

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

ARCHAEOLOGICAL

S E R V I C E S

**Land off Wilcot Road, Stonington,
Pewsey, Wiltshire**

Geophysical Survey (Magnetic)

by Kyle Beaverstock

Site Code: SPW14/213

(SU 1542 6035)

Land off Wilcot Road, Stonington, Pewsey, Wiltshire

Geophysical Survey (Magnetic) Report

For Dunmoore Group

by Kyle Beaverstock

Thames Valley Archaeological Services Ltd

Site Code SPW 14/213

November 2020

Summary

Site name: Land off Wilcot Road, Stonington, Pewsey, Wiltshire

Grid reference: SU 1542 6035

Site activity: Magnetometer survey

Date and duration of project: 26th October 2020

Project coordinator: Tim Dawson

Site supervisor: Kyle Beaverstock

Site code: SPW14/213

Area of site: c. 2ha

Summary of results: Other than some magnetic disturbance caused by modern services a positive linear anomaly was identified which may represent a buried feature such as a boundary ditch that may be of archaeological interest.

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✓ 18.11.20 Tim Dawson✓ 18.11.20 |
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Land off Wilcot Road, Stonington, Pewsey, Wiltshire A Geophysical Survey (Magnetic)

by Kyle Beaverstock

Report 14/213b

Introduction

This report documents the results of a geophysical survey (magnetic) carried out at Wilcot Road, Stonington, Pewsey, Wiltshire (SU 1542 6035) (Fig. 1). The work was commissioned by Roger Welchman of a.r.planning, The Exchange, Colworth Science Park, Sharnbrook, Bedford, MK44 1LZ on behalf of Dunmoore Group, Brightwalton House, Brightwalton, Newbury, Berkshire, RG20 7BZ

Planning consent is to be sought from Wiltshire Council for the laying out of one artificial and three natural grass sports pitches and training areas with an associated club house, a metalled car park and the construction of up to 49 dwellings. This assessment will accompany the application in order to inform the planning process with regard to potential archaeological and heritage implications. This is in accordance with the Department for Communities and Local Government's National Planning Policy Framework (NPPF 2012) and the Council's heritage policies. The fieldwork was undertaken by Kyle Beaverstock and Lucciano Cicu on the 26th of October 2020 and the site code is SPW14/213.

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

Location, topography and geology

The site is located northwest of the village of Pewsey, to the north of Woodborough Road and west of Wilcot Road (Fig. 1). The site is bounded by Woodborough Road to the south, Wilcot Road to the east, sports fields to the north and a private road to the west. The site sits at a height of 129m above Ordinance Datum (aOD) in the east sloping down to 124m aOD in the west and is currently under pasture. The underlying geology is stated as Upper Greensand Formation (BGS 2008).

Site history and archaeological background

The archaeological background has been highlighted in depth by the desktop study (Tabor 2014). To summarise, although there are no known archaeological assets within the survey area there are a number of known sites in the area. Including a number of prehistoric sites which are mostly concentrated along the north and south facing

scarps. Pewsey itself has a long history as the commercial centre for local agriculture and is surrounded by satellite settlements which grew up around early farmsteads (Chandler 2014).

Methodology

Sample interval

Data collection involved the traversing of the survey area along straight and parallel lines using two cart-mounted Bartington Grad601-2 fluxgate gradiometers. Even coverage was achieved with the use of regularly spaced markers at the ends of traverses and the real-time positional trace plot. Readings were taken at 0.25m intervals along traverses 1m apart, providing an appropriate methodology balancing cost and time with resolution. Traverses were walked at an alternating east to west orientation zig-zag pattern across the survey area. The site was relatively clear of obstructions other than fencing dividing the area into small paddocks. In the southwestern area of the site there was a large tree and overgrowth which prevented this area from being surveyed. The weather was mostly dry.

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 European Archaeological Council (EAC 2015) and the Chartered Institute *for* Archaeologists (2002, 2014).

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 the fast yet detailed surveying of an area.

The detailed magnetometry survey was carried out using two dual sensor Bartington Instruments Grad 601-2 fluxgate gradiometers mounted upon a Bartington non-magnetic cart. A two-wheeled lightweight structure

pushed by hand, the cart consisted a bank of four vertically-mounted Bartington Grad601-2 magnetic sensor tubes at 1m apart and a Trimble Geo 7x centimetre edition GPS. Readings were collected by two Bartington Grad601-2 loggers and collated using MLgrad601 software on a Linx 12x64 tablet running Windows 10 mounted at the rear of the cart. 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.

