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Land at Scratchface Lane, Bedhampton, Havant, Hampshire

Geophysical Survey (Magnetic)

by Tim Dawson

Site Code: SLB13/09

(SU 6951 0674)

Land at Scratchface Lane, Bedhampton, Havant, Hampshire

Geophysical Survey (Magnetic) Report

For Crayfern Homes Ltd

by Tim Dawson

Thames Valley Archaeological Services Ltd

Site Code SLB 13/09

October 2013

Summary

Site name: Land at Scratchface Lane, Bedhampton, Havant, Hampshire

Grid reference: SU 6951 0674

Site activity: Magnetometer survey

Date and duration of project: 21st - 23rd October 2013

Project manager: Steve Ford

Site supervisor: Tim Dawson

Site code: SLB 13/09

Area of site: 3.41ha

Summary of results: Only a single anomaly was identified during the survey although its magnetic signature and historic maps suggest this is the remains of a modern farm track. The southern field was particularly noted by the high levels of magnetic disturbance and debris, probably caused by modern vegetation and ferrous content in the soil.

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✓ 25.10.13
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Land at Scratchface Lane, Bedhampton, Havant, Hampshire
A Geophysical Survey (Magnetic)

by Tim Dawson

Report 13/09

Introduction

This report documents the results of a geophysical survey (magnetic) carried out at land at Scratchface Lane, Bedhampton, Havant, Hampshire (SU 6951 0674) (Fig. 1). The work was commissioned by Mr Ian Wood of Crayfern Homes Ltd, 14 St John's Road, Hedge End, Southampton, SO30 4AB.

Planning permission (APP/13/00103) for the construction of a variety of housing and associated garages has be granted by Havant Borough Council subject to three conditions (23, 24 and 25) which require the implementation of a programme of archaeological work. This is to comprise a geophysical survey followed by trial trenching targeting any anomalies of archaeological origin identified by the geophysics.

This is in accordance with the Department for Communities and Local Government's National Planning Policy Framework (NPPF 2012), and the Borough's policies on archaeology. The field investigation was carried out to a specification approved by Dr Hannah Fluck, Senior Archaeologist at Hampshire County Council. The fieldwork was undertaken by Tim Dawson, Anna Ginger and Lizzi Lewins between 21st and 23rd October 2013 and the site code is SLB 13/09.

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 to the south of Scratchface Lane on the western edge of Bedhampton, a suburb of Havant in the south-eastern corner of Hampshire (Fig. 1). The site is shaped roughly as two inverted triangles (Fig. 2) with the north field having previously been used as a paddock and the south as an overgrown extension to this. The northern field is predominantly covered in short grass while the southern has several patches of brambles, which were removed in preparation for the survey. To the east are the backs of a late 20th century housing development, to the north is Scratchface Lane and Littlepark Wood and to the west is an embankment leading down to the A3(M). The site is level at *c*.29m above Ordnance Datum (aOD) at the northern end before rising slightly to *c*.31m aOD and then falling gently to the drain that marks the boundary between the northern and southern fields at a height of *c*.22m aOD and then rises again to its highest point of *c*.41m aOD at the southern

tip of the southern field. The underlying geology varies across the site: in the northern field it is described as primarily London Clay with a band of Bognor Sand crossing it approximately half way along the length of the field whereas the southern field overlies head deposits near the dividing drain and, further up the hill, Portsdown Chalk (BGS 1998).

Conditions during the survey varied from heavy rain to warm sunshine with thunderstorms occurring overnight and the ground remained damp for the majority of the duration. Groundcover had largely been removed by the time of the survey with just a few small shrubs and bushes remaining in the southern field. Thickets of bramble bushes had been removed above ground level but much of the debris still covered the ground surface (Plates 1-4). There were a large amount of metallic objects either in close proximity to the survey area or within the area itself. The entire site was surrounded with a reptile barrier and all except for the eastern edge of the north field was bordered with Heras fencing which marked out the tree protection zone. In addition to these there were dumps of building debris along the eastern side of the north field and around all edges of the south field with piles of scrap metal and road irons positioned towards the centre of the latter. The metallic caps of several boreholes were also noted in both survey areas.

