

T H A M E S V A L L E Y

ARCHAEOLOGICAL

S E R V I C E S

**Land at Shipton Road,
Woodstock, Oxfordshire**

Geophysical Survey (Magnetic)

by Daniel Bray and Tim Dawson

Site Code: SWO14/131

(SP 4573 1622)

Land at Shipton Road, Woodstock Oxfordshire

Geophysical Survey (Magnetic) Report For Vanbrugh Trustees and Pye Homes

by Daniel Bray and Tim Dawson
Thames Valley Archaeological Services Ltd

Site Code
SWO14/131

October 2014

Summary

Site name: Land at Shipton Road, Woodstock, Oxfordshire

Grid reference: SP 4573 1622

Site activity: Magnetometer survey

Date and duration of project: 14th August - 30th September 2014

Project manager: Steve Ford

Site supervisors: Daniel Bray and Tim Dawson

Site code: SWO 14/131

Area of site: 61.6ha

Summary of results: A range of magnetic anomalies were recorded in the course of the survey. These include an extensive complex of linear features which are most likely associated with the known Roman villa (Scheduled Monument 1021367) which lies in the centre of the site. Other areas of anomalies of potential archaeological origin were recorded in the site's north-western and north-eastern corners. The remaining magnetic anomalies reflect the agricultural use of the fields as well as structures and field boundaries recorded on historic maps and aerial photographs.

Location of archive: The archive is presently held at Thames Valley Archaeological Services, Reading in accordance with TVAS digital archiving policies.

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Report edited/checked by: Steve Ford ✓ 07.10.14 Steve Preston ✓ 07.10.14

Land at Shipton Road, Woodstock, Oxfordshire A Geophysical Survey (Magnetic)

by Daniel Bray and Tim Dawson

Report 14/131b

Introduction

This report documents the results of a geophysical survey (magnetic) carried out on land comprising three fields to the south of Shipton Road, Woodstock, Oxfordshire (SP 4573 1622) (Fig. 1). The project was commissioned by Mr Steve Pickles of West Waddy ADP LLP, The Malthouse, 60 East St Helen Street, Abingdon, Oxfordshire, OX14 5EB on behalf of Vanbrugh Trustees, c/o The Estate Office, Blenheim Palace, Woodstock, OX20 1PP and Pye Homes (Oxford), Langford Locks, Kidlington, OX5 1HZ.

A planning application is being prepared for submission to Cherwell District Council and West Oxfordshire District Council (the site incorporates areas within both) for mixed residential and commercial use. A geophysical survey of the land has been requested in order both to inform the planning process and to influence the design of the scheme. The field investigation was carried out to a specification approved by Mr Chris Welch, Inspector of Ancient Monuments at English Heritage and in accordance with the Ancient Monuments and Archaeological Areas Act 1979 (as amended) section 42 under licence to carry out a geophysical survey on a Scheduled Monument (Licence No: SL00085925). The fieldwork was undertaken by Will Attard, Aiji Castle, Aidan Colyer, Rebecca Constable, Sophie Frampton, Anna Ginger, Tom Stewart, Dan Strachan, Andy Taylor and Ben Tebbit under the supervision of Daniel Bray and Tim Dawson and the site code is SWO 14/131.

The archive is presently held at Thames Valley Archaeological Services, Reading in accordance with TVAS digital archiving policies.

Location, topography and geology

The site currently consists wholly of arable land spread across three fields (Fig. 2: Fields 1-3). The proposed development area is centred on NGR SP 4573 1622 and covers around 60ha. It is bounded by Shipton Road to the north, Upper Campsfield Road to the east, Oxford Road (the A44) to the south and by properties forming the eastern edge of Woodstock to the west. Small occupied areas within the larger area of the overall site are excluded. The majority of the site is located on Cornbrash geology, but the south-western portion is mapped as on Forest marble (clay with limestone) (BGS 1982). It is at a height of approximately 90m above Ordnance Datum, sloping down from west to east and with a significant drop down towards the main road at the southern

end of the site. The presence of stubble and later a crop obscured any mound that may have existed in the location of the villa.

The cereal crop covering the site was harvested shortly before commencement of the survey in August 2014, and thus largely consisted of stubble. However a secondary experimental crop was planted on the eastern field (Field 3) at the beginning of the project and by the time this area was surveyed had grown substantially and caused a small but increasing amount of disruption to the survey process (Pl. 1-4). Conditions were dry during the majority of the survey period with thunderstorms interrupting work during the first few days with heavy rain showers appearing in early September. This resulted in dry, firm ground across the whole site.

Site history and archaeological background

The archaeological background for the site has been outlined in an archaeological desk-based assessment prepared for the proposed development (Preston 2014). In summary, the confluence of two Thames tributaries (the Evenlode and Glyme), and the proximity of the Cherwell, will have made the area in which the site lies an attractive one for settlement of all periods, so it is perhaps a little surprising that the area around Woodstock is not especially noted for its wealth of prehistoric archaeology. There are some barrows in the wider area, and the West Oxfordshire Grim's Ditch is to the north of Woodstock. The area comes into more prominence in the Roman period, as the road between the towns of Alchester and Cirencester (Akeman Street) passed not far to the north and its line attracted settlement including several villas to the area. The Scheduled Ancient Monument of Blenheim (or Begbroke) Villa is wholly within the proposal area (Scheduled Monument 1021367). Discovered from aerial photographs, this site has seen limited excavation which revealed well-preserved walls and other features, set within an enclosure complex, although relatively little is known for certain about the extent of this complex. Finds of Roman and medieval material are also recorded from this field. The site is also adjacent to Blenheim Park, a registered park, within which is the World Heritage Site, Blenheim Palace.

Methodology

Sample interval

Data collection required a temporary grid to be established across the survey area using wooden pegs at 20m intervals with further subdivision where necessary. Readings were taken at 0.25m intervals along traverses 1m apart. This provides 1600 sampling points across a full 20m × 20m grid (English Heritage 2008), providing an appropriate methodology balancing cost and time with resolution. The survey grids for all three fields were

aligned with the major axis of each area. For Fields 1 and 2 this coincided with the National Grid north while Field 3 was rotated through *c.*25°. The only obstructions to the survey were a series of metal borehole caps that were installed during the geotechnical survey ahead of the geophysical work.

The Grad 601-2 has a typical depth of penetration of 0.5m to 1.0m. This would be increased if strongly magnetic objects have been buried in the site. Under normal operating conditions it can be expected to identify buried features >0.5m in diameter. Features which can be detected include disturbed soil, such as the fill of a ditch, structures that have been heated to high temperatures (magnetic thermoremnance) and objects made from ferro-magnetic materials. The strength of the magnetic field is measured in nano Tesla (nT), equivalent to 10^{-9} Tesla, the SI unit of magnetic flux density.

Equipment

The purpose of the survey was to identify geophysical anomalies that may be archaeological in origin in order to inform a targeted archaeological investigation of the site prior to development. The survey and report generally follow the recommendations and standards set out by both English Heritage (2008) and the Institute for Archaeologists (2002, 2011).

Magnetometry was chosen as a survey method as it offers the most rapid ground coverage and responds to a wide range of anomalies caused by past human activity. These properties make it ideal for fast yet detailed survey of an area.