The Trimble Geo7x centimetre edition GPS system with centimetre real-time accuracy was used to tie the cart traverses 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 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 -5.50 to 5.53 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. |
| De-stagger: all grids, both by -1 intervals | Cancel out effects of site's topography on irregularities in the traverse speed. |

The raw data plot is presented as a greyscale plot shown in relation to the site (Fig. 2) with the processed data then presented as a second figure (Fig. 3), followed by a third plan to present the abstraction and interpretation of the magnetic anomalies (Fig. 4). Anomalies are shown as colour-coded lines, points and polygons.

The greyscale plot of the processed data is exported from TerraSurveyor in a georeferenced 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 combined with grid and site plans in QGIS 2.18.15 and exported again in .PNG format in order to present them in figure templates 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

Across the site there are a number of areas of magnetic disturbance, these are represented by bipolar and dipolar signals of a high amplitude in a linear pattern. One of these is orientated from west to east running from the western boundary to the eastern edge of the survey area. The second runs from the northeast corner across the central area of the site to the southwestern edge of the survey area. These most likely represent modern services. There are also a number of magnetic spikes in the central area of the site, these are represented by bipolar responses of a high amplitude and are likely caused by buried ferrous objects. There are also several areas of magnetic debris, these are areas with positive and negative responses of high amplitude. These may represent areas with disturbed geology or may be caused by scatters of buried ferrous objects.

In the northern part of the site is a positive linear anomaly, it runs from the northwestern edge of the site towards the east for 34m before curving round to the southeast before disappearing into the magnetic disturbance and is 120m in total. Although this may represent a linear feature such as a ditch of indeterminate date it is possible that it is associated with the modern track which runs along the edge of the field.

Conclusion

The site has several areas of magnetic disturbance across the survey area due to buried services, these may be masking more subtle features such as gullies or pits. Beyond this is a positive linear anomaly that runs along the northern and part of the northeastern edge of the survey area which may represent a buried linear feature such as a boundary ditch.

References

- BGS, 2008, *British Geological Survey*, 1:50,000, Sheet 282, Bedrock and Superficial Edition, Keyworth
- Chandler, J, 2014, 'Pewsey', Concise History', from Chandler, 2001, Marlborough and Eastern Wiltshire
<http://history.wiltshire.gov.uk/community/getconcise.php?id=188> (accessed: 31st October 2014)
- CI/A, 2014, 'Standard and Guidance for archaeological geophysical survey', Reading
- EAC, 2015, *EAC Guidelines for the use of Geophysics in Archaeology: Questions to Ask and Points to Consider*, EAC Guidelines 2, Namur
- IFA, 2002, 'The Use of Geophysical Techniques in Archaeological Evaluation', IFA Paper No. 6, Reading
- NPPF, 2012, National Planning Policy Framework, Dept Communities and Local Government, London

Tabor, R, 2014, Land off Wilcot Road, Stonington, Pewsey, Wiltshire, archaeological desk-based assessment,
Reading

Appendix 1. Survey and data information

Programme:

Name: TerraSurveyor
Version: 3.0.25.0

Raw data

Filename: *Pewsey RAW.xcp*
Instrument Type: *MLgrad Import*
Units:
UTM Zone: 30
Survey corner coordinates (X/Y):
Northwest corner: 415353.840900205, 160462.34099624 m
Southeast corner: 415562.620900205, 160269.29099624 m
Direction of 1st Traverse: 90 deg
Collection Method: *Parallel*
Sensors: 2 @ 1 m spacing.
Dummy Value: 32702

Dimensions

Survey Size (meters): 209 m x 193 m
X&Y Interval: 0.13 m
Source GPS Points: Active: 55055, Recorded: 55055

