

LAND AT WHITE OX FARM, PENRITH, CUMBRIA

Archaeological Strip and Record



Client: Atkinson Building
Contractors Ltd

Planning Application Ref.:
16/1029

NGR: 350892 531511 (centre)

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October 2020



The Site	
Site Name	Land at White Ox Farm, Penrith
County	Cumbria
NGR	350892 531511 (centre)

Client	
Client Name	Atkinson Building Contractors Ltd

Planning	
Pre-planning?	No
Planning Application No.	16/1029
Summary of plans	Residential development
Condition number	-
Local Planning Authority	Eden District Council
Planning Archaeologist	Jeremy Parsons, Cumbria County Council

Archaeological work	
Desk-based assessment carried out as previous phase of work?	Yes
Geophysical survey carried out as previous phase of work?	Yes
Archaeological evaluation carried out as previous phase of work?	Yes
Approximate dimensions of areas of strip and record proposed	Two areas: one approximately 5m by 10m, targeting continuation of ditch revealed in evaluation Trenches 4-6, one approximately 10m by 20m targeting a group of post holes/pits revealed in Evaluation Trench 2

Archiving	
Relevant Record Office(s)/Archive Centre(s)	Carlisle
Relevant HER	Cumbria
Relevant Museum	Penrith and Eden Museum, Penrith

Staffing	
Site work	Dan Elsworth Tom Mace
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Date(s) site work carried out	6 th -14 th October 2020

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Contents

Illustrations	2
List of Figures	2
List of Plates	2
Summary.....	3
Acknowledgements.....	3
1. Introduction	4
1.1 Circumstances of the Project.....	4
2. Methodology	6
2.1 Archaeological Strip and Record	6
2.2 Finds	6
2.3 Environmental Samples	6
2.4 Archive	7
3. Site History.....	8
3.1 Introduction	8
3.2 Map Regression.....	8
3.3 Site History.....	10
3.4 Conclusion	13
4. Fieldwork Results.....	14
4.1 Area A	14
4.2 Area B	16
4.3 Finds and Samples	27
4.4 Environmental Samples	27
5. Discussion.....	28
5.1 Results	28
5.2 Conclusion	29
6. Bibliography	30
6.1 Primary and Cartographic Sources.....	30
6.2 Secondary Sources.....	30
Appendix 1: Project Design	33
Appendix 2: Summary Context List	39
Appendix 3: Environmental Sample Data	40
Appendix 4: Flot Assessment Report	41

Illustrations

List of Figures

Figure 1: Site location	5
Figure 2: Site plan	21
Figure 3: Plan of Area A	22
Figure 4: Plan of pit 1002.....	22
Figure 5: Cross-section A-A1.....	22
Figure 6: Plan of Area B	23
Figure 7: Plan of 2009	23
Figure 8: Plan of Slot 1 through 403.....	24
Figure 9: Plan of Slot 2 through 403.....	24
Figure 10: Cross-sections B-B1, C-C1 and D-D1.....	25

List of Plates

Plate 1: Extract from the tithe map of 1849 showing the location of the two areas.....	8
Plate 2: Extract from the 1:2,500 Ordnance Survey map of c1864 showing the location of the two areas	8
Plate 3: Extract from an early 19 th century tracing of the road from the White Ox northwards (CAC(C) ST/3/63 early 19 th century) showing the location of the two areas	9
Plate 4: Extract from the 1:2,500 Ordnance Survey map of 1900 showing the location of the two areas	9
Plate 5: Extract from the 1:2,500 Ordnance Survey map of 1925 showing the location of the two areas	9
Plate 6: Satellite imagery, 2019 showing the location of the two areas	10
Plate 7: Pit 1002 before excavation, viewed from the west.....	14
Plate 8: Pit 1002 half-sectioned, viewed from the south	15
Plate 9: Animal burrows revealed in Area A before investigation, viewed from the west.....	15
Plate 10: Ditch 403 exposed in Area B, viewed from the south	16
Plate 11: Slot 1 cutting through the terminus of ditch 403, viewed from the north	17
Plate 12: Slot 2 cutting through ditch 403, viewed from the south	17
Plate 13: Section through pit 2004, viewed from the south	18
Plate 14: Section through ditch 403 in Slot 2, viewed from the south	18
Plate 15: Ditch 2009 before excavation, viewed from the west.....	19
Plate 16: Slot 3 showing section through ditch 2009, viewed from the west.....	19
Plate 17: The location of the features revealed in the evaluation and strip and record combined with the wider cropmarks	28

Summary

Following the submission of a planning application for the construction of a residential development on land at White Ox Farm, Penrith, Cumbria, and the completion of an archaeological desk-based assessment, geophysical survey, and evaluation, Greenlane Archaeology was commissioned to carry out an archaeological strip and record. This comprised the excavation of two areas targeting features of archaeological interest revealed during the previous evaluation in order to better understand their extent and, if possible, determine their date.

Documentary evidence demonstrates that the wider area contains archaeological remains from at least the Mesolithic period onwards, but the area around the site is dominated by those of later prehistoric and Roman date and the core of Penrith itself, which is primarily medieval.

The strip and record revealed that in Area A, which was focussed on a group of pits/post holes found during the evaluation, there was limited evidence for further activity. A single additional pit was discovered, some distance from the rest, and an area of animal burrows. The original features were not found to be part of a coherent structure and the presence of animal burrows might indicate that some of the original pits derived from similar activity. Area B was intended to trace the continuation of a large ditch identified in cropmarks and investigated in three of the previous evaluation trenches, and revealed that it did extend to the north although it turned slightly to the west and stopped at a terminus. Another section of ditch was also revealed, orientated east/west, with the gap between sections assumed to be an entrance of some form. In addition, a large rectangular pit was revealed near the terminus of the original ditch section.

While the strip and record confirmed the continuation of the large ditch revealed in the evaluation, it also identified an apparent entrance of some form. Conversely it also revealed that the pits/post holes in Area A were unlikely to be of any archaeological significance. While no additional dating evidence was obtained it still seems likely that the ditch represents a structure of late prehistoric date, perhaps Iron Age. It would, however, be important to obtain scientific dating through radiocarbon assay for the ditch and perhaps also the definite post hole revealed during the evaluation. This would be particularly interesting in terms of better understanding the construction and later filling of the ditch, the latter of which appears to have been relatively rapid. The results of the various phases of fieldwork at the site, once better understood through scientific dating, would also benefit from being published in an appropriate location.

Acknowledgements

Greenlane Archaeology would like to thank Atkinson Building Contractors Ltd for commissioning the project and in particular Jonathan Green for his assistance during the project. Thanks are also due to Luscombe Plant Hire for providing the excavator and Peter Kellett for his excellent plant operation. Additional thanks are due to Lynne Gardiner at Wardell Armstrong Archaeology for managing the assessment of the flots from the environmental samples.

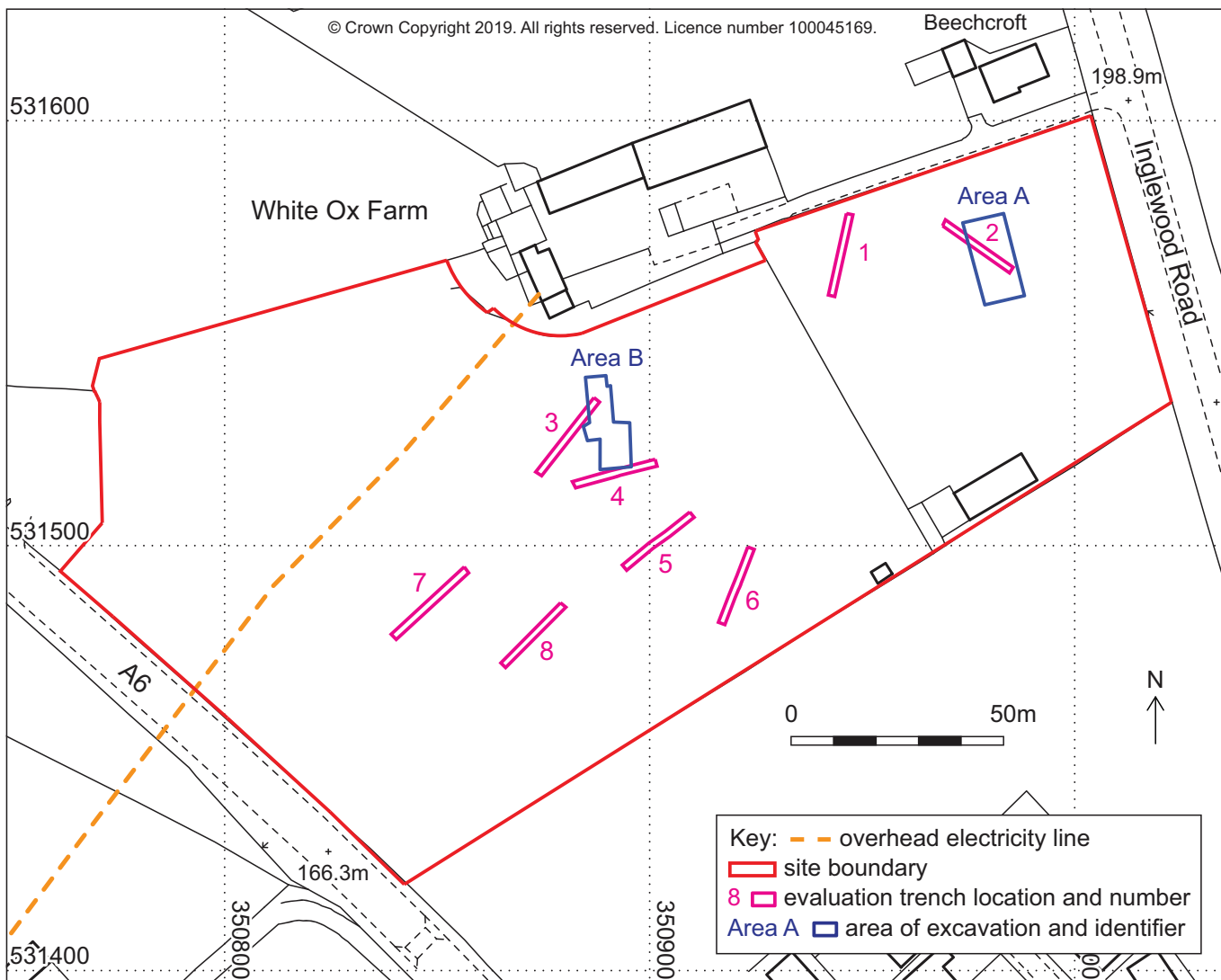
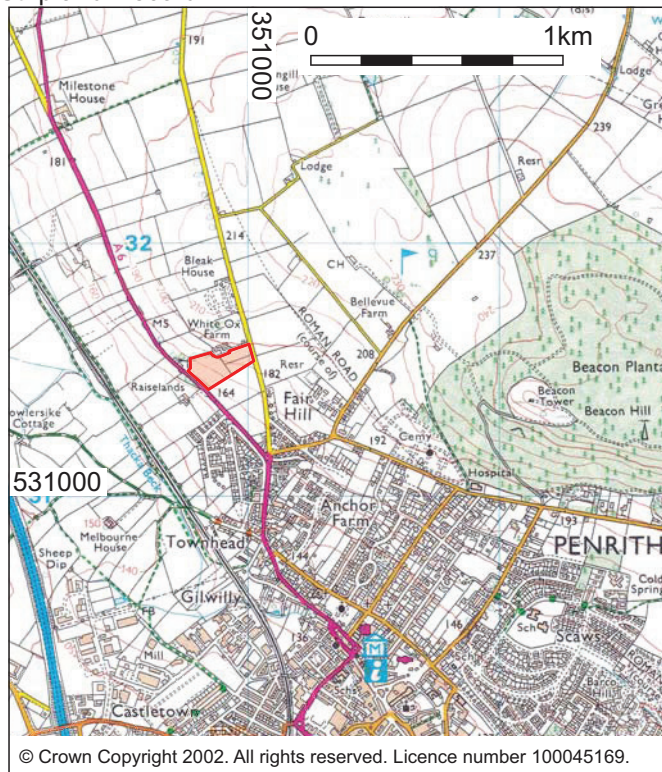
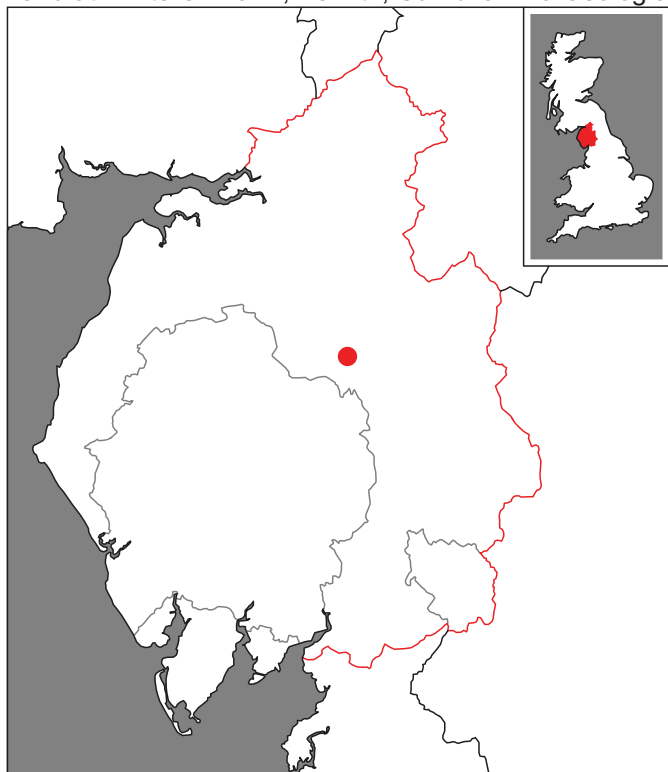
1. Introduction

1.1 Circumstances of the Project

1.1.1 The circumstances of the project are set out in the tables on the inside cover of this report.

1.2.1 The c2.4 hectare site is to the north side of Penrith and comprises two fields to the south of White Ox Farm, situated between the A6 to the west and Inglewood Road to the east (Figure 1). The Penrith to Carlisle branch of the West Coast Main Line railway runs north-west/south-east approximately 300m to the west (Ordnance Survey 2002). The solid geology comprises red Permian sandstone of the Penrith group (Moseley 1978, plate 1), with overlying glacial deposits concealing much of the bedrock (Countryside Commission 1998, 40).