The detailed magnetometry survey was carried out using a dual sensor Bartington Instruments Grad 601-2 fluxgate gradiometer. The instrument consists of two fluxgates mounted 1m vertically apart with a second set positioned at 1m horizontal distance. This enables readings to be taken of both the general background magnetic field and any localised anomalies with the difference being plotted as either positive or negative buried features. All sensors are calibrated to cancel out the local magnetic field and react only to anomalies above or below this base line. On this basis, strong magnetic anomalies such as burnt features (kilns and hearths) will give a high response as will buried ferrous objects. More subtle anomalies such as pits and ditches, can be seen from their infilling soils containing higher proportions of humic material, rich in ferrous oxides, compared to the undisturbed subsoil. This will stand out in relation to the background magnetic readings and appear in plan following the course of a linear feature or within a discrete area.

A Trimble GeoXH 6000 handheld GPS system with sub-decimetre accuracy was used to tie the site grid into the Ordnance Survey national grid. This unit offers both real-time correction and post-survey processing; enabling a high level of accuracy to be obtained both in the field and in the final post-processed data.

Data gathered in the field was processed using the TerraSurveyor v.3.0.25.1 software package. This allows the survey data to be collated and manipulated to enhance the visibility of anomalies, particularly those likely to be of archaeological origin. The table below lists the processes applied to this survey, full survey and data information is recorded in Appendix 1.

Process	Effect
Clip from -5.00 to 5.00 nT	Enhance the contrast of the image to improve the appearance of possible archaeological anomalies.
De-stripe: median, all sensors	Removes the striping effect caused by differences in sensor calibration, enhancing the visibility of potential archaeological anomalies.
De-spike: threshold 1, window size 3×3	Compresses outlying magnetic points caused by interference of metal objects within the survey area.
Range match	Equalises the range of values between areas surveyed by different operatives, correcting for differences in setup.
De-stagger: all grids, both by -1 intervals	Cancels out effects of site's topography on irregularities in the traverse speed.

Once processed, the results are presented as a greyscale plot shown in relation to the site (Fig. 3), followed by a second plan to present the abstraction and interpretation of the magnetic anomalies (Fig. 4). Anomalies are shown as colour-coded lines, points and polygons. The grid layout and georeferencing information (Fig. 2) is prepared in EasyCAD v.7.58.00, producing a .FC7 file format, and printed as a .PDF for inclusion in the final report.

The greyscale plot of the processed data is exported from TerraSurveyor in portable network graphics (.PNG) format, a raster image format chosen for its lossless data compression and support for transparent pixels, enabling it to easily be overlaid onto an existing site plan. The data plot is rotated to orientate it to north and combined with grid and site plans in Adobe InDesign CS5.5, creating .INDD file formats. Once the figures are finalised they are exported in .PDF format for inclusion within the finished report.

Results

Field 1 (Figs. 5-6)

Very few magnetic anomalies were recorded within Field 1. Those that were identified consisted of a series of linear positive anomalies running parallel on a north-south orientation at regular intervals across the entire area of the field [Fig. 6: 1a]. Positive anomalies commonly represent buried cut features such as ditches and pits, but those recorded here as a series of parallel anomalies are probably of agricultural origin. A small amount of magnetic disturbance was detected around the southern and eastern edges of the field which was most likely caused by discarded ferromagnetic items within the hedgerow.

Field 2 (Figs. 5-7)

The survey of Field 2 revealed a much larger number of magnetic anomalies than the previous area. Of particular interest are a series of linear and discrete positive anomalies at the northern end of the field which, because of their layout, may represent buried archaeological features (Fig. 7). The set of strong positive anomalies against the site boundary [Fig. 6: 2a] appears to consist of three subrectangular enclosures with stubs of other ditch-type positive anomalies abutting them both on the inside and out. A possible discrete positive anomaly, maybe representing a buried pit, is visible at the southern end of the enclosures. Another group of linear and discrete positive anomalies were recorded a short distance away to the east [2b]. These appear to form three sides of another enclosure with another possible pit to the south along with a ferrous spike, possibly indicating a buried ferrous object. Further to the south a pair of linear positive anomalies [2c, 2d] cross the field in an east-west direction with a break in the centre. These may represent a buried ditch, possibly indicating a former field boundary. Two further strong positive linear anomalies in the southern part of the field [2e] may represent buried ditches of archaeological origin although their orientation in relation to other anomalies in the area suggest a possible agricultural link.

Two sets of parallel positive linear anomalies, both likely to be agricultural in origin (e.g. furrows), were recorded within Field 2. The northern set [2f] are aligned east-west following the line of the field's northern boundary while the southern group [2h] are north-south following the eastern and western boundaries. A slightly stronger linear anomaly in [2f] may represent a now-removed field boundary that was recorded on the Bladon parish tithe map of 1818 and the First Edition Ordnance Survey map of 1880 (Preston 2014, Figs. 6 and 7). A significantly stronger positive linear anomaly which runs almost the entire length of the field [2g] also appears to correspond to a field boundary visible on the tithe and First Edition Ordnance Survey maps. The last anomaly of

note in Field 2 is a large area of magnetic disturbance against the northern site boundary [2i] which corresponds to a large structure visible on aerial photographs of the 1940s (Preston 2014).

Field 3 (Figs. 8-11)

Field 3 was found to contain two densely packed sets of magnetic anomalies with a much more sparse area in between. The first set of anomalies (Fig. 10) consists of several linear and discreet positive signatures which probably indicate the presence of buried ditches and pits of archaeological origin. These form a line of rectangular and subrectangular enclosures along the western edge of the field. At the northern end this comprises a three-sided enclosure with a smaller linear positive anomaly and a possible discreet positive anomaly at its southern end [Fig. 8: 3a]. Immediately to the south is a much larger enclosed space [3b] which appears to be open at the western end but also contains further anomalies, possibly representing a smaller internal enclosure and pair of pits. Another short linear positive anomaly appears to extend from the enclosure's southern boundary before it ends in an area dotted with several large pit-type anomalies [3c]. The next group of positive anomalies were recorded 45m to the south where several weak linears perhaps represent the corners of at least two largely ploughed-out enclosures [3d].

Continuing southwards, another group of three linear anomalies form the southern end of a large enclosure [3e] which appears to contain two large pits in the south-western and south-eastern corners. Another row of positive pit-type anomalies extend northwards from the eastern edge of the enclosure [3f]. Two weaker positive linear anomalies [3g] were recorded to the south-west of [3e], possibly representing parts of further enclosures, with two curvilinear anomalies [3h] immediately to the west. The main body of the western group of anomalies starts with [3i], a three-sided enclosure with what appears to be several pit-type anomalies within its boundaries. Of particular interest is the strong positive rectangular anomaly that was recorded in the north-eastern corner of the enclosure. Continuing to the south, the western linear anomaly of [3i] steps out to the west to form the western edge of enclosure [3j]. This too has a variety of internal pit- and ditch-type anomalies, including a very strong semi-circular linear anomaly inside its southern boundary.

Abutting [3j] to the south are two further enclosures [3k]. The western one is rectangular with what appears to be further internal subdivision and appears as positive crop-marks on an oblique aerial photograph taken in 1990 (Preston 2014) while to the east the second enclosure has its eastern edge dictated by the positive linear anomaly that appears to form the eastern limit for the whole complex. Both enclosures contain various potential pit-type positive anomalies. [3k] is followed by a small subrectangular enclosure [3l] which, like [3i], contains a strong positive rectangular-shaped discreet anomaly. To the south is [3m], a larger, more open enclosure

bounded on three sides by strong positive linear anomalies with a much weaker linear anomaly to the south. Along the enclosure's eastern edge is a series of strong positive and negative linear responses which include a semi-circular shape on its south-western end. The regularity and layout of these anomalies suggest that they might represent the villa building as described in the Scheduled Monument listing:

“The house is a simple cottage form, aligned north-east - south-west, measuring 41.5m long by 10.8m wide. Its single range is made up of six rooms, with a corridor 2.7m wide on the south-east side. The corridor runs for about two thirds of the length of the villa, ending at a point where a larger room, of about 10 sq m, forms a slight wing off the main range, with an adjoining semicircular room creating an apsidal finish to the south-west end.”