Stats

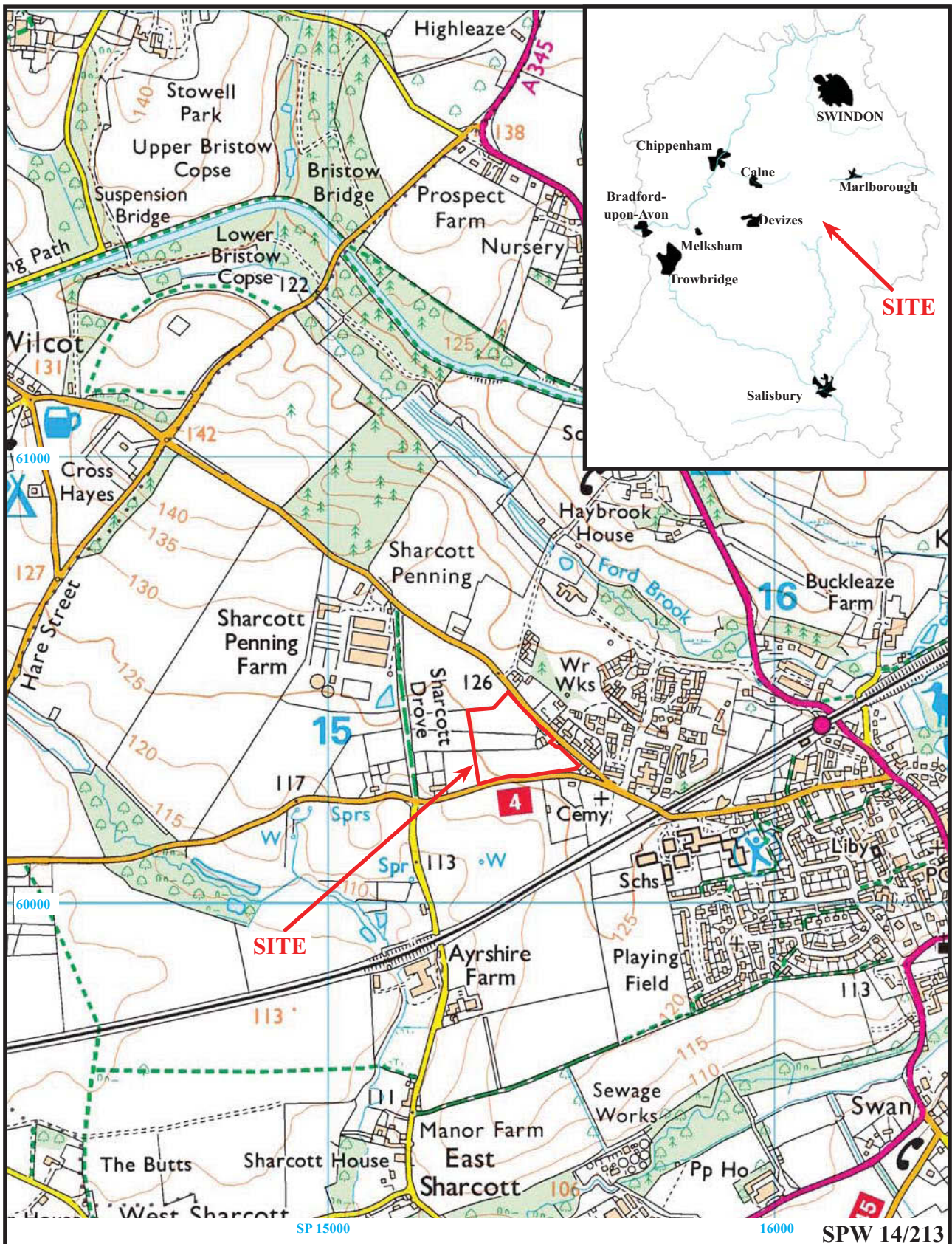
Max: 107.13
Min: -109.74
Std Dev: 13.22
Mean: -2.52
Median: -1.65
Composite Area: 4.0305 ha
Surveyed Area: 1.9765 ha

Processed data

Filename: *Pewsey.xcp*
Stats
Max: 5.53
Min: -5.50
Std Dev: 1.99
Mean: -0.22
Median: 0.03
Composite Area: 4.0305 ha
Surveyed Area: 1.9765 ha

GPS based Proce4

- 1 Base Layer.
- 2 Unit Conversion Layer (Lat/Long to UTM).
- 3 DeStripe Median Traverse:
- 4 Clip from -5.00 to 5.00



**Land off Wilcot Road, Stonington,
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Geophysical Survey (Magnetic)**

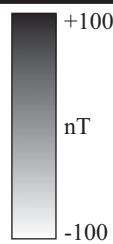
Figure 1. Location of site within Pewsey and Wiltshire.

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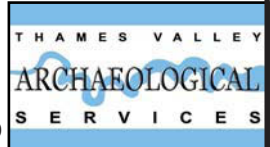
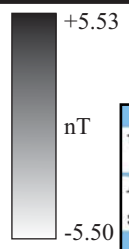


**Land off Wilcot Road, Stonington,
 Pewsey, Wiltshire, 2020
 Geophysical Survey (Magnetic)**
 Figure 2. Plot of raw gradiometer data.





**Land off Wilcot Road, Stonington,
 Pewsey, Wiltshire, 2020**
Geophysical Survey (Magnetic)
 Figure 3. Plot of processed gradiometer data.



