Evaluation at Cursey Lane Hardwicke Gloucestershire

Archaeological Evaluation

oxfordarchaeology south

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Archaeological Evaluation Report

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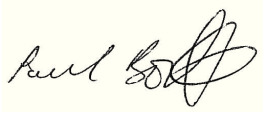
1	Vix Hughes Project Officer	Steve Lawrence Senior Project Manager	Paul Booth Senior Project Manager	

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Illustrated by	Georgina Slater

Janus House
Osney Mead
Oxford OX2 0ES
t: +44 (0) 1865 263800 e: oasouth@thehumanjourney.net
f: +44 (0) 1865 793496 w: oasouth.thehumanjourney.net
Oxford Archaeology is a Registered Charity No: 285627

Cursey Lane, Hardwicke, Gloucestershire

Archaeological Evaluation Report

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Summary

In April 2012, Oxford Archaeology South undertook a two-stage archaeological evaluation of land at Cursey Lane, Hardwicke, Gloucestershire.

The first stage comprised a detailed geophysical survey that identified extensive ridge and furrow cultivation remains and anomalies of possible archaeological origin that could be targeted during the second phase.

The second phase comprised the excavation of nine trial trenches. No features of archaeological significance were encountered. This also confirmed the presence of furrows within the full extent of the evaluation area. Artefacts recovered from these suggest that they were in use into the post-medieval period. Other possible archaeological features previously identified generally proved to be absent with the exception of two thermoremanent (heated/fired) responses within Trenches 6 and 9 and a small, undated pit within Trench 7. The thermoremanent responses proved to be of recent origin visible as cut features within the ploughsoil.

Several abraded sherds of Roman pottery and a fragment of tegula recovered from the furrow fills suggest a Roman presence within the vicinity although no features of this date were encountered. These artefacts may have alternatively arrived at the site as part of a manuring scatter or through other means of importation.

1 INTRODUCTION

1.1 Project details

1.1.1 Oxford Archaeology South (OAS), was commissioned by Fisher German LLP on behalf of Western Arable Services Ltd to undertake an archaeological geophysical survey and trial trench evaluation of land to the south of Cursey Lane, Hardwicke, Gloucestershire.

1.1.2 The work was undertaken to inform a planning application for the construction of a grain store, accompanying structures and landscaping that will impact upon approximately 4.5ha of current arable land. A detailed site specific brief was not issued. However, a requirement for a background historic record search and detailed geophysical survey to inform a subsequent 2% trail trench sample was specified by the Archaeological Planning Officer (Charles Parry). This document outlines how OAS implemented these requirements in accordance with local and national planning policies.

1.1.3 The information collated from the record search is presented as the Archaeological and Historical Background section below. A summary of the geophysical survey results is also included as part of the Results section below with the full report presented within the Appendices at the rear of this document.

1.1.4 The geophysical survey fieldwork was completed on 2nd April with the trial trench evaluation fieldwork undertaken between 16th and 18th April 2012.

1.2 Location, topography and geology

1.2.1 The development boundary encloses an area of approximately 4.5 hectares centred on National Grid Reference SO 8994 2819 (Fig. 1). The northern boundary of the site is formed by Cursey Lane with the eastern, southern and western sides being set within the hedge boundaries of a larger arable field. The surface topography of this field slopes gently from the high ground within the north-eastern corner at 21.5m aOD to approximately 18m aOD along the south-western boundary.

1.2.2 The underlying geology largely comprises deposits of the Rugby Limestone Member; alternating grey, argillaceous limestones and mudstones (BGS web site).

1.3 Archaeological and historical background

1.3.1 The development area lies within a landscape which contains a number of Scheduled Monuments, as well as a Registered Battlefield (Tewkesbury, 2.8km to the north). The Scheduled Monuments comprise Margaret's Camp, a moated site with associated remains (3.2km to the north), Deerhurst monastic site and multi-period settlement (3.5km to the west), Moat House moated site (3.8km to the south), a deserted medieval village (3.6km to the north) and the site of St Mary's Abbey (4.2km to the north-west).

1.3.2 Archaeological investigations in 1996-7 along the route of the Tewkesbury Eastern Relief Road (Walker et al. 2004), which lies 2.5km north of Cursey Lane, revealed a series of Bronze Age and Roman sites located along a low clay ridge, surrounded on three sides by the flood-plains of the Tirle Brook and the River Swilgate. Within the four excavation areas three distinct locations produced earlier prehistoric pottery, albeit in very small quantities, two of which revealed features and artefacts of Bronze Age date, while a third site produced a few residual late Neolithic/ Bronze Age artefacts but no features. The Bronze Age activity apparently intensified from the early 2nd millennium

BC, and was represented in archaeological terms by ditches, pits, at least one small enclosure, and a significant bronze-working site (Walker et al. 2004).

1.3.3 The Gloucestershire Historic Environment Record (HER) records three linear events that have crossed the south-eastern corner of the development boundary, all linked to the construction of the Gloucester Security of Supply Pipeline. The events comprise a desk-based assessment (DBA) (HER ref. 33192), geophysical survey (ref. 33518) and evaluation (ref. 33902), although none of these recorded the presence of archaeological remains within the this development boundary. Oxford Archaeology also undertook excavations and a watching brief along the pipeline, the nearest excavation site being at Fiddington, *c* 3.5km to the north-east, which recorded a complex of enclosures, probably on the periphery of a more extensive rural settlement. This was occupied from the 1st to the 4th century AD with an early Saxon presence suggested by the recovery of a single pottery sherd of this date.

1.3.4 The only other archaeological activity recorded by the HER within a 500m radius of the site, are some undated cropmarks (HER ref. 7716), a square enclosure (HER ref. 5542) and the findspot of Roman pottery sherds (HER ref. 5545) all situated *c* 450m to the south-west.

1.3.5 The development lies within the historic parish of Elmstone Hardwicke. Within the historic records the land was, until the 19th century, used mainly for arable farming, with the open arable fields covering the greater part of the parish until 1855, when Uckington was enclosed (VCH, 1968, 50-60). A review of late 19th and 20th century Ordnance Survey maps, dating from 1880 onwards, shows that the enclosing boundaries of this field have largely remained unchanged since 1884. No modern development or alteration of this field has taken place other than the addition of the Cursey Lane Caravan Park within the north-western corner of the field.

2 Evaluation Aims and Methodology

2.1 Geophysical survey

2.1.1 The geophysical survey was undertaken prior to the trial trench evaluation. The aims of this survey were;

- to establish the presence/absence of potential archaeological remains using non intrusive survey methods,
- to inform the trial trench layout and evaluation strategy.

2.2 Trial trench evaluation

2.2.1 The evaluation aimed to establish the archaeological potential of the site. To achieve this the objectives were;

- to establish the presence/absence of archaeological remains within the proposal/impact area,
- to establish the effectiveness of the geophysical survey results,
- to expose and examine potential archaeological features identified by the geophysical survey,
- to determine and confirm the character of any remains present, without compromising any deposits that may merit detailed investigation under full area excavation,

- to determine or estimate the date range of any remains from artefacts or otherwise,
- to characterise any underlying archaeological strata down to undisturbed geology without significantly impacting upon significant younger (overlying) deposits where possible,
- to determine the geo-archaeological and palaeo-environmental potential of any archaeological deposits encountered,
- to establish what archaeological remains/deposits may be affected by any proposed development,
- to make available the results of the investigation to inform the planning application and the potential for any further mitigation strategy,
- to produce a report and full archive,
- to disseminate the results of the investigation at a level appropriate to their importance.

2.3 Methodology

2.3.1 The fieldwork comprised the excavation of nine evaluation trenches (approximately 50m x 2m) representing a 2% sample of the 4.5ha area enclosed by the development boundary. These were arranged to specifically target possible archaeological features identified by the geophysical survey whilst also providing a trench distribution to evenly evaluate the whole area.

2.3.2 All trenches were excavated using a 13 tonne 360° mechanical excavator fitted with a 2m wide toothless ditching bucket under the direct supervision of an experienced archaeologist. The exposed surface of the natural clay, which was the first horizon encountered below the topsoil/subsoil, was sufficiently clean following machine excavation to establish the presence/absence of archaeological remains. Hand excavation of a number of features was undertaken to establish or confirm their origin and significance.

2.3.3 The trench locations, features and variations in the geological natural, along with levels for all trenches were recorded using a Leica GPS. Individual recorded points have an accuracy to within 0.075m.

2.3.4 All fieldwork was undertaken in accordance with standard OAS practices and the summary results were discussed with the Planning Archaeologist prior to backfilling. As the results were largely negative a monitoring site visit was not required by the Planning Archaeologist.

3 Results

3.1 Introduction and presentation of results

3.1.1 Summary results of the geophysical survey are presented below with the full report included at the rear of this document (Appendix E). The results of the trail trench evaluation follow with a general description of the non archaeological deposits and features encountered across the site along with more detailed descriptions of other features encountered within Trenches 7 and 9.

3.1.2 Individual trench summaries and context inventories are presented in Appendix A. The trench locations and associated features/deposits are presented on figures 2, 3 and 4.

3.2 Geophysical survey summary

3.2.1 A detailed gradiometry survey identified evidence of ridge and furrow cultivation and several positive anomalies indicative of former cut features of possible archaeological origin (see Fig. 2 and survey report, Appendix E). Two possible thermoremanent features were identified alongside a scattering of discrete anomalies possibly associated with archaeological pits. Patches of magnetic debris, magnetic spikes and a service within the south-eastern corner of the field are also evident in the data and are likely to be of modern origin.