To the south of the possible structure a series of positive linear anomalies **[3n]** appear to form parts of further enclosures although they appear largely incomplete.

Other magnetic anomalies of potential archaeological origin that were recorded in Field 3 include **[3o]**, a complex of positive linears and patches in the north-eastern corner of the site (Fig. 11). These appear to form parts of two enclosures with several pit-type anomalies and some larger area anomalies which may represent features such as quarry pits. To the south are two weak linear positive anomalies **[3p]** which appear to be of a different alignment to the other field boundaries and therefore may represent a much older field layout. The final set of anomalies that may be the result of buried archaeological features were recorded near the southern corner of the field **[3q]**. These consisted of three lengths of positive linear anomaly, possibly indicating buried ditches, which appear to form three sides of a square or rectangular enclosure.

The majority of the remaining anomalies recorded during the survey most likely represent previous field boundaries, plough furrows and modern features. A series of positive linear anomalies can be seen forming regular subrectangular enclosures across the whole site **[3s]** with a series of smaller areas enclosed in the northern part of the field. Of these, **[3r]** in the north-western corner of the field is plotted on historic Ordnance Survey maps from 1880 through to 1954 and **[3u]** is shown although only as a Rural District and, later, a County Constituency boundary rather than a physical feature. None of the others are recorded on Ordnance Survey maps and therefore may represent a pre-1880 field systems. In addition to the anomalies which may represent field boundaries the survey also recorded a set of positive linear anomalies which form a cross aligned to the points of the compass just to the west of the centre of the field **[3v]** which is then linked to the eastern edge of the field by a single linear anomaly **[3v]**. This is visible as lines on the ground on aerial photographs of the 1940s and later (Preston 2014) and may represent a navigational aid linked to the airfield to the east. A final anomaly of note consisting of an area of magnetic disturbance was recorded in the northern part of the field **[3w]**. While this might not normally be of interest, the anomaly matches the location of the Isolation Hospital shown on the 1919 Ordnance Survey map (Preston 2014, Fig. 9) but without showing the surrounding enclosure.

Conclusion

The geophysical survey of the site at Shipton Road, Woodstock was undertaken successfully with a large number of magnetic anomalies being identified. Three main clusters of anomalies with potential archaeological origins were recorded located in the north-western corner, centre and north-eastern corner of the site. Those in the north-western and north-eastern corners consisted of a mix of linear and discrete positive anomalies which formed very few obvious patterns whereas those in the centre mapped out a series of rectangular and subrectangular enclosures stretching almost the entire length of the site. Of particular note is a group of positive and negative anomalies which appear to form the shape of the villa structure as described in the English Heritage Scheduled Monument listing. Other anomalies recorded most likely represent the agricultural furrowing and field boundaries with a small number correlating with features shown on historic mapping and aerial photography.

References

- BGS, 1982, *British Geological Survey*, 1:50,000, Sheet 236, Solid and Drift Edition, Keyworth
- English Heritage, 2008, *Geophysical Survey in Archaeological Field Evaluation*, English Heritage, Portsmouth (2nd edn)
- IFA, 2002, *The Use of Geophysical Techniques in Archaeological Evaluation*, IFA Paper No. 6, Reading
- IFA, 2011, *Standard and Guidance: for archaeological geophysical survey*, Reading
- Preston, S, 2014, 'Land at Shipton Road, Woodstock, Oxfordshire: An archaeological desk-based assessment', Thames Valley Archaeological Services report 14/131, Reading

Appendix 1. Survey and data information

Programme

Name: TerraSurveyor
Version: 3.0.25.1

Field 1**Raw data**

Direction of 1st Traverse: 359.903 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 2047.5

Dimensions

Composite Size (readings): 1200 x 280
Survey Size (meters): 300 m x 280 m
Grid Size: 20 m x 20 m
X Interval: 0.25 m
Y Interval: 1 m

Stats

Max: 59.00
Min: -60.00
Std Dev: 5.87
Mean: 1.30
Median: -0.22
Composite Area: 8.4 ha
Surveyed Area: 5.2403 ha

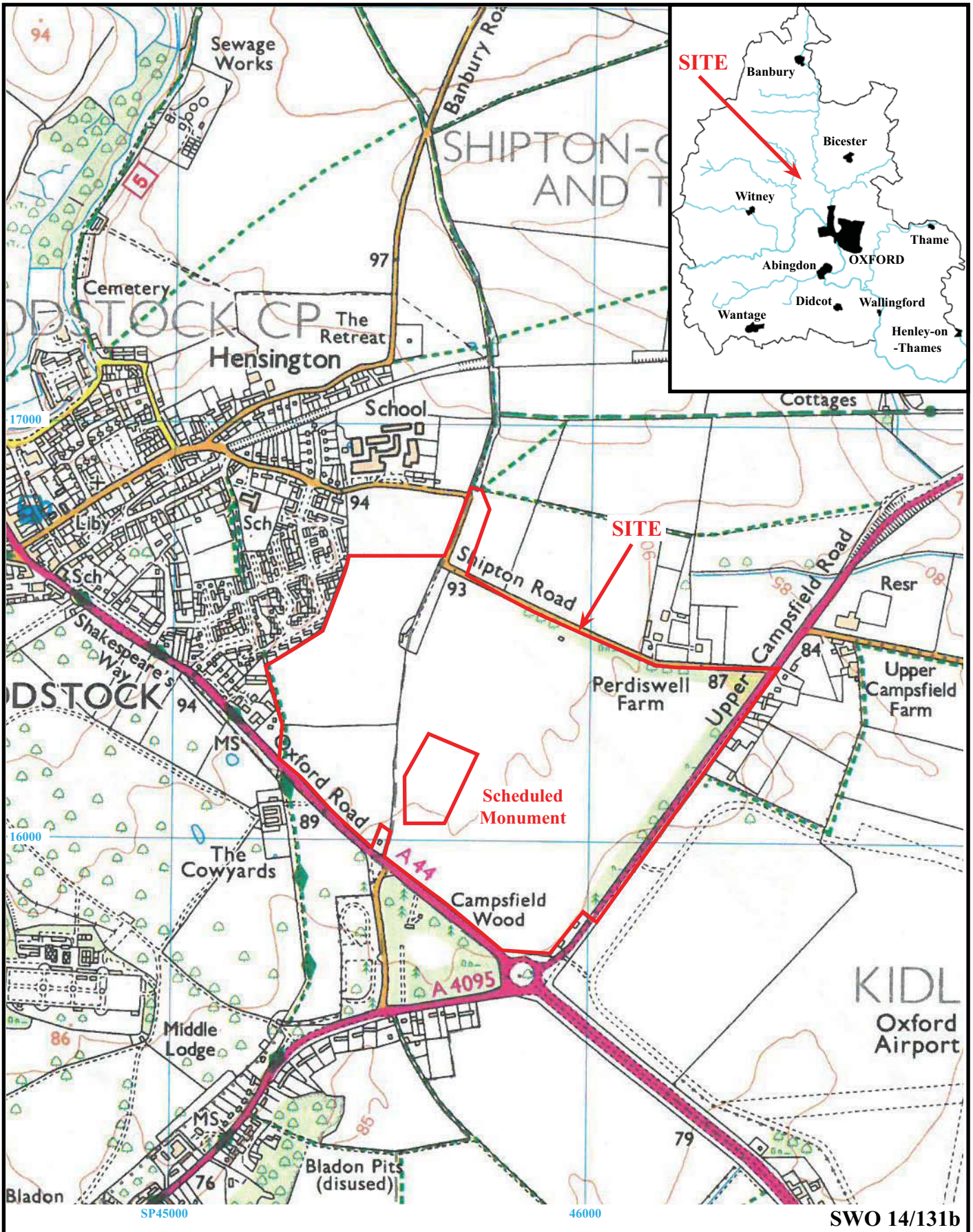
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Field 2**Raw data**