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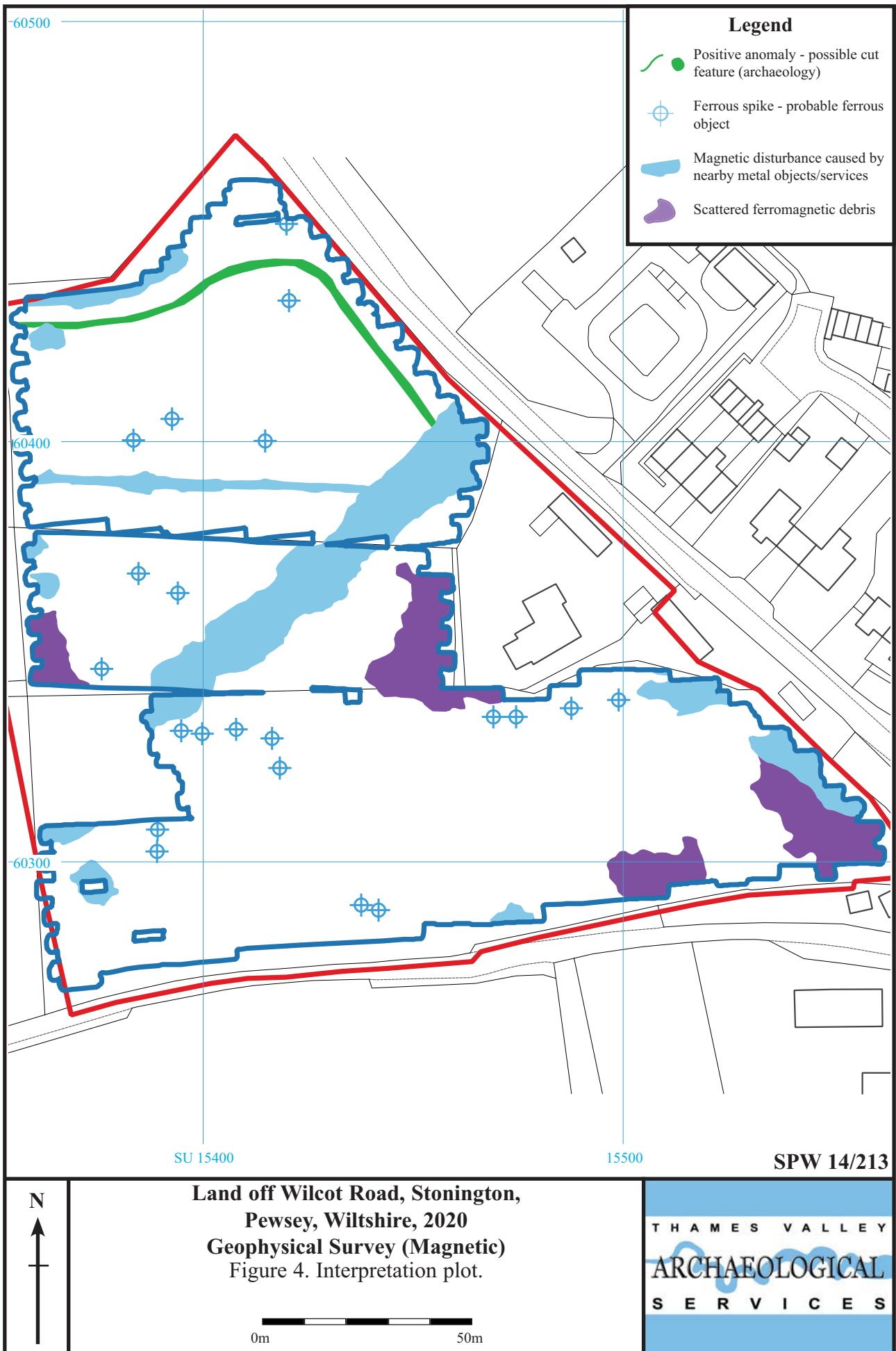