Site history and archaeological background

The archaeological potential of the site has been considered in a desk-based assessment (Smith 2009). In summary, it is possible that the Roman road from Chichester to Bitterne may cross the north-eastern part of the site, close to Scratchface Lane. Whilst no archaeological finds or features have been recorded on the site itself, Bronze Age pottery and flintwork was found when the A3(M) was constructed in the 1970s, along with an Iron Age pit. Slightly further afield, the Neolithic long barrow known as Bevis' Grave is located on Portsdown Hill, *c*.300m west of the site. This feature is a Scheduled Ancient Monument, and a sizeable early Saxon cemetery is recorded in its vicinity, suggesting that an associated settlement maybe located nearby. Littlepark Roman villa is another Scheduled Ancient Monument, about 300m to the northwest of the site. Roman activity has also been recorded to the north and east of the site.

Methodology

Sample interval

Data collection required a temporary grid to be established across the survey area using wooden pegs at 30m 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. Due to the irregular shape of the site it was decided to align the survey grids to Ordnance Survey Grid North. The entire site inside the reptile barrier was covered with only the area in the north-eastern corner of the south field left unsurveyed due the presence of trees and thick undergrowth.

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 set out by both English Heritage (2008) and the Institute for Archaeologists (2002).

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 seem 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 TerraSurveyorLite 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 -10.00 to 10.00 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-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.7.22.01, 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 TerraSurveyorLite 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

North Field

The north field contains a single anomaly that indicates the presence of a buried feature although this is unlikely to be of archaeological interest. The strong but non-uniform positive linear anomaly with associated negative responses cuts across the field from northeast to southwest roughly following the contour line **[Fig. 1: 1]**. The anomaly follows the line of a pronounced bank which is visible as an earthwork on the surface of the field (Plate

4). The Ordnance Survey map of 1952 shows a track in this location which links Scratchface Lane to a farm which was demolished by the 1970s to make way for the A3(M). The other anomalies recorded in the northern field were caused by the Heras fencing panels that formed the tree protection barrier around the site and areas of building debris along the eastern site boundary. Several ferromagnetic spikes were also recorded across the area which most likely represent buried metallic objects. The area nearest the predicted line of the Roman road (Fig. 2) in the northeast corner of the field was subject to strong magnetic disturbance, probably caused by a near-by pile of rubble and the close proximity of the metal gate and fencing, which may have masked any underlying anomalies caused by archaeological remains.

South Field

The magnetic plot for the southern field is characterised by heavy disturbance caused by above- and below-ground metallic objects and soil disturbance. Several stacks of metal items, such as fence posts and corrugated sheets, were present on the surface while, as with the northern field, the whole area was enclosed with Heras fencing. The patches of scattered ferromagnetic debris most likely represent either buried metallic objects or disturbance caused by the undergrowth and small trees that were once present in this area.

Conclusion

While the survey itself was undertaken successfully to plan, the conditions around the edge of the northern field and across the entire southern field were less than ideal for a magnetic survey due to the presence of several metallic objects in close proximity to the survey area. These may have had a masking affect on underlying anomalies of archaeological origin. The projected Roman road at the northern end of the site was not located, possibly due to the strong magnetic interference in that area caused by the metal fencing and building debris. No anomalies were identified that may be of archaeological origin, with the line of the 1950's farm track being the only feature recorded on the site.

References

BGS, 1998, *British Geological Survey*, 1:50,000, Sheet 316, 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

NPPF, 2012, *National Planning Policy Framework*, Dept Communities and Local Government, London

Smith, M, 2009, 'Land at Scratchface Lane, Bedhampton, Havant, Hampshire: an archaeological desk-based assessment', CgMs report, London

Appendix 1. **Survey and data information**

Programme
Name: TerraSurveyor
Version: 3.0.19.22

NORTH FIELD

Georeferencing (Fig. 2):
N1: E 469527, N 106948
N2: E 469527, N 106908

Raw data
Instrument Type: Bartington (Gradiometer)
Units: nT
Surveyed by: Tim Dawson, Lizzi Lewins on 22/10/2013
Assembled by: on 22/10/2013
Direction of 1st Traverse: 0 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32000

Dimensions
Composite Size (readings): 1040 x 140
Survey Size (meters): 260 m x 140 m
Grid Size: 20 m x 20 m
X Interval: 0.25 m
Y Interval: 1 m

Stats
Max: 100.00
Min: -100.00
Std Dev: 19.29
Mean: -1.49
Median: 0.28
Composite Area: 3.64 ha
Surveyed Area: 1.9334 ha