Direction of 1st Traverse: 0.6908 deg
Collection Method: ZigZag



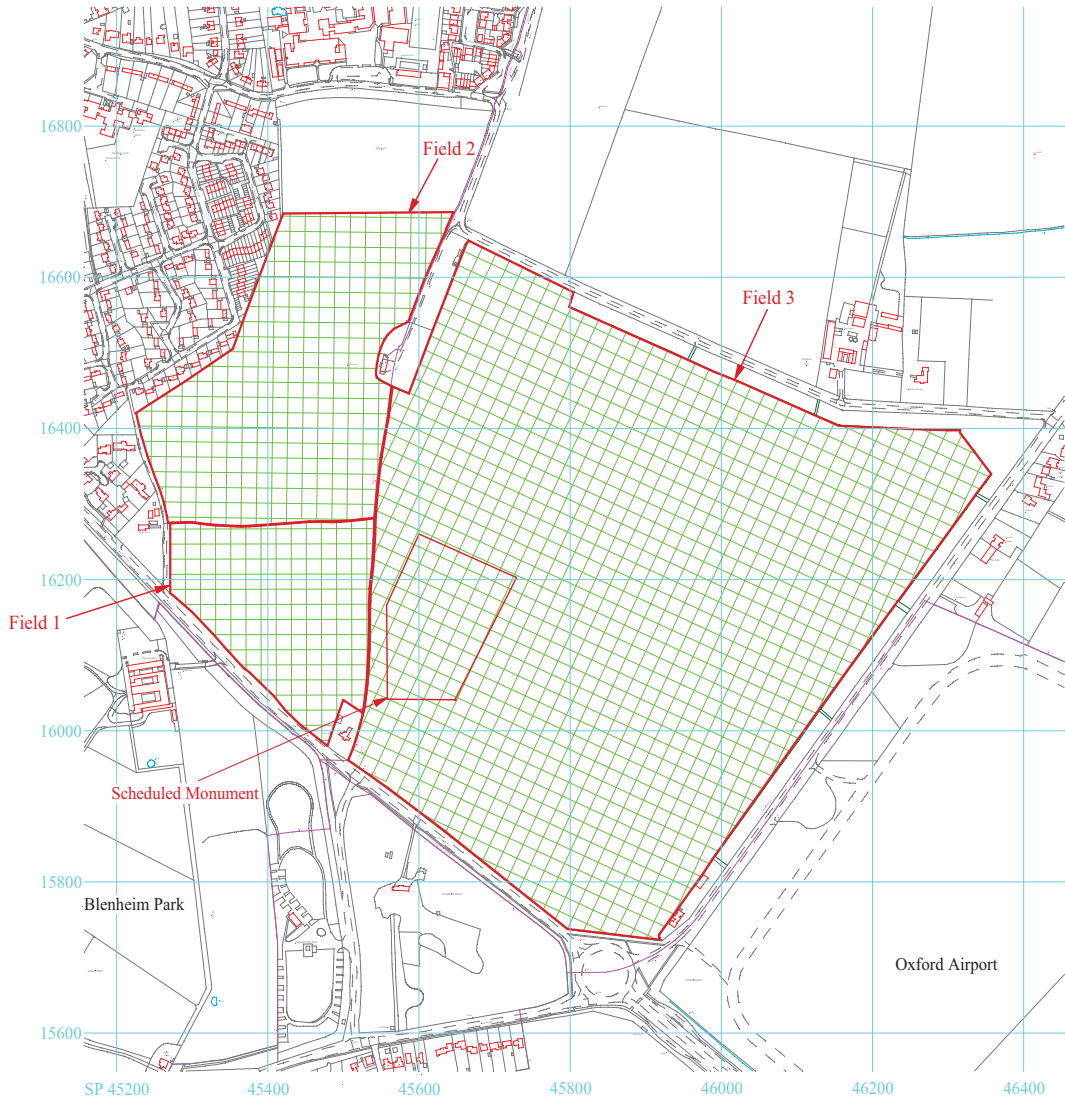
**Land at Shipton Road, Woodstock,
Oxfordshire, 2014**

Geophysical Survey (Magnetic)

Figure 1. Location of site within Woodstock and Oxfordshire,
showing location of Scheduled Monument (approximate).

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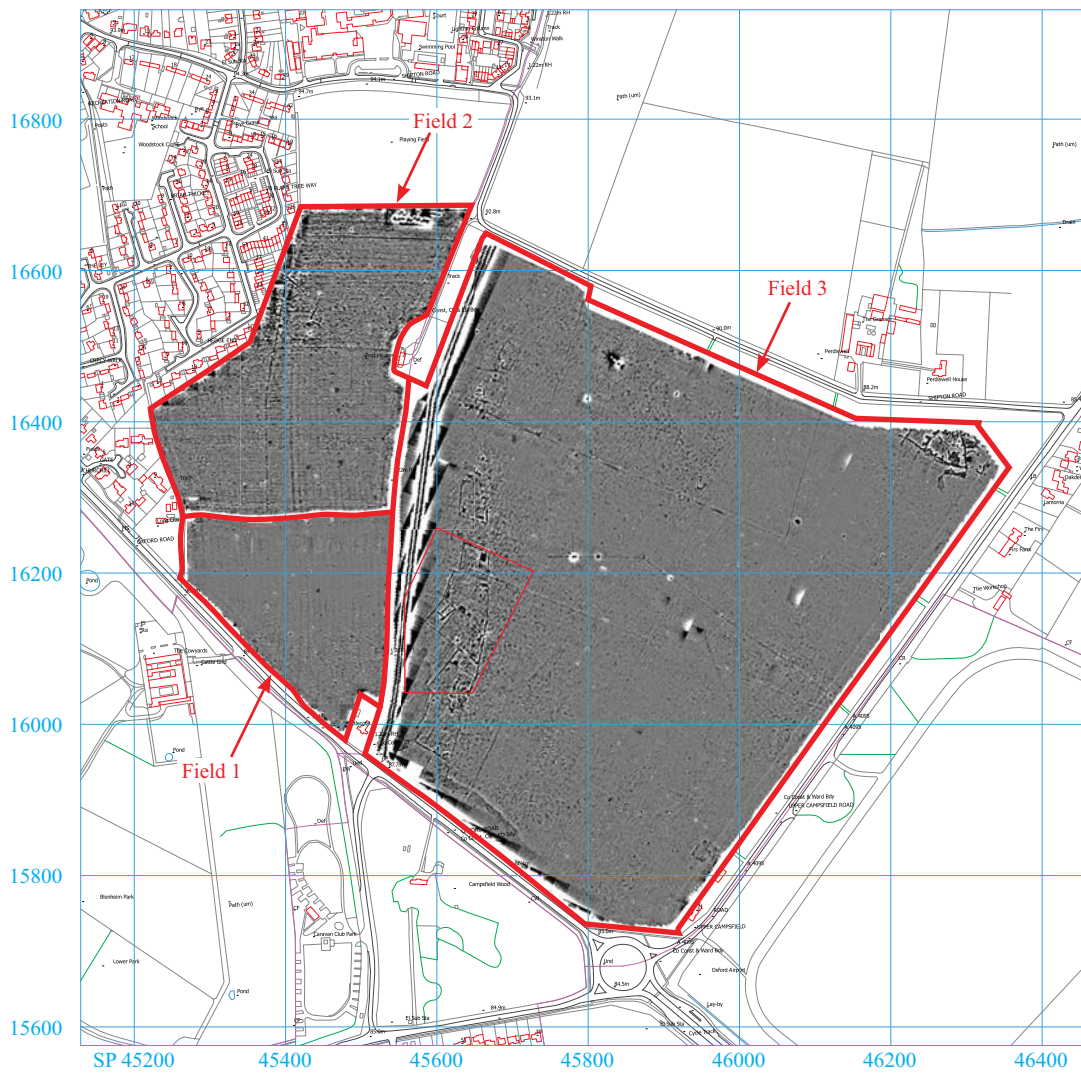
**Land at Shipton Road, Woodstock,
Oxfordshire, 2014
Geophysical Survey (Magnetic)**