1.2.2 The landscape is situated within the Eden Valley, which is primarily dominated by '*improved pasture bounded by mature hedgerows and dry stone walls*' with areas of arable cultivation (Countryside Commission 1998, 41).



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Figure 1: Site location

2. Methodology

2.1 Archaeological Strip and Record

2.1.1 The strip and record was carried out according to the standards and guidance of the Chartered Institute for Archaeologists (CIfA 2020) and comprised the excavation of two areas, labelled A to B from east to west (Plate 2). Area A was 10m wide by 20m long (north/south) and focussed on a group of pits/post holes revealed in Trench 2 during the previous evaluation (Greenlane Archaeology 2020, 17-20). Area B was an irregular shape but approximately 8m wide by 20m long (north/south) totalling c150m² and intended to plot the continuation of the large ditch revealed in Trenches 4-6 during the previous evaluation (Greenlane Archaeology 2020, 21-26) and determine whether this ended or continued to the north out of the proposed development area. Excavation was discontinued once the natural geology was reached, which was typically around 0.3m below the ground surface at a height of between approximately 186m and 195m above sea level.

2.1.2 The topsoil was removed using a mechanical excavator with a toothless bucket and underlying deposits were cleaned and further investigated by hand. The following recording techniques were used during the strip and record:

- **Written record:** descriptive records of all deposits and features (see *Appendix 2*) were made using Greenlane Archaeology *pro forma* record sheets, specifically trench record sheets;
- **Photographs:** photographs in colour digital format (both 12 meg JPEG and RAW file format) were taken of the site during the strip and record, including general views of the site, the surrounding landscape, and working shots. A selection of the colour digital photographs is included in this report and the remainder are included in the archive. A written record of all of the photographs was also made using Greenlane Archaeology *pro forma* record sheets (Greenlane Archaeology 2007);
- **Instrument survey:** the area locations were recorded using a Leica TS06 Plus total station which captures the survey data as a digital .dwg file directly in AutoCAD on a Microsoft Surface Pro computer. This enabled the location of each area to be positioned relative to the local topography and allowed levels above Ordnance Datum to be provided through reference to a nearby spot height;
- **Drawings:** plans and sections of features were hand-drawn at a scale of 1:10 or 1:20 as appropriate.

2.2 Finds

2.2.1 No finds were recovered by hand during the project.

2.3 Environmental Samples

2.3.1 **Strategy:** a total of 148 litres of samples were taken from eight different contexts from five different features. From each of these a single bucket of up to 10 litres (depending on the total size of the sample) was processed. A summary of all of the samples taken and the material recovered from them is presented in *Appendix 4* and *Appendix 5*.

2.3.2 **Processing:** the samples were wet sieved by hand; the light fragments were floated off and collected in 250µm and 500µm sieves with the coarse component (retent) collected on a 1mm mesh. The flots and retent were then dried in a drying oven. The flots were sent for specialist assessment (see *Appendix 5*). The retent was also examined by eye and all ecofacts and artefacts extracted.

2.3.3 The flots were scanned using a stereo microscope (up to x45 magnification). Any non-palaeobotanical finds would be noted on the flots *pro forma* (Table 1). All suitable sized fragments of charcoal (>2mm of transverse section) were selected for identification. The charcoal was identified to species as far as possible, using Hather (2000), Schweingruber (1982) and the author's reference

collection. Nomenclature for plant taxa followed Stace (2010). The environmental assemblage has been assessed for its local, regional and national potential and for its potential to contribute to the relevant research frameworks.

2.4 Archive

2.4.1 The archive of the project will be deposited with the relevant Record Office or Archive Centre, as detailed on the cover sheet of this report, together with a copy of the report. The archive has been compiled according to the standards and guidelines of the ClfA guidelines (ClfA 2014). In addition, details will be submitted to the *Online Access to the Index of Archaeological Investigations* (OASIS) scheme. This is an internet-based project intended to improve the flow of information between contractors, local authority heritage managers and the general public. A copy of the report will be provided to the client and a digital copy of the report will be provided for the relevant Historic Environment Record, as detailed on the cover sheet of this report.

3. Site History

3.1 Introduction

3.1.1 The site history is intended to place the results of the evaluation in their local historical and archaeological context and primarily involved the examination of early maps and consultation of published histories of the area. The site history section is taken from the previous desk-based assessment carried out by Greenlane Archaeology (2019).

3.2 Map Regression

3.2.1 **Tithe map for Penrith (CAC(C) DRC/8/150 1849)**: this is the earliest detailed map of the area and shows the site comprises parts of two fields labelled 615 and 616 (Plate 1). The accompanying apportionment provides details of the owners and occupiers as well as the names of the fields and descriptions of their state of agriculture (CAC(C) DRC/8/150 1843; see Table 1). The corners of the main field (615) are apparently shown as containing small enclosures.

Plot No.	Owner	Occupier	Name	Description
615	Joseph Salkeld Johnson and Anthony Harrison	William Bird	Hare Gill	Arable
616	Joseph Salkeld Johnson and Anthony Harrison	William Bird	Planting	Arable

Table 1: Details of the plots within the site as given in the tithe apportionment (CAC(C) DRC/8/150 1843)

3.2.2 **Ordnance Survey c1864**: this map shows that the strip of land along the north edge comprised a wooded area and the west corner of the large field was a quarry (Plate 2).

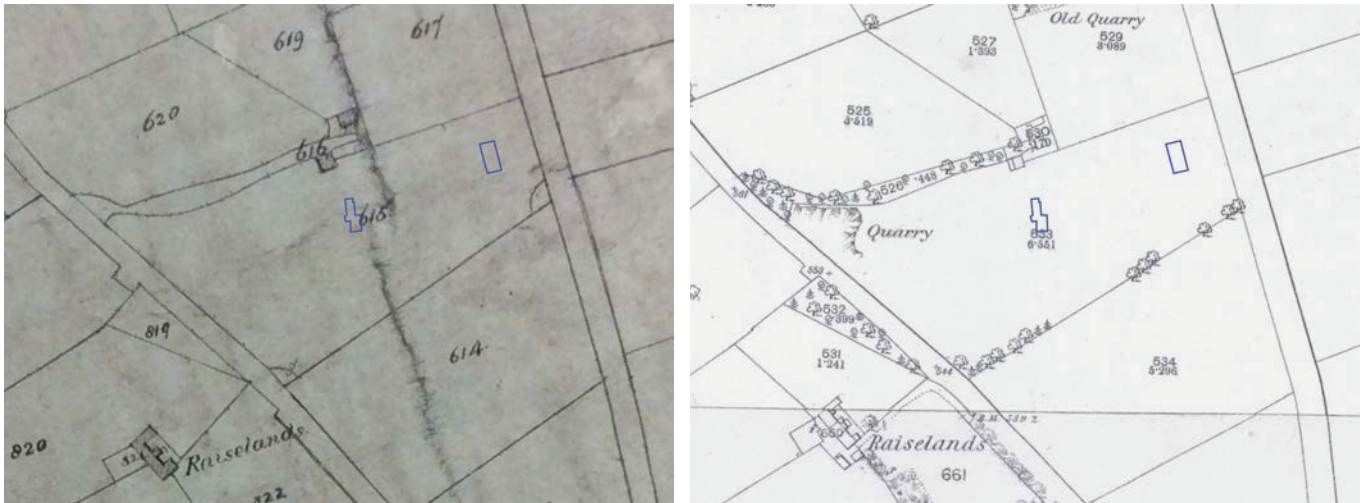


Plate 1: Extract from the tithe map of 1849 showing the location of the two areas

Plate 2: Extract from the 1:2,500 Ordnance Survey map of c1864 showing the location of the two areas

3.2.3 **Tracing of the Road from the White Ox Northwards**: this map is a tracing of the 1864 Ordnance Survey map and does not show any additional detail about the site (CAC(C) ST/3/63 early 19th century; Plate 3; cf. Plate 2).

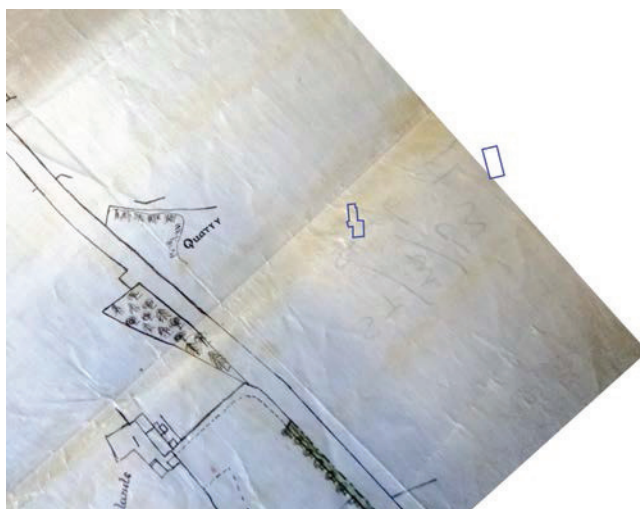


Plate 3: Extract from an early 19th century tracing of the road from the White Ox northwards (CAC(C) ST/3/63 early 19th century) showing the location of the two areas

3.2.4 **Ordnance Survey 1900:** the Ordnance Survey map of 1900 (Plate 4) shows that there have been some minor changes to the field boundaries around the 'old quarry' to the west and an east/west track is now marked along the north edge of the site to the farm buildings on the north side of the area.



Plate 4: Extract from the 1:2,500 Ordnance Survey map of 1900 showing the location of the two areas

Plate 5: Extract from the 1:2,500 Ordnance Survey map of 1925 showing the location of the two areas

3.2.5 **Ordnance Survey 1925:** the site remains undeveloped. The only obvious differences in the wider area are that the old quarry is no longer marked as such and the farm to the north of the site has been extensively added to (Plate 5; cf. Plate 4).

3.2.6 **Satellite imagery, 2019:** various possible cropmarks are visible in neighbouring fields from satellite imagery (Google 2019; **Error! Reference source not found.**) and earlier oblique aerial photographs of the site, some of which potentially extend within the site boundary (as shown in Plate 6 and **Error! Reference source not found.**). These have not been mapped in any detail before and apparently cover a wide area, but are probably part of what has been described as an enclosure (**Site 9**).



Plate 6: Satellite imagery, 2019 showing the location of the two areas

3.3 Site History

3.3.1. **Prehistoric Period (c11,000 BC – 1st century AD):** while there is limited evidence for human activity in the county in the period immediately following the last Ice Age, this is typically found in the southernmost part on the north side of Morecambe Bay. Excavations of a small number of cave sites have found the remains of animal species common at the time but now extinct in this country and artefacts of Late Upper Palaeolithic type (Young 2002). Human remains from one of these have also recently been dated to approximately 7,100 BC (Smith *et al* 2013). No remains of this date are known from the immediate area of the site, although a pair of barbed spear heads made from antler were found at Crosby-on-Eden (Hodgson 1895), which, although undated, may belong to the end of the Palaeolithic or early Mesolithic. The county was clearly more densely inhabited during the following period, the Mesolithic (c8,000 – 4,000 BC), as large numbers of artefacts of this date have been discovered during field-walking and eroding from sand dunes along the coast, but these are typically concentrated in the west coast area and on the uplands around the Eden Valley (Cherry and Cherry 2002). More recently a particularly large assemblage has been recovered during excavations, directly on the edge of the River Eden, outside Carlisle (Clark 2010) and field-walking has found additional scatters of some significance also in the Eden valley near Penrith (Clarke *et al* 2008), perhaps demonstrating the importance of the Eden and its tributaries. Coastal areas and river valleys are notably places where such material is frequently found in the wider region (Middleton *et al* 1995, 202; Hodgkinson *et al* 2000, 151-152; Hodgson and Brennand 2006, 26).

3.3.2 In the following period, the Neolithic (c4,000 – 2,500 BC), large scale monuments such as burial mounds and stone circles begin to appear in the region and one of the most recognisable tool types of this period, the polished stone axe, is found in large numbers across the county, having been manufactured at Langdale in the central Lake District (Hodgson and Brennand 2006, 45). During the Bronze Age (c2,500 – 600 BC) monuments, particularly those thought to be ceremonial in nature, become more common still. Cist burials of possible Bronze Age date are believed to have been discovered c500m east of the site at the location marked 'cistvaens' on the 1864 edition of the Ordnance

Survey map (Ordnance Survey 1864), but there is no known written record of their discovery (WAA 2016, 11).

