WYAS Archaeological Services

Greetwell Hall Farm

Messingham Quarry

North Lincolnshire

Trial Trench Evaluation

Report no. 2788
September 2015

Client: Andrew Josephs Associates

Greetwell Hall Farm
Messingham Quarry
North Lincolnshire

Trial Trench Evaluation

Summary

An archaeological trial trench evaluation comprising thirty-four trenches was undertaken on the land north of Brigg Road, Messingham. Very few archaeological features were identified, although a ditch exposed in Trench 7 produced a large slag block which is either of Iron Age or Saxon date. A substantial early modern field drain system was also identified.

WYAS
Archaeological Services

Report Information

Client:	Andrew Josephs Associates
Address:	16 South Terrace, Sowerby, Thirsk, YO7 1RH
Report Type:	Archaeological Trial Trenching
Location:	Greetwell Hall Farm, Messingham
County:	North Lincolnshire
Grid Reference:	SE 928 047
Period(s) of activity:	?Iron Age, ?Saxon, post-medieval
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Date of fieldwork:	03/08/2015 – 19/08/2015
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	Chirs Cumberpatch (pottery)
	Gerry McDonnell (slag)

Authorisation for distribution: ----------

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1 Introduction

Archaeological Services WYAS (ASWYAS) was commissioned by Andrew Josephs Associates (AJA) on behalf of Sibelco Europe Ltd, to undertake an archaeological trial trench evaluation on land adjacent to Greetwell Hall Farm, Messingham. The evaluation was carried out between August 3rd and August 19th 2015. The work was undertaken in line with the National Planning Policy Framework and in accordance with a Written Scheme of Investigation (WSI) produced by ASWYAS (Appendix 1) and approved by Alison Williams of North Lincolnshire Council.

Site location, topography and land-use

The site is located eight kilometers to the south-east of Scunthorpe, centred on NGR SE 928 047, immediately to the north of Brigg Road (Fig. 1). The land is bordered by woodland to the east, open fields and woodland to the north and an area of mineral extraction to the west and south (Fig. 2). The site is located at approximately 20m above Ordnance Datum (aOD). The site was previously used for arable cultivation but has been left unplanted in recent years to encourage ecological diversity and provide game cover.

Soils and geology

The underlying bedrock comprises mudstone of the Charmouth Mudstone Formation, with superficial deposits of wind-blown sand of the Sutton Sand Formation (British Geological Survey 2015). The soils in this area are classified in the Blackwood association characterised as deep permeable sandy coarse loamy soils (Soil Survey of England and Wales 1983).

2 Archaeological Background

The heritage statement produced by Andrew Josephs Associates (2015) gives an extensive overview of the archaeological background of the site, which is summarised here.

A small collection of prehistoric flints were recovered to the north of Greetwell Farm (HER Number: 2158). Prehistoric flints were also recovered from the topsoil during a trial trench evaluation undertaken in 2007-8 to the south of the site, one of which was given a potential Neolithic date (Dobson and Pouncett, 2009). Several other prehistoric flints have also been located further to the south of the site.

Following a geophysical survey (Dobson and Pouncett 2009) and a desk-based assessment on land to the south of the Proposed Development Area (PDA) (Gowans and Pouncett 2009a), trial trenching and subsequent excavations revealed evidence of iron working (Gowans and Pouncett 2009b; Clarke 2015). Based on radiocarbon dates, these significant iron smelting remains are of likely Early Iron Age date (Clarke 2015), in contrast to a putative post-Roman date proposed for iron slag deposits and associated ponds noted at Greetwell Hall Farm

(Dudley 1949, 143). Other features associated with the excavations were ditches of post-medieval or modern date (Clarke 2015).

Aerial photographs available online were examined as part of the current project (Andrew Josephs Associates 2015) and a possible squarish cropmark is evident from one photograph in the western part of the site. While this is likely to be the result of sub-surface drainage and cropping patterns, it cannot be entirely dismissed.

The PDA has also been subject to a partial geophysical survey by ArchaeoPhysica Ltd and a walkover survey by Oxford Archaeology (Andrew Josephs Associates 2015). The geophysical survey identified no anomalies of archaeological significance, and the walk-over survey identified no surface features in Fields 1 and 2. Undulating ridges and hollows in Field 3, however, may prove to be significant.

Possible medieval or post-medieval retting ponds (PastScapeID: 1458458) have been identified to the southwest of the site.

3 Aims and Objectives

The overall aim of the archaeological excavation was to provide information on the presence or absence and the extent, character, chronology, depth of burial and degree of archaeological survival across the site, in order to inform the level and type of archaeological investigations that may be required to mitigate the effects of further extraction on the archaeological record.

4 Methodology

All work was undertaken in accordance with accepted professional standards and guidelines (English Heritage 2008; CIfA 2014), in accordance with the ASWYAS site recording manual and the WSI (Appendix 1).

All trenches were set out and the limits resurveyed using a Trimble VRS differential GPS accurate to +/-0.01cm. The area of excavation was then searched by an ecologist to ensure minimal damage to any ecology present. This resulted in the movement of several trenches from their original locations to avoid nesting birds, animal burrows and lizard or amphibian habitation. Trenches were relocated as close as possible to their original positions or shortened to minimize impact on the ecology. It was agreed with Alison Williams that Trench 6 would not be excavated due to its close proximity to game cover within Field 1.

The top few centimetres of topsoil were first removed (Plate 1) to minimise the risk of animals returning to the trench, prior to full excavation. The trenches were then opened in a controlled manner using a 360 tracked excavator using a flat-bladed ditching bucket under direct archaeological supervision. All topsoil deposits were removed in level spits (not more

than 0.20m) with the topsoil and subsoil being separated to allow for re-instating in reverse order. Machining stopped at the first archaeological horizon or natural deposits, whichever was encountered first. All excavations of archaeological deposits were undertaken manually with the stripped surface being cleaned and investigated for archaeological remains.

An appropriate sample was excavated through all linear features to investigate the full depth, profile and fills, where possible, and to recover dating from the fills. All excavated sections were, where possible, located adjacent to the trench edge in order to provide a full stratigraphic sequence.

All archaeological features were accurately recorded in plan at a scale of 1:20 or 1:50. Feature sections were drawn at a scale of 1:10 or 1:20. All sections include spot heights that relate to Ordnance Datum in metres.

A full written, drawn and photographic record was made of all archaeological work undertaken. An inventory of the primary archive is presented in Appendix 2. ASWYAS currently hold the site archive in a stable and secure location, and it will be deposited with a local museum in due course.

5 Results

A description of each trench in which archaeology was encountered is given below, with further detail about the depths and descriptions of individual deposits by trench provided in Appendix 3. Trenches devoid of archaeology are not discussed, but their depths and stratigraphic sequence are recorded in Appendix 3. A list of contexts yielding finds or samples is provided in Appendix 4.

Unless otherwise stated, all features investigated were sealed by a soft dark grey-brown silty sand topsoil and a mid-grey silty sand subsoil. The geology encountered across the site was a soft sand which varied in colour from a pale grey to a dark orange.

Many trenches featured land drains usually, but not exclusively, on a northeast-southwest alignment. Many of these were tested due to their varying widths, but almost all contained a ceramic pipe buried at depths varying from just below the subsoil to almost a metre into the geology. From the variation in types of pipe, it is likely that these were installed in separate phases, which would also explain the difference in depth and width.

Trench 7 (Fig. 3)

Trench 7 contained a northwest-southeast aligned ditch (703) with a heavily disturbed silty sand fill (704, Plate 2). Fill 704 contained several pieces of slag, including a large slag block, which are discussed below. In addition, two small north-south aligned ditches were investigated (705 and 707). Ditch 707 contained two fills (708 and 709) whereas ditch 705

contained a single fill (706). Both ditches were disturbed by animal burrowing and neither contained any dating evidence.

Trench 12 (Figs 4 and 5)

Trench 12 contained two large ditches (1205 and 1207). These were both on the same northeast-southwest alignment and of approximately the same width and depth. Ditch 1207 contained several land drains in its base, some broken, some *in-situ* (Plate 3). While the fills of the ditches are certainly post-medieval, the wide profile of the ditches may suggest that they were historic drainage ditches which had been re-purposed as land drains.

Trench 30 (Fig. 6)

Trench 30 contained three drainage ditches (3003, 3005 and 3006). Ditches 3003 and 3006 contained a few sherds of pottery dating to the mid to late 19th century or even early 20th century (see below). Given the similarity in the alignment of ditches 3005 and 3006, a similar date is proposed for ditch 3005.

Trench 31 (Figs 7 and 8)

Trench 31 contained a pit on its eastern side (3108, Plate 4), which contained two fills (3106 and 3107). A single piece of ceramic land drain was found in the lower fill (3107) and modern seeds were recovered from the environmental sample. It is highly likely that this is a modern pit associated with the recently demolished adjacent farmhouse. In addition, a small linear feature on a northwest-southeast alignment was investigated (3103), which contained a single fill (3102) and is probably a small drainage gully or possibly an animal burrow. Two small ditches were also excavated (3105 and 3110, Plate 5). These contained very mixed fills (3104 and 3109), and no dating evidence was recovered from them. Due to the northeast-southwest alignment of ditch 3105, this feature is likely to be part of the drainage system seen across the rest of the site.

6 Artefact Record

Pottery by C.G. Cumberpatch

Three sherds of pottery were examined and are catalogued as followed:

1. One sherd of pottery weighing 4 grams from a large kitchenware bowl. The vessel has a cane-coloured fabric with white glaze internally and relief moulded decoration externally. *Trench 30, ditch 3006, fill 3007*
2. One rim sherd from a large Brown Glazed Coarseware bowl or pancheon weighing 125 grams. The rim is everted and overhanging with a slight hammerhead effect and the vessel is glazed internally. *Trench 30, ditch 3003, fill 3004*

3. One Brown Glazed Coarseware body sherd weighing 17 grams, most probably from the same vessel as the rim although the two do not join. *Trench 30, ditch 3003, fill 3004*

Brown Glazed Coarseware pancheons were manufactured continuously from the early 18th century until the mid-20th century, although quantities fell rapidly from the early 20th century onwards. They seem to have been a multi-purpose domestic vessel used for a variety of tasks including bread-making, pickling and preserving and are a common find on a wide range of sites (Cumberpatch 2014). Unfortunately they have been the subject of very little detailed study and are difficult to date with any accuracy. On the basis of the character of the fabric and finish, these examples are more likely to be mid to late 19th century or even early 20th century in date and might be broadly contemporary with each other.

Slag by Gerry McDonnell

Morphological examination

The slags and micro-residues recovered from the environmental sieving programme were visually examined and the classification is based solely on morphology. In general they are divided into two broad groups. First are the diagnostic ferrous material which can be attributed to a particular industrial process; these comprise ores and the ironworking slags, i.e. smelting and smithing slags. The second group, are the non-diagnostic slags, which could have been generated by a number of different processes but show no diagnostic characteristic that can identify the process. In many cases the non-diagnostic residues, e.g. hearth or furnace lining, may be ascribed to a particular process through archaeological association. The residue classifications are defined below.

Diagnostic ferrous slags and residues

Slag Block - a large mass of smelting slag that tapped into a pit either in front of, or beneath the furnace.

Smelting Slag - this smelting slag is characterised by flowed surfaces, the presence of droplets indicating that it had been fully liquid, although not free flowing. Large charcoal impressions may be present.

Hammer Scale - there are two forms of hammer scale, flake and spheroidal generated during the smithing process. The presence of hammer scale is therefore a strong indicator that smithing (primary or secondary) was carried out on the site. Their small size precludes their hand recovery, and they are usually recovered during soil sample sieving (for environmental data).

Non-diagnostic slags and residues

Hearth or Furnace Lining - the lining of an industrial hearth, furnace or kiln that has a vitrified or slag-attacked face. It is not possible to distinguish between furnace and hearth lining.