Source Grids: 61
1 Col:0 Row:3 grids\01-a.xgd
2 Col:0 Row:4 grids\02.xgd
3 Col:0 Row:5 grids\03.xgd
4 Col:1 Row:3 grids\04.xgd
5 Col:1 Row:4 grids\05.xgd
6 Col:1 Row:5 grids\06.xgd
7 Col:2 Row:3 grids\07.xgd
8 Col:2 Row:4 grids\08.xgd
9 Col:2 Row:5 grids\09.xgd
10 Col:3 Row:2 grids\10.xgd
11 Col:3 Row:3 grids\11.xgd
12 Col:3 Row:4 grids\12.xgd
13 Col:3 Row:5 grids\13.xgd
14 Col:4 Row:2 grids\14.xgd
15 Col:4 Row:3 grids\15.xgd
16 Col:4 Row:4 grids\16.xgd
17 Col:4 Row:5 grids\17.xgd
18 Col:5 Row:2 grids\18.xgd
19 Col:5 Row:3 grids\19.xgd
20 Col:5 Row:4 grids\20.xgd
21 Col:5 Row:5 grids\21.xgd
22 Col:6 Row:1 grids\22.xgd
23 Col:6 Row:2 grids\23.xgd
24 Col:6 Row:3 grids\24.xgd
25 Col:6 Row:4 grids\25.xgd
26 Col:6 Row:5 grids\26.xgd
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28 Col:7 Row:2 grids\28.xgd
29 Col:7 Row:3 grids\29.xgd
30 Col:7 Row:4 grids\30.xgd
31 Col:7 Row:5 grids\31.xgd
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39 Col:9 Row:1 grids\39.xgd
40 Col:9 Row:2 grids\40.xgd
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47 Col:10 Row:2 grids\47.xgd
48 Col:10 Row:3 grids\48.xgd
49 Col:10 Row:4 grids\49.xgd
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54 Col:11 Row:2 grids\54.xgd
55 Col:11 Row:3 grids\55.xgd
56 Col:11 Row:4 grids\56.xgd
57 Col:11 Row:5 grids\57.xgd
58 Col:11 Row:6 grids\58.xgd
59 Col:12 Row:0 grids\59.xgd
60 Col:12 Row:1 grids\60.xgd
61 Col:12 Row:2 grids\61.xgd

Processed data
Stats
Max: 10.00
Min: -10.00
Std Dev: 3.73
Mean: -0.26
Median: 0.00

Processes: 4
1 Base Layer
2 De Stagger: Grids: All Mode: Both By: -2 intervals
3 DeStripe Median Sensors: All
4 Clip from -10.00 to 10.00 nT

SOUTH FIELD

Georeferencing (Fig. 2):
S1: E 469544, N 106623
S2: E 469543, N 106583

Raw data
Instrument Type: Bartington (Gradiometer)
Units: nT
Surveyed by: Tim Dawson, Anna Ginger on 23/10/2013
Assembled by: on 23/10/2013
Direction of 1st Traverse: 0 deg
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32000

Dimensions
Composite Size (readings): 560 x 80
Survey Size (meters): 140 m x 80 m
Grid Size: 20 m x 20 m
X Interval: 0.25 m
Y Interval: 1 m

Stats
Max: 100.00
Min: -100.00
Std Dev: 30.55
Mean: -5.62
Median: -0.27
Composite Area: 1.12 ha
Surveyed Area: 0.55705 ha Source Grids: 22

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2 Col:0 Row:3 grids\02.xgd
3 Col:1 Row:1 grids\03.xgd
4 Col:1 Row:2 grids\04.xgd
5 Col:1 Row:3 grids\05.xgd
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8 Col:2 Row:3 grids\08.xgd
9 Col:3 Row:1 grids\09.xgd
10 Col:3 Row:2 grids\10.xgd
11 Col:3 Row:3 grids\11.xgd
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13 Col:4 Row:1 grids\13.xgd
14 Col:4 Row:2 grids\14.xgd
15 Col:4 Row:3 grids\15.xgd
16 Col:5 Row:0 grids\16.xgd
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18 Col:5 Row:2 grids\18.xgd
19 Col:5 Row:3 grids\19.xgd
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21 Col:6 Row:1 grids\21.xgd
22 Col:6 Row:2 grids\22.xgd

Processed data
Stats
Max: 10.00
Min: -10.00
Std Dev: 5.86
Mean: -0.60
Median: 0.00