3.3.3 Settlement sites thought to belong to this period are often identified as such from cropmarks, revealed in aerial photographs; however, this interpretation must remain speculative as these sites are generally undated and little understood. Two areas of cropmarks are recorded in the vicinity of the site, elements of which are within the proposed development area, but these are all of unknown date.

3.3.4 **Romano-British to Early Medieval Period (1st century AD – 11th century AD):** The Roman military presence in the North West is apparent from the existence of forts, which in many cases led to the formation of associated civilian settlements (*vici*), and the supply network of roads and coastal trade, as well as the incidence of Roman artefacts such as coins (Philpott 2006, 71). The Lune and Eden valleys provided a route of access to Carlisle for the Roman advance (*ibid.*, 63) and the route northwards is still apparent along the modern A6 between Carlisle and Penrith (Shotter 2004, 31). The route of the Roman road from the fort at Brougham (*Brocavum*) to Old Penrith (*Voreda*) is suggested to pass c220m to the east of the site before merging with the route of Inglewood Road c1km to the north of the White Ox Farm site (CCC and EH c2002; Ordnance Survey 2002). The fort at Old Penrith is located at Plumpton, 7km to the north from the centre of Penrith. It was constructed c90-100 AD, abandoned sometime between 125 and 130 AD, and rebuilt around 163 AD (Richardson and Allan 2009, 117). The associated *vicus* was occupied from the 1st to 4th century AD (CCC and EH c2002, 5). A cemetery excavated to the east of the fort at Brougham, c2.5km to the south-east of Penrith, contained burials dated to the 2nd to 4th centuries AD (Cool 2004). A section the road at Fair Hill was excavated to the north-west side of Salkeld Road in 2016, and a small quantity of artefacts were retrieved from its surface, dated from the late 1st to 2nd century AD (WAA 2016; 2017; Jackson 2019; see *Section 4.6*). The road comprised a c8.4m wide embankment, which formed a raised cambered platform, with a 7m wide cobbled surface between larger kerbstones (WAA 2016; 2017; Jackson 2019). A series of intermittent cobbled surfaces was examined along its northern edge, which could represent fragments of a secondary minor road, resting or passing places, or other temporary roadside structures (WAA 2016; 2017; Jackson 2019). A large proportion of the identified Romano-British settlement sites in Cumbria are located to the south and east of Penrith (Philpott 2006, 75) and there are extensive field systems around the wider Eden Valley area that are likely to have been in use in this period and beyond, although they may have earlier origins (Higham and Jones 1975; 1991). The status and manner of use of the settlement sites is debatable, although the discovery of a Roman parade helmet on a supposedly 'native' site at Crosby Garrett suggests potentially close contacts with quite high-status members of the Roman military (Breeze and Bishop 2013; Breeze 2018). The size of the 'military market' to the local area must have been of great importance, but it is clear that many 'natives' initially continued to live in much the same way they had before the arrival of the Romans, perhaps supplying them with goods and maybe even benefiting from their arrival (Higham 1986, 216-225). It possible that one or both of the sites revealed as cropmarks might be of Roman period, indeed it has been suggested that one represents the remains of a Roman signalling station (Higham and Jones 1991, 50), although this remains, as yet, unproven.

3.3.5 It has been stated that 'the name Penrith may be of Britannic origin, comprising the elements *pen*, meaning head, chief or top, and *riton*, meaning ford or stream' (Armstrong *et al* 1950, 229-230; quoted in CCC and EH c2002, 4). The meaning of Penrith could therefore be 'chief ford'. Older historical sources give the meaning as 'red hill' (Nicholson and Burn 1777; quoted in CCC and EH c2002, 4).

3.3.6 Following the cessation of Roman administration in the early fifth century the region fragmented into smaller kingdoms and it is difficult to form a coherent picture of the nature of political control. Much of what is now Cumbria probably came under the control of Rheged, a kingdom that seems likely to have extended across the border between what became England and Scotland and whose central territory may have been focussed on the nearby Lynvennet valley (Clarkson 2010, 68-78; Breeze 2012). However, by the mid-seventh century the area seems to have been securely under Northumbrian rule (Kirkby 1962, 80-81). Firmly dated archaeological evidence for the immediate post-Roman period in the county is sparse due in part to poor site visibility, which often consists of traces of rural settlements which have been heavily truncated (Philpott 2006, 59). Furthermore, there is inevitably a great deal of uncertainty with dating settlement sites on stylistic grounds alone given the persistence of traditional

styles from the Roman to the early medieval period. A group of four hogback tombstones and weathered cross-shafts, known as the 'Giant's Grave', and another cross-shaft to the north-west, known as the 'Giant's Thumb', in the churchyard of St Andrew's Church, Penrith are thought to be of Norse origin, dating approximately to the end of the 10th century (Salter 1998, 84). Significantly, pieces of Anglian metalwork, including a hammered copper alloy Northumbrian Styca and a partial copper alloy strap-end, dated to the mid-9th century to 10th century, were found during excavations at Fair Hill (WAA 2017; Jackson 2019, 89-90). Indeed, a settled rural hinterland around the foci at Dacre and Penrith is suggested for the early medieval period (Heawood and Howard-Davis 2002, 168).

3.3.7 The arrival of Norse settlers between perhaps the late ninth and early 10th century had a considerable effect on the area, in particular on the local place-names (Edwards 1998, 7-8). Physical evidence for settlement is rare, although an increasing number of burials of Norse type from both rural and urban contexts are known (see Paterson *et al* 2014; McCarthy and Paterson 2015; McCarthy *et al* 2015) with a furnished Viking burial known at Hesket-in-the-Forest, north of Penrith perhaps the closest to the site (Edwards 1998, 10-12). Several complete and fragmentary 'Viking Age' (late ninth and early 10th century) silver brooches have also been found in the Penrith area, most notably on Flusco Pike, three miles to the west of Penrith (Edwards 1998, 33-36; Richardson 1996), and within Penrith itself it is clear that the churchyard was a focus of considerable activity from at least the Viking period and there is limited archaeological evidence from elsewhere in the town (Zant 2015). Place-name evidence indicates that there was a complicated mixture of people settled in the area that is now Cumbria, and within the local area containing examples primarily of Old English and Norse origin (Armstrong *et al* 1950). Politically the area remained very mixed though, with a considerable resurgence in the 'British' population during the 9th and 10th century due to the expansion of Strathclyde southward from its base in what is now south-west Scotland, although the exact area that they directly controlled is debated (see Elsworth 2018).

3.3.8 **Medieval Period (11th century AD – 16th century AD):** the medieval period in general in Cumbria was one of considerable initial growth, followed by serious decline in the 14th century as a result of the combined effects of Scottish raids and disease in both people and animals (Winchester 1987, 46-47). Outbreaks of plagues during the 14th century contributed to a drastic decline in the population at that time (CCC and EH c2002, 8).

3.3.9 The town of Penrith was believed to be in Scottish hands at the time of the Norman Conquest and is not referred to in the Domesday records (CCC and EH c2002, 7). The earliest documentary evidence is from the 12th century when 'Bishops Row' was granted to the diocese of Carlisle at the creation of the see in 1133 (*ibid*). This grant suggests that there was a block of land in the centre of the town that belonged to the church (Newman *et al* 2000, 107). The earliest surviving reference specifically to Penrith is in the Pipe Rolls in 1167, under the pleas of Alan de Nevill of the forest, when the Sheriff rendered account for ten shillings for 'Penred Regis'. This sum was probably for forest offences or for encroachments (CCC and EH c2002, 7). The town was granted a market charter in 1222 by Henry III at which time it was a royal borough (CCC and EH c2002, 8). In 1291 a house of the Augustinian Friars was founded although no visible remains for this have been located (CCC and EH c2002, 8). More recent archaeological work within the town itself also confirm that by the 12th century it was well-established and flourishing (Zant 2015).

3.3.10 Repeated Scottish raids in the 13th and 14th century hit the town hard and it is at this time that the town's castle and other fortified buildings were constructed (CCC and EH c2002, 7-8). In 1397, William Strickland was granted a licence 'to crenellate his chamber in Penreth' (Huddleston 1930). It would seem likely that the fortified western tower of St Andrew's church would have been a response to this threat and may have been used by parishioners. What is more, after the town was pillaged and burnt in the Douglas raid of 1345 the burgesses received a licence to erect a defensive wall in 1346; whether the wall was ever completed is a matter of dispute and no physical remains have ever been located (Newman *et al* 2000, 109). Penrith became a centre of industry in the later medieval period, having markets for cattle, sheep, and horses. Medieval industries in the town included tanning and textiles, and a fulling mill and dye works, as well as weaving shops, cobblers and saddlers (Winchester 1987, 127; CCC and EH c2002, 8). The castle itself fell into disrepair by the mid-16th century and its fabric was beginning to be repurposed elsewhere (CCC and EH c2002, 8).

3.3.11 **Post-medieval Period (16th century AD – present):** The map evidence (see *Section 3.3*) demonstrates that the White Ox Farm site had reached approximately its present state by the beginning of the 19th century, with the field(s) enclosed, and it is likely that relatively little changed in the area immediately following the end of the medieval period. In general, it was not until the Industrial Revolution that rural areas such as this began to see any substantial new development as the population began to rise and demand for land and the need for new housing saw a considerable amount of building take place (Pearsall and Pennington 1989, 256). Population pressures and development continued to increase throughout the Industrial Revolution, although rural areas were perhaps less noticeably affected (Winchester 2016, 232). The area in general has remained semirural in character.

3.4 Conclusion

3.4.1 Although the site lies some distance to the north of the centre of the historic town of Penrith it is in a wider area of archaeological interest, with remains of prehistoric and Roman date found nearby. The map evidence demonstrates that the site, and indeed the wider area around it, has seen no major development with the construction of White Ox Farm (itself based around an earlier small structure of uncertain purpose) the only notable exception. It was not until the 20th century that the wider area began to be encroached upon by housing as the suburbs of Penrith grew.

4. Fieldwork Results

4.1 Area A

4.1.1 The topsoil comprised a soft dark greyish orange silty clay up to 0.3m thick with 20% rounded cobbles (**1000**). Following the removal of this a single additional pit was found towards the north-east corner of the area. This had a single fill comprising a pale brownish grey silt fill 0.1m thick with 1% rounded gravel (**1001**), and was approximately oval, orientated north-east/south west and 0.6m by 0.5m with shallow sloping sides less than 45° and an irregular base (**1002**) (Plate 7 and Plate 8). A further group of possible pits to the south-west of the original cluster was found, on investigation, to be a relatively recent animal burrow (Plate 9).



Plate 7: Pit **1002** before excavation, viewed from the west



Plate 8: Pit 1002 half-sectioned, viewed from the south



Plate 9: Animal burrows revealed in Area A before investigation, viewed from the west

4.2 Area B

4.2.1 The topsoil comprised a soft mid orangey-grey silty clay 0.2m to 0.3m thick with up to 20% rounded cobbles (**2000**). Beneath this the line of ditch **403** revealed in the evaluation was revealed, continuing on a broadly north/south alignment but turning to the north-west before reaching a terminus (Plate 10). Two slots were cut across this revealing the same general profile seen in the evaluation – an initially shallow cut becoming steeper and almost V-shaped at the base, although in Slot 2 there was a second shallower cut, not quite as deep as the main one, to the east. The fills of the ditch were broadly the same as those encountered during the evaluation. The upper fill in Slot 1, at the terminus of ditch **403** (Plate 11), comprised a dark reddish orange loose sandy clay 0.3m – 0.4m thick with 30% angular cobbles (**2001**). Below this was a pale orangey-brown soft silty clay up to 0.35m thick with 40% rounded gravel (**2002**). To the south of Slot 1, Slot 2 was excavated across ditch **403** (Plate 12). The east end of this also cut through a large pit, the fill of which comprised a dark reddish brown loose sandy clay up to 0.3m thick and with 10% angular cobbles (**2003**). The pit itself was broadly rectangular, orientated north/south and 1.1m long by 0.5m wide with vertical or near vertical sides to the east and west while the south was shallower, less than 45°, with a possible spur off the south-east corner [**2004**] (Plate 13). To the west of this pit, in the section across Slot 2 proper, the upper deposit comprised a dark reddish brown loose sandy clay 0.3m – 0.35m thick and with 20% rounded cobbles and gravel (**2005**). Below this was a pale orangey brown soft silty clay up to 0.3m thick and 5% rounded gravel (**2006**) (Plate 14). To the north-east of ditch **403** another section of ditch was revealed (Plate 15). A slot (Slot 3) taken through the terminus of this ditch revealed that it had an upper fill of dark reddish orange loose sandy clay up to 0.3m thick with 40% angular red sandstone cobbles (some possibly dressed) and 5% rounded cobbles in volcanic stone (**2007**). Below this was a pale brownish-orange soft silty clay up to 0.2m thick with 1% rounded gravel (**2008**). The ditch itself was linear, orientated east/west, 2.3m wide and 0.5m deep with a shallow south and west side, at less than 45°, steep north side and flattened round base (**2009**) (Plate 16).