XRF analysis

The instrument used was a Bruker S1 Turbosdr hand-held XRF instrument operating at 15kV. A beam of x-rays is generated in the instrument and focussed on a fresh fractured surface of the sample, the x-rays interact with the elements present in the sample resulting in the emission of secondary x-rays which are characteristic (in terms of their energy and wavelength) of the elements present in the sample. The energies of the secondary x-rays are measured and a spectrum generated showing a level of background noise with peaks of the elements present superimposed on the background noise. Samples were analysed for 30 live seconds, and the spectrum is stored. All elements heavier than magnesium (Mg, Z=12), can be detected. The technique is non-destructive.

Metallographic examination of the sample of the slag block

A small fragment of the large slag block was removed and sent for examination. The slag sample was photographed, and a thick section was cut from the slag lump using a powered diamond cutting wheel. The thick section mounted in cold setting resin, ground and polished to a 1 micron finish. The specimens were examined in the as-prepared condition using a metallurgical reflected light microscope, with magnification ranging from x10 objective to x40 objective lenses to examine the slag mineralogy. Digital images were recorded.

Context 704

The slag block weighed 9.1kg and measured approximately 210 x 190 x 230mm (major diameter x minor diameter x depth; Plate 9). The sample from the slag block weighed 640g and had flowed exterior surfaces, with a sandy texture, due to burial in the sand and reaction of the slag with sand when molten. There were large gas vesicles on the surface and in the cut cross-section. This indicates that the slag was very molten. In section the slag was black in colour with no inclusions visible.

Context 704, sieved sample 700

Hand recovered samples from the sieving programme included one fragment of flowed smelting slag (weight 31g) and three fragments of furnace lining, which was predominantly heat affected sand rather than clay (weight 120g). The lining had also reacted with the slag. This indicates that the slag flowed into a pit cut into the sand, possibly lined thinly with clay.

Context 704, Sieved Sample 700

One small bag of the magnetic fraction from the environmental sieving programme (weight 3g) was examined under low powered binocular microscope (x10 magnification). The fragments were rounded particles of material, red in colour. There was no hammerscale present. The particles could either be fragments of slag, ore or natural iron rich material. Another smaller bag of a finer fraction (weight <1g) contained similar material.

The XRF analysis

The XRF analyses of the slag block sample and the fragment of smelting slag recovered from the sieving programme are compared in Fig. 9 and show that the slag block is richer in manganese (Mn). These spectra are also compared with a spectrum derived from a tap slag sample from the slag mound excavated in the field to the south at Greetwell Hall Farm (Fig. 10) which is also low in manganese. The analysis of the micro-residue showed that it was richer in silica and calcium compared to the slag block; this probably indicates that the material is magnetized natural stone fragments. The analysis of the lining sample confirmed a high silica content confirming that it is heat affected/slag attacked sand.

Metallographic Examination of the sample of the slag block

The polished sample displayed a typical slag microstructure (Plate 10) comprising silicate laths (*c*. 70%) with fine skeletal free iron oxide dendrites (*c*.10%) in a glassy matrix (*c*. 20%). There were occasional metallic prills and in some areas the free iron oxide occurred as globular dendrites.

Discussion

The significant find is the block of slag. The other residues, the lining, slag fragment and magnetic micro-residues, probably came off the slag block. The analysis of the slag block indicates two significant findings. Firstly the microstructure of the slag contains very little free iron oxide which indicates that the smelting process was very efficient. Secondly, the XRF analysis indicated a small but significant manganese content, which differs from the analysis of the tap fragment and a sample from the slag heap to the south across the road. Large slag blocks occur in the Iron Age, e.g. Welham Bridge, East Yorkshire (Halkon and Millet. 1999, 81-95), North Cave, East Yorkshire (McDonnell 1988b), and in the Saxon period, e.g. Romsey, Hampshire (McDonnell 1988a), Mucking, Essex (McDonnell 1993, Clark 1993) and Little Totham Essex (Adkins 1989). The size of the Messingham block is compared to the data from Welham Bridge (Clogg 1999) and Romsey (McDonnell 1988a). The data used are the weight of the block plotted against the volume using a calculation for an ellipsoidal cap, using the major diameter, minor diameter and depth of the block (Fig. 11). The Welham Bridge data are the mean values for the four slag block types defined by Clogg (1999, 86) and the Romsey data are the minimum, maximum and mean values of the

measurements (McDonnell 1988a, 3). This shows that the Messingham block is smaller than the Welham Bridge examples and is similar to the mean of the Romsey specimens.

The microstructure of the Messingham slag indicates a very efficient process. The smelters were able to extract nearly all the iron available in the ore as indicated by the very low volumetric phase percentage of free iron oxide remaining in the slag. Less efficient smelting processes result in greater quantities of free iron oxide remaining in the slag. As a result of this efficiency, the slag would have lower viscosity, which improves slag/metal separation.

The volumetric phase percentages of the silicate, free iron oxide and glass of the Messingham slag block are compared to similar slags from other sites (Table 1). The Welham Bridge data are the average of the phase percentages of the different classes of furnace bases and the overall average presented by Clogg (1999, 94). The North Cave data are the average of two samples taken from two furnace bases analysed by Bromley (2009). The Romsey data are the average from the analysis of four slag blocks after McDonnell (1988a). The most significant value is the quantity of free iron oxide remaining in the slag. The Messingham block has the lowest amount (10%), while the Welham Bridge Group FB4 slags have the lowest value of the other slags (13%). In addition both the Messingham block and the Welham Bridge slags are characterised by the silicate having crystallised out as laths indicative of fast cooling, whereas both the North Cave and Romsey blocks have massive silicate indicative of slow cooling. This may reflect where the samples were taken from; clearly the Messingham sample came from the surface of the block, whereas, for example, the Romsey sections were taken from nearer the core of the block.

Table. 1. Comparison of volumetric phase percentages of silicate, free iron oxide (FeOx) and glass from different sites

Site	**Type**	**Period**	**Silicate**	**FeOx**	**Glass**	**Silicate morphology**
Messingham	Block	?	70	10	20	Lath
Welham Bridge	FB1	IA	70	20	9	Lath
Welham Bridge	FB2	IA	77	18	5	Lath
Welham Bridge	FB3	IA	44	46	10	Lath
Welham Bridge	FB4	IA	75	13	12	Lath
Welham Bridge	mean	IA	69	19	12	Lath
North Cave	FB	IA	64	23	14	Massive
Romsey	Block	Saxon	67	16	17	Massive

Interpretation and Conclusion

The Messingham block is a slag block derived from highly efficient iron smelting. There is no chronological increase in technology as iron smelting progressed through the different

periods. For example there is no strong evidence to show that Saxon smelting was more efficient than Iron Age or Roman smelting. The XRF analysis indicates a small but significant manganese content which differs from the analyses of samples from the adjacent site at Greetwell Hall Farm.

It is most probable that the slag block is either of Iron Age date similar to the material recovered from Welham Bridge, (East Yorkshire) or is of Saxon date similar to the Romsey (Hampshire) slags. It is therefore either a stray find, indicative of iron smelting in the vicinity or if it is of Iron Age date there may be a slag mound similar to the Welham Bridge Site (Plate 11). If it is of Saxon date, then the slag blocks may be dispersed across the landscape similar to the slag fields recorded e.g. in Jutland (Pleiner 2000, Plate 12).

7 Environmental Record

Carbonised plant macrofossils and charcoal by Diane Alldritt

Bulk environmental samples were processed by ASWYAS using a Siraf style water flotation system (French 1971). The flots were dried before examination under a low power binocular microscope typically at x10 magnification. All identified plant remains including charcoal were removed and bagged separately by type.

Wood charcoal was examined using a high powered Vickers M10 metallurgical microscope at magnifications up to x200. The reference photographs of Schweingruber (1990) were consulted for charcoal identification. Plant nomenclature utilised in the text follows Stace (1997) for all vascular plants apart from cereals, which follow Zohary and Hopf (2000).

The two samples (700 and 3100) produced contrasting results with no charred remains recovered from pit 3108, whilst a good concentration of charcoal and hazel nutshell was present from ditch 703. The ditch produced 40ml of carbonised remains, with the majority of this found to be charcoal recovered in fragments up to 20mm in size. An element of intermittent waterlogging may have been present in both features with a few degraded, possibly originally waterlogged seeds, found in pit fill 3107 and some decayed bark fragments in ditch fill 704. Modern material in the form of straw fragments, seeds, and occasional earthworm egg capsules was found in small amounts indicating a degree of modern bioturbation in these deposits.

Table 2. Carbonised plant macrofossils and charcoal

	Sample	700	3100
	Context	704	3107
	Trench	Tr.7	Tr.31
	Feature	ditch 703	pit 3108
Charcoal	**Common Name**		
Quercus	oak	20 (10.46g)	
Carbonised Wild Resources			
Corylus avellana nutshell	hazel nutshell	16 (0.59g)	
Other Remains			
Bark fragments		10+	
Modern seeds		2	20+
Modern straw			20+
Earthworm egg capsules		1	
Coal			1

The single sample examined from the fill of ditch 703 in Trench 7 produced mainly charcoal plus some hazel nutshell. The charcoal was identified as being all *Quercus* (oak) found in flakes and chunks up to 20mm in size from both flot and retent. Some very abraded and degraded *Corylus avellana* (hazel) nutshell was present in the retent in fragments up to 10mm in size, although the majority was smaller. A small amount of bark fragments in the flot may suggest a degree of preservation by waterlogging in the deposit, although this was probably intermittent or seasonal. This discrete deposit of carbonised material in ditch 703 could be hearth waste or re-deposited burnt material from a fire pit, and probably originated from processing or cooking of hazel nuts for food with oak used as fuel. The deposit has the potential to represent prehistoric activity but this would require confirmation by radiocarbon dating the nutshell.

The lower fill (3107) of pit 3108 in Trench 31 produced no carbonised remains. A small number of degraded non-carbonised seeds present in the deposit may potentially have been waterlogged but could have been fairly recent intrusions.

8 Discussion and Conclusions

Feature visibility and reliability

The archaeological features that were revealed were clearly visible against the geological background and no problems were encountered in finding the depth or extent of features. A sufficient number of field drains and animal burrows were excavated to give confidence in the identification of archaeological features against these background features. Relatively few geological features were encountered.

Conclusions and recommendations

The evaluation found little in the way of archaeological evidence from the majority of the site. Almost all features investigated, particularly to the east of the site, proved to be land drains or of a post-medieval origin with the exception of the features in Trench 7.

Although the ditches found in Trench 7 remain undated, the slag block found in ditch 703 derives either from an Iron Age slag mound or a Saxon period 'slag field'. Both would represent significant discoveries that would require a further mitigation strategy to be designed to excavate and record this area should permission be granted for mineral extraction. The hazels nutshells recovered from the fill of the ditch give the option for radiocarbon dating which may provide a more accurate date for the slag. It should be noted that the remaining two ditches in Trench 7 are of a different alignment to ditch 703 and may not be contemporary despite of their close proximity.

Because of this slag block, there is potential for a research-based programme that would contribute to national and European knowledge of archaeometallurgy. This would add to the recent corpus of information obtained from excavations carried out on the slag mound to the south within the current quarry and potentially allow a unique insight into early iron smelting sites.

It is suggested that any further archaeological excavation on the site is concentrated on the area surrounding Trench 7, particularly with the aim of further investigating the topographical mound (Fig. 2) to provide more evidence for the date, phase and function of any metal working in that area. This should be preceded by geophysical survey of areas not previously surveyed that would be a reliable technique for the identification of iron-working sites (Andrew Josephs, *pers. comm*.)

