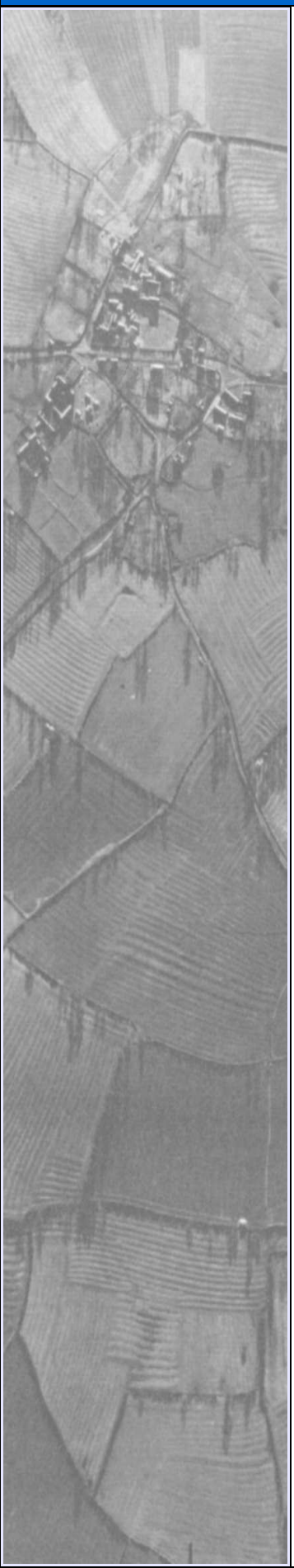

Chewton Fields Farm
Ston Easton
Somerset

MAGNETOMETER SURVEY REPORT

for

AH Green & Son

David Sabin and Kerry Donaldson

August 2012

Ref. no. 430

ARCHAEOLOGICAL SURVEYS LTD

Chewton Fields Farm
Ston Easton
Somerset

Magnetometer Survey

for

AH Green & Son

Fieldwork by David Sabin
Report by David Sabin BSc (Hons) MIFA and Kerry Donaldson BSc (Hons)

Survey date – **15th August 2012**
Ordnance Survey Grid Reference – **ST 61065 53840**

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SUMMARY

A detailed magnetometer survey was carried out by Archaeological Surveys Ltd for AH Green & Son, at Chewton Fields Farm near Ston Easton, Somerset. The survey was conducted over areas outlined for the development of an equestrian arena, car park and access track. The results revealed widespread anomalies indicative of increased soil depth within cracks in the underlying limestone. A series of positive linear, rectilinear and discrete anomalies towards the north eastern corner of the site have a morphology that could suggest ditch-like and pit-like features; however, they are on a similar orientation to the geological anomalies and a natural origin cannot be ruled out.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by AH Green and Son, at the request of Mr Thomas Ireland (Associate and RICS Registered Valuer for Carter Jonas), to undertake a magnetometer survey of an area of land at Chewton Fields Farm, near Ston Easton in Somerset. The site has been outlined for the proposed development of an equestrian arena, car park and access track. The survey forms part of an archaeological assessment of the site.

1.2 Survey objectives and techniques

1.2.1 The objective of the survey was to use magnetometry to locate geophysical anomalies that may be archaeological in origin, so that they may be assessed prior to development of the site. The methodology is considered an efficient and effective approach to archaeological prospection.

1.2.2 The survey and report generally follow the recommendations set out by: English Heritage (2008) *Geophysical survey in archaeological field evaluation;* and Institute for Archaeologists (2002) *The use of Geophysical Techniques in Archaeological Evaluations*. The work has been carried out to the Institute for Archaeologists (2011) *Standard and Guidance for Archaeological Geophysical Survey.*

1.3 Site location, description and survey conditions

1.3.1 The site is located at Chewton Fields Farm, within the parish of Chewton Mendip, but close to Ston Easton in Somerset. It is centred on Ordnance Survey National Grid Reference (OS NGR) ST 61065 53840, see Figures 01

and 02.