Figure 2. Survey grid layout.



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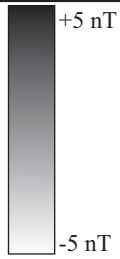












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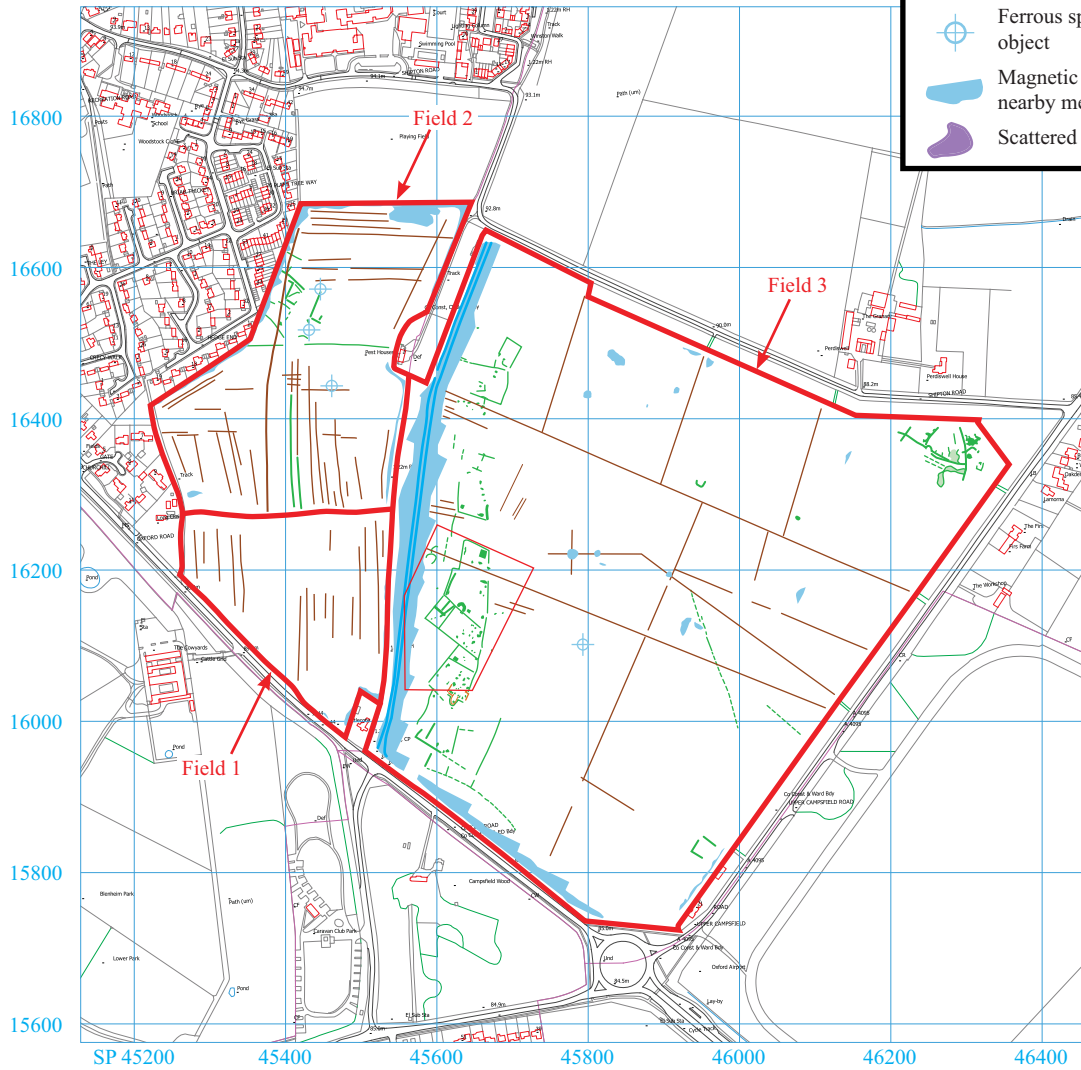


**Land at Shipton Road, Woodstock,
Oxfordshire, 2014
Geophysical Survey (Magnetic)**
Figure 3. Plot of minimally processed gradiometer data.



Legend

-  Positive anomaly - possible cut feature (archaeology)
-  Weak positive anomaly - possible cut feature
-  Negative anomaly - possible earthwork (archaeology)
-  Positive anomaly - probably of geological origin
-  Positive anomaly - probably of modern (e.g. agricultural) origin
-  Ferrous spike - probable ferrous object
-  Magnetic disturbance caused by nearby metal objects/services
-  Scattered ferromagnetic debris