3.3 General soil sequence and historic agricultural features

3.3.1 The underlying mudstone geology (Rugby Limestone Member) was consistently encountered within each trench as a deposit of weathered orange brown to greyish brown clay with paler grey silty clay patches and inclusions. Cut into the surface of the natural clay within Trenches 2-9 were a series of furrows aligned NNE-SSW. These ranged in surviving width from 1.2 m to over 3 m and were generally 0.2 m to 0.4 m deep where excavated and spaced 6 to 8 m apart centre to centre. Within Trench 1 a single furrow was identified aligned east to west probably marking the northern limit of the strip alignments to the south. The furrows encountered confirmed and enhanced the results of the geophysical survey, demonstrating that they are present across the whole field on the same alignment with the exception of the area to the north of Trench 2.

3.3.2 The furrows were sample excavated at six locations (Trenches 1, 4, 5, 6, 8 and 9) to establish that these were not concealing earlier features. No such instances were encountered. Artefacts recovered from the excavated sections provided a consistent post-medieval date but also included several small and abraded fragments of Roman pottery and a single piece of tegula tile.

3.3.3 A modern service trench (foul) was revealed in Trenches 4, 6 and 8. This truncated the fills of the furrows.

3.3.4 The current ploughsoil across the site averaged 0.35 m thick and had frequent inclusions of modern debris (not collected). The base of the topsoil also had a very diffuse and undulating boundary with the underlying geology and furrow fills as a result of deep ploughing.

3.4 Trench descriptions

Trench 6

3.4.1 Within the south-western end of the trench a modern shallow feature was noted (no issued context numbers) that was cut into the ploughsoil. This corresponds to the thermoremanent feature recorded by the geophysical survey.

Trench 7

3.4.2 Two small pits (705 and 708) were encountered within the northern part of Trench 7 (Fig. 3). Pit 705 was roughly oval-shaped in plan and measured 1.2 m by 0.7 m and 0.26 m deep and contained three fills (Fig. 3 section 700). The clayey fills had been tipped into the pit to backfill it with the earliest (704) being sterile and the final two deposits (703 and 702) containing varying amounts of burnt clay and charcoal inclusions. No artefacts were encountered from this feature. This pit corresponded to an anomaly identified by the geophysical survey.

3.4.3 Pit 708 was only partly exposed within the trench. This was 0.7 m across by 0.24 m deep (Fig. 3 section 701). This contained two fills, the lower (707) of which had frequent small inclusions of fired clay. The upper fill (706) comprised brown clay with occasional charcoal inclusions. Neither fill produced any artefacts other than amorphous fragments of fired clay.

Trench 9

3.4.4 Two features other than furrows were encountered within the eastern part of Trench 9. These comprised a small pit or posthole (903) and a large pit (902) (Fig. 4). The fill of the small pit produced a single fragment of modern glass. The large pit (902) measured 1.8 m by 1 m and was 0.46 m deep and was clearly cut through the current ploughsoil. The pit contained a single backfill (905) with wood fragments. The location of this feature corresponds to the thermoremanent feature recorded by the geophysical survey.

4 Discussion

4.1 Evaluation results in relation to the project objectives

4.1.1 The results of the evaluation fulfilled the objectives of the investigation establishing a clear absence of archaeological remains within the scope of the sample percentage. The combination of the geophysical survey and trench sample level can be viewed as a reliable means to establish the presence of all but the most scattered and ephemeral types of archaeological feature. The trial trench results also demonstrated that the geophysical survey was reasonably effective within the ground and geological conditions present at the site.

4.2 Interpretation and discussion

4.2.1 There is little to interpret or discuss further from these results. However, it should be noted that the small pits recorded within Trench 7 remain undated and that occasional fragments of Roman material were recovered from the fills of some furrows. However, the negative results of the evaluation coupled with the geophysical survey results would strongly suggest that no substantive remains of Roman origin, that would be likely to include ditched enclosures or similarly visible remains, are present within the development boundary.

Appendix A. Trench Descriptions and Context Inventory

Trench 1						
General description					**Orientation**	WNW-ESE
Trench contained one furrow aligned E-W. Geology comprised a mid orangey brown silty clay. No other features as suggested by the geophysical survey results were identified.					**Avg. depth (m)**	0.5
					Width (m)	2.0
					Length (m)	50.84
Contexts						
context no	**type**	**Width (m)**	**Depth (m)**	**comment**	**finds**	**date**
100	Layer	-	0.5	Ploughsoil	pot, nail, slag	19-20th C
101	Cut	1.4	0.1	Furrow	-	-
102	Fill	1.4	0.1	Furrow	pot/brick/tile	17-19th C
103	Layer	-	-	Natural clay	-	-

Trench 2						
General description					**Orientation**	N-S
Trench contained one furrow aligned NNE-SSW. Geology comprised a mid orangey brown silty clay. No other features as suggested by the geophysical survey results were identified.					**Avg. depth (m)**	0.35
					Width (m)	2.0
					Length (m)	50.9
Contexts						
context no	**type**	**Width (m)**	**Depth (m)**	**comment**	**finds**	**date**
200	Layer	-	0.3	Ploughsoil	-	-
201	Layer	-2	-	Natural clay	-	-
202	Fill	1.2	-	Furrow	nail	19th C or later
203	Cut	1.2	-	Furrow	-	-

Trench 3						
General description					**Orientation**	NNE-SSW
Trench contained one furrow aligned NNE-SSW. Geology comprised a mid orangey brown silty clay. No other features as suggested by the geophysical survey results were identified.					**Avg. depth (m)**	0.45-0.6
					Width (m)	2.0
					Length (m)	50.85
Contexts						
context no	**type**	**Width (m)**	**Depth (m)**	**comment**	**finds**	**date**
300	Layer	-	0.5	Ploughsoil	-	-
301	Layer	-	-	Natural clay	-	-
302	Fill	2.0	-	Furrow	pot	18-e19th C
303	Cut	2.0	-	Furrow	-	-

Trench 4						
General description					**Orientation**	NW-SE
Trench contained a service trench within the NW end and five furrows aligned NNE-SSW. Service trench same as that in Trenches 6 and 8. Geology comprised a mid orangey brown silty clay. No other features as suggested by the geophysical survey results were identified.					**Avg. depth (m)**	0.4
					Width (m)	2.0
					Length (m)	50.6
Contexts						
context no	**type**	**Width (m)**	**Depth (m)**	**comment**	**finds**	**date**
400	Layer	-	0.4	Ploughsoil	-	-
401	Layer	-	-	Natural	-	-
402	Cut	2.85	0.2	Furrow	-	-
403	Fill	2.85	0.2	Furrow	pot	c1780-1830

Trench 5						
General description					**Orientation**	NW-SE
Trench contained six furrows aligned NNE-SSW. Geology comprised a mid orangey brown silty clay. No other features as suggested by the geophysical survey results were identified. Residual abraded Roman pottery recovered from furrow fill 503.					**Avg. depth (m)**	0.4
					Width (m)	2.0
					Length (m)	50.75
Contexts						
context no	**type**	**Width (m)**	**Depth (m)**	**comment**	**finds**	**date**
500	Layer	-	0.4	Ploughsoil	-	-
501	Layer	-	-	Natural	-	-
502	Cut	3.3	0.2	Furrow	-	-
503	Fill	3.3	0.2	Furrow	pot, tile	Roman or later (residual)

Trench 6						
General description					**Orientation**	NE-SW
Trench contained five furrows aligned NNE-SSW and a Service trench. Service trench same as that in Trenches 4 and 8. Geology comprised a mid orangey brown silty clay. No other features as suggested by the geophysical survey results were identified. Residual fragment of Roman tegula tile recovered from furrow fill 603.					**Avg. depth (m)**	0.4
					Width (m)	2.0
					Length (m)	50.0
Contexts						
context no	**type**	**Width (m)**	**Depth (m)**	**comment**	**finds**	**date**
600	Layer	-	0.28	Ploughsoil	-	-
601	Layer	-	-	Natural	-	-
602	Cut	2.1	0.35	Furrow	-	-
603	Fill	2.1	0.35	Furrow	pot, brick, tile	18-19th C

Trench 7						
General description					**Orientation**	N-S
Trench contained three furrows aligned NNE-SSW. Two small undated pits containing fills with inclusions of fired clay corresponded to the geophysical survey results. Geology comprised a mid orangey brown silty clay.					**Avg. depth (m)**	0.4
					Width (m)	2.0
					Length (m)	51.2
Contexts						
context no	**type**	**Width (m)**	**Depth (m)**	**comment**	**finds**	**date**
700	Layer	-	0.28	Ploughsoil	-	-
701	Layer	-	0.22	Natural	-	-
702	Fill	0.55	0.26	Fill of pit 705	-	-
703	Fill	0.6	0.26	Fill of pit 705	-	-
704	Fill	1.0	0.22	Fill of pit 705	-	-
705	Cut	1.2	0.26	Pit	-	-
706	Fill	0.24	0.12	Fill of pit 708	-	-
707	Fill	0.34	0.18	Fill of pit 708	fired clay	-
708	Cut	0.7	0.24	Pit	-	-
709	Fill	-	-	Finds reference number for all furrows within the trench	pot, glass	19th C
710	Cut	-	-	Reference number for all furrows within the trench	-	-

Trench 8						
General description					**Orientation**	E-W
Trench contained seven furrows aligned NNE-SSW and a service trench. Service trench same as that in Trenches 4 and 6. Geology comprised a mid orangey brown silty clay. Residual abraded Roman pottery recovered from furrow fill 803.					**Avg. depth (m)**	0.5
					Width (m)	2.0
					Length (m)	52.2
Contexts						
context no	**type**	**Width (m)**	**Depth (m)**	**comment**	**finds**	**date**
800	Layer	-	0.5	Ploughsoil	-	-
801	Layer	-	-	Natural	-	-
802	Cut	1.9	0.4	Furrow	-	-
803	Fill	1.9	0.4	Furrow	pot	Roman

Trench 9						
General description					**Orientation**	WNW-ESE
Trench contained six furrows aligned NNE-SSW. Two modern pits corresponded to the geophysical survey results. Geology comprised a mid orangey brown silty clay.					**Avg. depth (m)**	0.3
					Width (m)	2.0
					Length (m)	51.7
Contexts						
context no	**type**	**Width (m)**	**Depth (m)**	**comment**	**finds**	**date**
900	Layer	-	0.3	Ploughsoil	-	-
901	Layer	-	-	Natural	-	-
902	Cut	1.8	0.5	Pit	-	-
903	Cut	0.4	0.1	Pit	-	-
904	Cut	3	0.4	Furrow	-	-
905	Fill	1.8	0.5	Fill of 902, includes wood	brick, glass	19th C+
906	Fill	0.4	0.1	Fill of 903	glass	19th C+
907	Fill	3	0.3	Furrow (upper fill)	brick	16-19th C
908	Fill	2.5	0.1	Furrow (primary fill)	-	-

APPENDIX B. FINDS REPORTS

B.1 Pottery

By John Cotter

Introduction and methodology

B.1.1 A total of 23 sherds of pottery weighing 266g were recovered from 8 contexts. These are mainly of post-medieval date although the assemblage also includes a few worn sherds of Roman pottery. All the pottery was examined and spot-dated. For each context the total pottery sherd count and weight were tabulated (see Table B1.1 below) followed by the context spot-date which is the date-bracket during which the latest pottery types in the context are estimated to have been produced or were in general circulation. Comments on the presence of datable types are also recorded, usually with mention of vessel form (jugs, bowls etc) and any other attributes worthy of note (eg decoration etc).