1.3.2 The geophysical survey covers approximately 3ha within two survey areas. Area 1 is the main body of the arena, car park and access track and Area 2 is a continuation of the access track within the field to the north.

1.3.3 The ground conditions across the site were generally considered to be favourable for the collection of magnetometry data. Weather conditions during the survey were variable with periods of very heavy rain and high winds.

1.4 Site history and archaeological potential

1.4.1 The Somerset Historic Environment Record lists several archaeological sites and findspots close to the survey area. To the north west a magnetometer survey at Worberry Gate, where the path of a proposed pipeline ran past a barrow (PRN 23262), identified a complex of anomalies of archaeological interest. These include: circular ditches of 48m diameter, hearths, concentric ditches, a large open sided enclosure with possible hearth, a complex of large pits and ditches which extends north of the present field boundary and survey limit. Further anomalies largely representing ditches and pits suggest a number of sub-rectangular enclosures, some of particularly large dimensions (60x50m, 70x55m, 40x40m) and containing further arrangements of pits, ditches and hearths indicating occupation and stock control. Interpretation may be affected by variations in background noise.

1.4.2 Also in 1982 to the south west of the current survey area a Romano British settlement was located attached to a field system which runs along the north slope of Chew Down (PRN 23279). A high density of RB pottery was picked up, mostly 4th century in date. Magnetometer and resistivity survey showed the presence of further buildings to the north in areas now under the plough. Concentrations of slag and ferric material were seen indicating industrial activity and the concentrated locations of pottery scatters suggested distinct industrial zones. Buildings and enclosures were also discovered.

1.4.3 An Archaeological Desktop Assessment has been compiled by R A Broomhead (2012) which outlines the archaeological sites and findspots in the vicinity and evaluates the potential of locating further archaeological features. Given the proximity to several Bronze Age funerary monuments in the immediate area, there is a relatively high potential for locating further barrows or associated features. There is also a high potential for locating further archaeological features relating to the Iron Age and Romano-British periods due to the widespread settlement sites close to the application area.

1.5 Geology and soils

1.5.1 The underlying geology is undifferentiated mudstones and limestones from the Langport Member and Blue Lias Formation (BGS, 2012).

1.5.2 The overlying soils across the site are from the Ston Easton association which are typical argillic brown earths. These consist of well drained, fine silty over clayey soils on limestone (Soil Survey of England and Wales, 1983).

1.5.3 Magnetometer surveys carried out over similar soils and geology have proved effective at locating geophysical anomalies relating to archaeological cut features, where they exist. However, where soils are shallow and the underlying solid geology cracked, the soil filled cracks can result in linear and rectilinear anomalies.

2 METHODOLOGY

2.1 Technical synopsis

2.1.1 Magnetometry survey records localised magnetic fields that can be associated with features formed by human activity. Magnetic susceptibility and magnetic thermoremnance are factors associated with the formation of localised fields. Additional details are set out below and within Appendix A.

2.1.2 Iron minerals within the soil may become altered by burning and the break down of biological material; effectively the magnetic susceptibility of the soil is increased, and the iron minerals become magnetic in the presence of the Earth's magnetic field. Accumulations of magnetically enhanced soils within features, such as pits and ditches, may produce magnetic anomalies that can be mapped by magnetic prospection.

2.1.3 Magnetic thermoremnance can occur when ferrous minerals have been heated to high temperatures such as in a kiln, hearth, oven etc. On cooling, a permanent magnetisation may be acquired due to the presence of the Earth's magnetic field. Certain natural processes associated with the formation of some igneous and metamorphic rock may also result in magnetic thermoremnance.

2.1.4 The localised variations in magnetism are measured as sub-units of the Tesla, which is a SI unit of magnetic flux density. These sub-units are nano Teslas (nT), which are equivalent to 10^{-9} Tesla (T).