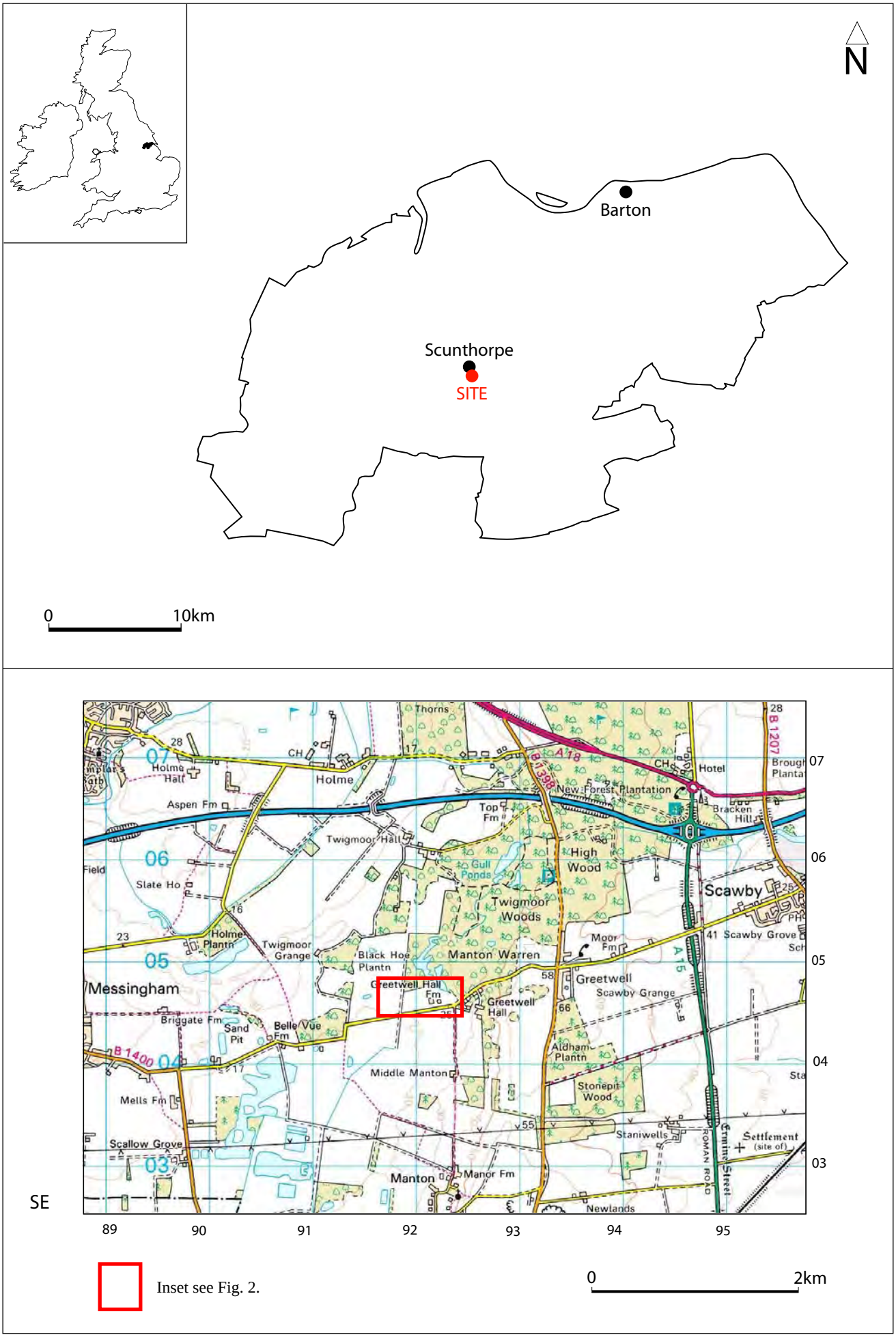


Fig. 1. Site location

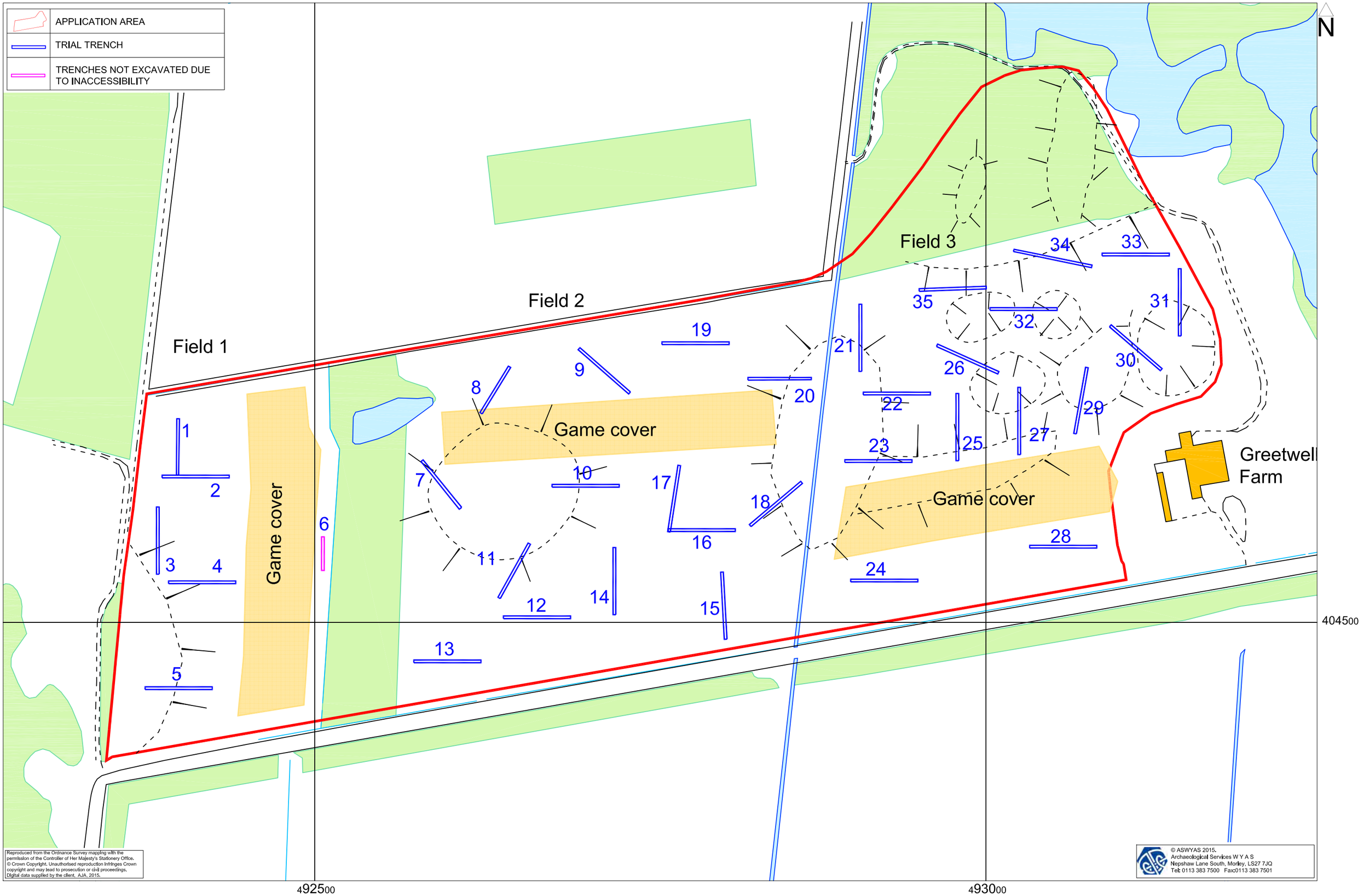


Fig. 2. Trial trench locations (1:2500 @ A3)