Date and nature of the assemblage

B.1.2 Apart from some of the more robust Victorian/modern wares the assemblage mostly comprises fairly small and mostly very worn sherds of pottery. Ordinary domestic pottery types are represented. These are detailed in the table and summarised here.

B.1.3 Seven or eight worn sherds of Roman pottery were recovered including three from context 803. These include a flanged bowl rim in Malvernian ware and a couple of worn body sherds in pink-buff Severn Valley ware. These provide only a very broad dating of *c* AD 40-400 although they were recovered from the fill of a furrow rather than a feature of that date. Context 503 produced two very small worn scraps of pottery one of which can probably be identified as Roman Malvernian ware. The other is in an oolitic limestone-tempered fabric but is too small to ascertain whether this is late Iron Age/Roman or whether it is a late Saxon/early medieval sherd of Cotswolds-type ware (*c* 850-1250) - as oolitic limestone tempering was commonly used in Gloucestershire during both periods. The CBM from this context is also ambiguous and on balance the context is perhaps more likely to be Roman than medieval - although all these pieces are redeposited within the fills of furrows.

B.1.4 The remaining pottery is all post-medieval including a sherd or two of 17th-18th century post-medieval glazed red earthenwares. Most of the assemblage comprises the mass-produced products of Staffordshire and Midlands potteries dating from *c* 1780 onwards, including transfer-printed whitewares. There are also a few pieces of red terracotta flowerpot and a modern stoneware flagon rim with internal screw-thread indicating a date after *c* 1880. All of the pottery, even the robust Victorian wares, is very abraded and characteristic of being redeposited and continually reworked as could be expected from a ploughsoil.

Table B1.1

Context	Spot-date	No.	Weight	Comments
100	c1880-1925+	10	129	Rim, with internal screw thread, from modern stoneware flagon with brown Bristol-type glaze. 4x blue TPW. Bs Yellow ware. 1x PMR bowl rim. 2x red terracotta flowerpot incl worn rim. 1x worn bs orange-buff med or Roman?
102	17-18C?	1	7	V worn ?dish rim in glazed post-med red earthenware (PMR)
302	18-E19C?	1	80	Worn rim from large jar in late-looking Midlands blackware - glaze mostly below the rim int and ext. Orange-buff ?coal measures fabric
403	c1780-1830	3	8	Scraps incl Pearlware blue feather-edge dish rim. Bs PMR. 1x worn brown sandy sherd - poss Roman Malvernian ware?
503	Roman or later	2	2	Small worn scraps. 1x small bs grey-brown fabric with quartz & oolitic limestone inclusions - poss LIA/Roman or just poss late Saxon/early med Cotswolds-type ware? 1x brown scrap poss Roman Malvernian ware?
603	18-19C+	1	16	Bs red terracotta flowerpot
709	c1825-1900	2	5	Small bs Staffs transfer-printed whiteware (TPW). 1x small worn bs poss Roman Severn Valley ware? Soft fine orange with grey core
803	cAD 40-400	3	19	Roman wares - all worn. Includes flanged bowl rim in Malvernian ware with sparse coarse granitic inclusions. 2x worn pink-buff Severn Valley ware with pale grey core. Ident by Paul Booth
TOTAL		**23**	**266**	

B.2 Ceramic building material and fired clay

By John Cotter

B.2.1 A total of 14 pieces of CBM weighing 478g were recovered from 5 contexts. These were examined, spot-dated and the data tabulated in the same manner as the pottery (see Table B2.1 below). The dating of broken fragments of ceramic or other building materials is often problematic and the spot-dates given are necessarily broad and should be regarded with caution. The assemblage is scrappy and worn and is described in more detail in the table with only summary results presented in the following text.

B.2.2 A worn piece of Roman tegula was recovered from deposit 603 but this occurred residually with a piece of post-medieval brick and a piece of flowerpot. A couple of other possible Roman brick/tile scraps were noted in other contexts. The remaining CBM comprises small pieces of post-medieval red brick. With the exception of the item from deposit 905, all of the assemblages were recovered from the fills of furrows.

Table B2.1

Context	Spot-date	No.	Weight	Comments
102	17-19C?	3	85	2x scraps post-med red brick - 1 poss 18/19C? 1x v worn scrap poss Roman pale brown brick/tile?
503	Roman/post-Roman?	1	2	Small shapeless scrap brick/tile - prob undatable
603	16-18C?	2	344	1x small worn scrap possibly early post-med orange sandy brick with coarse quartz - but not impossibly Roman? 1x large flattish end frag from a thick Roman tegula in a hard coarse pale brown fabric with much quartz and rare white quartz pebbles, very worn, 26mm thick, max length 120mm. Traces of knife-cut chamfer leading to missing flange.
905	16-19C?	1	13	Worn scrap soft red-brown post-med brick
907	16-19C?	7	34	Worn shapeless scraps post-med red brick & poss tile?
TOTAL		**14**	**478**	

B.2.3 In addition to the brick and tile, deposit 707 produced 16 pieces of fired clay (54g). These are small and very worn shapeless lumps or scraps under 25mm across. They have a similar hard greyish-brown fabric with reddish patches. Very little can be said about these apart from the fact that they probably came from a structure of some sort and they appear to be ‘ancient’. However, no reliable date may be attributed to these fragments.

B.3 Clay tobacco pipes

By John Cotter

B.3.1 Three small pieces of clay pipe weighing 6g were recovered from context 100. These are all pieces of slender pipe stem of probable 19th-century origin.

B.4 Glass, iron and slag

By Geraldine Crann and Ian Scott

Table B4.1

Context	Description	Date
100	Single nail, 7g.	19thC or later
100	Single piece of slag, 58g.	-
202	Single nail stem, 3g.	19thC or later
503	Single piece of clinker, 4g.	-
709	Single sherd olive green wine bottle glass, 4g.	19thC or later
905	Single sherd clear glass, one sherd clear moulded glass, 3g.	19thC or later
906	Single sherd clear moulded glass, 2g.	19thC or later

Appendix C. Bibliography and References

BGS web site http://maps.bgs.ac.uk/geologyviewer_google/googleviewer.html

Elrington, C. R (ed), 1968 *A history of the county of Gloucester, Volume VIII Tewkesbury and the Northern Vale:Cleeve Hundred: Bishop's Cleeve,* Victoria County History, Oxford.

Walker, G, Thomas A and Clifford, B, 2004 Bronze Age and Romano-British sites south-east of Tewkesbury: evaluations and excavations 1991–7. T*ransactions of the Bristol and Gloucestershire Archaeological Society* **122**, 29–94

Appendix D. Summary of Site Details

Site name:	Cursey Lane, Hardwicke, Gloucestershire
Site code:	ELMC12
Grid reference:	SO 8994 2819
Type:	Evaluation
Date and duration:	i. Geophysical Survey 2nd April 2012
	ii. Trial Trench Evaluation16th to 18th April 2012
Area of site:	4.5ha

Summary of results:

In April 2012, Oxford Archaeology South undertook a two-stage archaeological evaluation of land at Cursey Lane, Hardwicke, Gloucestershire.

The first stage comprised a detailed geophysical survey that identified extensive ridge and furrow cultivation remains and anomalies of possible archaeological origin that could be targeted during the second phase.

The second phase comprised the excavation of nine trial trenches. No features of archaeological significance were encountered. This also confirmed the presence of furrows within the full extent of the evaluation area. Artefacts recovered from these suggest that they were in use into the post-medieval period. Other possible archaeological features previously identified generally proved to be absent with the exception of two thermoremanent (heated/fired) responses within Trenches 6 and 9 and a small, undated pit within Trench 7. The thermoremanent responses proved to be of recent origin visible as cut features within the ploughsoil.

Several abraded sherds of Roman pottery and a fragment of tegula recovered from the furrow fills suggest a Roman presence within the vicinity although no features of this date were encountered. These artefacts may have alternatively arrived at the site as part of a manuring scatter or through other means of importation.

Location of archive:

The archive is currently held at Oxford Archaeology, Janus House, Osney Mead, Oxford, OX2 0ES. This will be deposited with Cheltenham Museum in due course under the accession number CAGM:2012.12.