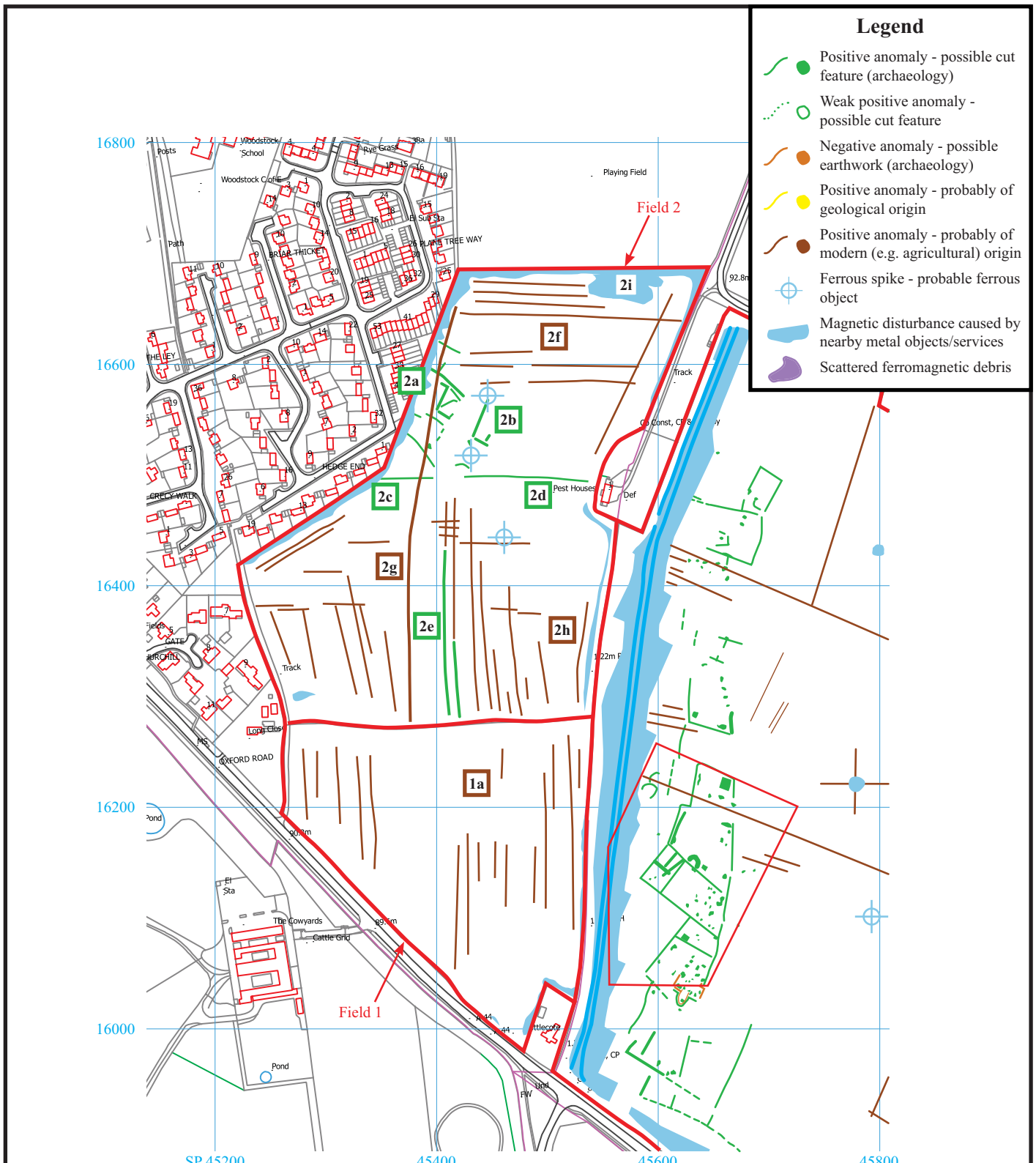
SWO 14/131b



**Land at Shipton Road, Woodstock,
Oxfordshire, 2014
Geophysical Survey (Magnetic)**
Figure 4. Interpretation plot.

0m  500m

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Legend

- Positive anomaly - possible cut feature (archaeology)
- Weak positive anomaly - possible cut feature
- Negative anomaly - possible earthwork (archaeology)
- Positive anomaly - probably of geological origin
- Positive anomaly - probably of modern (e.g. agricultural) origin
- ⊕ Ferrous spike - probable ferrous object
- Magnetic disturbance caused by nearby metal objects/services
- Scattered ferromagnetic debris

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**Land at Shipton Road, Woodstock,
Oxfordshire, 2014
Geophysical Survey (Magnetic)**
Figure 6. Interpretation plot. Fields 1 and 2.



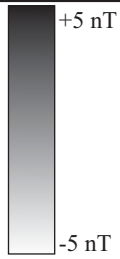


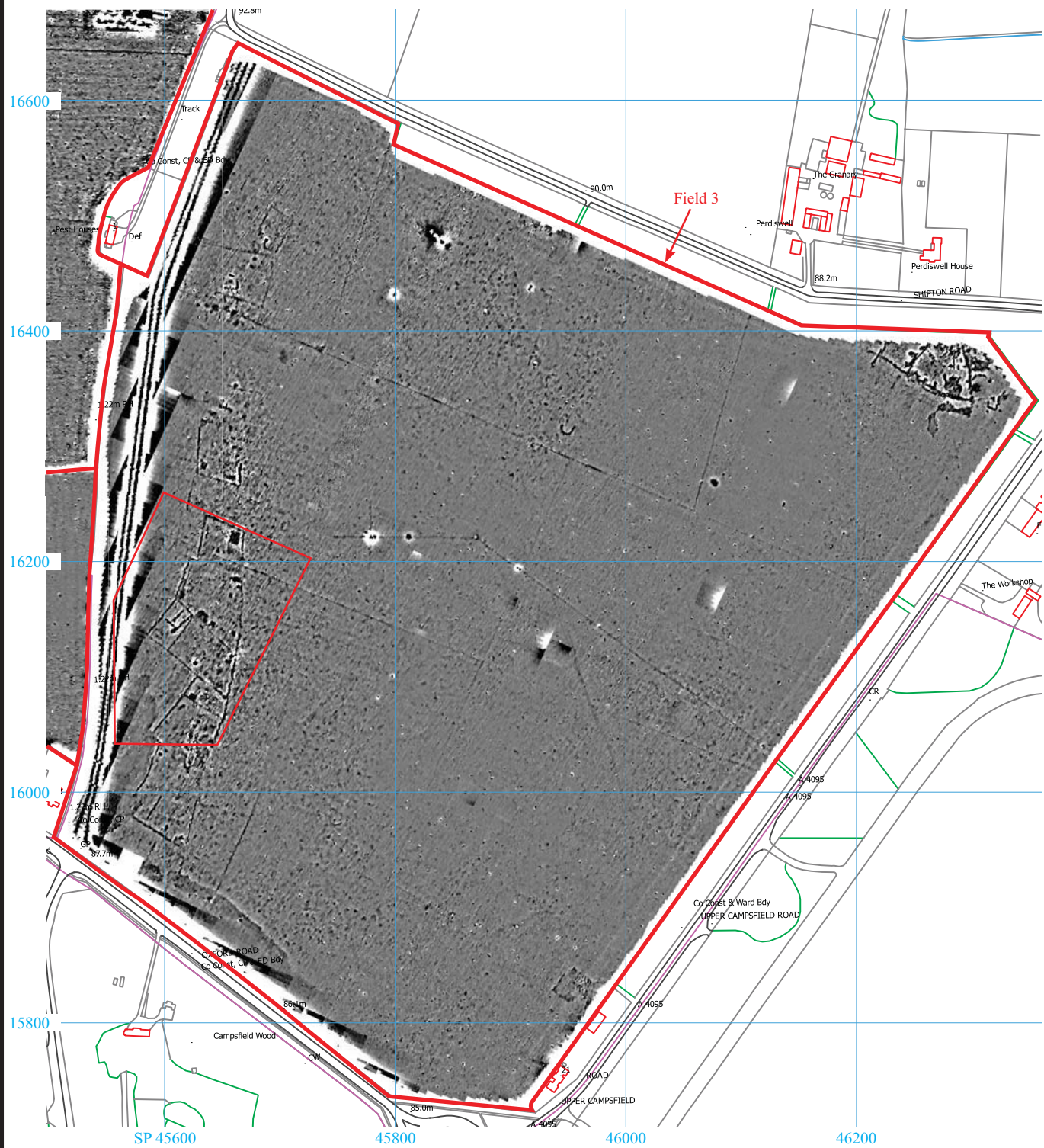
SWO 14/131b



**Land at Shipton Road, Woodstock,
Oxfordshire, 2014
Geophysical Survey (Magnetic)**

Figure 7. Plot of minimally processed gradiometer data.
Field 2 detail.