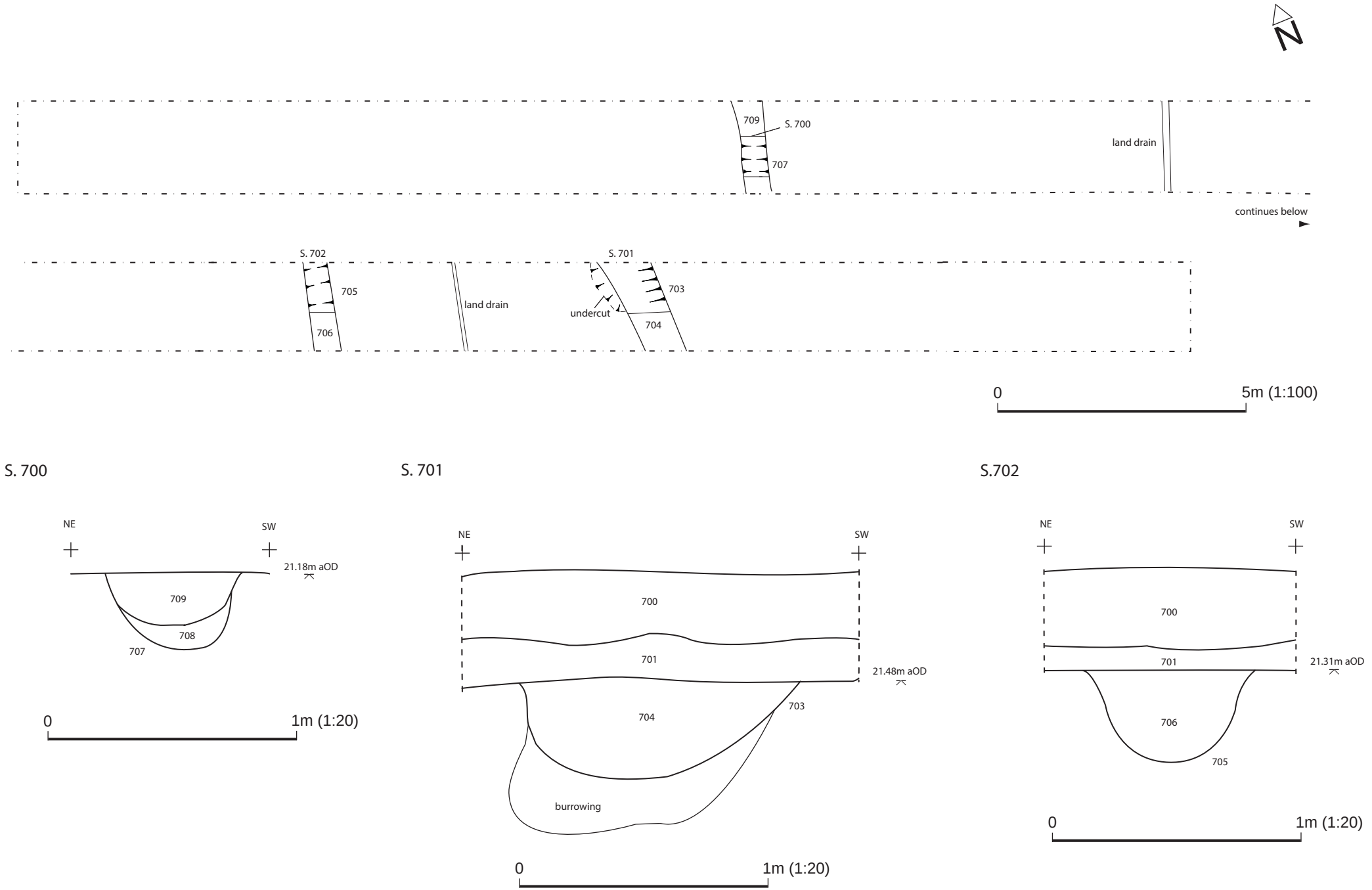


Fig. 3. Trench 7 plan and sections

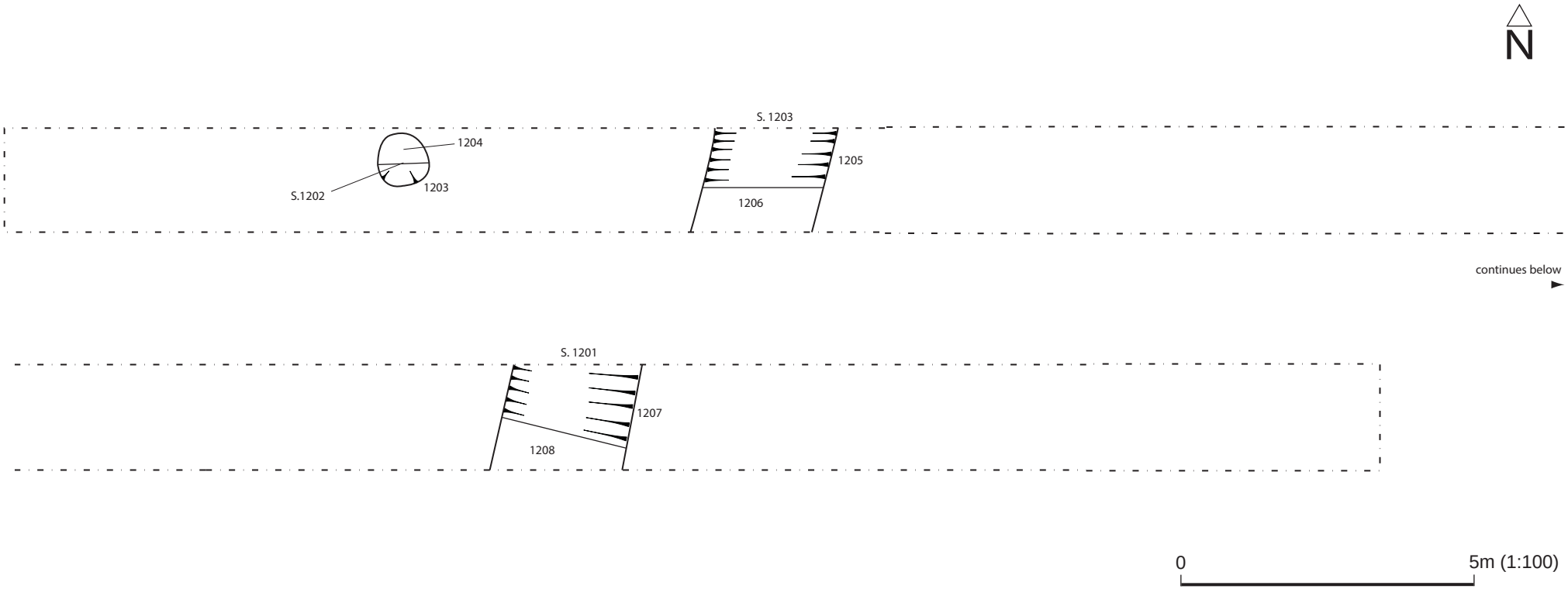
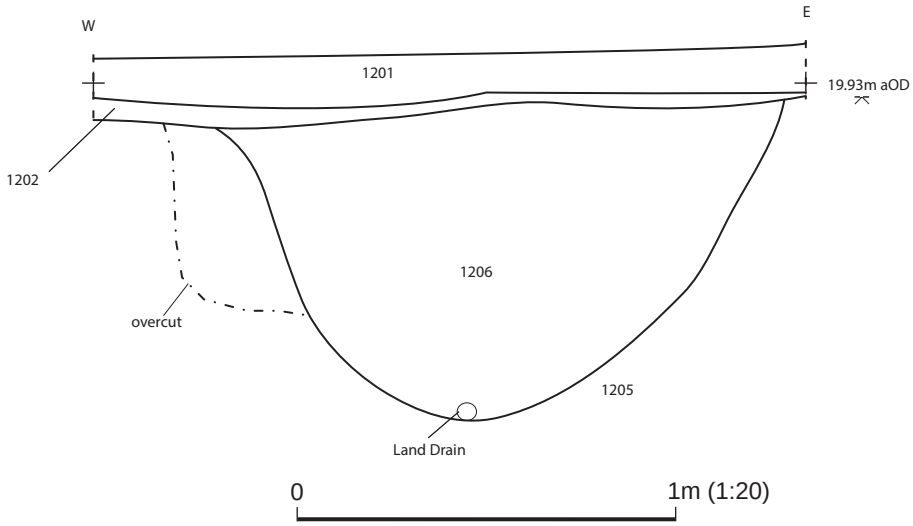


Fig. 4. Trench 12 plan

S. 1203



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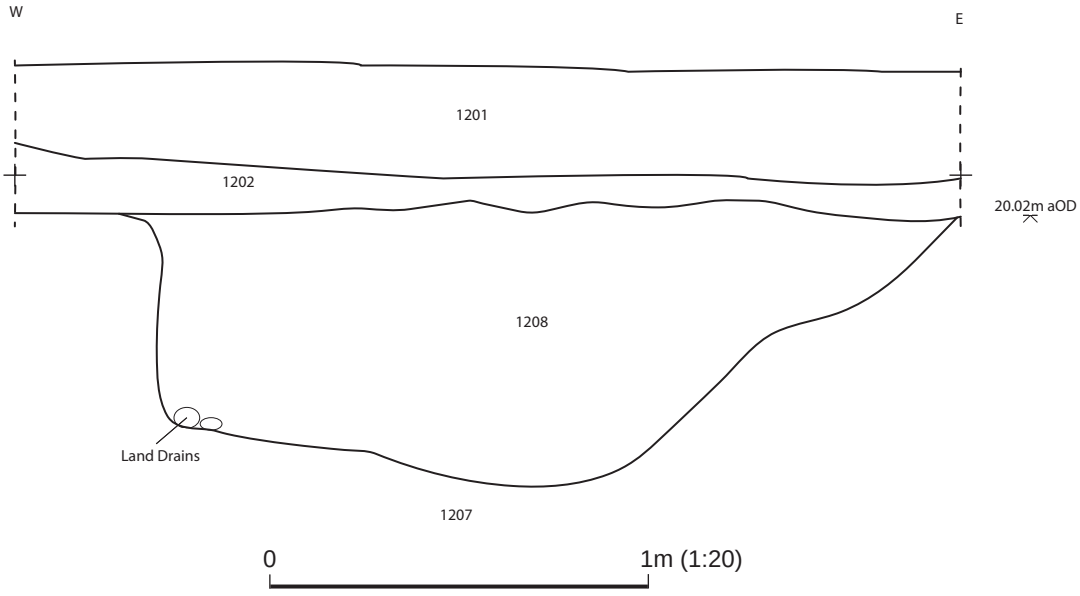

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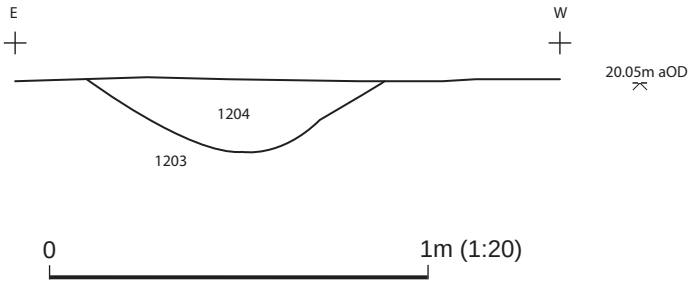
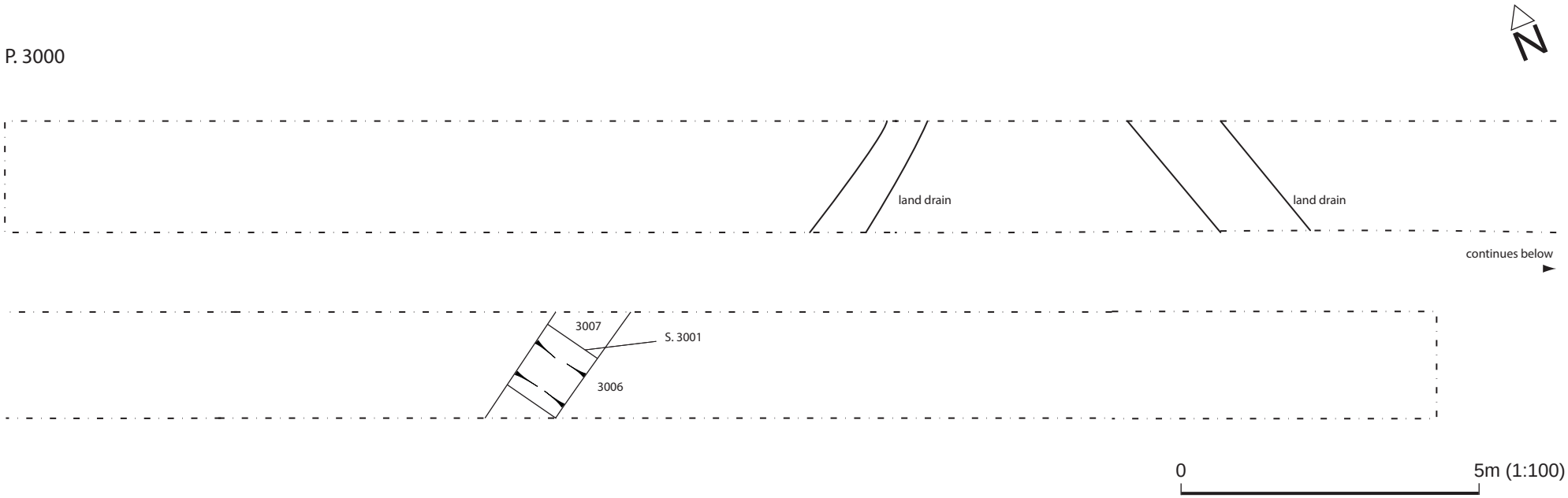