Plate 10: Ditch 403 exposed in Area B, viewed from the south



Plate 11: Slot 1 cutting through the terminus of ditch 403, viewed from the north



Plate 12: Slot 2 cutting through ditch 403, viewed from the south



Plate 13: Section through pit 2004, viewed from the south

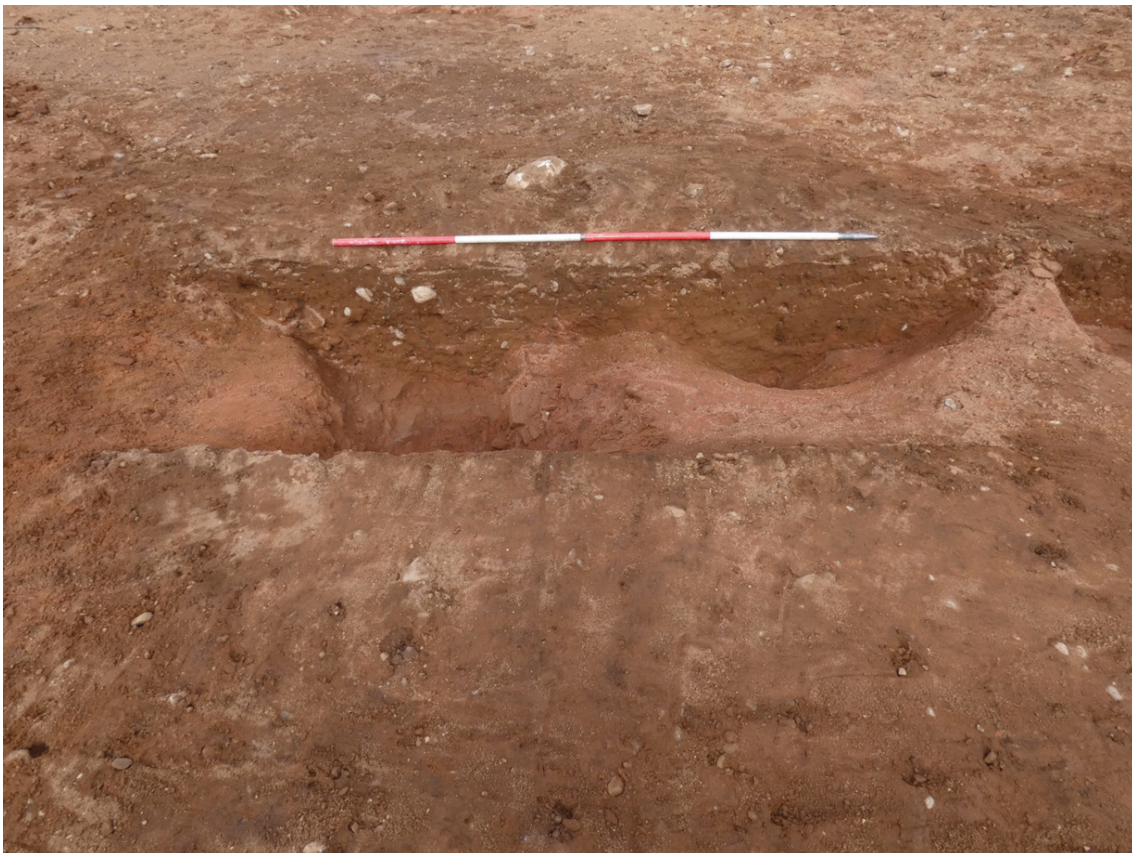


Plate 14: Section through ditch 403 in Slot 2, viewed from the south



Plate 15: Ditch 2009 before excavation, viewed from the west



Plate 16: Slot 3 showing section through ditch 2009, viewed from the west

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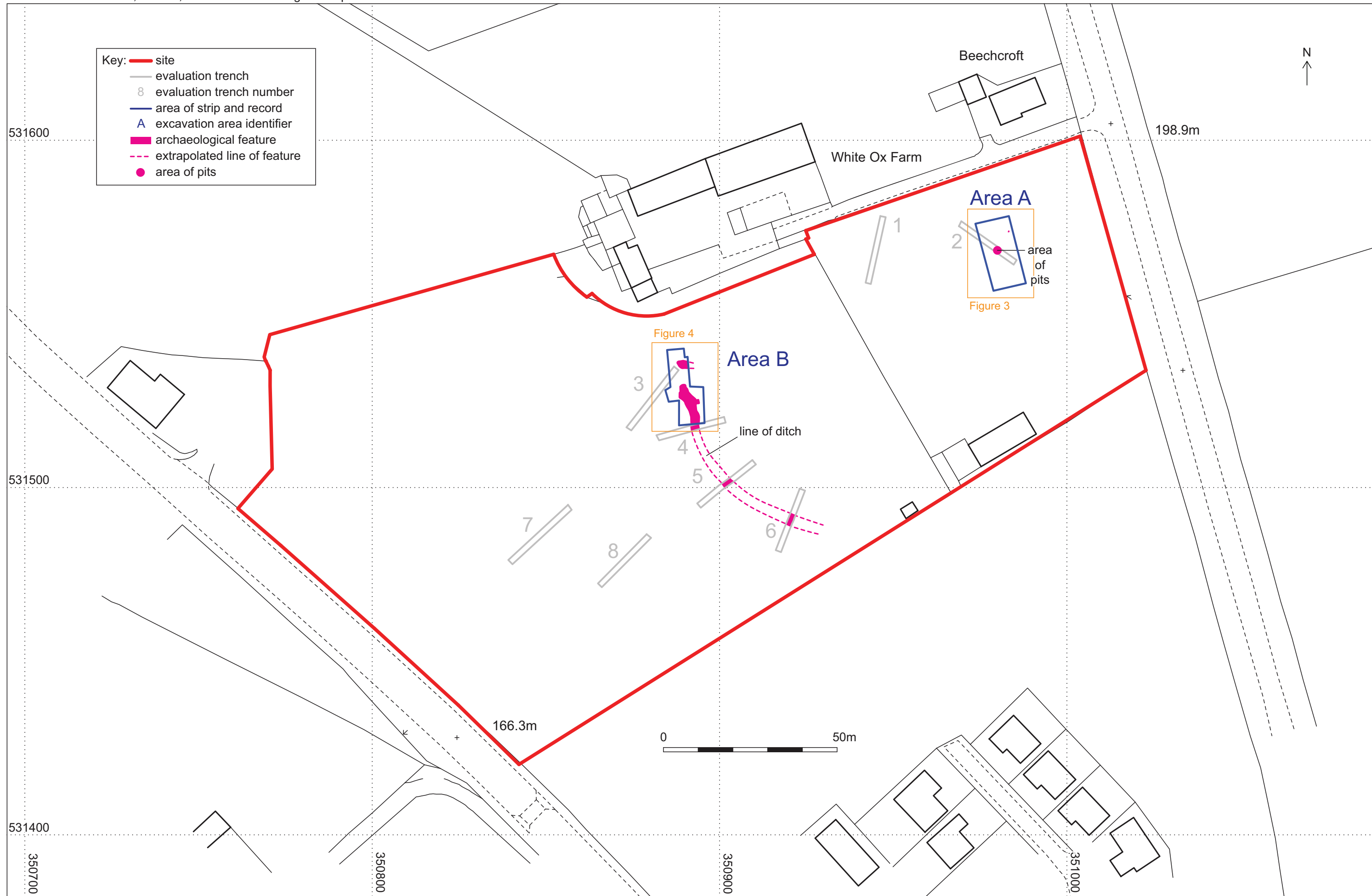


Figure 2: Site plan

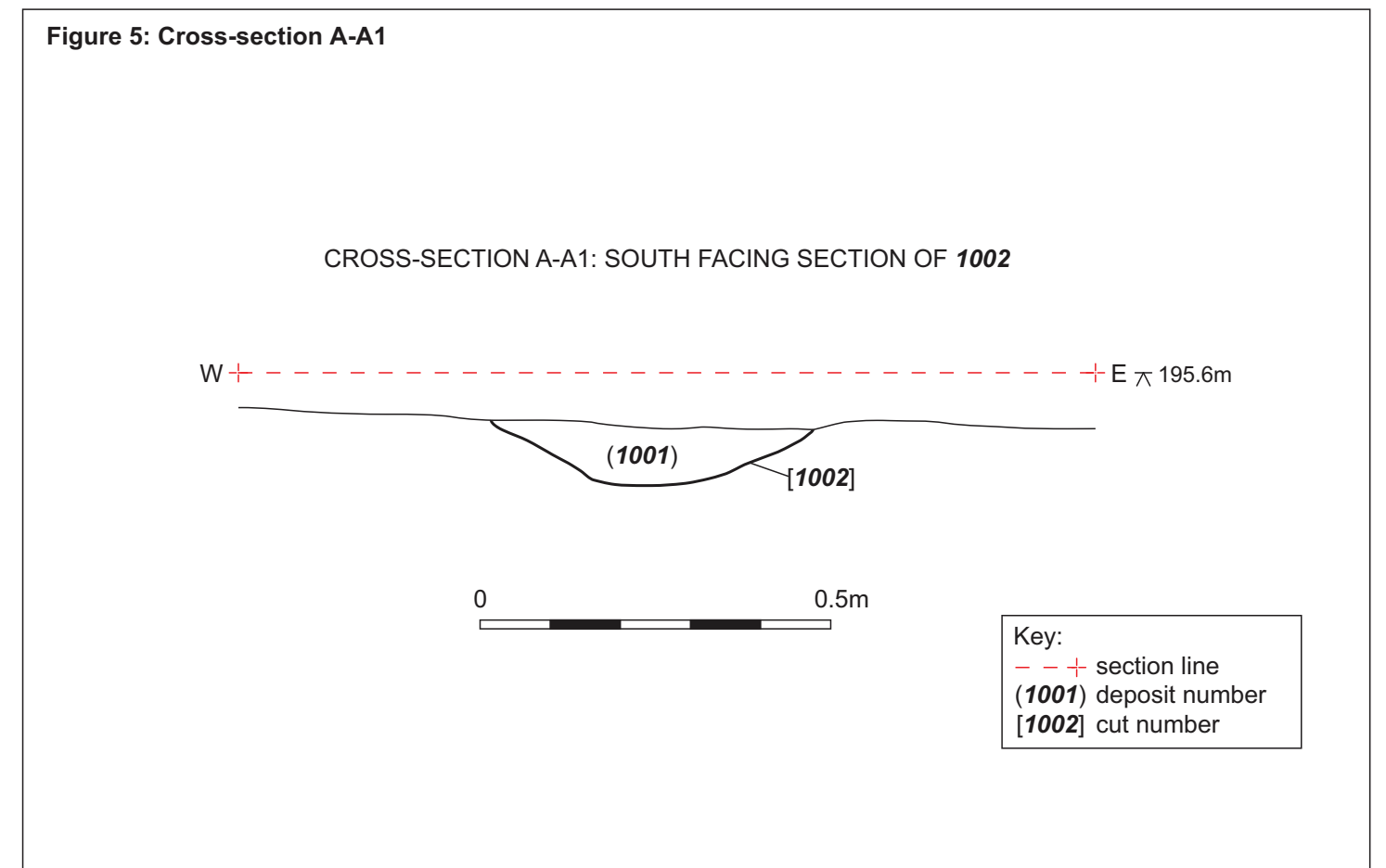
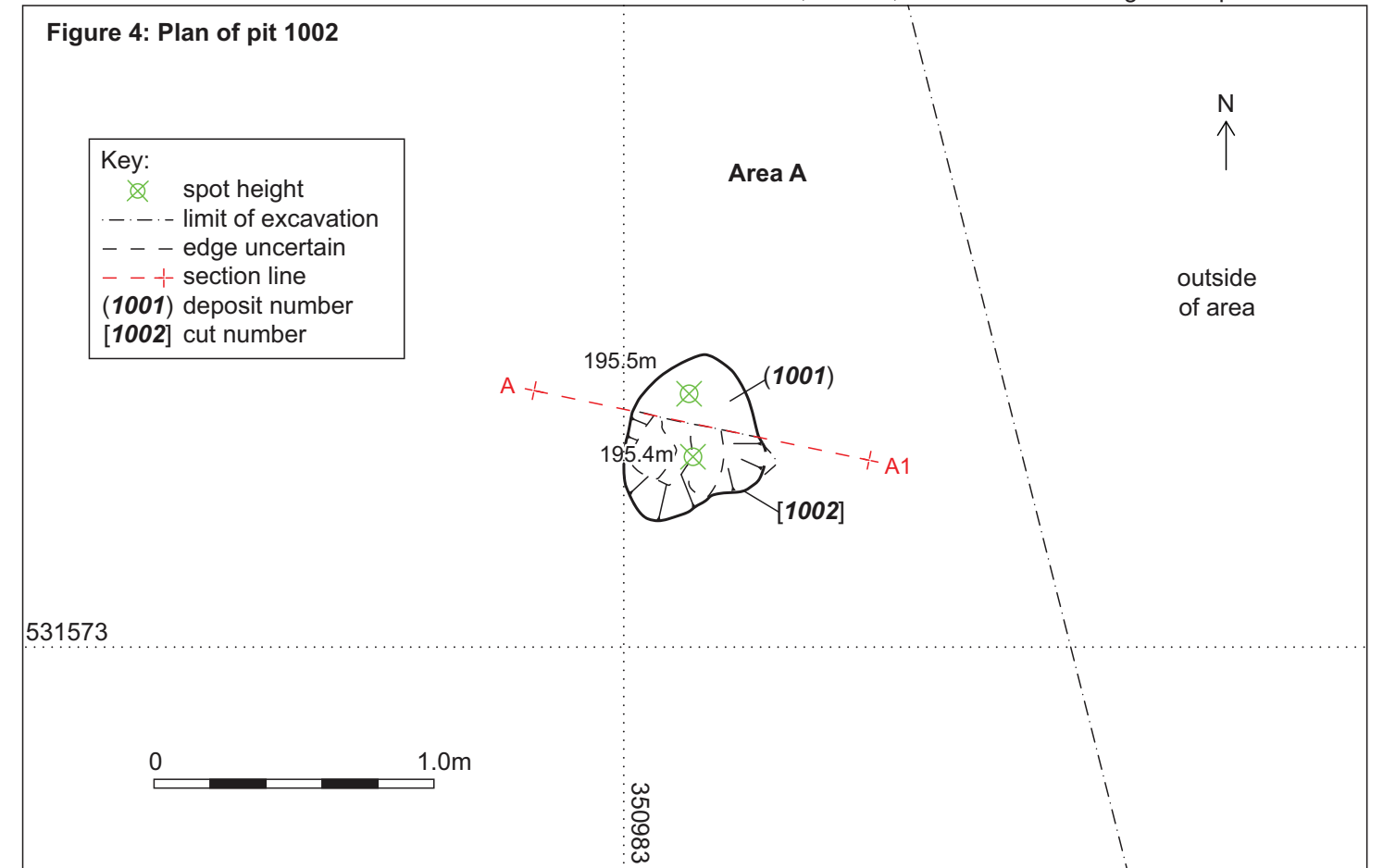
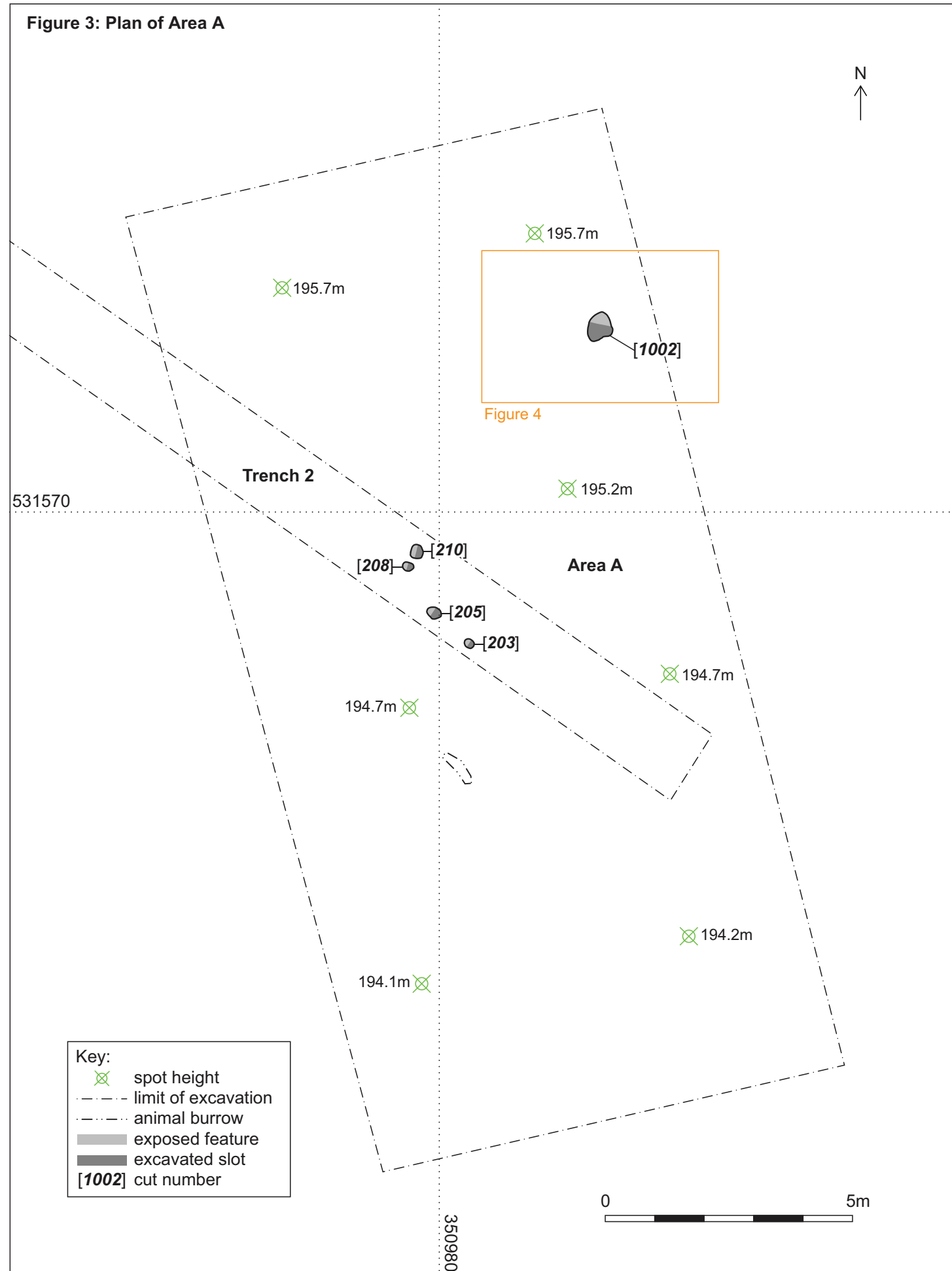