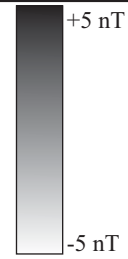


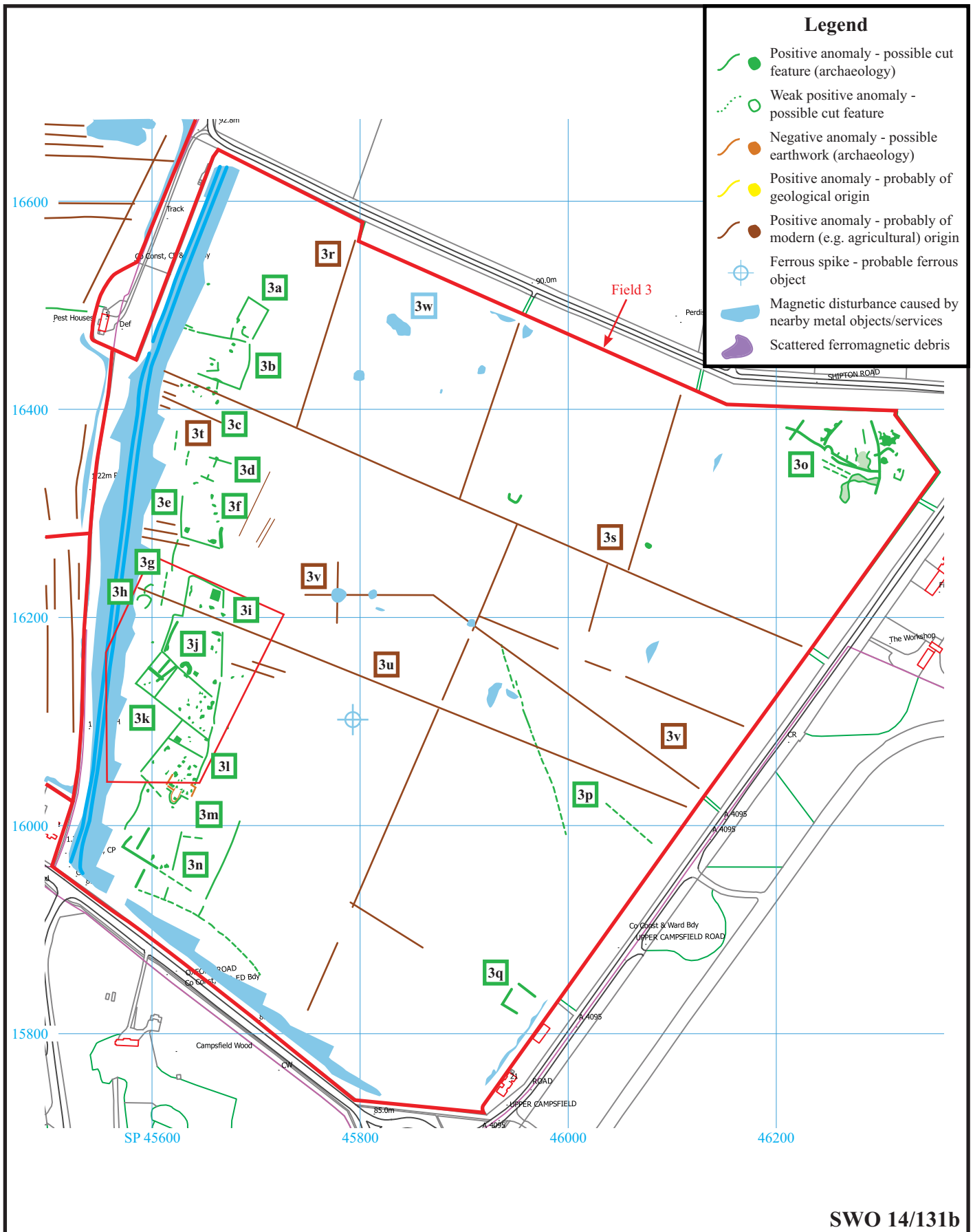
SWO 14/131b



**Land at Shipton Road, Woodstock,
Oxfordshire, 2014
Geophysical Survey (Magnetic)**

Figure 8. Plot of minimally processed gradiometer data.
Field 3.



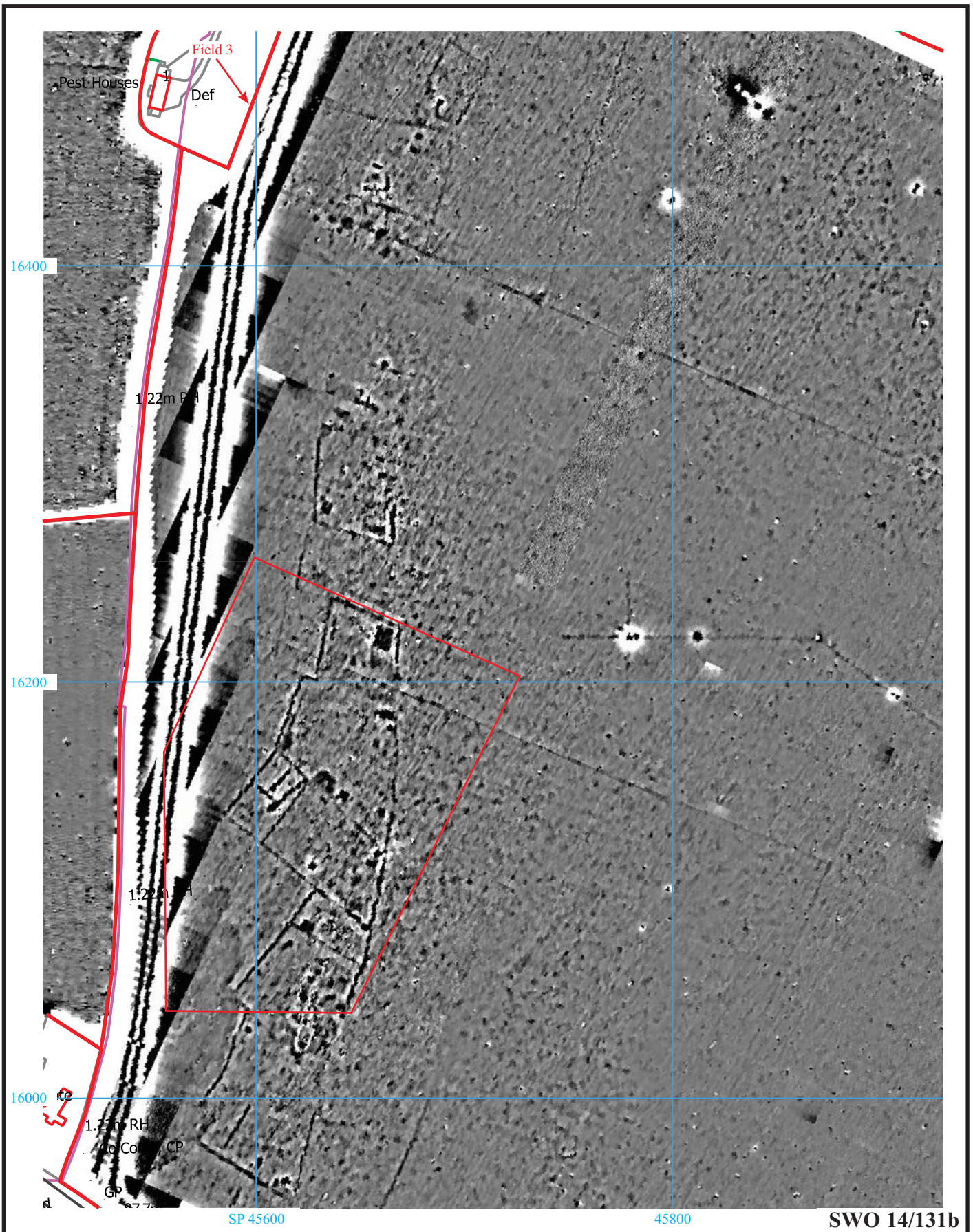


SWO 14/131b



Land at Shipton Road, Woodstock,
Oxfordshire, 2014
Geophysical Survey (Magnetic)
Figure 9. Interpretation plot. Field 3.