Fig. 5. Trench 12 sections



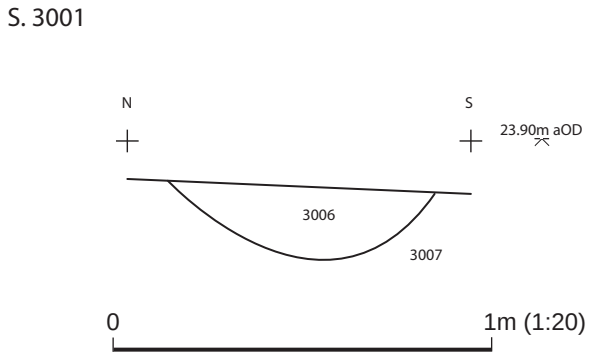


Fig. 6. Trench 30 plan and section

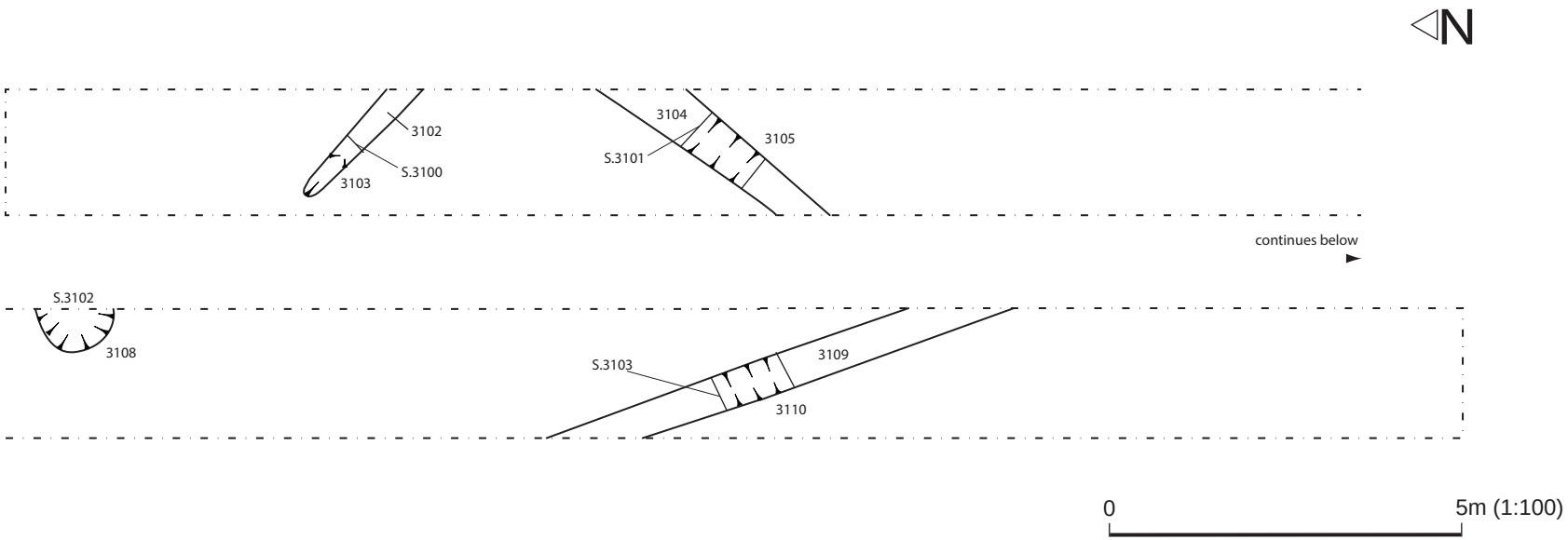


Fig. 7. Trench 31 plan

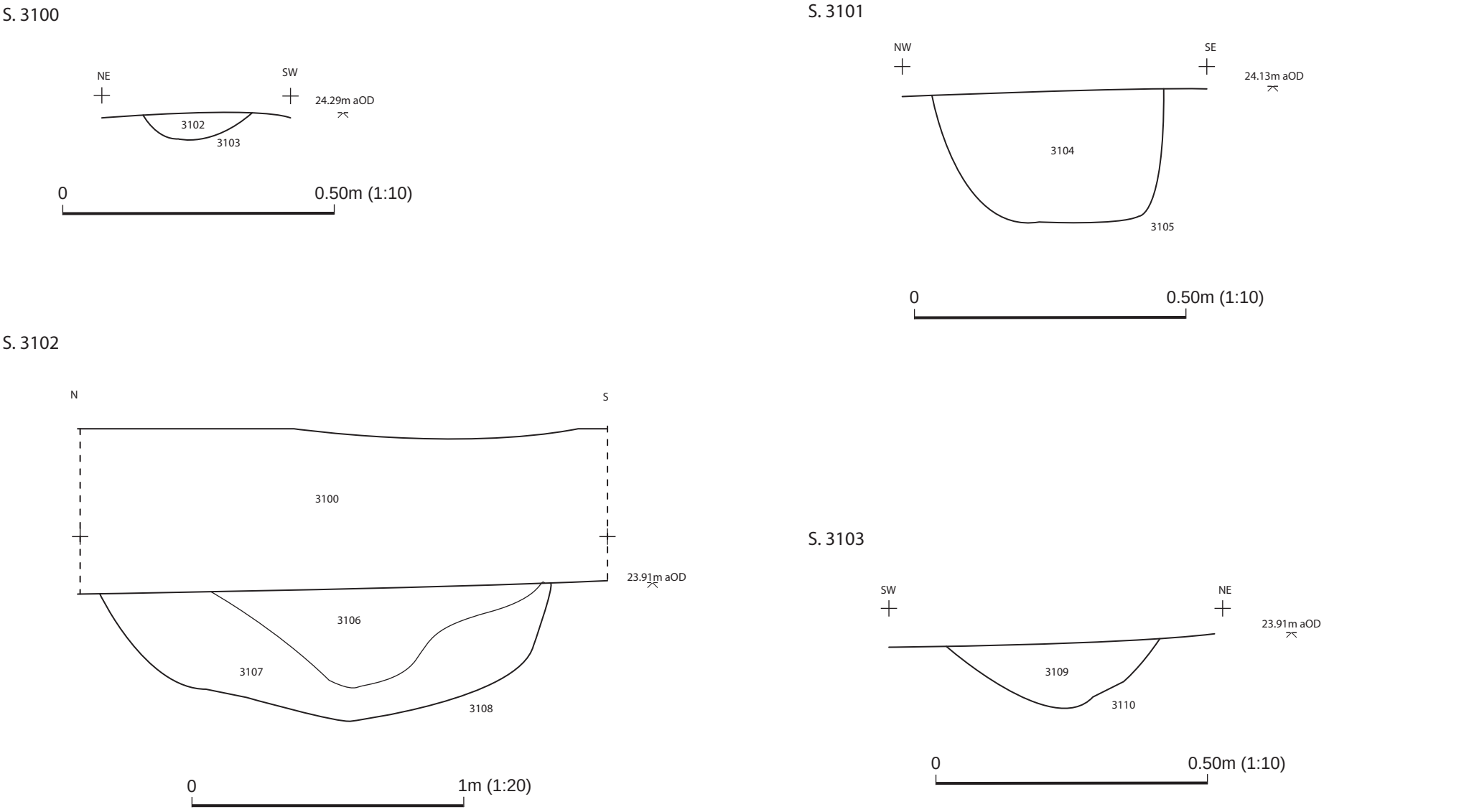


Fig. 8. Trench 31 sections

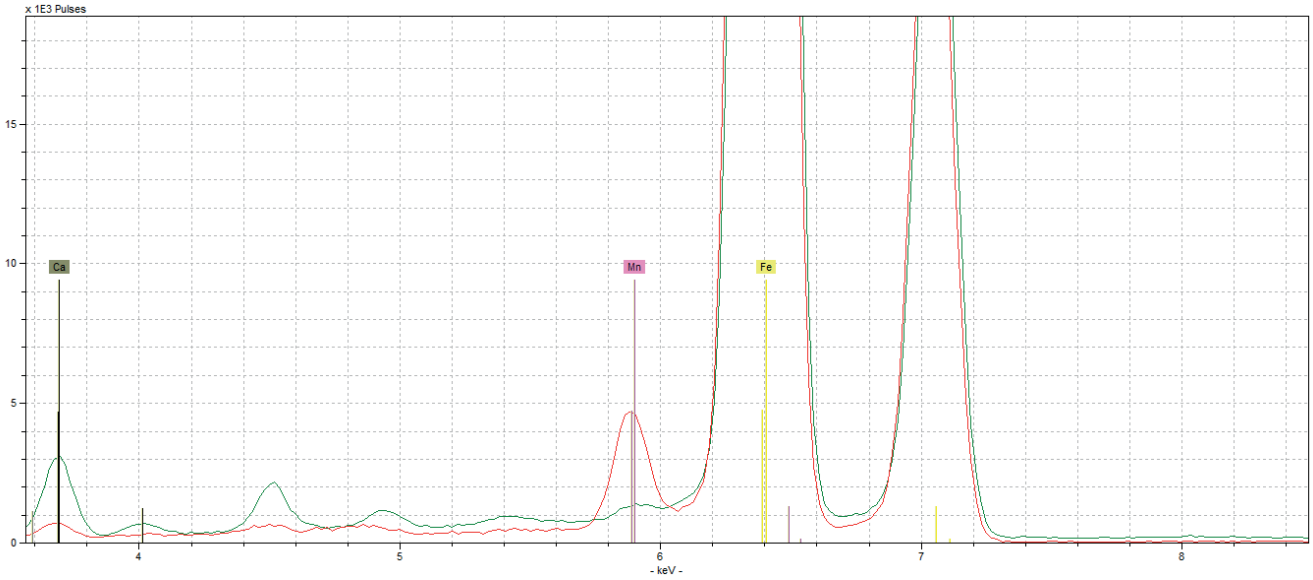


Fig. 9. Comparison of the spectrum from the slag block (red) with the tap slag fragment from the sieving programme (green)

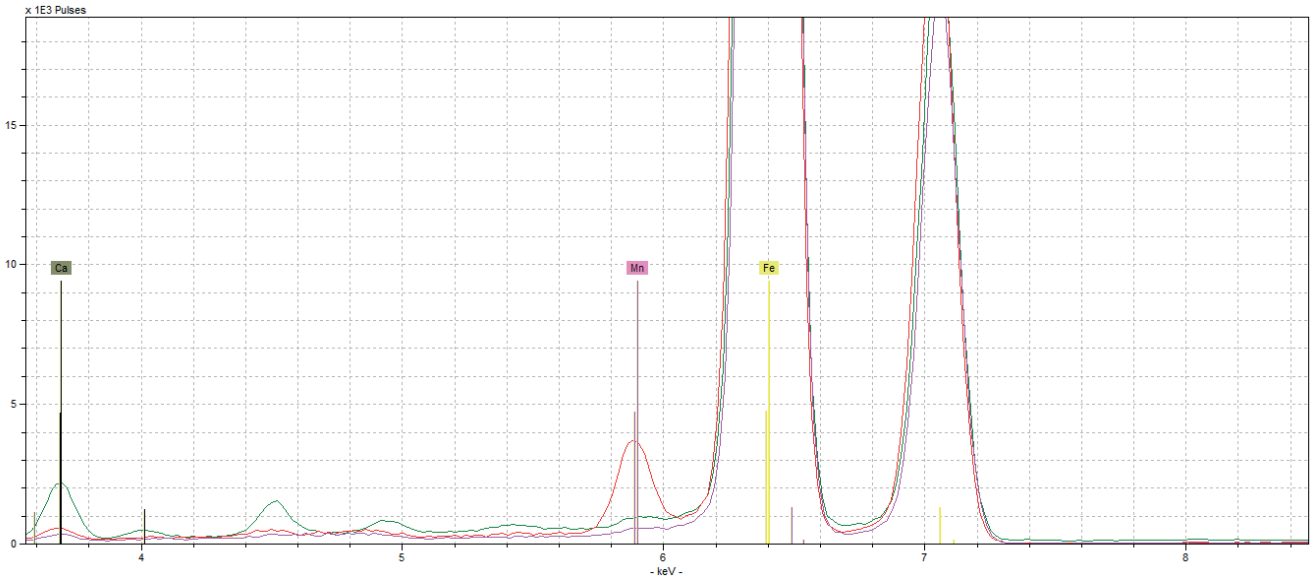


Fig. 10. Comparison of the spectrum from the slag block (red) with the tap fragment (green) and a sample from a sample from the Greetwell Hall Farm excavation (purple)

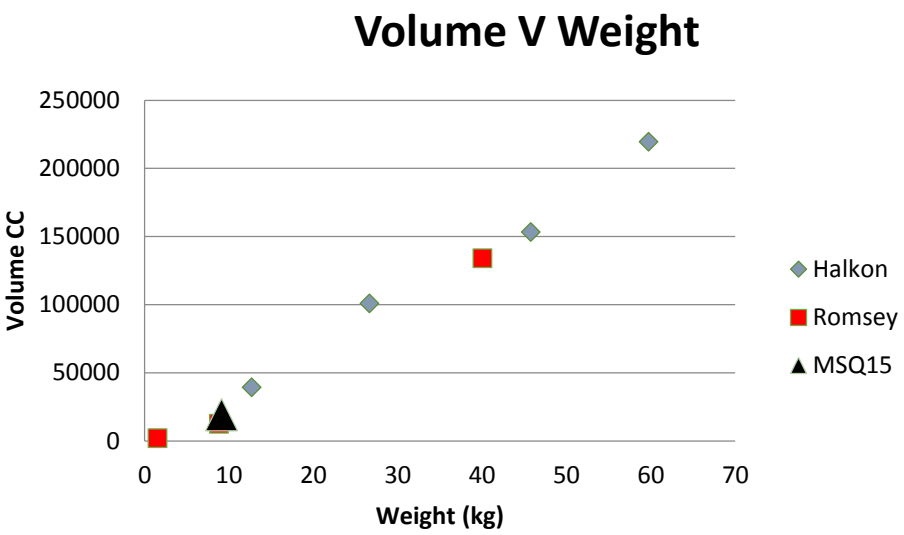


Fig. 11. Plot of the volume against weight of slag blocks from Welham Bridge and Romsey