Figure 3: Plan of Area A; Figure 4: Plan of pit 1002; Figure 5: Cross-section A-A1

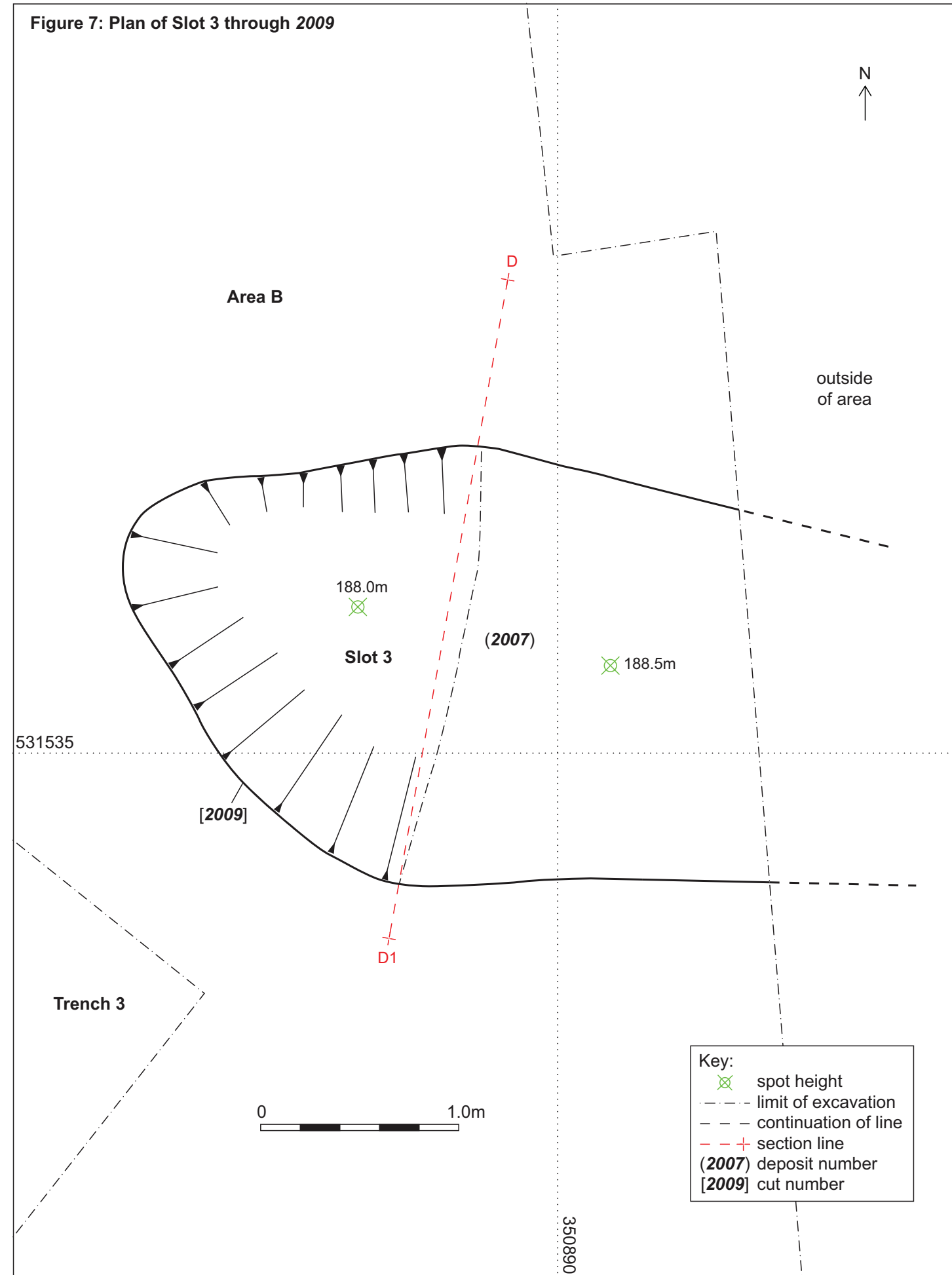
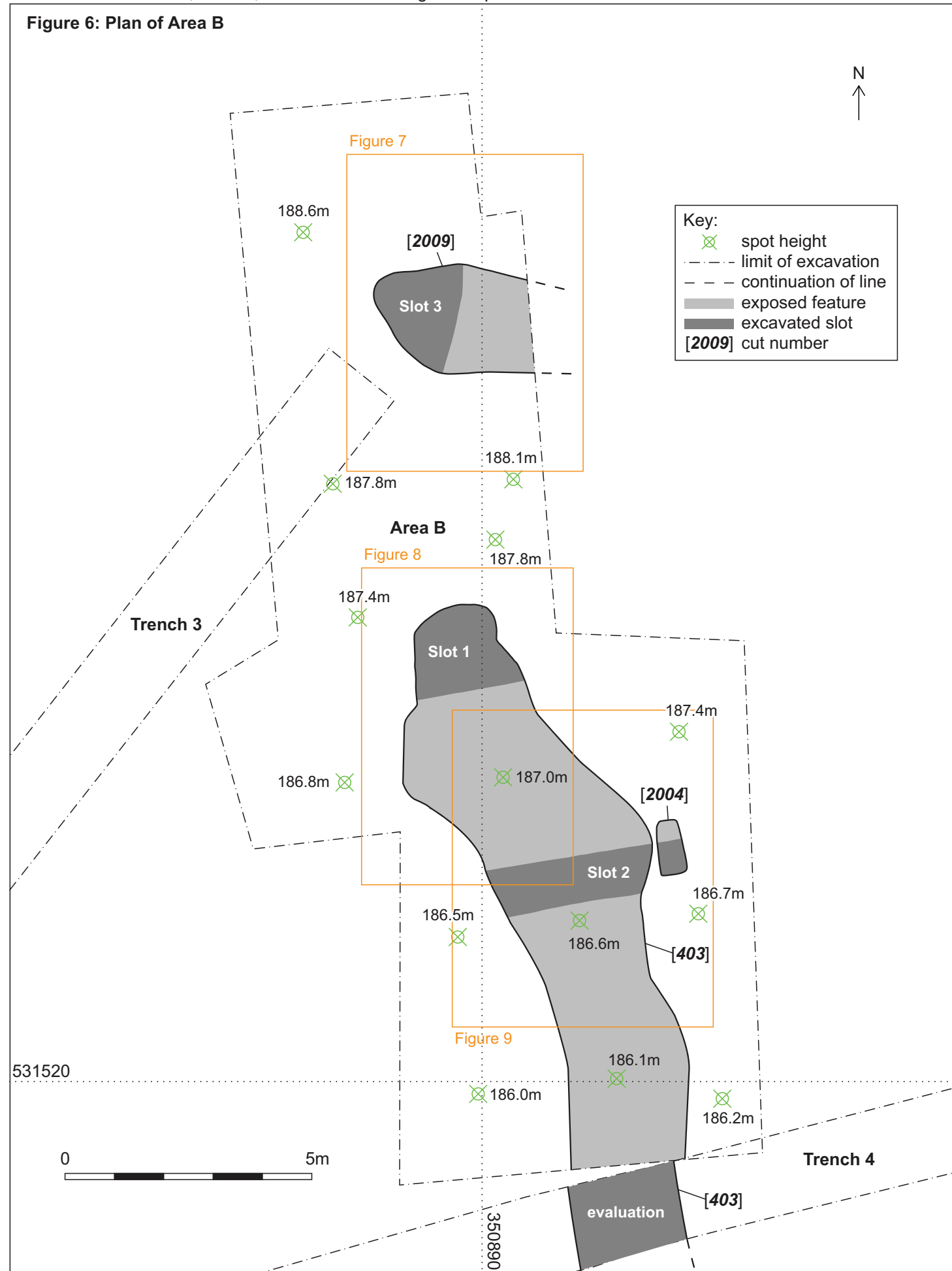