APPENDIX E. GEOPHYSICAL SURVEY REPORT

STRATASCAN

Geophysical Survey Report

Document Title:	**Geophysical Survey Report** **Cursey Lane, Elmstone Hardwick, Gloucestershire**
Client:	**Oxford Archaeology**
Stratascan Job No:	**J3080**
Techniques:	**Detailed magnetic survey (gradiometry)**
National Grid Ref:	**SO 899 282**
Date of Fieldwork:	**2nd April 2012**

Plate 1: The survey area viewed from the north, looking south

Field Team:	**Glenn Rose BA (Hons) & Sean Parker BSc (Hons)**
Project Manager:	**Simon Haddrell B.Eng (Hons) AMBCS PIFA**
Report written by:	**Bryony P Marsh BA**
CAD illustration by:	**Bryony P Marsh BA**
Checked by:	**Peter Barker C.Eng MICE MCIWEM MIFA FCInstCES**

Stratascan Ltd.

Vineyard House
Upper Hook Road
Upton upon Severn
WR8 0SA

Tel: 01684 592266
Fax: 01684 594142
Email: ppb@stratascan.co.uk

www.stratascan.co.uk

LIST OF FIGURES

1 SUMMARY OF RESULTS

A detailed gradiometry survey was conducted over approximately 4.5 hectares of agricultural land close to Elmstone Hardwick in Gloucestershire. The data collected has identified evidence of probable ridge and furrow cultivation and several positive anomalies indicative of former cut features of possible archaeological origin. Two possible thermoremanent features have been identified alongside a scattering of discrete anomalies possibly associated with archaeological pits. Patches of magnetic debris, magnetic spikes and a service are also evident in the data and are likely to be of modern origin.

2 INTRODUCTION

2.1 Background synopsis

Stratascan were commissioned to undertake a geophysical survey of an area outlined for development. This survey forms part of an archaeological investigation being undertaken by Oxford Archaeology.

2.2 Site location

The site is located near Elmstone Hardwick in Gloucetsteshire at OS ref. SO 899 282.

2.3 Description of site

The survey area consists of approximately 4.5ha of agricultural land, under short crop during the survey. One area located to the north of the site, was unsurveyable due to the presence of a horse, tethered using a metallic chain which would have affected the data collected.

2.4 Geology and soils

The site lies on the border of two different underlying geologies: the majority of the survey area is Rugby Limestone Member – mudstone and limestone interbedded, however a small area in the north eastern corner is classified as Charmouth Mudstone Formation (British Geological Survey website 2012). There is no drift geology recorded on the site (British Geological Survey website 2012).

The overlying soils are known as Evesham 2 which are typical calcareous pelosols. These consist of slowly permeable calcareous clayey soils, some slowly permeable with seasonal waterlogging (Soil Survey of England and Wales, Sheet 5 South West England).

2.5 Site history and archaeological potential

No specific details were made available to Stratascan.

2.6 Survey objectives

The objective of the survey was to locate any features of possible archaeological significance in order that they may be assessed prior to development.

2.7 Survey methods

Detailed magnetic survey (gradiometry) was used as an efficient and effective method of locating archaeological anomalies. More information regarding this technique is included in the Methodology section below.

3 METHODOLOGY

3.1 Date of fieldwork

The fieldwork was carried out over one day on the 2nd April 2012. Weather conditions during the survey were fine and dry.

3.2 Grid locations

The location of the survey grids has been plotted in Figure 1 together with the referencing information. Grids were set out using a Leica Smart Rover RTK GPS.

An RTK GPS (Real-time Kinematic Global Positioning System) can locate a point on the ground to a far greater accuracy than a standard GPS unit. A standard GPS suffers from errors created by satellite orbit errors, clock errors and atmospheric interference, resulting in an accuracy of 5m-10m. An RTK system uses a single base station receiver and a number of mobile units. The base station re-broadcasts the phase of the carrier it measured, and the mobile units compare their own phase measurements with those they received from the base station. A SmartNet RTK GPS uses Ordnance Survey's network of over 100 fixed base stations to give an accuracy of around 0.01m.

3.3 Survey equipment and gradiometer configuration

Although the changes in the magnetic field resulting from differing features in the soil are usually weak, changes as small as 0.2 nanoTeslas (nT) in an overall field strength of 48,000nT, can be accurately detected using an appropriate instrument.

The mapping of the anomaly in a systematic manner will allow an estimate of the type of material present beneath the surface. Strong magnetic anomalies will be generated by buried iron-based objects or by kilns or hearths. More subtle anomalies such as pits and

ditches can be seen if they contain more humic material which is normally rich in magnetic iron oxides when compared with the subsoil.

To illustrate this point, the cutting and subsequent silting or backfilling of a ditch may result in a larger volume of weakly magnetic material being accumulated in the trench compared to the undisturbed subsoil. A weak magnetic anomaly should therefore appear in plan along the line of the ditch.

The magnetic survey was carried out using a dual sensor Grad601-2 Magnetic Gradiometer manufactured by Bartington Instruments Ltd. The instrument consists of two fluxgates very accurately aligned to nullify the effects of the Earth's magnetic field. Readings relate to the difference in localised magnetic anomalies compared with the general magnetic background. The Grad601-2 consists of two high stability fluxgate gradiometers suspended on a single frame. Each gradiometer has a 1m separation between the sensing elements so enhancing the response to weak anomalies.

3.4 Sampling interval, depth of scan, resolution and data capture

3.4.1 Sampling interval

Readings were taken at 0.25m centres along traverses 1m apart. This equates to 3600 sampling points in a full 30m x 30m grid.

3.4.2 Depth of scan and resolution

The Grad 601-2 has a typical depth of penetration of 0.5m to 1.0m, though strongly magnetic objects may be visible at greater depths. The collection of data at 0.25m centres provides an optimum methodology for the task balancing cost and time with resolution.

3.4.3 Data capture

The readings are logged consecutively into the data logger which in turn is daily down-loaded into a portable computer whilst on site. At the end of each site survey, data is transferred to the office for processing and presentation.

3.5 Processing, presentation of results and interpretation

3.5.1 Processing

Processing is performed using specialist software known as *Geoplot 3* and in-house software . This can emphasise various aspects contained within the data but which are often not easily seen in the raw data. Basic processing of the magnetic data involves 'flattening' the background levels with respect to adjacent traverses and adjacent grids.

Once the basic processing has flattened the background it is then possible to carry out further processing which may include low pass filtering to reduce 'noise' in the data and hence emphasise the archaeological or man-made anomalies.

The following schedule shows the basic processing carried out on all processed gradiometer data used in this report:

1. *Destripe* (Removes striping effects caused by zero-point discrepancies between different sensors and walking directions)

2. *Destagger* (Removes zigzag effects caused by inconsistent walking speeds on sloping, uneven or overgrown terrain)

3.5.2 Presentation of results and interpretation

The presentation of the data for each site involves a print-out of the minimally processed data both as a greyscale plot (Figure 3) and a colour plot showing extreme magnetic values (Figure 4). Magnetic anomalies have been identified and plotted onto the 'Abstraction and Interpretation of Anomalies' drawing for the site (Figure 5).

4 RESULTS

The following list of numbered anomalies refers to numerical labels on the interpretation plot (Figure 5).

Probable Archaeology

1. A series of widely spaced linear anomalies are identified across the site, running in a broad south west to north east orientation. These anomalies are indicative of ridge and furrow cultivation and are therefore classified as of probable archaeological origin.

Possible Archaeology

2. Several positive area anomalies have been identified in two areas of the site; one in the north of the survey area and three in the west. These anomalies are commonly associated with former cut features such as pits or ditches and may be of archaeological origin.

3. A number of discrete positive anomalies can also be seen scattered across the site. These responses are commonly associated with in-filled pits and may be of archaeological origin.

4. A number of magnetic 'spikes' (strong focussed values with associated antipolar response) are identified across the site and indicate ferrous metal objects. Although most of these are likely to be modern debris, some may be of archaeological interest. Particular attention may be paid to those found in association with other potentially archaeological anomalies.

5. Two moderate strength discrete anomalies have been noted which may indicate thermoremanent features of possible archaeological origin.

Other Anomalies

6. A single negative linear anomaly can be seen in the south western corner of the survey area, in similar orientation to the field boundary and is probably associated with agricultural activity.

7. A linear anomaly of strong amplitude has been identified crossing the south eastern corner of the survey area and is indicative of a modern pipe or service.

8. Areas of magnetic disturbance are the result of substantial nearby ferrous metal objects such as fences and underground services. These effects can mask weaker archaeological anomalies, but on this site have not affected a significant proportion of the area. In this instance only one area of disturbance is noted and this is associated with the probable service (Anomaly 7).

9. A number of patches of scattered magnetic debris are also evident across the site.

5 CONCLUSION

The data collected across approximately 4.5ha of agricultural land close to Elmstone Hardwick in Gloucestershire has identified evidence of probable ridge and furrow cultivation on the site alongside several positive anomalies which may indicate former in-filled cut features of possible archaeological origin. Two possible thermoremanent anomalies can also be seen in the west and south of the site and discrete anomalies indicative of former pits can be seen scattered across the survey area. Anomalies likely to be of modern origin can be seen across much of the site including a pipe or service in the south east, patches of magnetic debris and a scattering of magnetic spikes across the survey area.

6 REFERENCES

British Geological Survey, n.d., *website* (http://maps.bgs.ac.uk/geologyviewer_google/googleviewer.html)

Soil Survey of England and Wales, 1983. *Soils of England and Wales, Sheet 5 South West England*.

APPENDIX A – Basic principles of magnetic survey

Detailed magnetic survey can be used to effectively define areas of past human activity by mapping spatial variation and contrast in the magnetic properties of soil, subsoil and bedrock.

Weakly magnetic iron minerals are always present within the soil and areas of enhancement relate to increases in *magnetic susceptibility* and permanently magnetised *thermoremanent* material.

Magnetic susceptibility relates to the induced magnetism of a material when in the presence of a magnetic field. This magnetism can be considered as effectively permanent as it exists within the Earth's magnetic field. Magnetic susceptibility can become enhanced due to burning and complex biological or fermentation processes.

Thermoremanence is a permanent magnetism acquired by iron minerals that, after heating to a specific temperature known as the Curie Point, are effectively demagnetised followed by re-magnetisation by the Earth's magnetic field on cooling. Thermoremanent archaeological features can include hearths and kilns and material such as brick and tile may be magnetised through the same process.

