Archaeological Services 2000 *Proposed Construction of the Eaves Green Link Road, Chorley – A Programme of Archaeological Evaluation*
- English Heritage 1991 *The Management of Archaeological Projects*
- English Heritage Centre for Archaeology Guidelines 2000/2001 *Environmental Archaeology: A guide to the theory and practice of methods, from sampling and recovery to post-excavation*
- English Heritage, The Church of England 2005 *Guidance for best practice for treatment of human remains excavated from Christian burial grounds in England*
- Farrer, J, Brownbill, W, eds 1992 (reprint of 1911 edition) *The Victoria County History of the County of Lancaster Volume 6*
- Geoquest Associates 2000 *Geophysical Survey on the Route of the Eaves Green Link Road, Chorley*
- Lancaster University Archaeology Unit 1996 *Eaves Green Link Road, Chorley – Archaeological Assessment*
- Department of the Environment 1991 *Planning Policy Guidance Note 16 – Archaeology and Planning*

Department of National Heritage 1996 *The Treasure Act 1996 Code of Practice*

Institute of Field Archaeologists 1994 *Standard and Guidance for archaeological watching briefs*

Institute of Field Archaeologists 1995 *Standard and Guidance for archaeological excavation*

Institute of Field Archaeologists 2002a, *Code of Conduct*

Institute of Field Archaeologists 2002b, *Code of approved practice for the regulation of contractual arrangements in field archaeology*

APPENDIX 2: PROJECT DESIGN

7.1 UPDATED RESEARCH AIMS AND OBJECTIVES

7.1.1 This section follows the guidance of English Heritage (nd, 2-3) regarding the formulation of updated project aims. This guidance recommends that it is helpful to treat *aims* as major themes or goals to which specific *objectives* contribute, and to consider these aims and objectives as questions.

7.1.2 The majority of the original aims of the fieldwork are still valid, but these have now been updated, with new aims and objectives derived from the statement of potential set out in *Section 6* above. At the present stage of assessment, these necessarily emphasise the presence, absence and sufficiency of data to support further analysis of components of the archaeological record. This analysis would have two primary objectives in view: to add to the archaeological knowledge in the areas prioritised by the original fieldwork aims; and to understand how people lived in Lancashire in the past.

7.1.3 The updated research aims will consider the following:

- *chronological and morphological development of the site;*
- *daily life on the site in the post-medieval period, including diet, pastimes, costume and personal adornment;*
- *processes of change, particularly in terms of water-powered industry, and changes brought about by the advent of new industry into an area;*
- *the economy of the industrialised later post-medieval period in this part of Chorley, including the development of industries, and especially the use and management of the millrace;*
- *the character of occupation during industrialisation, particularly the pollution of watercourses.*

7.1.4 **Updated Research Aim 1:** What can be learnt of the development of the site in the later post-medieval and modern periods, from the late eighteenth to early twentieth centuries?

- *Objective 1:* What are the main periods of activity on the site as shown by stratigraphic and artefactual record?
- *Objective 2:* Is it possible to refine the phasing of the site further through the identification and dating of stratigraphic sub-phases, and to attribute further contexts to these periods?
- *Objective 3:* Which structures of timber and stone, and other features, can be assigned to these refined phases?
- *Objective 4:* What is the dating evidence for each of the refined periods and sub-phases of activity on the site?

7.1.5 **Updated Research Aim 2:** What can we learn about daily life in the post-medieval and later periods?

- *Objective 5:* What personal possessions have been found and can they tell us anything about the everyday life of the local community?

7.1.6 **Updated Research Aim 3:** What can the Eaves Green site tell us about the transition from post-medieval to modern activity on the outskirts of Chorley?

- *Objective 6:* Is there any evidence for continuity (or discontinuity) in the layout of the site or in the character and range of features from the late post-medieval period onwards?
- *Objective 7:* Do the artefactual and ecofactual assemblages recovered from the site shed light on the nature of the use of the site at this time?

7.1.8 **Updated Research Aim 5:** What can we learn about the character of occupation and exploitation of Eaves Green during the industrialisation of the later post-medieval period?

- *Objective 8:* Is there any evidence for industrial activity on or near the site?
- *Objective 9:* Do the Eaves Green datasets contain any evidence of industrial pollution?
- *Objective 10:* What evidence is there for exploitation of local resources?

7.2 PRESENTATION OF RESULTS

7.2.1 In accordance with the guidelines provided in *MAP2* (English Heritage 1991a), it is proposed that the results of the project should be presented as follows:

- *Report publication text:* following the completion of the full analysis and interpretation of all the stratigraphic and artefactual evidence, a text will be prepared for deposition in the County HER and Record Office. This will be in the format described in *Section 9*, and will incorporate as necessary any information from comparable excavations. A synthesised version of the text could also be prepared for inclusion in a journal if an appropriate outlet was available. There is, however, no county archaeological journal in Lancashire at the present time, and although a report on these excavations are unlikely to be accepted by the *Industrial Archaeology Review*, it is possible that the Council for British Archaeology (CBA) North West group might publish some details of the work in their newsletter.
- *Project archive:* the completion of the project will result in a single integrated project archive with the results of the excavation. The archive will be deposited with the County Record Office, Preston.

7.3 PROGRAMME STRUCTURE

7.3.1 The post-excavation programme will be divided into the following stages:

- project set-up;
- analysis;
- illustration;
- synthesis and production of report;
- QA;
- Archive deposition.