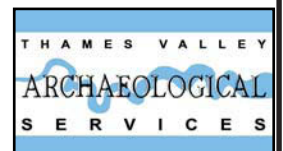
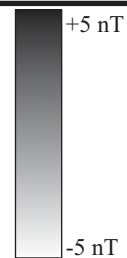


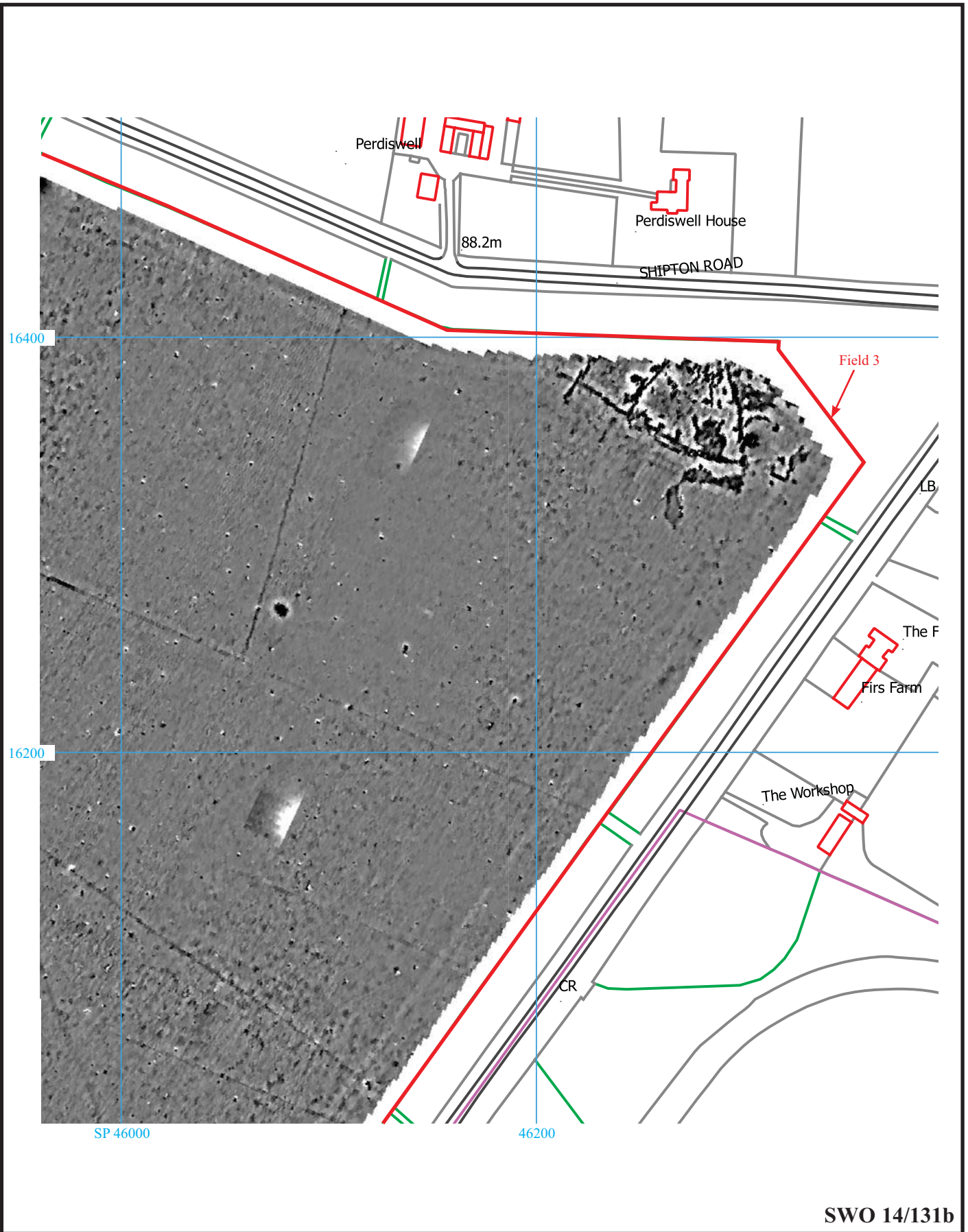


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Oxfordshire, 2014
Geophysical Survey (Magnetic)**

Figure 10. Plot of minimally processed gradiometer data.
Field 3 west detail.

0m 125m





**Land at Shipton Road, Woodstock,
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Geophysical Survey (Magnetic)**

Figure 11. Plot of minimally processed gradiometer data.
Field 3 east detail.

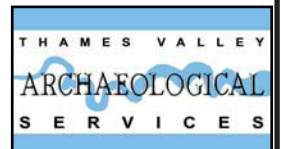
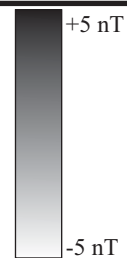




Plate 1. Field 1, looking south-east.



Plate 2. Field 2, looking north.



Plate 3. Field 3, experimental crop on the west side,
looking south.



Plate 4. Field 3, looking west.

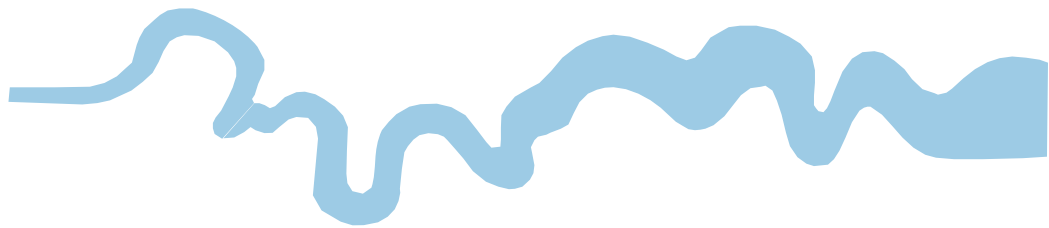
SWO 14/131b

**Land at Shipton Road, Woodstock,
Oxfordshire, 2014
Geophysical Survey (Magnetic)**
Plates 1 - 4.

THAMES VALLEY
ARCHAEOLOGICAL
SERVICES

TIME CHART

	Calendar Years
Modern _____	AD 1901
Victorian _____	AD 1837
Post Medieval _____	AD 1500
Medieval _____	AD 1066
Saxon _____	AD 410
Roman _____	AD 43
Iron Age _____	BC/AD 750 BC
Bronze Age: Late -----	1300 BC
Bronze Age: Middle -----	1700 BC
Bronze Age: Early -----	2100 BC
Neolithic: Late	3300 BC
Neolithic: Early	4300 BC
Mesolithic: Late	6000 BC
Mesolithic: Early	10000 BC
Palaeolithic: Upper	30000 BC
Palaeolithic: Middle	70000 BC
Palaeolithic: Lower	2,000,000 BC
↓	↓



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