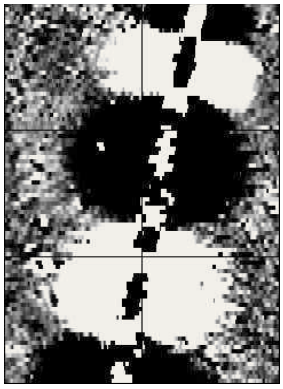
Silting and deliberate infilling of ditches and pits with magnetically enhanced soil creates a relative contrast against the much lower levels of magnetism within the subsoil into which the feature is cut. Systematic mapping of magnetic anomalies will produce linear and discrete areas of enhancement allowing assessment and characterisation of subsurface features. Material such as subsoil and non-magnetic bedrock used to create former earthworks and walls may be mapped as areas of lower enhancement compared to surrounding soils.

Magnetic survey is carried out using a fluxgate gradiometer which is a passive instrument consisting of two sensors mounted vertically either 0.5 or 1m apart. The instrument is carried about 30cm above the ground surface and the top sensor measures the Earth's magnetic field whilst the lower sensor measures the same field but is also more affected by any localised buried field. The difference between the two sensors will relate to the strength of a magnetic field created by a buried feature, if no field is present the difference will be close to zero as the magnetic field measured by both sensors will be the same.

Factors affecting the magnetic survey may include soil type, local geology, previous human activity, disturbance from modern services etc.

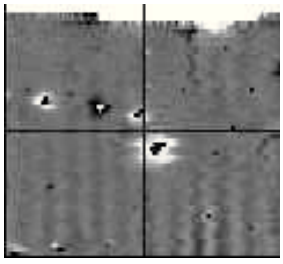
APPENDIX B – Glossary of magnetic anomalies

Bipolar



A bipolar anomaly is one that is composed of both a positive response and a negative response. It can be made up of any number of positive responses and negative responses. For example a pipeline consisting of alternating positive and negative anomalies is said to be bipolar. See also dipolar which has only one area of each polarity. The interpretation of the anomaly will depend on the magnitude of the magnetic field strength. A weak response may be caused by a clay field drain while a strong response will probably be caused by a metallic service.

Dipolar

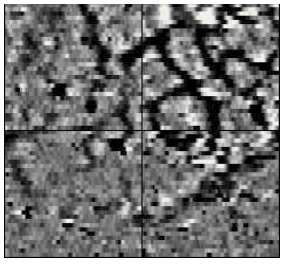


This consists of a single positive anomaly with an associated negative response. There should be no separation between the two polarities of response. These responses will be created by a single feature. The interpretation of the anomaly will depend on the magnitude of the magnetic measurements. A very strong anomaly is likely to be caused by a ferrous object.

Positive anomaly with associated negative response

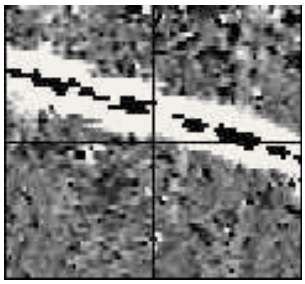
See bipolar and dipolar.

Positive linear



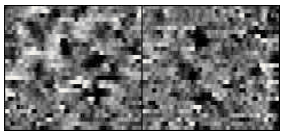
A linear response which is entirely positive in polarity. These are usually related to in-filled cut features where the fill material is magnetically enhanced compared to the surrounding matrix. They can be caused by ditches of an archaeological origin, but also former field boundaries, ploughing activity and some may even have a natural origin.

Positive linear anomaly with associated negative response



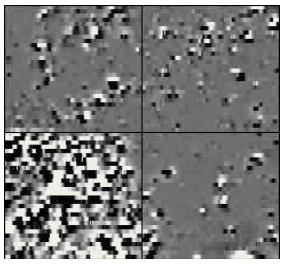
A positive linear anomaly which has a negative anomaly located adjacently. This will be caused by a single feature. In the example shown this is likely to be a single length of wire/cable probably relating to a modern service. Magnetically weaker responses may relate to earthwork style features and field boundaries.

Positive point/area



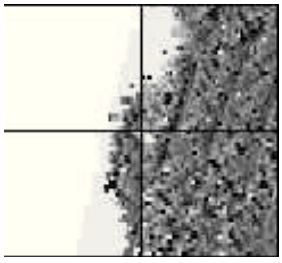
These are generally spatially small responses, perhaps covering just 3 or 4 reading nodes. They are entirely positive in polarity. Similar to positive linear anomalies they are generally caused by in-filled cut features. These include pits of an archaeological origin, possible tree bowls or other naturally occurring depressions in the ground.

Magnetic debris



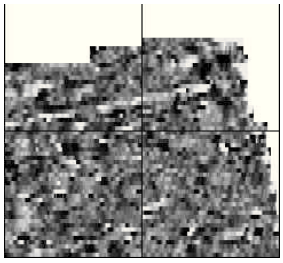
Magnetic debris consists of numerous dipolar responses spread over an area. If the amplitude of response is low (+/-3nT) then the origin is likely to represent general ground disturbance with no clear cause, it may be related to something as simple as an area of dug or mixed earth. A stronger anomaly (+/-250nT) is more indicative of a spread of ferrous debris. Moderately strong anomalies may be the result of a spread of thermoremanent material such as bricks or ash.

Magnetic disturbance



Magnetic disturbance is high amplitude and can be composed of either a bipolar anomaly, or a single polarity response. It is essentially associated with magnetic interference from modern ferrous structures such as fencing, vehicles or buildings, and as a result is commonly found around the perimeter of a site near to boundary fences.

Negative linear

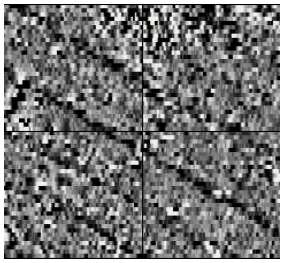


A linear response which is entirely negative in polarity. These are generally caused by earthen banks where material with a lower magnetic magnitude relative the background top soil is built up. See also ploughing activity.

Negative point/area

Opposite to positive point anomalies these responses may be caused by raised areas or earthen banks. These could be of an archaeological origin or may have a natural origin.

Ploughing activity



Ploughing activity can often be visualised by a series of parallel linear anomalies. These can be of either positive polarity or negative polarity depending on site specifics. It can be difficult to distinguish between ancient ploughing and more modern ploughing, clues such as the separation of each linear, straightness, strength of response and cross cutting relationships can be used to aid this, although none of these can be guaranteed to differentiate between different phases of activity.

Polarity

Term used to describe the measurement of the magnetic response. An anomaly can have a positive polarity (values above 0nT) and/or a negative polarity (values below 0nT).

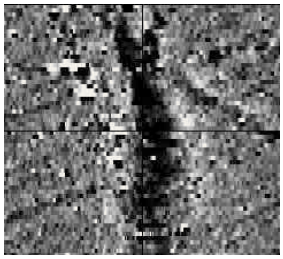
Strength of response

The amplitude of a magnetic response is an important factor in assigning an interpretation to a particular anomaly. For example a positive anomaly covering a $10m^2$ area may have values up to around 3000nT, in which case it is likely to be caused by modern magnetic interference. However, the same size and shaped anomaly but with values up to only 4nT may have a natural origin. Colour plots are used to show the amplitude of response.

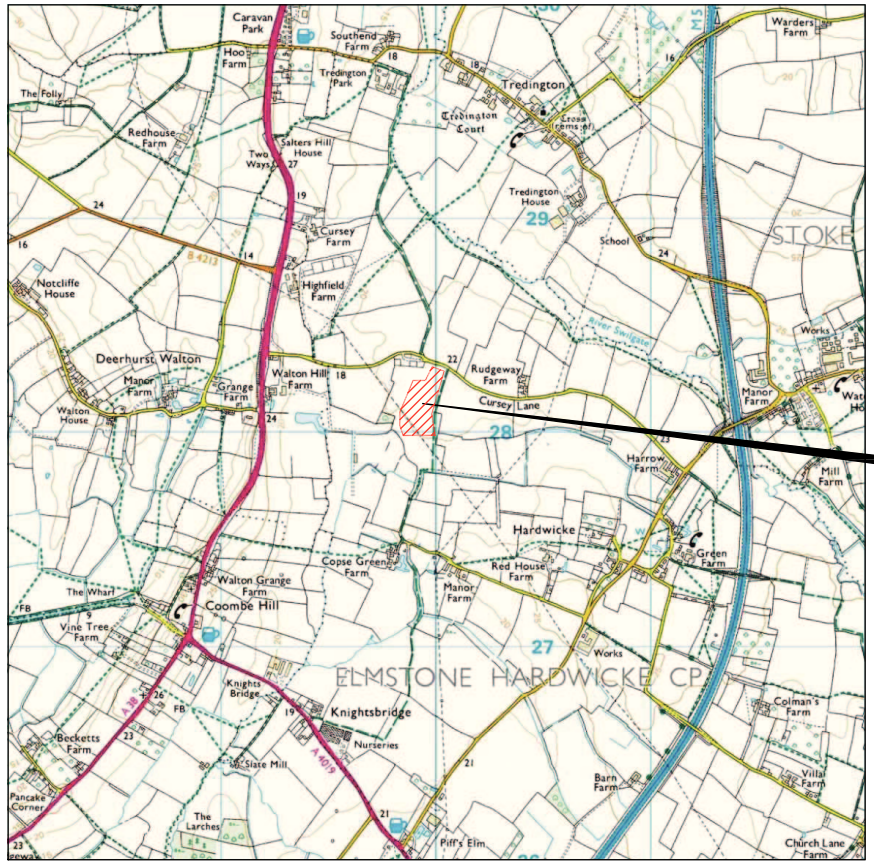
Thermoremanent response

A feature which has been subject to heat may result in it acquiring a magnetic field. This can be anything up to approximately +/-100 nT in value. These features include clay fired drains, brick, bonfires, kilns, hearths and even pottery. If the heat application has occurred in situ (e.g. a kiln) then the response is likely to be bipolar compared to if the heated objects have been disturbed and moved relative to each other, in which case they are more likely to take an irregular form and may display a debris style response (e.g. ash).