Plate 1. General view of Trench 30, with grass removed for ecological work

Plate 2. Ditch 703, looking north

Plate 3. Ditch 1207, looking north

Plate 4. Pit 3108, looking east

Plate 5. Ditch 3110, looking north-west

Plate 6. Trench 25, looking north

Plate 7. Trench 28, looking west

Plate 8. Trench 27, looking south

Plate 9. Slag block from context 704

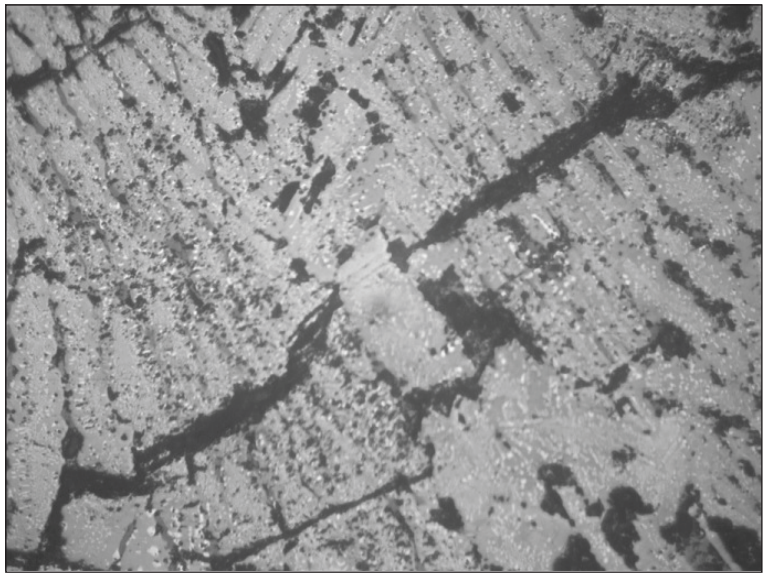


Plate 10. micrograph of the slag block sample showing silicate laths (grey) with free iron oxide (white) in a glassy matrix (black). (WoF=10mm)

Plate 11. Welham Bridge slag mound (Photo P Halkon)

Plate 12. Slag pits Snorup, Jutland (Pleiner 2000, Plate X)

Appendix 1: Written Scheme of Investigation

Greetwell Hall Farm, Messingham Quarry

North Lincolnshire

Archaeological Trial Trenching Project Design

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July 2015

Project Design for Archaeological Trial Trenching at Greetwell Hall Farm, Messingham Quarry, North Lincolnshire

1. Introduction

1.1 This Project Design has been prepared by Archaeological Services WYAS (ASWYAS) for Andrew Josephs Associates (AJA) in advance of archaeological trial trenching of land at Greetwell Hall Farm, Messingham, North Lincolnshire.

1.2 The scheme of work will be undertaken in accordance with the requirements of the National Planning Policy Framework (DCLG 2012), and relevant standards (CIfA 2014; Historic England 2008).

1.3 This document details a proposed programme of archaeological evaluation by trial trenching.

2. Site location and Description

2.1 The proposed quarry area is located 3.4km to the east of Messingham. It comprises three agricultural fields, bounded by Brigg Road to the south, agricultural land to the west and north with woodland and lakes to the north-east. The proposed quarry area covers *c.* 22 hectares and is centred at SE 928 046, located between 25-30m above Ordnance Datum (aOD).

3. Geology and Soils

3.1 The underlying bedrock comprises mudstone of the Charmouth Mudstone Formation, with superficial deposits of wind blown sand of the Sutton Sand Formation (British Geological Survey 2015). The soils in this area are classified in the Blackwood association, characterised as deep permeable sandy coarse loamy soils (Soil Survey of England and Wales 1983).

4. Archaeological Background

4.1 A small collection of prehistoric flints were recovered to the north of Greetwell farm (HER Number: 2158). Prehistoric flints were also recovered from the topsoil during a trial trench evaluation undertaken in 2007-8, one of which was given a potential Neolithic date (Dobson and Pouncett, 2009). Several other prehistoric flints have also been located further to the south of the site.

4.2 Following a geophysical survey (Dobson and Pouncett 2009) and a desk-based assessment on land to the south of the Proposed Development Area (PDA) (Gowans and Pouncett 2009a), trial trenching and subsequent excavations revealed evidence of iron working (Gowans and Pouncett 2009b; Clarke 2015). Based on radiocarbon dates, these significant iron smelting remains are of likely Early Iron Age date (Clarke 2015), in contrast to a putative post-Roman date proposed for iron slag deposits and associated ponds noted at Greetwell

Hall Farm (Dudley 1949, 143). Other features associated with the excavations were ditches of post-medieval or modern date (Clarke 2015).

4.3 Aerial photographs available online were examined as part of the current project (Andrew Josephs Associates 2015) and a possible squarish cropmark is evident from one photograph in the western part of the site. While this is likely to be the result of sub-surface drainage and cropping patterns, it cannot be entirely dismissed.

4.4 The PDA has also been subject to a geophysical survey by ArchaeoPhysica Ltd and a walkover survey by Oxford Archaeology (Andrew Josephs Associates 2015). The geophysical survey identified no anomalies of archaeological significance, and the walk-over survey identified no surface features in Fields 1 and 2. Undulating ridges and hollows in Field 3, however, may prove to be significant. 4.5 Possible medieval or post-medieval retting ponds (PastScapeID: 1458458) have been identified to the southwest of the site.

5. Aims and Objectives

5.1 The overall aim of the trial trench evaluation is to provide information on the presence or absence and the extent, character, chronology, depth of burial and degree of archaeological survival across the site. The results of the trial trenching will be used to inform the level and type of archaeological investigations that will be required to mitigate further extraction.

6. Fieldwork Methodology

6.1 All excavation will be undertaken in accordance with the relevant standards (CIfA 2014; Historic England 2008). The evaluation will involve the excavation of 36 trial trenches (see Fig. 1), although two trench locations (Trenches 6 and 36) were deemed inaccessible during a site visit on 22nd July due to the close proximity of game cover and dense vegetation respectively. Contingency trenching may be required at a later stage, when the same methodology would be employed. The locations of the trial trenches have been agreed with Alison Williams of North Lincolnshire HER in consultation with AJA. The general strategy is to target topographical features and to provide a spread of trial trenches across the proposed extraction. All trenches will measure 50m by 2m in size.

6.2 The trial trenches will 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 will the machine be used to cut arbitrary trenches down to natural deposits. Any machine work will 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 may be exposed by the machine, but will then be cleaned by hand and inspected for features.

6.3 No archaeological deposits will be entirely removed unless this is unavoidable in achieving the objectives of this evaluation, although all features identified are expected to be half-sectioned and the full depth of archaeological deposits will be assessed.

6.4 After planning, all archaeological features will be manually sample excavated in an archaeologically controlled and stratigraphic manner, in order to meet the aims and objectives.

6.5 Features will be sample excavated employing the following strategy:

- Linear features: sufficient excavation will be carried out to investigate the depth, profile and fills of a ditch or gully and to recover dating and environmental evidence from its fills. Normally this will involve a minimum of 10% sample dispersed along the length of the feature (each sample section to be not less than 1m wide), or a minimum of a 1m wide sample section, if the feature is less than 10m long, or if only a small part of it is exposed. With respect to trial trenches, one 1m section will be located and recorded adjacent to the trench edge. Feature intersections will always be excavated in a way that will allow a stratigraphic relationship to be determined.

- Discrete features: pits, post-holes and other discrete features will normally be half-sectioned by area to determine and record their form.

- Deposits or structures relating to iron-working, which may be encountered, will be half-sectioned to determine and record their form. All associated deposits will be sampled for the recovery of metallurgical debris (see below).

6.6 A full written, drawn and photographic record of all material revealed during the course of the work shall be made. The excavation limits will be surveyed using electronic survey equipment with larger scale hand drawn plans of features, at 1:20 or 1:50, being created as appropriate. Sections of linear and discrete features will be drawn at 1:10 or 1:20. All sections, plans and elevations will include spot-heights related to Ordnance Datum in metres as correct to two decimal places. Tie-in information will be undertaken during the course of the evaluation and will be fixed in relation to nearby permanent structures and roads and to the National Grid. The photographic archive will comprise monochrome negative photographs at a minimum format of 35mm, augmented by digital photographs taken using cameras with a resolution of at least 10 megapixels.

6.7 All excavated archaeological contexts shall be fully recorded by detailed written records, giving details of location, composition, shape, dimensions, relationships, finds, samples, and cross-references to other elements of the record and other relevant contexts, in accordance with best practice. All

contexts, and any small finds and samples from them will be given unique numbers. Bulk finds will be collected by context. 20th-century finds will be noted and discarded.

6.8 All artefacts will be removed from the site for assessment and analysis, and where it is appropriate, their find spots shall be recorded three dimensionally. Non-modern artefacts from the excavated topsoil and subsoil will be collected. Finds material will be stored in controlled environments, where appropriate. All artefacts recovered will be retained, cleaned, labelled and stored as detailed in the guidelines laid out in the CIfA (2014b). Any conservation work will be undertaken by approved conservators working to UKIC guidelines.

6.9 A soil-sampling programme shall be undertaken during the course of the investigation for the identification and recovery of carbonised and waterlogged remains, vertebrate remains, molluscs and small artefactual material. Metallurgical debris is a possibility on this site and samples will be processed accordingly (including scanning both flots and retents with a magnet for hammerscale). Historic England's Regional Science Advisor, environmental and soil specialists will be consulted during the course of the excavation with regard to the implementation of this sampling programme, should waterlogged deposits be identified. In the event of waterlogged deposits being found an Environmental Strategy will make provision for the potential study of waterlogged plant material, insects and parasites. Provision will be made for the removal of soil samples of a minimum 40 litres from deposits with clear potential, and larger samples from any organically-rich deposits. Samples may also be taken from seemingly sterile deposits. Particular attention will be paid to the sampling of primary ditch fills and any surviving buried soils beneath banks or other positive features. Environmental material removed from site will be stored in appropriate controlled environments. The collection and processing of environmental samples will be undertaken in accordance with guidelines set out by the Association for Environmental Archaeology (1995) and Historic England's Environmental Archaeology Guidelines (http://www.english-heritage.org.uk/publications/environmental-archaeology-2nd/environmental-archaeology-2nd.pdf). In addition, the processing of environmental samples will only take place within facilities approved for such purposes by Historic England's Regional Science Advisor.

6.10 In the event of human remains being discovered they will, in the first instance, be left *in situ*, covered and protected. Excavation of human remains at this evaluation stage is to be avoided if possible. If removal is required, this will only take place in compliance with the Burial Act 1857 and with an exhumation licence obtained form the Ministry of Justice prior to the removal of the remains. Provision will be made for the specialist reporting of the remains by a recognised osteoarchaeologist.

6.11 All finds of gold and silver and associated objects shall be reported to HM Coroner according to the procedures relating to the Treasure Act 1997.

6.12 Provision will be made for specialist dating if required, in particular radiocarbon dating.

7. Post-excavation Methodology

7.1 In addition to the site records, artefacts, ecofacts and other sample residues, the archive shall contain all the data collected during the excavation, including records, finds and environmental samples. It will be quantified, ordered, indexed and internally consistent. Archive consolidation will be undertaken immediately following the conclusion of fieldwork and will involve:

- the site record being checked, cross-referenced and indexed as necessary;
- retained finds being cleaned, stabilised, marked and packaged in accordance with the requirements of the recipient museum;
- retained finds being assessed and recorded using pro forma recording sheets, by suitably qualified and experienced staff. Initial artefact dating will be integrated within the site matrix; and
- retained environmental samples being processed by suitably experienced and qualified staff and recorded using pro forma recording sheets.

7.2 The integrity of the primary field record will be preserved. Security copies will be maintained where appropriate.

7.3 Provision will be made for the deposition of the archive, artefacts and environmental material, subject to the permission of the relevant landowner (and if no further archaeological work is to be initiated), in the North Lincolnshire Museum. The museum will be contacted before any fieldwork is undertaken in order to advise them of the proposed timetable and to take into account their requirements for the archive. The archive will otherwise be prepared in accordance with the UKIC (1990), the Museums and Galleries Commission (1994) and CIfA (2014c) guidelines. Provision will be made for the stable storage of paper records and their long-term storage.