Processes: 3
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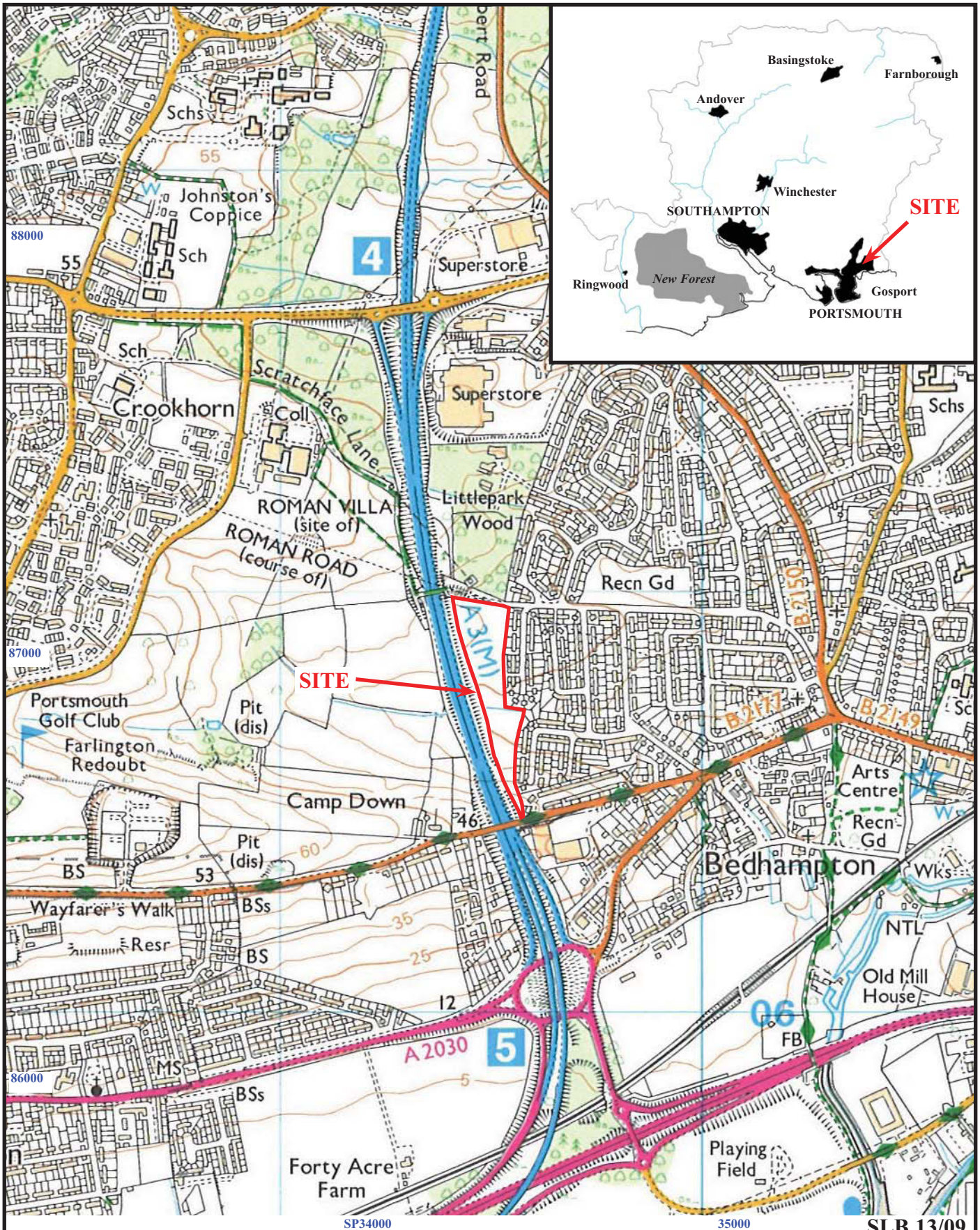
2 DeStripe Median Sensors: All
3 Clip from -10.00 to 10.00 nT



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Land at Scratchface Lane, Bedhampton, Havant, Hampshire, 2013
Geophysical Survey (Magnetic)

Figure 1. Location of site within Bedhampton and Hampshire.