Figure 6: Plan of Area B; Figure 7: Plan of Slot 3 through 2009

Figure 8: Plan of Slot 1 through 403

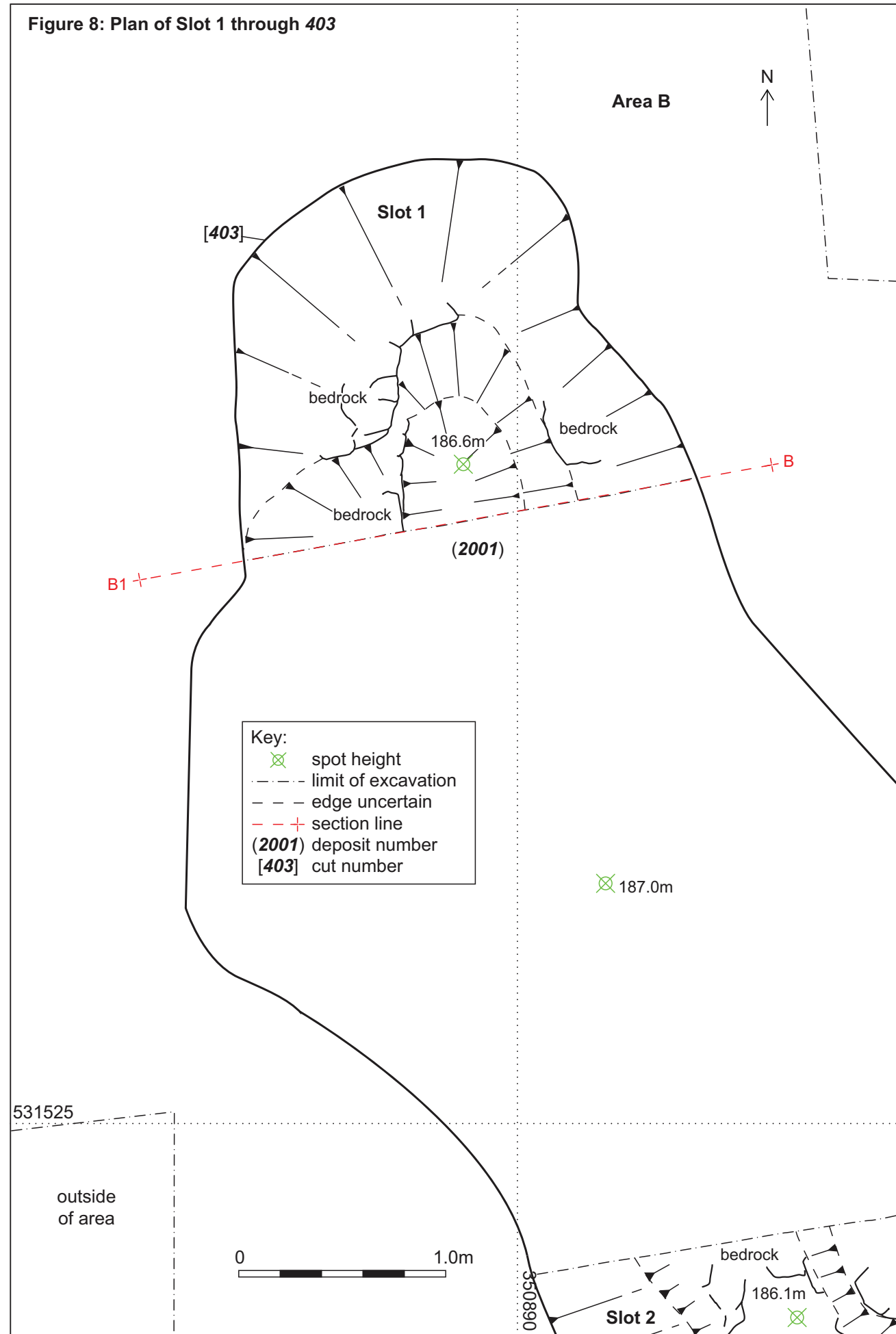


Figure 9: Plan of Slot 2 through 403

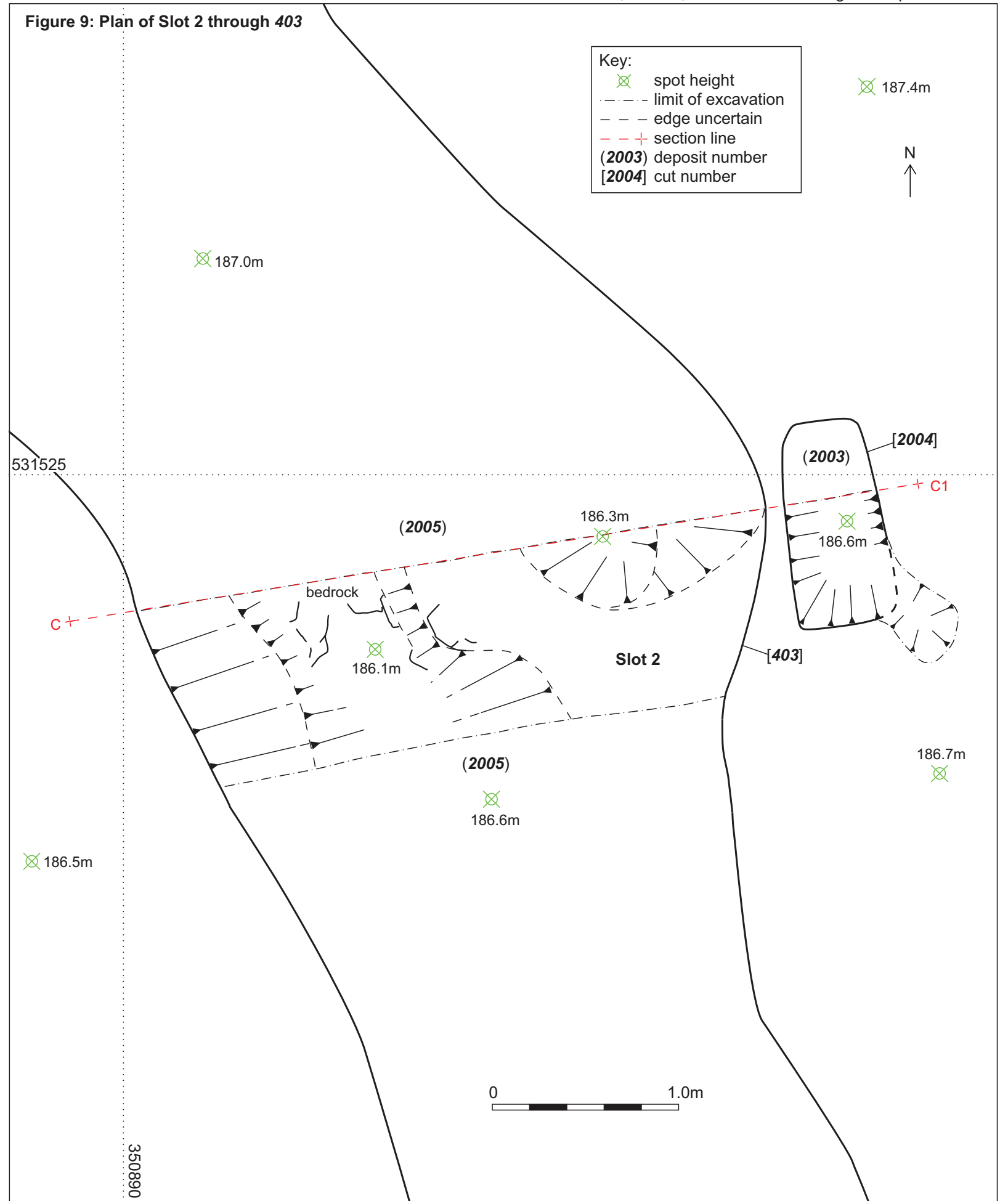
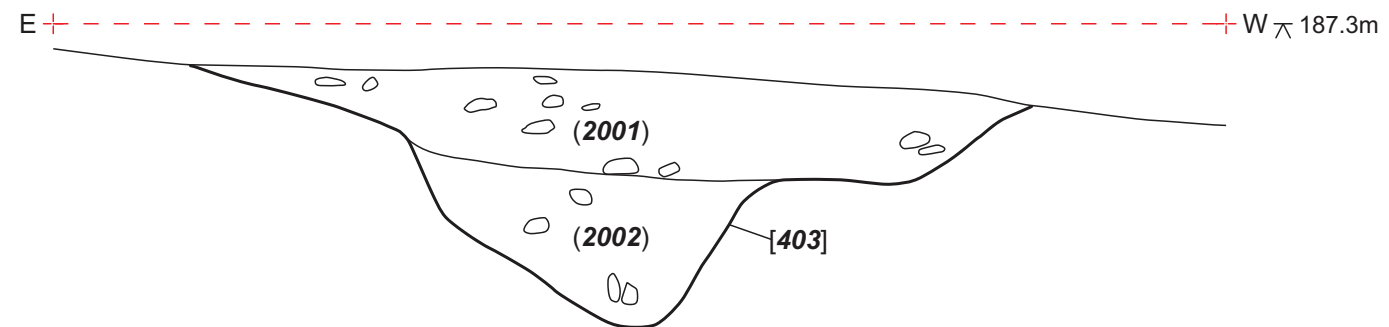
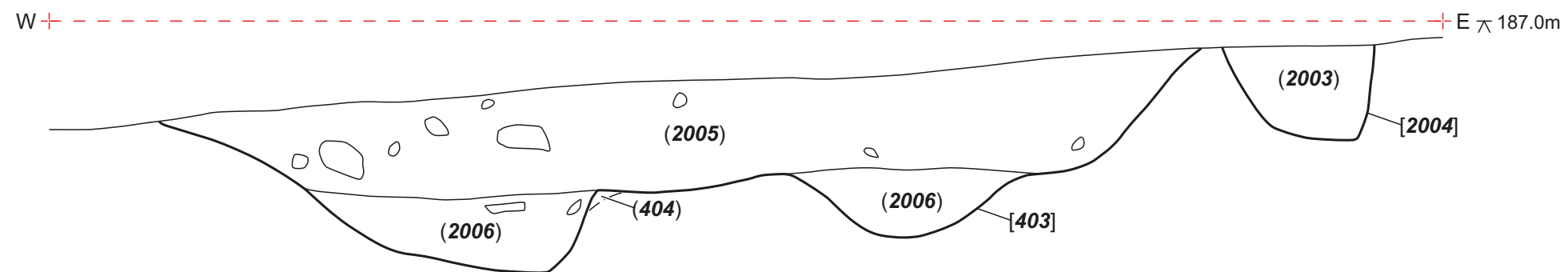


Figure 8: Plan of Slot 1 through 403; Figure 9: Plan of Slot 2 through 403

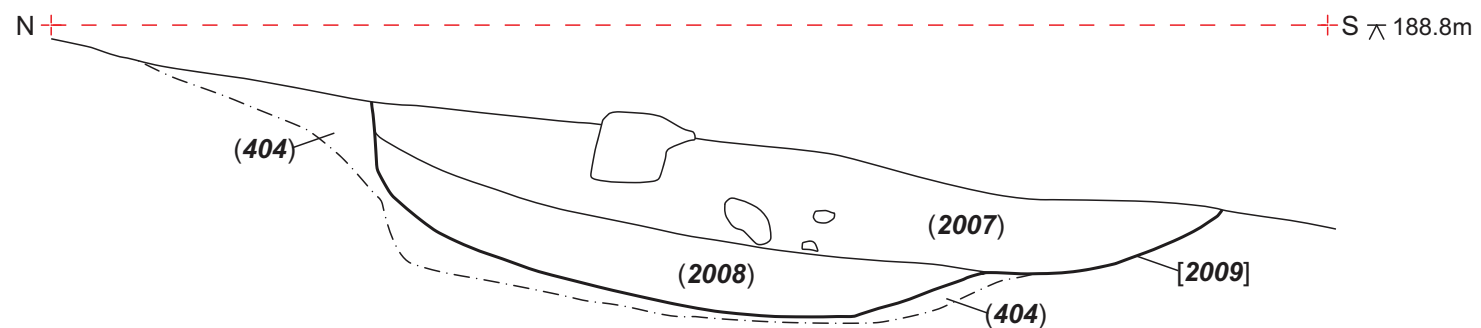
CROSS-SECTION B-B1: NORTH FACING SECTION OF SLOT 1 THROUGH 403



CROSS-SECTION C-C1: SOUTH FACING SECTION OF SLOT 2 THROUGH 403



CROSS-SECTION D-D1: WEST FACING SECTION OF SLOT 3 THROUGH 2009



Key:
 - - - - - limit of excavation
 - - - + section line
 (2001) deposit number
 [401] cut number

Figure 10: Cross-sections B-B1, C-C1 and D-D1

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4.3 Finds and Samples

4.3.1 **Introduction:** no finds were recovered during the strip and record.

4.4 Environmental Samples

4.4.1 **Introduction** eight bulk sediment samples were recovered from suitable contexts during the strip and record. The aims of the assessment were to assess the presence, preservation and abundance of any environmental remains and to determine the potential of the material for indicating the character and significance of the deposit. The results of the assessment are presented in *Appendix 4* and *Appendix 5*.

4.4.2 **Retents:** a small amount of material was recovered from the retents, primarily carbonised organic material, mostly evidently wood. In addition, uncharred material in the form of insect egg casings and roots was recovered from five samples, and very small pieces of bone, probably burnt, from four samples (Samples <300>, <400>, <500> and <600> – contexts **2003**, **2005**, **2006** and **2007**). Other finds included two nodules of unworked flint from Sample <300> (context **2003**), a flint flake with possible retouch from Sample 600 (context **2007**), and a small piece of glass also from Sample 600. Evidence for iron working was found in all but Sample <100>, in the form of small amounts of slag, hammerscale, and prill.