Weak background variations



Weakly magnetic wide scale variations within the data can sometimes be seen within sites. These usually have no specific structure but can often appear curvy and sinuous in form. They are likely to be the result of natural features, such as soil creep, dried up (or seasonal) streams. They can also be caused by changes in the underlying geology or soil type which may contain unpredictable distributions of magnetic minerals, and are usually apparent in several locations across a site.



Amendments

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-	-	-

Site centred on NGR: SO 899 282

Client: OXFORD ARCHAEOLOGY

Project Title: GEOPHYSICAL SURVEY - CURSEY LANE, ELMSTONE HARDWICK

Job No. 3080

Subject: LOCATION PLAN OF SURVEY AREA

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UPTON UPON SEVERN
WR8 0SA
T: 01684 592266
E: info@stratascan.co.uk
www.stratascan.co.uk

SUMO GROUP MEMBER

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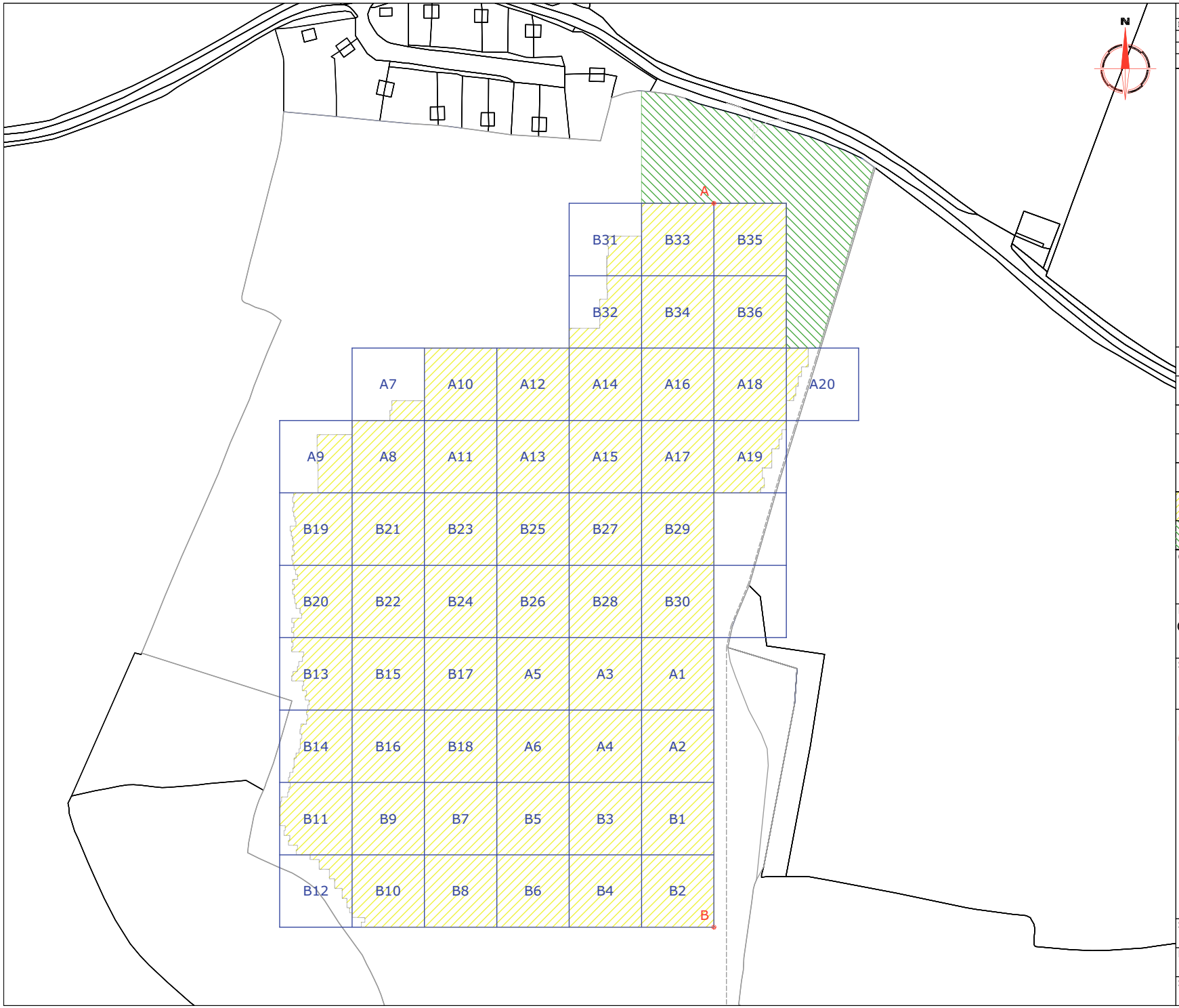
Survey date: APR 2012	Drawn by: BPM	Figure No.: 01



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Issue No.	Date	Description
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OS GRID REFERENCES

A	389990.53, 228275.01
B	389990.53, 227975.01

KEY

A1	Survey grid number
	Survey area
	Area unable to survey - horse tethered in area with large metallic chain

Client

OXFORD ARCHAEOLOGY

Project Title — Job No. 3080

GEOPHYSICAL SURVEY - CURSEY LANE, ELMSTONE HARDWICK

Subject

LOCATION OF SURVEY GRIDS AND REFERENCING

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VINEYARD HOUSE
UPTON UPON SEVERN
WR8 0SA
T: 01684 592266
E: info@stratascan.co.uk
www.stratascan.co.uk

SUMO GROUP MEMBER

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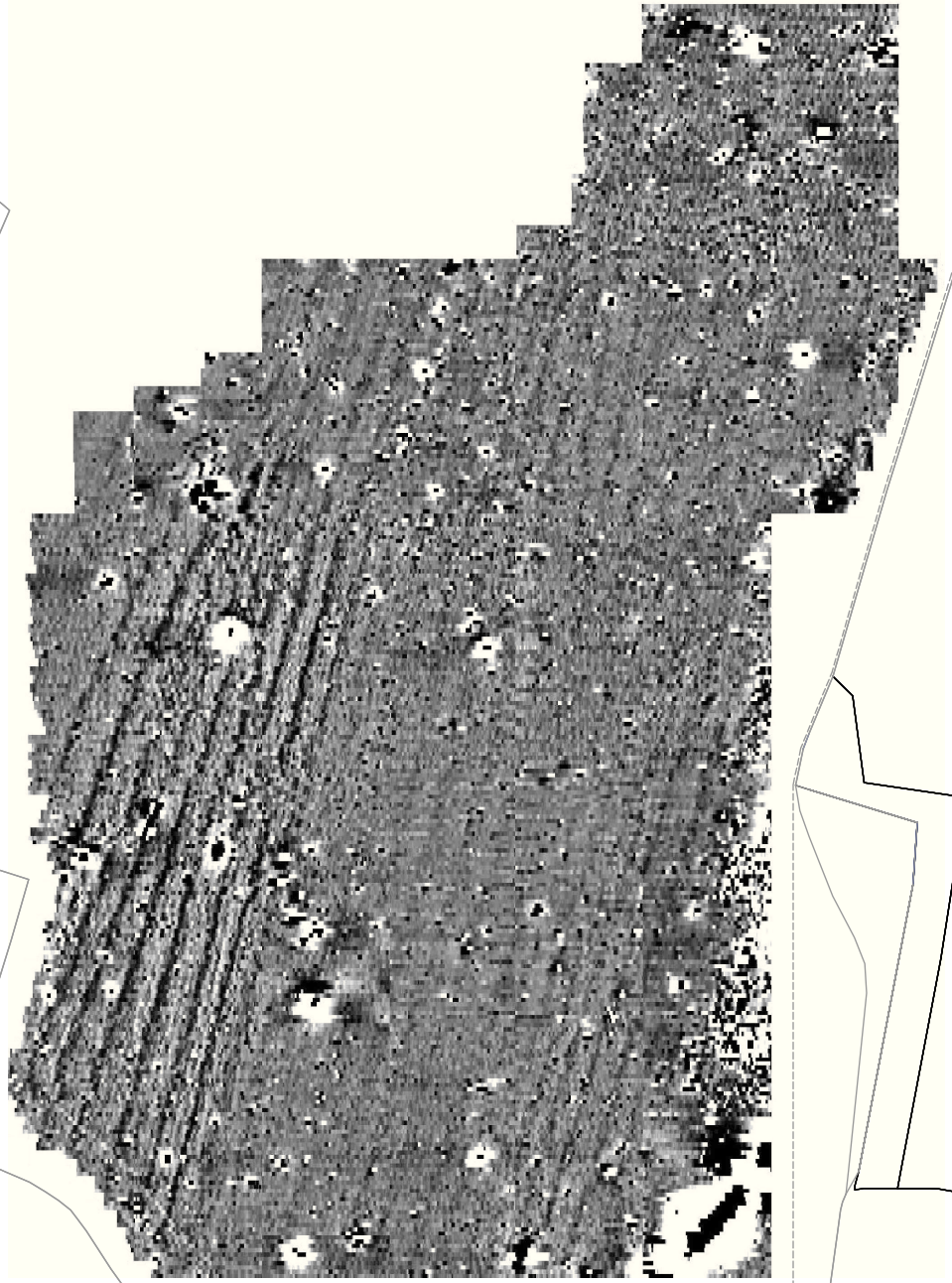

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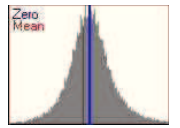
Minimum -2nT (white)