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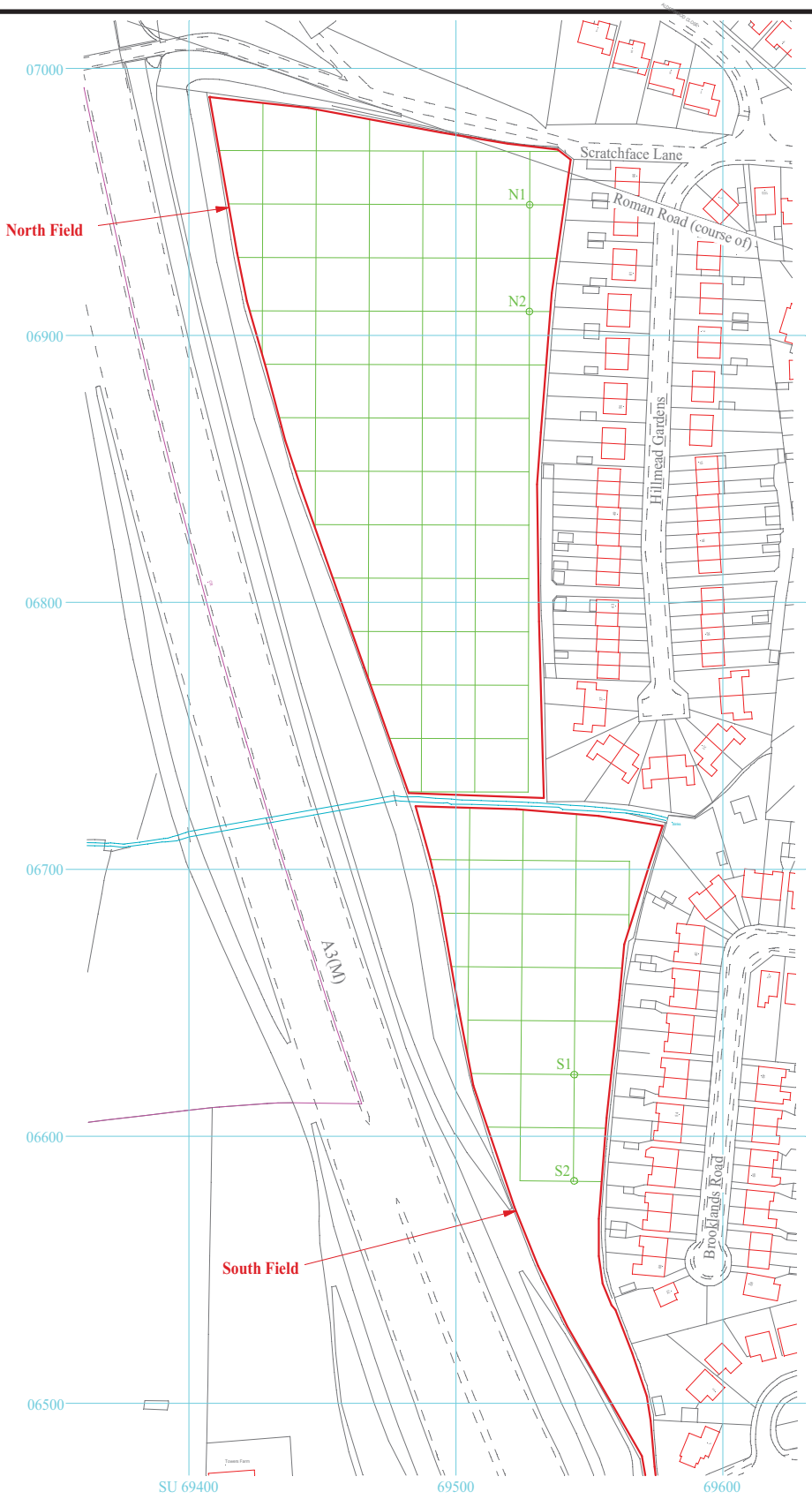

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N

Land at Scratchface Lane, Bedhampton, Havant, Hampshire, 2013 Geophysical Survey (Magnetic)

Figure 2. Survey grid layout with georeferencing points.

0 100m

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N

Land at Scratchface Lane, Bedhampton, Havant, Hampshire, 2013
Geophysical Survey (Magnetic)

Figure 3. Plot of minimally processed gradiometer data.