4.4.3 **Flots:** charcoal was evident in all of the flots, with the exception of that from Sample <100> (**2001**) and Sample <800> (**2008**) although a small amount of charcoal was recovered from the retents of both of these samples). The majority of it comprised wood charcoal derived from oak, although ash and rose were also present in smaller quantities. A full assessment is presented in *Appendix 6*.

5. Discussion

5.1 Results

5.1.1 While the strip and record revealed very limited evidence for further archaeological features in Area A, it did demonstrate more evidence relating to the ditch revealed during the evaluation in Trenches 4-6.

5.1.2 **Area A:** despite a group of four pits/post holes being revealed in this area during the evaluation, the strip and record did not find any evidence that these formed part of a larger structure, boundary, or any other type of coherent feature. Only a single additional pit was revealed during the strip and record [1002], and, as with the others, this could not be readily dated but on the basis of material recovered from the sample it is likely to be relatively recent. A possible feature to the south of the original group was discovered to be the result of an animal burrow, and it is plausible that some of the less distinct pits in the original group derived from similar activity.

5.1.3 **Area B:** the strip and record clearly demonstrated that the ditch visible as a crop mark and revealed during the evaluation continued to the north, turning slightly to the west, before coming to a terminus. A probable continuation of this ditch was also found a short distance from this terminus, running to the east, with its own terminus at the end. These two sections seem to have formed an entrance in the line of the ditch at this point, apparently with a simple in turned form; although the ultimate direction of the east/west section of ditch [2009] is uncertain it is likely on the basis of the crop mark evidence that it turns back to the north and continues underneath the farm buildings (Plate 17). It is conceivable that the pit [2004] found just to the south of the southern terminus represents a post hole, which might relate to a gateway, although it is very shallow relative to its area in plan and no evidence for a post or associated packing was present. As with the evaluation no dating evidence was discovered in either of the two ditch sections or the pit.



Plate 17: The location of the features revealed in the evaluation and strip and record combined with the wider cropmarks

5.1.4 In the absence of any finds dating evidence is very limited but it is clear from the presence of iron working residue in most of the samples from the ditch that it is unlikely to date to before the Iron Age, although it is possible that such small quantities of material arrived in these deposits through bioturbation and are therefore intrusive. The small possibly worked flint flake from context **2007** is difficult to date but is perhaps likely to be late Mesolithic or early Neolithic as it has characteristics similar to microlithic technology. It is, however, most probably residual and cannot be taken as reliable evidence for dating the ditch from which it was recovered. The glass recovered from the same context, while not closely dateable, is not likely to be earlier than the Roman period in origin. As with the evaluation the presence of small amounts of burnt bone and industrial residue in the fills of the ditch is indicative of 'settlement' type activity in the immediate vicinity, but perhaps not enough to suggest it was directly adjacent to the ditch. Such material is extremely hard wearing and could have been carried some distance before being deposited. The presence of coal (burnt and unburnt) in pit **1002**, alongside further evidence for iron working, suggests that this feature is relatively late in date, although it is not known with any certainty when coal was first used as a fuel in the area.

5.2 Conclusion

5.2.1 The strip and record provided very different evidence in each of the two areas. In Area A it demonstrated that the group of pits/post holes was not part of a wider structure and was in fact a relatively isolated cluster in an area disturbed by animal burrows. Although some of the pits and the one definite post hole might be of archaeological interest, without dating, which would only be possible through radio carbon assay, they are of limited interest. Even with dating they do not form a coherent group from which any useful conclusions could be drawn.

5.2.2 In Area B the ditch revealed in the evaluation was found to have a probable entrance at this point, although again no dating evidence was revealed. The sequence of fills within the ditch indicates that after an initial period of gradual silt accumulation it was then filled fairly rapidly, especially given the large amounts of broken up red sandstone in deposit **2007**. On morphological grounds alone the form of the ditch adds relatively little to any potential conclusion, although it is reminiscent of the type of complex entrances found on sites of all types and sizes in the Iron Age (eg Darvill 1993, 135-152). This would be extremely unusual in Cumbria where such large-scale enclosures are relatively uncommon and upstanding earthworks are more typical (see Barrowclough 2010, 192-197). The best comparison perhaps remains the enclosure at Swarthy Hill, Ewanrigg (Bewley 1992) although this is apparently very different in plan form and contained a number of internal features.

5.2.3 The most problematic issue with the whole site at White Ox Farm is the lack of dating evidence, although, as already mentioned, the widespread presence of iron working residue indicates that a date before the Iron Age is unlikely. It is therefore of considerable importance that radiocarbon dates are obtained. This is particularly important in terms of understanding the ditch in Area B, especially the manner in which it was formed and then filled, and to confirm that the two ditch sections are broadly contemporary. The one definite post hole in Area A might also be worthwhile obtaining a date for, although it is of limited interest in itself. With sufficient dating evidence it is likely that the results of the work at White Ox Farm will form an interesting addition to the understanding of the archaeology of the environs of Penrith, which have recently been found to contain important archaeological remains (Jackson 2019). Assuming this is the case it would worthwhile publishing an account of the work at White Ox Farm in a suitable location such as the *Transactions of the Cumberland and Westmorland Antiquarian and Archaeological Society*.

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Appendix 1: Project Design

Archaeological Strip and Record Cover Sheet and Project Design

The Site	
Site Name	White Ox Farm, Penrith
County	Cumbria
NGR	350892 531511 (centre)

Client	
Client Name	Atkinson Building Contractors Ltd

Planning	
Pre-planning?	No
Planning Application No.	16/1029
Condition number	-
Local Planning Authority	Eden District Council
Planning Archaeologist	Jeremy Parsons, Historic Environment Officer, Cumbria County Council

Archaeological work	
Desk-based assessment done as previous phase of work?	Yes, and geophysical survey
Area of investigation	Two areas, one 5m by at least 10m, one 10m by 20m

Archiving	
Relevant Record Office(s)/Archive Centre(s)	Carlisle
Relevant HER	Cumbria
Relevant Museum	Penrith and Eden Museum/Tullie House



1. Introduction

1.1 Project Cover Sheet

1.1.1 All the details specific to this project are set out on the cover sheet of this project design. The project design itself covers all elements that are involved in archaeological strip and record.

1.2 Greenlane Archaeology

1.2.1 Greenlane Archaeology is a private limited company based in Ulverston, Cumbria, and was established in 2005 (Company No. 05580819). Its directors, Jo Dawson and Daniel Elsworth, have worked continuously in commercial archaeology since 2000 and 1999 respectively, principally in the north of England and Scotland. Greenlane Archaeology is committed to a high standard of work, and abides by the Chartered Institute for Archaeologists' (CIfA) Code of Conduct. The various elements of the project will be carried out according to the Standards and Guidance of the Chartered Institute for Archaeologists (CIfA 2014a-d).

1.3 Staff

1.3.1 **Dan Elsworth (MA (Hons)), ACIfA** graduated from the University of Edinburgh in 1998 with an honours degree in Archaeology, and began working for the Lancaster University Archaeological Unit, which became Oxford Archaeology North (OA North) in 2001. Daniel ultimately became a project officer, and for over six and a half years worked on excavations and surveys, building investigations, desk-based assessments, and conservation and management plans. These have principally taken place in the North West, and Daniel has a particular interest in the archaeology of the area. He has managed many recent projects in Cumbria and Lancashire including several archaeological evaluations.

1.3.2 **Tom Mace (BA (Hons), MA, MIFA)** has extensive experience of working on a variety of archaeological projects, especially watching briefs, but also excavations, evaluations, and building recordings, as well as report writing and illustration production. He joined Greenlane Archaeology in 2008 having worked for several previous companies including Archaeological Solutions and Oxford Archaeology North. He currently works on a broad range of projects and is also responsible for the production of all illustrations for reports and publications as well as some post-excavation assessments. He is a Member of the Chartered Institute for Archaeologists.

1.3.3 **Jo Dawson (MA (Hons), ACIfA)** graduated from University of Glasgow in 2000 with a joint honours degree in Archaeology and Mathematics, and since then has worked continuously in commercial archaeology. Her professional career started at Glasgow University Archaeological Research Division (GUARD), following which she worked for Headland Archaeology, in Edinburgh, and then Oxford Archaeology North, in Lancaster. During this time she has been involved in a range of different archaeological projects. She has extensive experience of both planning and pre-planning projects, and has undertaken assessments of all sizes. Since establishing Greenlane Archaeology in 2005 she has managed numerous projects in south Cumbria, including desk-based assessments and evaluations. She currently mainly carries out quality control of reports and post-excavation assessments. She is an Associate member of the Chartered Institute for Archaeologists.

1.3.4 **Specialists:** Greenlane Archaeology have a range of outside specialists who are regularly engaged for finds and environmental work. Engagement is dependent upon availability, but specialists typically engaged are as follows:

Specialism	Specialist
Animal bone	Naomi Sewpaul
Ceramic building material, medieval and Roman	Phil Mills
Conservation	York Archaeological Trust
Clay tobacco pipe	Peter Davey (or Tom Mace in house for smaller assemblages)
Flots	Wardell Armstrong Archaeology
Human bone	Malin Holst
Industrial residue	Gerry McDonnell
Medieval pottery	Chris Cumberpatch for assemblages from the North East of England
Miscellaneous find types, for example Roman glass and medieval and earlier metalwork	Chris Howard-Davis
Prehistoric pottery	Blaise Vyner
Radiocarbon dates	Scottish Universities Environmental Research Centre
Roman pottery	Ruth Leary
Samian	Gwladys Monteil
X-ray of metal finds	York Archaeological Trust

2. Objectives

2.1 Rapid Desk-Based Assessment

2.1.1 To examine early maps of the site and any other relevant primary and secondary sources in order to better understand the site, and set it in its historic context, where this has not already been carried out as part of a previous phase of work.

2.2 Archaeological Strip and Record

2.2.1 To strip an area as specified in the project design cover sheet, in order to identify the presence of any archaeological deposits, features, and structures on the site and establish their form, function, and date where possible.

2.3 Report

2.3.1 To produce a report detailing the results of the strip and record, which will outline the form and date of any archaeological features encountered.

2.4 Archive

2.4.1 Produce a full archive of the results of the project.

3. Methodology

3.1 Rapid Desk-Based Assessment

3.1.1 Where an archaeological desk-based assessment has not already been carried out in a previous phase of work, a rapid examination of easily available sources, particularly maps, relating to the site will be carried out. The sources that will be used as part of the desk-based assessment will include:

- **Record Office/Archive Centre:** the majority of original and secondary sources relating to the site are deposited in the relevant Record Office(s) or Archive Centre(s), as specified in the cover sheet of this project design. Of principal importance are early maps of the site, particularly Ordnance Survey maps but also the Tithe Map, but other relevant primary sources such as the census, taxation records, parish registers, wills, deeds and other documents will also be consulted. In addition, relevant secondary sources will also be consulted and all of this information will be utilised to better understand the historical and archaeological development of the site and set it in context;
- **Historic Environment Record:** this is a list of all of the recorded sites of archaeological interest recorded in the county, and is the primary source of information for a study of this kind. Each site is recorded with any relevant references, a brief description and location related to the National Grid. The HER will be consulted and relevant information relating to any sites in close proximity to or within the proposed development area. In addition, relevant secondary sources, particularly previous archaeological investigations in the immediate area and aerial photographs, will also be examined;
- **Online Resources:** where available, mapping such as Ordnance Survey maps and tithe maps will be consulted online;
- **Greenlane Archaeology:** a number of copies of maps and local histories are held by Greenlane Archaeology. These will be consulted in order to provide information about the site.

3.2 Archaeological Strip and Record

3.2.1 The anticipated area to be stripped is set out on the cover sheet of this project design. The strip and record methodology, which is based on Greenlane Archaeology's excavation manual (Greenlane Archaeology 2007), will be as follows:

- The areas will be stripped with regard to the position of any known constraints, focussing on the areas of high archaeological interest or potential, and avoiding areas which are likely to have been severely damaged or truncated by later activity, unless they are considered to have a high potential;
- The overburden, which is unlikely to be of any archaeological significance, will be removed by machine under the supervision of an archaeologist until the first deposit beneath it is reached;

- All deposits below the overburden will be examined by hand in a stratigraphic manner, using shovels, mattocks, or trowels as appropriate for the scale. Deposits will only be sampled, rather than completely removed, below the first identified level of archaeological interest, unless specified by the Planning Archaeologist (see cover sheet), with the intension of preserving as much *in situ* as possible;
- The position of any features, such as ditches, pits, or walls, will be recorded and where necessary these will be investigated in order to establish their full extent, date, and relationship to any other features. Negative features such as ditches or pits will be examined by sample excavation, typically half of a pit or similar feature and approximately 10% of a linear feature;
- All recording of features will include hand-drawn plans and sections, typically at a scale of 1:20 and 1:10, respectively, and photographs in colour digital format (both RAW files and JPEG format at at least 12meg resolution) will be taken;
- All deposits, trenches, drawings and photographs will be recorded on Greenlane Archaeology *pro forma* record sheets;
- All finds will be recovered during the strip and record for further assessment as far as is practically and safely possible. Should significant quantities of finds be encountered an appropriate sampling strategy will be devised;
- All faunal remains will also be recovered by hand during the strip and record, but where it is considered likely that there is potential for the bones of fish or small mammals to be present appropriate volumes of samples will be taken for sieving;
- Deposits that are considered likely to have, for example, preserved environmental remains, industrial residues, and/or material suitable for scientific dating will be sampled. Bulk samples of between 20 and 60 litres in volume (or 100% of smaller features), depending on the size and potential of the deposit, will be collected from stratified undisturbed deposits and will particularly target negative features (e.g. gullies, pits and ditches) and occupation deposits such as hearths and floors. An assessment of the environmental potential of the site will be undertaken through the examination of samples of suitable deposits by specialist sub-contractors (see *Section 1.3.4* above), who will examine the potential for further analysis. All samples will be processed using methods appropriate to the preservation conditions and the remains present;
- Any human remains discovered during the strip and record will be left *in situ*, and, if possible, covered. The Planning Archaeologist will be immediately informed as will the local coroner. Should it be considered necessary to remove the remains this will be carried out under the guidance of the local coroner, and a licence obtained from the Ministry of Justice, under Section 25 of the Burial Act of 1857;
- Any objects defined as 'treasure' by the Treasure Act of 1996 (HMSO 1996) will be immediately reported to the local coroner and securely stored off-site, or covered and protected on site if immediate removal is not possible;
- The areas stripped will be backfilled following excavation although it is not envisaged that any further reinstatement to its original condition will be carried out.