-2nT +2nT

+2nT

-2nT

Client

OXFORD ARCHAEOLOGY

Project Title — Job No. 3080

GEOPHYSICAL SURVEY - CURSEY LANE, ELMSTONE HARDWICK

Subject

PLOT OF MINIMALLY PROCESSED GRADIOMETER DATA

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UPTON UPON SEVERN
WR8 0SA
T: 01684 592266
E: info@stratascan.co.uk
www.stratascan.co.uk

SUMO GROUP MEMBER

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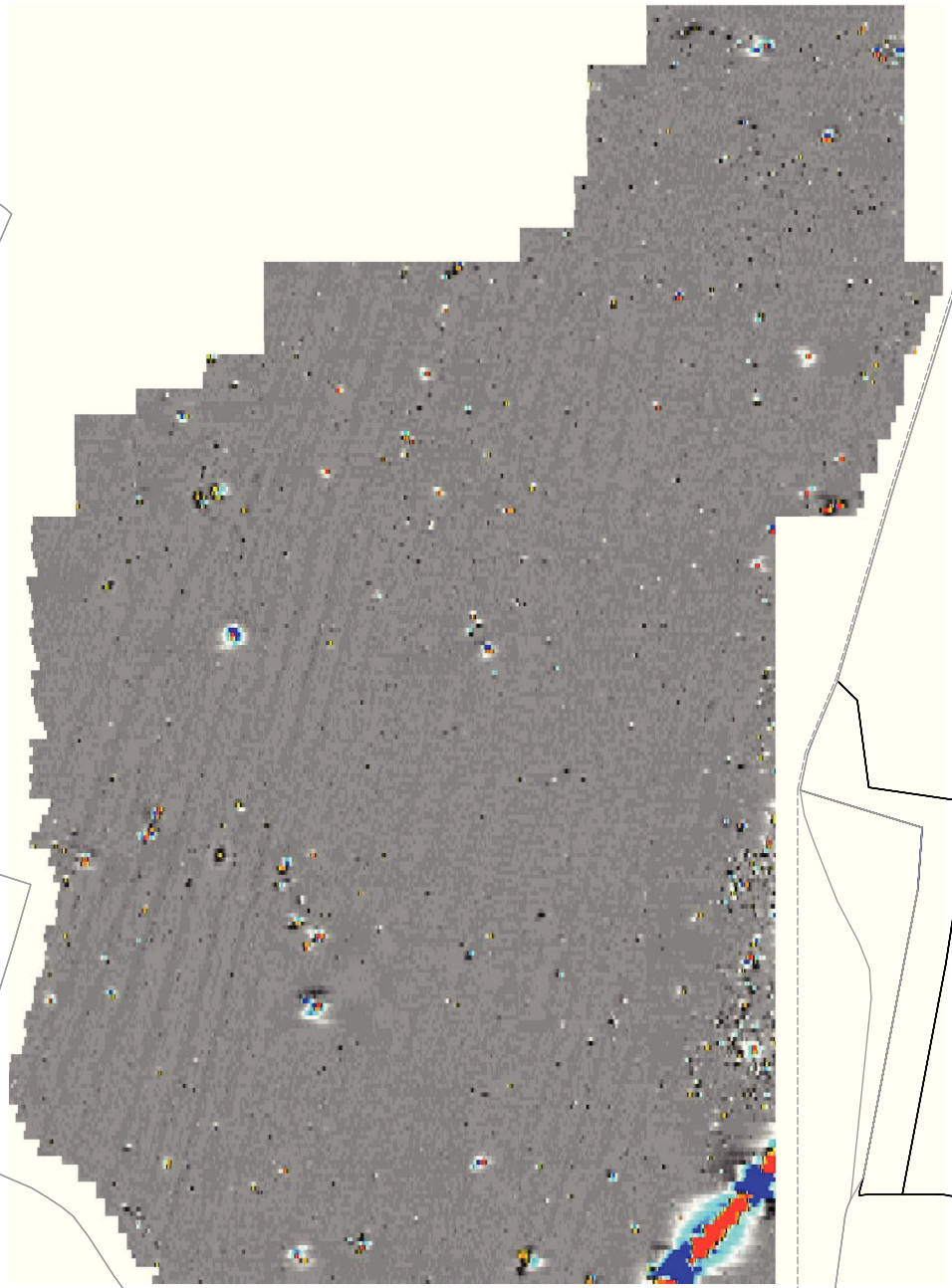

Amendments		
Issue No.	Date	Description
-	-	-
-	-	-

Plotting parameters

Maximum +250nT (red)
Minimum -250nT (blue)

+250nT

-250nT

Client

OXFORD ARCHAEOLOGY

Project Title — Job No. 3080

GEOPHYSICAL SURVEY - CURSEY LANE, ELMSTONE HARDWICK

Subject

COLOUR PLOT OF GRADIOMETER DATA SHOWING EXTREME VALUES

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VINEYARD HOUSE
UPTON UPON SEVERN
WR8 0SA
T: 01684 592266
E: info@stratascan.co.uk
www.stratascan.co.uk

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Scale 1:1250

0m 10 20 30 40 50m

Plot	Checked by	Issue No.
A3	PPB	01
Survey date	Drawn by	Figure No.
APR 2012	BPM	04

Amendments

Issue No.	Date	Description
-	-	-
-	-	-

KEY

PROBABLE ARCHAEOLOGY

- Positive anomaly / weak positive anomaly - probable cut feature of archaeological origin
- Negative anomaly / weak negative anomaly - probable bank or earthwork of archaeological origin
- Moderate strength discrete anomaly - probable thermoremanent feature
- Widely spaced curving parallel linear anomalies - probably related to ridge-and-furrow

POSSIBLE ARCHAEOLOGY

- Positive anomaly / weak positive anomaly - possible cut feature of archaeological origin
- Negative anomaly / weak negative anomaly - possible bank or earthwork of archaeological origin
- Moderate strength discrete anomaly - possible thermoremanent feature
- Magnetic spike - probable ferrous object

OTHER ANOMALIES

- Closely spaced parallel linear anomalies - probably related to agricultural activity such as ploughing
- Linear anomaly - probably related to pipe, cable or other modern service
- Linear anomaly - possibly related to land drain
- Magnetic disturbance associated with nearby metal object such as service or field boundary
- Strong magnetic debris - possible disturbed or made ground
- Scattered magnetic debris
- 1 — Anomaly identification number

Client

OXFORD ARCHAEOLOGY

Project Title — Job No. 3080

GEOPHYSICAL SURVEY - CURSEY LANE, ELMSTONE HARDWICK

Subject

ABSTRACTION AND INTERPRETATION OF GRADIOMETER ANOMALIES

STRATASCAN™
GEOPHYSICS FOR ARCHAEOLOGY AND ENGINEERING
VINEYARD HOUSE
UPTON UPON SEVERN
WR8 0SA
T: 01684 592266
E: info@stratascan.co.uk
www.stratascan.co.uk

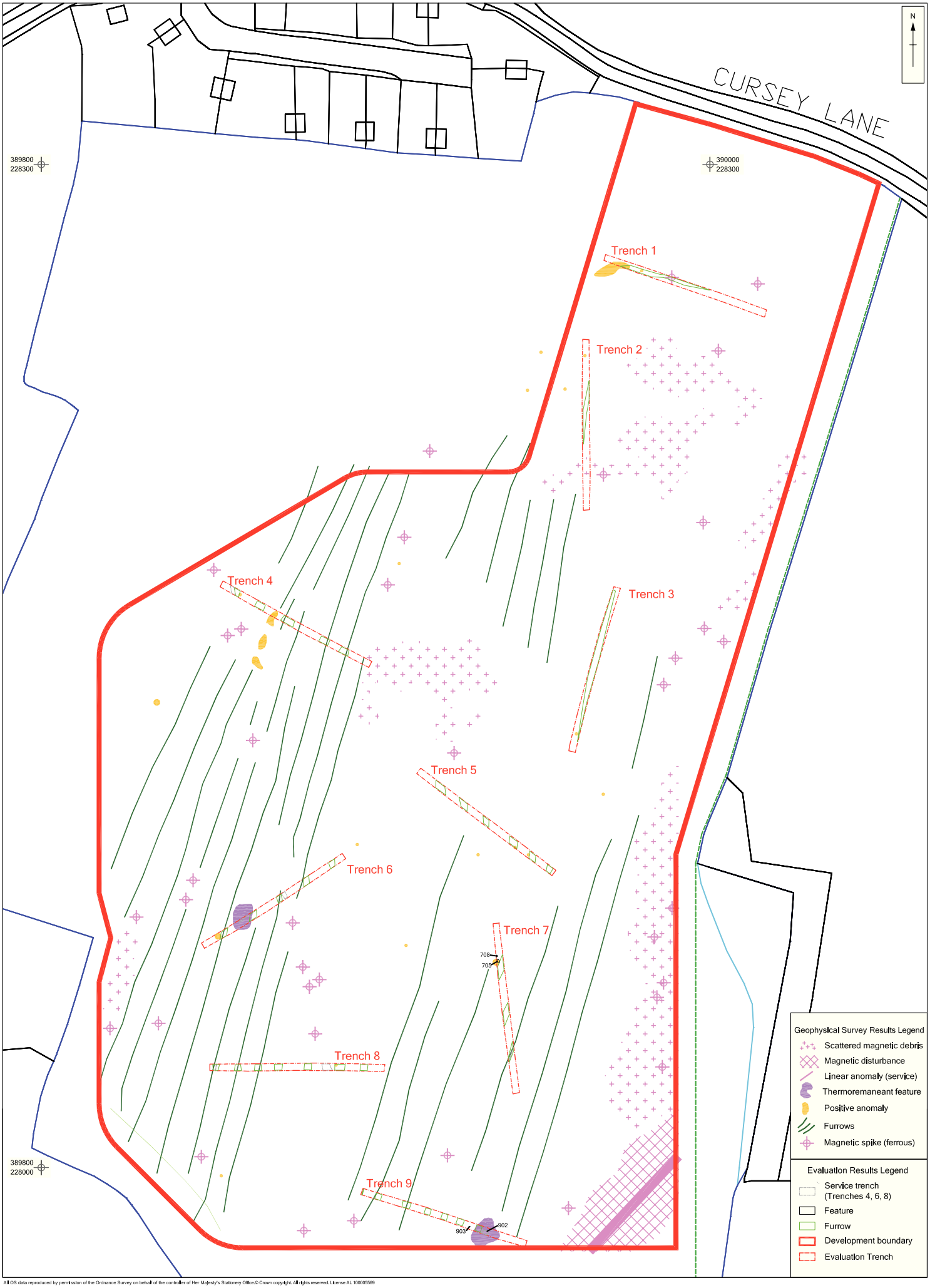
SUMO GROUP MEMBER

Scale 1:1250 (0m 10 20 30 40 50)