+10 nT

-10 nT

0m 100m

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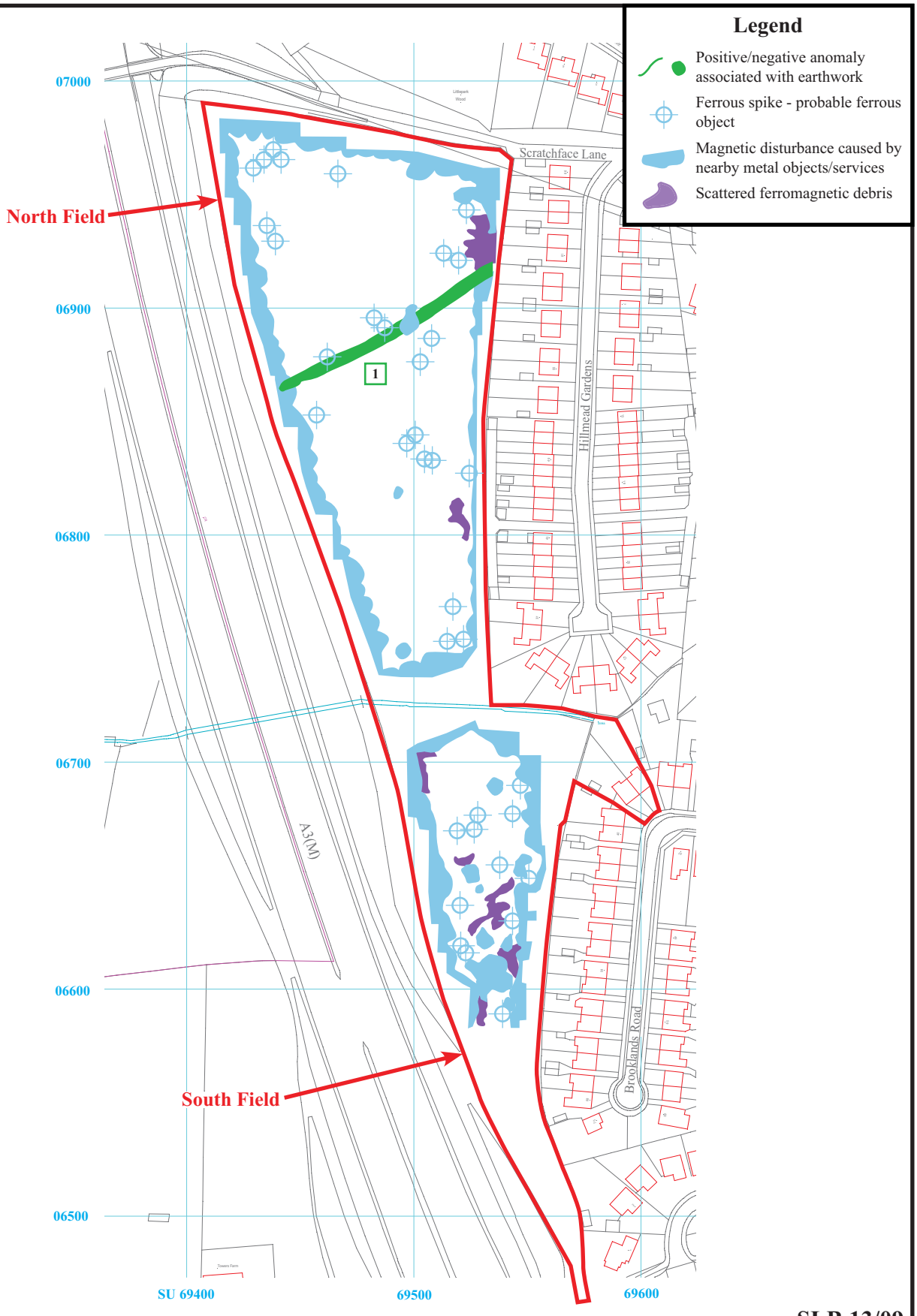

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N

Land at Scratchface Lane, Bedhampton, Havant, Hampshire, 2013
Geophysical Survey (Magnetic)

Figure 4. Interpretation plot of the geophysics data.

0m 100m

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Plate 1. The north field, looking south.

Plate 2. The north field, looking north towards the corner where the projected line of the Roman road crosses the site.

Plate 3. The south field, looking north.

Plate 4. The earthwortk, probably the 1950s farm track, which crosses the north field, looking west.

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Land at Scratchface Lane, Bedhampton, Havant, Hampshire, 2013
Geophysical Survey (Magnetic)
Plates 1 - 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
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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