3.2.2 Should any significant archaeological deposits be encountered during the strip and record these will immediately be brought to the attention of the Planning Archaeologist so that the need for further work can be confirmed. Any additional work will be carried out following discussion with the Planning Archaeologist and subject to a new project design, and the ensuing costs will be agreed with the client.

3.3 Report

3.3.2 The results of the strip and record will be compiled into a report, which will provide a summary and details of any sources consulted. It will include the following sections:

- A front cover including the appropriate national grid reference (NGR);
- A concise non-technical summary of results, including the date the project was undertaken and by whom;
- Acknowledgements;
- Project Background;
- Methodology, including a description of the work undertaken;
- Results of the rapid desk-based assessment;

- Results of the strip and record, including finds and samples;
- Discussion of the results including phasing information;
- Bibliography;
- Illustrations at appropriate scales including:
 - a site location plan related to the national grid;
 - a plan showing the location of the stripped areas in relation to nearby structures and the local landscape;
 - plans and sections of any features discovered during the strip and record;
 - photographs of any features encountered during the strip and record and general shots of the stripped areas;
 - extracts from historic mapping.

3.4 Archive

3.4.1 The archive, comprising the drawn, written, and photographic record of the strip and record, formed during the project, will be stored by Greenlane Archaeology until it is completed. Upon completion it will be deposited with the relevant Record Office or Archive Centre, as detailed on the cover sheet of this project design, together with a copy of the report. The archive will be compiled according to the standards and guidelines of the ClfA (ClfA 2014c). In addition details will be submitted to the Online AccesS to the Index of archaeological investigationS (OASIS) scheme. This is an internet-based project intended to improve the flow of information between contractors, local authority heritage managers and the general public.

3.4.2 A paper and digital copy of the report will be provided to the client and a digital copy of the report will be provided to the relevant Historic Environment Record, as detailed on the cover sheet of this project design.

3.4.3 The client will be encouraged to transfer ownership of the finds to a suitable museum. Any finds recovered during the strip and record will be offered to an appropriate museum (see cover sheet). If no suitable repository can be found the finds may have to be discarded, and in this case as full a record as possible would be made of them beforehand.

4. Work timetable

4.1 Greenlane Archaeology will be available to commence the project on the date specified on the Order Form, or at another date convenient to the client. It is envisaged that the elements of the project will be carried out in the following order:

- **Task 1:** rapid desk-based assessment (where this has not already been carried out as a previous phase of archaeological work);
- **Task 2:** archaeological strip and record;
- **Task 3:** processing and assessment of finds and samples;
- **Task 4:** production of draft report including illustrations;
- **Task 5:** feedback on draft report, editing and production of final report;
- **Task 6:** finalisation and deposition of archive.

5. Other matters

5.1 Access and clearance

5.1.1 Access to the site will be organised through co-ordination with the client and/or their agent(s).

5.2 Health and Safety

5.2.1 Greenlane Archaeology carries out risk assessments for all of its projects and abides by its internal health and safety policy and relevant legislation. Health and safety is always the foremost consideration in any decision-making process.

5.3 Insurance

5.3.1 Greenlane Archaeology has professional indemnity insurance to the value of **£1,000,000**. Details of this can be supplied if requested.

5.4 Environmental and Ethical Policy

5.4.1 Greenlane Archaeology has a strong commitment to environmentally and ethically sound working practices. Its office is supplied with 100% renewable energy by Good Energy, uses ethical telephone and internet services supplied by the Phone Co-op. In addition, the company uses the services of The Co-operative Bank for ethical banking, Naturesave for environmentally-conscious insurance, and utilises public transport wherever possible. Greenlane Archaeology is also committed to using local businesses for services and materials, thus benefiting the local economy, reducing unnecessary transportation, and improving the sustainability of small and rural businesses.

6. Bibliography

Chartered Institute for Archaeologists (CIfA), 2014a *Standard and guidance for historic environment desk-based assessment*, revised edn, Reading

CIfA, 2014b *Standards and Guidance for Archaeological Excavation*, revised edn, Reading

CIfA, 2014c *Standard and Guidance for the Creation, Compilation, Transfer and Deposition of Archaeological Archives*, revised edn, Reading

HMSO, 1996 *Treasure Act*, <http://www.opsi.gov.uk/acts/acts1996/1996024.htm>

Appendix 2: Summary Context List

Context	Type	Description	Interpretation
1000	Deposit	Dark greyish-brown soft silty clay, up to 0.3m thick, 20% rounded cobbles	Topsoil
1001	Deposit	Pale brownish grey soft silt, 0.5m by 0.6m and 0.1m thick, 1% rounded gravel	Fill of pit 1002
1002	Cut	Oval, orientated approximately north-east/south-west, 0.6m by 0.5m and 0.1m deep with shallow sides less than 45° and an irregular base	Cut of pit
2000	Deposit	Mid orangey-grey soft silty clay, 0.2m-0.3m thick with 20% rounded cobbles	Topsoil
2001	Deposit	Dark reddish orange loose sandy clay, 0.3m-0.4m thick with 30% angular cobble	Upper fill of ditch 403 in Slot 1
2002	Deposit	Pale orangey brown soft silty clay, 0.35m thick and with 40% rounded gravel	Lower fill of ditch 403 in Slot 1
2003	Deposit	Dark reddish brown loose sandy clay, 0.3m thick with 10% angular gravel	Fill of pit 2004
2004	Cut	Approximately rectangular, orientated north/south, 1.1m long by 0.5m wide and 0.3m deep. Sides vertical to west, near vertical on east and greater than 45° to south, flat base onto bedrock	Cut of pit
2005	Deposit	Dark reddish brown loose sandy clay 0.3m-0.35m thick with 10% rounded cobble and 10% rounded gravel	Upper fill of ditch 403 in Slot 2
2006	Deposit	Pale orangey brown soft silty clay, 0.3m thick with 5% rounded gravel	Lower fill of ditch 403 in Slot 2
2007	Deposit	Dark reddish brown loose sandy clay, 0.3m thick with 40% angular cobble (red sandstone, some dressed?) and 5% rounded cobbles (volcanic)	Upper fill of ditch 2009
2008	Deposit	Pale brownish orange soft silty clay, 0.2m thick with 1% rounded gravel	Lower fill of ditch 2009
2009	Cut	Linear, approximately orientated east/west, 2.3m wide, 0.5m deep, the south side shallow (less than 45°), the north side steeper and coming to a flat rounded base	Cut of ditch

Appendix 3: Environmental Sample Data

Sample number	Context number	Size (litres)	Context type
100	2001	20	Upper fill of ditch [403] Slot 1
200	2002	20	Lower fill of ditch [403] Slot 1
300	2003	20	Fill of pit [2004]
400	2005	20	Upper fill of ditch [403] Slot 2
500	2006	20	Lower fill of ditch [403] Slot 2
600	2007	20	Upper fill of ditch [2009] Slot 3
700	1001	20	Fill of pit [1002]
800	2008	8	Lower fill of ditch [2009] Slot 3

Table 2: Summary of samples taken

Sample number	100	200	300	400	500	600	700	800
Uncharred organic		+	+	+		+	++	
Charred organic	+	+	+	+	+	+	+	+
Burnt bone			+	+	+	+		
Hammerscale		+	+	+		+		+
Slag (iron)		+		+	+	+	+	
Prill								+
Coal							+	
Flint flake						+		
Flint unworked			+					
Glass						+		

Table 3: Contents of retents (Key: + = 1-9, ++ = 10-20, +++ = 21-50, ++++ = >51)

Appendix 4: Flot Assessment Report

Flot assessment

Introduction

Eight flots were presented for assessment following the excavations at White Ox Farm, Penrith.

This report presents the results of the assessment of the, palaeobotanical and charcoal remains in accordance with Campbell *et al.* (2011) and English Heritage (2008).

Methodology

The flot, plant macrofossils and charcoal were retained and scanned using a stereo microscope (up to x45 magnification).

The plant remains and charcoal were identified to species as far as possible, using Hather (2000), Schweingruber (1982) and the author's reference collection. Nomenclature for plant taxa followed Stace (2010).

Results

Of the eight flots (each flot contains two fractions created by 500 and 250 micron meshes) six yielded small amounts of charcoal. All from the 500-micron fraction, the 250-micron fraction for all flots consisted only of sand (see Table 1.1)

Due to the small comminuted fragments of charcoal approximately only 25% of the charcoal could be identified for the assessment. Most of charcoal was in good condition and identified as oak (*Quercus* sp.), with occasional ash (*Fraxinus excelsior*) and rose (Rosaceae) observed.

Discussion

The small quantities of charcoal, and the features from which they were recovered, suggested that the presence of charcoal was through the deposition of rubbish. This is backed up by the other material (such as burnt bone, flint, glass etc) recovered from the same features.

The charcoal itself is in such small quantities it cannot lead to any meaningful discussion of human agency at the site.

Radiocarbon Suitability

The quantities and species of charcoal means that a radiocarbon submission would not be ideal for this site. However, if the features cannot be dated through other means then the fragments of rose could be submitted. The oak and ash fragments are unsuitable due to the longevity of life of the species. In all cases it should be noted that the charcoal may only give a date for the backfilling, especially from the upper fills, and not for the occupation period of the site.

Statement of potential and recommendations

Due to the quantities of ecofactual material recovered there is no further potential for the material from these samples.

The charcoal is recommended for discard once the final report has been accepted.

Bibliography

Campbell, G., Moffett, L. and Straker, V., 2011. *Environmental Archaeology. A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-excavation* (second edition), English Heritage, Portsmouth

English Heritage, 2008. *MoRPHE Project Planning Note 3 Archaeological Excavations*

Hather, J.G., 2000. *The Identification of the Northern European Woods: A Guide for Archaeologists and Conservators*. Archetype, London

Schweingruber, F.H., 1982. *Microscopic Wood Anatomy* (2nd Ed), Swiss Federal Institute of Forestry Research, Zurich

Stace, C., 2010. *The New Flora of the British Isles*. 3rd edition. Cambridge University Press: Cambridge

Table 1: flot data

C	<>	Feature	Sieves	Description	FW	FV	Ch
2001	100	Upper fill of ditch [403] Slot 1	250mic	sand 100%	83.7	80	
2001	100	Upper fill of ditch [403] Slot 1	500mic	very fine rootlets 50%: sand 50%	3.8	30	
2002	200	Lower fill of ditch [403] Slot 1	250mic	sand 100%	81.1	70	
2002	200	Lower fill of ditch [403] Slot 1	500mic	very fine rootlets 10%: sand 90%	5.8	15	0.17
2003	300	Fill of pit [2004]	250mic	sand 100%	66.5	60	
2003	300	Fill of pit [2004]	500mic	very fine rootlets 90%: sand 10%	6.4	25	0.69
2005	400	Upper fill of ditch [403] Slot 2	250mic	sand 100%	35	35	
2005	400	Upper fill of ditch [403] Slot 2	500mic	very fine rootlets 70%: sand 30%	5.1	12	0.13
2006	500	Lower fill of ditch [403] Slot 2	250mic	sand 100%	33.1	25	
2006	500	Lower fill of ditch [403] Slot 2	500mic	fine rootlets 10%: sand 90%	5.8	12	0.88
2007	600	Upper fill of ditch [2009] Slot 3	250mic	sand 100%	118.6	120	
2007	600	Upper fill of ditch [2009] Slot 3	500mic	comminuted charcoal 20%: fine rootlets 60%: sand 20%	6.8	32	1.11
1001	700	Fill of pit [1002]	250mic	sand 100%	22.2	32	
1001	700	Fill of pit [1002]	500mic	fine rootlets 100%	7.1	175	0.18
2008	800	Lower fill of ditch [2009] Slot 3	250mic	sand 100%	15.8	15	
2008	800	Lower fill of ditch [2009] Slot 3	500mic	sand 100%	1.6	5	

Key: C=context; <>=sample number; Feature=description of feature sample taken from; Sieves=Mesh size used when processed; Description=description of material making up flot; FW=flot weight(g); FV=flot volume(ml); Ch=weigh of charcoal (g)