7.4 Upon completion of the investigations, the artefacts, ecofacts and stratigraphic information shall be assessed to ascertain their potential and significance for further analysis.

7.5 An evaluation report will be prepared within an agreed timescale following the completion of on-site archaeological investigations and include the following:

i) Site code/project number; dates for fieldwork visits; location plan, and trench plans showing excavated features.

ii) A non-technical summary of the reason, aims and main results of the assessment.

iii) An introduction to outline the circumstances leading to the commission of the report and any restrictions encountered.

iv) The aims and objectives of the study.

v) The methodology used.

vi) A summary and synthesis of the archaeological results in relation to the methods used. This shall be supported by location plans and feature. Each figure will have a bar scale and accurately oriented north sign.

vii) An assessment of the importance of the results against a background of national, regional or local importance, where appropriate.

viii) Consideration of the future treatment of the remains and/or any further archaeological work necessary on site in advance of, or during, development.

ix) References to all primary and secondary sources consulted.

7.6 Following completion and submission of the report to the client, and compiling of the archive, copies of the report will be sent to the relevant Historic Environment Record, local authority Planning Officer and/or Conservation Officer. In addition, ASWYAS will make their work accessible to the wider research community by submitting digital data and copies of the report on line to OASIS.

7. Copyright, Confidentiality and Publicity

7.1 The copyright of any written, graphic or photographic record and reports produced as part of this project shall belong to the client, unless otherwise agreed, with ASWYAS being acknowledged as the originating body.

7.2 The circumstances under which the report or records can be used by other parties will be identified at the commencement of the project, as will the proposals for the distribution of the report. ASWYAS will respect any requirements regarding confidentiality, but will endeavour to emphasise the company's professional obligation to make the results of archaeological work known to the wider archaeological community within a reasonable time.

8. Health and Safety

8.1 All work will conform to the ASWYAS Health and Safety Policy (a copy of which can be supplied if requested), which makes particular reference to the FAME (Federation of Archaeological Managers and Employers) Health and Safety

Manual and will be carried out according to the relevant Health and Safety Legislation. This includes, in particular, the following regulations:

- Health and Safety at Work 1974
- Construction (Design and Management) Regulations 2007
- The Management of Health and Safety at Work Regulations 1999
- Personal Protective Equipment at Work Regulations 1992
- Provision and Use of Work Equipment Regulations 1998
- Manual Handling Operations Regulations 1992
- Workplace (Health, Safety and Welfare) Regulations 1992

8.2 In addition each project undergoes a 'Risk Assessment' which sets project specific Health and Safety requirements to which all members of staff are made aware of prior to on-site work commencing.

8.3 Health and Safety will take priority over archaeological matters. Necessary precautions will be taken with regard to protecting ASWYAS staff and the public.

8.4 Archaeological Services WYAS is a fully accredited member of the Contractors Health and Safety Assessment Scheme (CHAS).

9. Insurance

9.1 ASWYAS is covered by the insurance and indemnities of the City of Wakefield Metropolitan District Council. Insurance has been effected with: Zurich Municipal, PO Box 568, 1st Floor, 1 East Parade, Leeds, LS1 2UA (policy number QLA-03R896 0013). Any further enquiries should be directed to: City of Wakefield Metropolitan District Council, Corporate Services, Financial Services (Insurance, Room 403), County Hall, Bond Street, Wakefield WF1 2QW.

10. Quality

10.1 ASWYAS is an accredited ISO 9001:2008 organisation and a Registered Archaeological Organisation with the Chartered Institute for Archaeologists, operating to nationally agreed guidelines, processes and procedures. These are set within a framework that endeavours to carry out the required work and submit the final report in a manner that meets with our client's specific needs, providing quality assurance throughout the project and for the end product. These guidelines, processes and procedures are contained within a Quality Manual and all staff work in accordance with this manual.

11. Monitoring

11.1 A standard working day will involve driving to site, and machine monitoring and/or excavation and recording of features. Regular updating of the excavation work will be relayed back to the office by telephone.

Contacts

Manager: Jane Richardson	0113 393 9751
Excavation Manager: David Williams	0113 393 9756
Health and Safety Coordinator: Jane Richardson	0113 393 9751
Supervisor: Kevin Moon	0113 393 9747

11.2 The project will be monitored by AJA and Alison Williams as appropriate.

12. Staffing

12.1 Archaeological Services WYAS currently employs archaeological project officers, supervisors and assistant supervisors with extensive field experience. Summary Curriculum Vitae for staff likely to be employed on this project are detailed below together with their proposed role in the scheme.

Project Manager	David Williams BA MCIfA
Supervisor	Kevin Moon BA

Name:- David Williams BA MCIfA

Current Position:- Excavation Manager

Proposed Role:- Project Manager

David graduated from the University of York in 2005 with a BA in Archaeology having worked with Cambria Archaeology on the Iron Age defended enclosure project and the training excavation at Castell Henllys, before joining Archaeological Services WYAS in September 2005.

David has worked on a range of projects, including the excavation and evaluation of later prehistoric and Romano-British rural settlement sites at Newbridge Quarry, Pickering, A165 Reighton Bypass and at Pastures Road, Mexborough. Since 2007 he has worked in a supervisory capacity, overseeing the open-area excavation of extensive rural sites including at Darrington Quarry and Newbridge Quarry, Pickering. David managed the excavations along the 15km cable corridor for the Westermost Rough Offshore Windfarm in 2012 and has just competed the excavation of a post-medieval graveyard at Square Chapel, Halifax.

Name:- Kevin Moon BA

Current Position:- Archaeologist (Excavation)

Proposed Role:- Supervisor

Kevin graduated with a degree in Ancient History and Archaeology from the University of Reading in 2007. He worked for Oxford Archaeology from 2007-2014 on projects in both England and France before joining Archaeological Services WYAS in April 2014. Kevin has worked on a range of projects including the excavation of an Romano-British settlement in Didcot, Oxfordshire and the excavation of the cemetery at St. Paul's Church, Hammersmith as well as undertaking work on historic buildings at sites such as Upper Heyford, Oxfordshire. Since 2013 Kevin has worked in a supervisory role, running a variety projects for clients including Oxford University, The National Grid and Skanska-Balfour Beatty. Kevin has also produced numerous client reports for excavations, evaluations and watching briefs as well as writing desk-based assessments and contributing to larger publications. He has recently completed an evaluation of an Anglo-Saxon settlement at Pocklington, Yorkshire and the excavation of a post-medieval graveyard at Square Chapel, Halifax.

12.2 Archaeological Services WYAS project personnel may be subject to change.

12.3 External specialists may be required to support ASWYAS in the assessment of artefacts and the production of the report. The list below represents the most likely specialists to be involved, but may not be exhaustive.

Environmental remains	Diane Alldritt PhD
Metallurgical remains	Gerry McDonnell PhD
Prehistoric/Roman pottery	Ian Rowlandson
Flint	Ian Brooks
Animal bone	Jane Richardson PhD
Human bone	Malin Holst
Radiocarbon dating	SUERRC

13. References

Andrew Josephs Associates, 2015, *Land west of Greetwell Hall Farm, Manton, North Lincolnshire. Heritage Statement*

Association for Environmental Archaeology, 1995, *Working Paper No. 2, Environmental Archaeology and Archaeological Evaluations - Recommendations concerning the Environmental Archaeology Component of Archaeological Evaluations in England*

Dudley, H., 1949, Early Days in North-west Lincolnshire. A Regional Archaeology

British Geological Survey, 2015. http://mapapps.bgs.ac.uk/geologyofbritain/home.html (viewed 15th July 2015)

CIfA, 2014. *Standard and Guidance for Archaeological Field Evaluation*. Chartered Institute for Archaeologists

CIfA, 2014b, *Standard and Guidance for Collection, Documentation, Conservation and Research of Archaeological Materials.* Chartered Institute for Archaeologists

CIfA, 2014c, *Standard and Guidance for Creation, Compilation and Deposition of Archaeological Archives*

Clarke G., 2015, *Land at Greetwell Hall Farm, Messingham Quarry, Manton, North Lincolnshire*. Oxford Archaeology East report 1696

DCLG, 2012. *National Planning Policy Framework.* Department of Communities and Local Government

Dobson, S. and Pouncett, J., 2009, *Land at Greetwell Hall Farm, Messingham Quarry, Manton, Geophysical Survey*. ASE Ltd report

Gowans E. and Pouncett, J., 2009a, *Land at Greetwell Hall Farm, Messingham Quarry, Manton, Desk-based Assessment*. ASE Ltd report

Gowans E. and Pouncett, J., 2009b, *Land at Greetwell Hall Farm, Messingham Quarry, Manton, Trial Trench Evaluation*. ASE Ltd report

Historic England, 2008, *Management of Research Projects in the Historic Environment. Archaeological Excavation* (PPN3)

Museums and Galleries Commission, 1994, *Standards in the Museum Care of Archaeological Collections*

Soil Survey of England and Wales, 1983, Soils of Midland and Western England, Sheet 1.

UKIC, 1990, *Guidelines for the Preparation of Excavation Archives for Long-term Storage*, United Kingdom Institute for Conservation

Appendix 2: Inventory of primary archive

Phase	File/Box No	Description	Quantity
Evaluation	File no.1	Trench Sheets	34
		Context Sheets	33
		Sample register sheets	1
		Finds register sheets	1
		Photo register sheets	5
		Permatrace Sheets	10
		B&W negative strips	2

Appendix 3: Trench tables

Table 3. Trench 1

Trench 1					
General Description				**Orientation**	N-S
Trench contained three land drains; one on an east-west alignment, one on a northeast-southwest alignment and one on a northwesr-southeast alignment. None were excavated.				**Average Depth (m)**	0.35
				Width (m)	2.00
				Length (m)	40.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
100	Layer	-	-	0.20	Topsoil
101	Layer	-	-	0.15	Subsoil
102	Layer	-	-	-	Natural

Table 4. Trench 2

Trench 2					
General Description				**Orientation**	E-W
Trench contained two land drains; one on a northeast-southwest alignment and one on a northwest-southeast alignment. Neither was excavated.				**Average Depth (m)**	0.35
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
200	Layer	-	-	0.20	Topsoil
201	Layer	-	-	0.15	Subsoil
202	Layer	-	-	-	Natural

Table 5. Trench 3

Trench 3					
General Description				**Orientation**	N-S
Trench contained three land drains; two on a northeast-southwest alignment and one on an east-west alignment.				**Average Depth (m)**	0.40
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
300	Layer	-	-	0.24	Topsoil
301	Layer	-	-	0.16	Subsoil
302	Layer	-	-	-	Natural

Table 6. Trench 4

Trench 4					
General Description				**Orientation**	E-W
Trench devoid of archaeology.				**Average Depth (m)**	0.40
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
400	Layer	-	-	0.20	Topsoil
401	Layer	-	-	0.20	Subsoil
402	Layer	-	-	-	Natural

Table 7. Trench 5

Trench 5					
General Description				**Orientation**	E-W
Trench devoid of archaeology.				**Average Depth (m)**	0.34
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
500	Layer	-	-	0.24	Topsoil
501	Layer	-	-	0.10	Subsoil
502	Layer	-	-	-	Natural

Table 8. Trench 7

Trench 7					
General Description				**Orientation**	N-S
Trench contained a north-south aligned ditch with two fills, a second north-south aligned ditch with one fill and a northwest-southeast aligned ditch with one fill.				**Average Depth (m)**	0.38
				Width (m)	2.00
				Length (m)	45.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
700	Layer	-	-	0.20	Topsoil
701	Layer	-	-	0.18	Subsoil
702	Layer	-	-	-	Natural
703	Cut	1.80	1.12	0.40	‘U’-Shaped ditch with steeply sloping sides and a rounded base
704	Fill of 703	1.80	1.12	0.40	Heavily disturbed, dark brown-grey sandy silt
705	Cut	1.80	0.64	0.36	‘U’-Shaped ditch with steeply sloping sides and a flat base