Plate 1. Central paddock looking east



Plate 2. Northern paddock looking east



Plate 3. Northern edge of central paddock looking south



Plate 4. Southern paddock looking west

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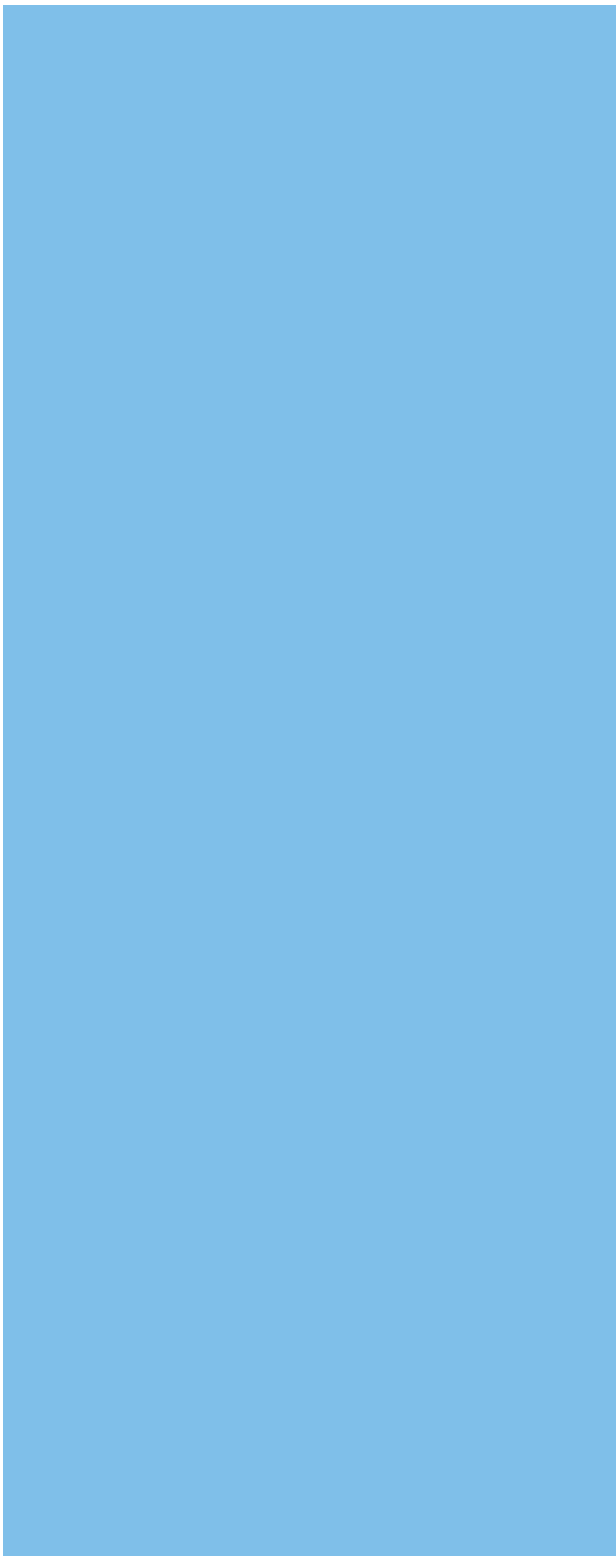
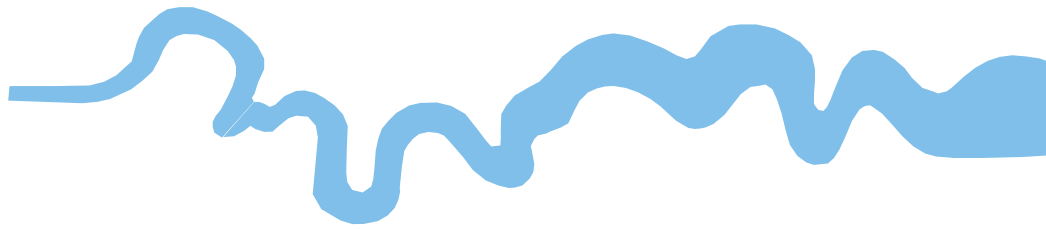
**Land off Wilcot Road, Stonington,
Pewsey, Wiltshire, 2020
Geophysical Survey (magnetic)
Plates 1 to 4.**

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TIME CHART

| | Calendar Years |
|----------------------------|------------------|
| Modern _____ | AD 1901 |
| Victorian _____ | AD 1837 |
| Post Medieval _____ | AD 1500 |
| Medieval _____ | AD 1066 |
| Saxon _____ | AD 410 |
| Roman _____ | AD 43 AD 0 BC |
| Iron Age _____ | 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 |





**Thames Valley Archaeological Services Ltd,
47-49 De Beauvoir Road,
Reading RG1 5NR**

**Tel: 0118 9260552
Email: tvas@tvas.co.uk
Web: www.tvas.co.uk**

***Offices in:
Brighton, Taunton, Stoke-on-Trent, Wellingborough
and Ennis (Ireland)***