Plot	Checked by	Issue No.
A3	PPB	01
Survey date	**Drawn by**	**Figure No.**
APR 2012	BPM	05

Figure 1: Site location

X:\ELMCEV_Cursey_Lane_Elmstone_Hardwicke \010Geomatics\02 CAD\001current\02_ELMCEV_Cursey_Lane_180412.dwg*SL*03.05.12



0 50 m

Scale at A3 1:1000

Trench locations with geophysical survey results summary

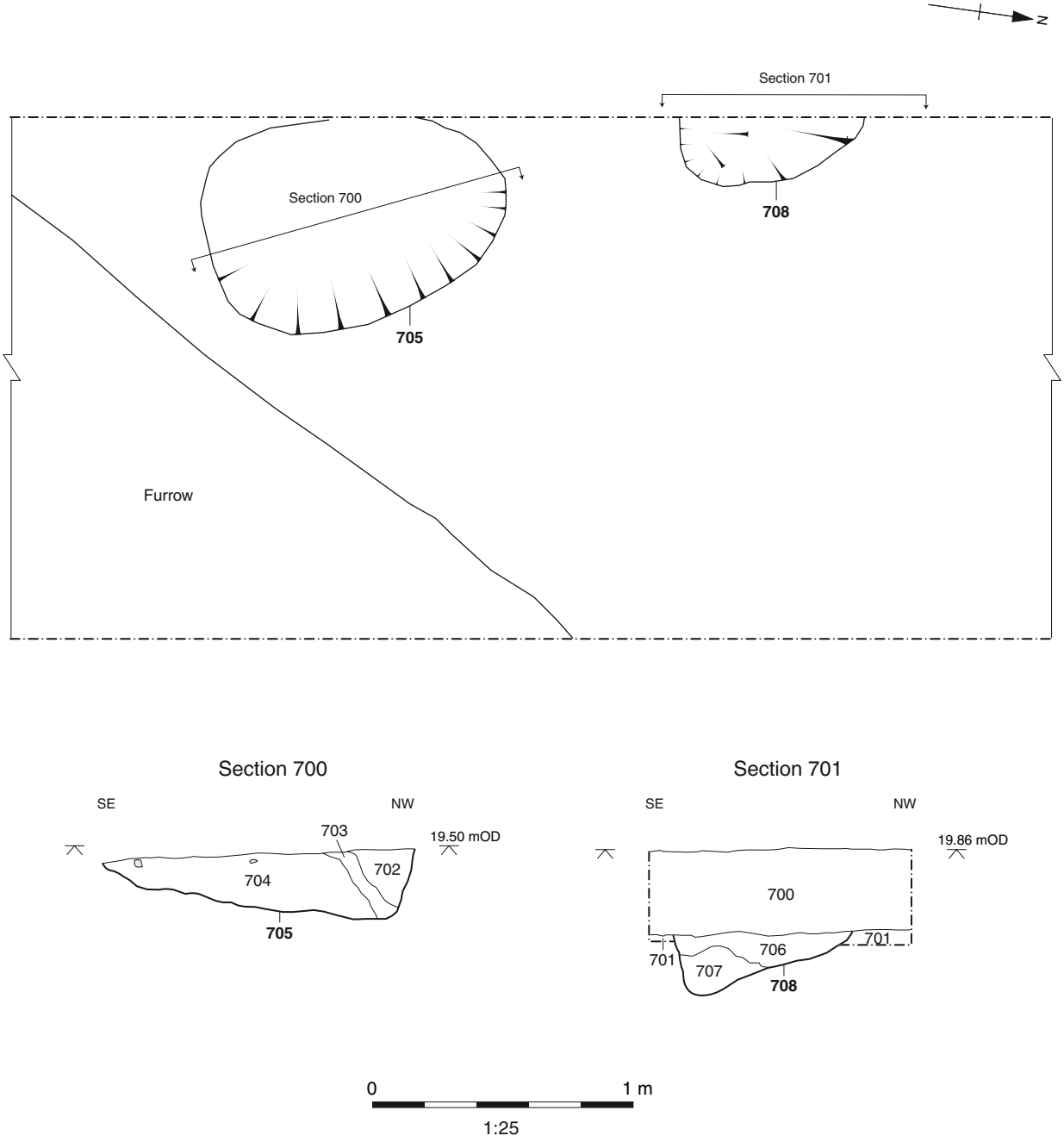


Figure 3: Trench 7, feature plans and sections

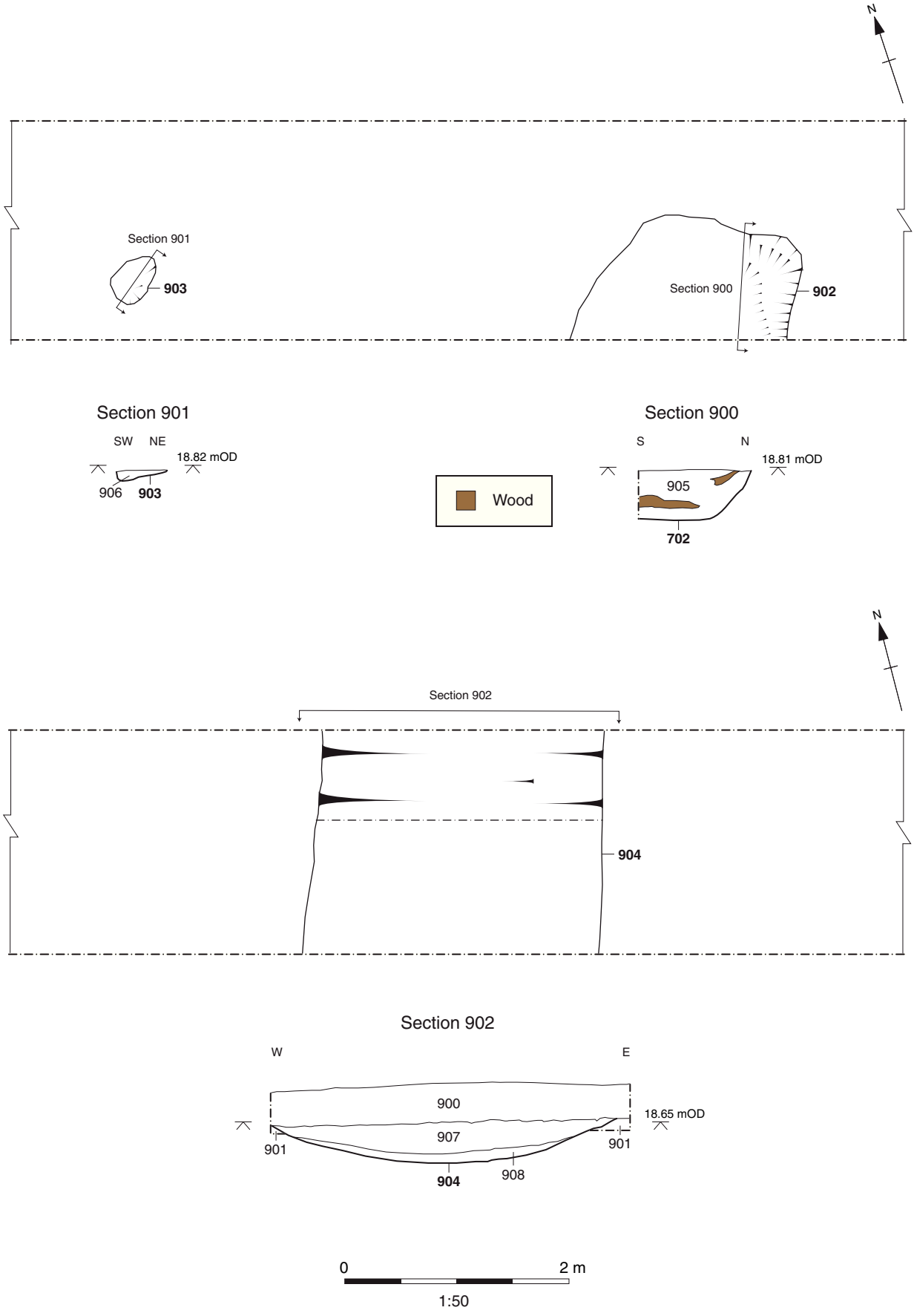


Figure 4: Trench 9, feature plans and sections

Head Office/Registered Office/ OA South

Janus House
Osney Mead
Oxford OX2 0ES

t: +44 (0) 1865 263 800
f: +44 (0) 1865 793 496
e: info@oxfordarch.co.uk
w:http://thehumanjourney.net

OA North

Mill 3
Moor Lane
Lancaster LA1 1GF

t: +44 (0) 1524 541 000
f: +44 (0) 1524 848 606
e: oanorth@thehumanjourney.net
w:http://thehumanjourney.net

OA East

15 Trafalgar Way
Bar Hill
Cambridgeshire
CB23 8SQ

t: +44 (0) 1223 850500
f: +44 (0) 1223 850599
e: oaeast@thehumanjourney.net
w:http://thehumanjourney.net