706	Fill of 705	1.80	0.64	0.36	Dark brown-grey silty sand
707	Cut	1.80	0.54	0.38	'U'-Shaped ditch with steeply sloping sides and a rounded base
708	Fill of 707	1.80	0.54	0.18	Mid-orange-brown sand
709	Fill of 707	1.80	0.54	0.20	Dark grey-brown sandy silt

Table 9. Trench 8

Trench 8					
General Description				**Orientation**	N-S
Trench contained two drains on an east-west alignment.				**Average Depth (m)**	0.45
				Width (m)	2.00
				Length (m)	40.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
800	Layer	-	-	0.25	Topsoil
801	Layer	-	-	0.20	Subsoil
802	Layer	-	-	-	Natural

Table 10. Trench 9

Trench 9					
General Description				**Orientation**	N-S
Trench contained a three land drains on varying alignments and a tree bole.				**Average Depth (m)**	0.45
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
900	Layer	-	-	0.25	Topsoil
901	Layer	-	-	0.20	Subsoil

902	Layer	-	-	-	Natural
903	Cut	1.00	1.00	0.10	Tree bole
904	Fill of 903	1.00	1.00	0.10	Dark grey-brown sandy silt

Table 11. Trench 10

Trench 10					
General Description				**Orientation**	NE-SW
Trench contained a four land drains; three on a northeast-southwest alignment and one on a north-south alignment.				**Average Depth (m)**	0.42
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
1000	Layer	-	-	0.25	Topsoil
1001	Layer	-	-	0.17	Subsoil
1002	Layer	-	-	-	Natural

Table 12. Trench 11

Trench 11					
General Description				**Orientation**	N-S
Trench devoid of archaeology.				**Average Depth (m)**	0.45
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
1100	Layer	-	-	0.25	Topsoil
1101	Layer	-	-	0.20	Subsoil
1102	Layer	-	-	-	Natural

Table 13. Trench 12

Trench 12					
General Description				**Orientation**	NE-SW
Trench contained two large north-south aligned ditches, used for drainage, and a tree bole.				**Average Depth (m)**	0.40
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
1200	Layer	-	-	0.30	Topsoil
1201	Layer	-	-	0.10	Subsoil
1202	Layer	-	-	-	Natural
1203	Cut	0.85	0.78	0.20	Tree bole
1204	Fill of 1203	0.85	0.78	0.20	Very dark brown sandy silt
1205	Cut	1.80	1.47	0.83	Ditch
1206	Fill of 1205	1.80	1.47	0.83	Mid-grey-brown sandy silt. Very disturbed.
1207	Cut	1.80	2.16	0.74	Ditch
1208	Fill of 1207	1.80	2.16	0.74	Mid-grey-brown sandy silt. Very disturbed.

Table 14. Trench 13

Trench 13					
General Description				**Orientation**	E-W
Trench contained three drains on a northeast-southwest alignment.				**Average Depth (m)**	0.50
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
1300	Layer	-	-	0.40	Topsoil

1301	Layer	-	-	0.10	Subsoil
1302	Layer	-	-	-	Natural

Table 15. Trench 14

Trench 14					
General Description				**Orientation**	N-S
Trench devoid of archaeology.				**Average Depth (m)**	0.45
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
1400	Layer	-	-	0.25	Topsoil
1401	Layer	-	-	0.20	Subsoil
1402	Layer	-	-	-	Natural

Table 16. Trench 15

Trench 15					
General Description				**Orientation**	N-S
Trench contained two northeast-southwest aligned land drains.				**Average Depth (m)**	0.40
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
1500	Layer	-	-	0.25	Topsoil
1501	Layer	-	-	0.15	Subsoil
1502	Layer	-	-	-	Natural

Table 17. Trench 16

Trench 16					
General Description				**Orientation**	E-W
Trench devoid of archaeology. An area of burrowing was investigated.				**Average Depth (m)**	0.40
				Width (m)	2.00
				Length (m)	42.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
1600	Layer	-	-	0.25	Topsoil
1601	Layer	-	-	0.15	Subsoil
1602	Layer	-	-	-	Natural

Table 18. Trench 17

Trench 17					
General Description				**Orientation**	N-S
Trench contained a single land drain on a northeast-southwest alignment.				**Average Depth (m)**	0.50
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
1700	Layer	-	-	0.30	Topsoil
1701	Layer	-	-	0.20	Subsoil
1702	Layer	-	-	-	Natural

Table 19. Trench 18

Trench 18					
General Description				**Orientation**	NE-SW
Trench contained a single land drain.				**Average Depth (m)**	0.60
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
1800	Layer	-	-	0.30	Topsoil
1801	Layer	-	-	0.30	Subsoil
1802	Layer	-	-	-	Natural

Table 20. Trench 19

Trench 19					
General Description				**Orientation**	E-W
Trench contained two northeast-southwest aligned land drains.				**Average Depth (m)**	0.30
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
1900	Layer	-	-	0.20	Topsoil
1901	Layer	-	-	0.10	Subsoil
1902	Layer	-	-	-	Natural

Table 21. Trench 20

Trench 20					
General Description				**Orientation**	N-S
Trench devoid of archaeology.				**Average Depth (m)**	0.60
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
2000	Layer	-	-	0.24	Topsoil
2001	Layer	-	-	0.36	Subsoil
2002	Layer	-	-	-	Natural

Table 22. Trench 21

Trench 21					
General Description				**Orientation**	N-S
Trench devoid of archaeology.				**Average Depth (m)**	0.40
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
100	Layer	-	-	0.40	Topsoil
101	Layer	-	-	-	Natural

Table 23. Trench 22

Trench 22					
General Description				**Orientation**	E-W
Trench devoid of archaeology				**Average Depth (m)**	0.40
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
2200	Layer	-	-	0.40	Topsoil
2202	Layer	-	-	-	Natural

Table 24. Trench 23

Trench 23					
General Description				**Orientation**	E-W
Trench devoid of archaeology.				**Average Depth (m)**	0.50
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
2300	Layer	-	-	0.35	Topsoil
2301	Layer	-	-	0.15	Subsoil
2302	Layer	-	-	-	Natural

Table 25. Trench 24

Trench 24					
General Description				**Orientation**	E-W
Trench devoid of archaeology.				**Average Depth (m)**	0.40
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
2400	Layer	-	-	0.20	Topsoil
2401	Layer	-	-	0.20	Subsoil
2402	Layer	-	-	-	Natural

Table 26. Trench 25

Trench 25					
General Description				**Orientation**	E-W
Trench devoid of archaeology.				**Average Depth (m)**	0.50
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
2500	Layer	-	-	0.35	Topsoil
2501	Layer	-	-	0.15	Subsoil
2502	Layer	-	-	-	Natural

Table 27. Trench 26

Trench 26					
General Description				**Orientation**	NW-SE
Trench devoid of archaeology. Three animal burrows were investigated.				**Average Depth (m)**	0.40
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
2600	Layer	-	-	0.35	Topsoil
2601	Layer	-	-	0.05	Subsoil
2602	Layer	-	-	-	Natural

Table 28. Trench 27

Trench 27					
General Description				**Orientation**	N-S
Trench devoid of archaeology.				**Average Depth (m)**	0.45
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
2700	Layer	-	-	0.35	Topsoil
2701	Layer	-	-	0.15	Subsoil
2702	Layer	-	-	-	Natural

Table 29. Trench 28

Trench 28					
General Description				**Orientation**	E-W
Trench contained a single northwest-southeast aligned land drain with a ceramic pipe.				**Average Depth (m)**	0.50
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
2800	Layer	-	-	0.35	Topsoil
2801	Layer	-	-	0.15	Subsoil
2802	Layer	-	-	-	Natural

Table 30. Trench 29

Trench 29					
General Description				**Orientation**	NE-SW
Trench contained a single land drain on a northeast-southwest alignment with a ceramic pipe.				**Average Depth (m)**	0.36
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
2900	Layer	-	-	0.20	Topsoil
2901	Layer	-	-	0.16	Subsoil
2902	Layer	-	-	-	Natural

Table 31. Trench 30

Trench 30					
General Description				**Orientation**	E-W
Trench contained three land drains on a northeast-southwest alignment and a north-south alignment.				**Average Depth (m)**	0.45
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
3000	Layer	-	-	0.35	Topsoil
3001	Layer	-	-	0.10	Subsoil
3002	Layer	-	-	-	Natural
3003	Cut	1.80	0.90	-	'U'-shaped drainage ditch. Excavated to top of ceramic drain only
3004	Fill of 3003	1.80	0.90	0.19	Dark grey-brown sand with early modern pottery
3005	Cut	1.80			Modern drain (not excavated)
3006	Cut	1.80	0.70	0.19	Shallow 'U'-shaped drainage ditch
3007	Fill of 3006	1.80	0.70	0.19	Dark grey-brown sand with early modern pottery

Table 32. Trench 31

Trench 31					
General Description				**Orientation**	N-S
Trench contained three ditches and a pit.				**Average Depth (m)**	0.60
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
3100	Layer	-	-	0.60	Topsoil

3101	Layer	-	-	-	Natural
3102	Fill of 3103	1.80	0.24	0.06	Dark brown-grey silty sand
3103	Cut	1.80	0.24	0.06	Gully with 'U'-Shaped profile, steep sides and a rounded base
3104	Fill of 3105	3.60	0.57	0.32	Very mixed silty sand
3105	Cut	3.60	0.57	0.32	'U'-Shaped ditch with near vertical sides and a flat base
3106	Fill of 3108	1.15	0.60	0.18	Mid-brown silty sand
3107	Fill of 3108	1.15	0.60	0.48	Dark brown silty sand
3108	Cut	1.15	0.60	0.48	Pit, steep sides, rounded base
3109	Fill of 3110	8.00	0.52	0.16	Dark brown-green silty sand
3110	Cut	8.00	0.52	0.16	'V'-Shaped ditch with steep sides

Table 33. Trench 32

Trench 32					
General Description				**Orientation**	E-W
Trench devoid of archaeology.				**Average Depth (m)**	0.50
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
3200	Layer	-	-	0.50	Topsoil
3201	Layer	-	-	-	Natural

Table 34. Trench 33

Trench 33					
General Description				**Orientation**	E-W
Trench devoid of archaeology.				**Average Depth (m)**	0.35
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
3300	Layer	-	-	0.35	Topsoil
3302	Layer	-	-	-	Natural

Table 35. Trench 34

Trench 34					
General Description				**Orientation**	NW-SE
Trench contained a single ditch, used for drainage.				**Average Depth (m)**	0.55
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
3500	Layer	-	-	0.55	Topsoil
3501	Layer	-	-	-	Natural
3502	Fill of 3503	2.50	0.54	0.09	Dark grey silty sand
3503	Cut	2.50	0.54	0.09	Shallow ‘U’-Shaped ditch.

Table 36. Trench 35

Trench 35					
General Description				**Orientation**	E-W
Trench devoid of archaeology.				**Average Depth (m)**	0.50
				Width (m)	2.00
				Length (m)	50.00
Contexts					
Context	**Type**	**Length (m)**	**Width (m)**	**Depth (m)**	**Description**
3500	Layer	-	-	0.50	Topsoil
3501	Layer	-	-	-	Natural

Appendix 4: Concordance of contexts which yielded artefacts or environmental remains (all contexts are listed in Appendix 3 by trench)

Context	Trench	Description	Artefacts and environmental samples
704	7	Ditch fill	Slag, GBA 700
3004	30	Ditch fill	Pottery (2)
3007	30	Ditch fill	Pottery (1)
3107	31	Pit fill	GBA 3100

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