2.2 Equipment configuration, data collection and survey detail

2.2.1 The detailed magnetic survey was carried out using a Bartington Grad 601-2 gradiometer. The instrument effectively measures a magnetic gradient between two fluxgate sensors mounted vertically 1m apart. Two sets of sensors are mounted on a single frame 1m apart horizontally.

2.2.2 The instrument is extremely sensitive and is able to measure magnetic

variation to 0.01nanoTesla (nT), with an effective resolution of 0.03nT. The data are limited to ±100nT when surveying with the highest sensitivity. All readings are saved to an integral data logger for analysis and presentation.

2.2.3 The instrument is operated according to the manufacturer's instructions with consideration given to the local conditions. An adjustment procedure is required, prior to collection of data, in order to balance the sensors and remove the effects of the Earth's magnetic field; further adjustment is required during the survey due to instrument drift often associated with temperature change.

2.2.4 It can be very difficult to obtain optimum balance for the sensors due to localised magnetic vectors that may be associated with large ferrous objects, geological/pedological features, 'magnetic debris' within the topsoil and natural temperature fluctuations. Imperfect balance results in a heading error often visible as striping within the data; this can be effectively removed by software processing and generally has little effect on the data unless extreme.

2.2.5 The Bartington gradiometer undergoes regular servicing and calibration by the manufacturer. A current assessment of the instrument is shown in Table 1 below.

Sensor type and serial numbers	Bartington Grad - 01 – 1000 Nos. 242 and 396
Date of certified calibration/service	Sensors 242 and 396 - 14th October 2011 (due Oct 2013)
Bandwidth	12Hz (100nT range) both sensors
Noise	<100pT peak to peak
Adjustable errors	<2nT

Table 1: Bartington fluxgate gradiometer sensor calibration results

The instrument was considered to be in good working order prior to the survey with no known faults or defects.

2.2.6 Data were collected at 0.25m centres along traverses 1m apart. The survey area was separated into 30m by 30m grids (900m²) giving 3600 recorded measurements per grid. This sampling interval is very effective at locating archaeological features and is the recommended methodology for archaeological prospection (English Heritage, 2008).

2.2.7 The survey grids were set out to the Ordnance Survey OSGB36 datum using a Penmap RTK GPS. The GPS is used in conjunction with Leica's SmartNet service, where positional corrections are sent via a mobile telephone link. Positional accuracy of around 10 – 20mm is possible using the system. The instrument is regularly checked against the ETRS89 reference framework using Ordnance Survey ground marker C1ST7784 (Horton).

2.3 Data processing and presentation

2.3.1 Magnetometry data downloaded from the Grad 601-2 data logger are analysed and processed in specialist software known as ArcheoSurveyor. The software allows greyscale and trace plots to be produced for presentation and display. Survey grids are assembled to form an overall composite of data (composite file) creating a dataset of the complete survey area. Appendix C contains specific information concerning the survey and data attributes and is derived directly from ArcheoSurveyor; this should be used in conjunction with information provided by Figure 02.

2.3.2 Only minimal processing is carried out in order to enhance the results of the survey for display. Raw data are always analysed, as processing can modify anomalies. The following schedule sets out the data and image processing used in this survey:

- clipping of the raw data at ±30nT to improve greyscale resolution,
- clipping of processed data at ±3nT to enhance low magnitude anomalies,
- de-stagger is used to enhance linear anomalies,
- zero median/mean traverse is applied in order to balance readings along each traverse.

Reference should be made to Appendix B for further information on the specific processes carried out on the data. Appendix C metadata includes details on the processing sequence used for each survey area.

2.3.3 An abstraction and interpretation is offered for all geophysical anomalies located by the survey. A brief summary of each anomaly, with an appropriate reference number, is set out in list form within the results (Section 3) to allow a rapid and objective assessment of features within each survey area.

2.3.4 The main form of data display prepared for this report is the greyscale plot. Both 'raw' and 'processed' data have been shown followed by an abstraction and interpretation plot. Anomalies are abstracted using colour coded points, lines and polygons. All plots are scaled to landscape A3 for paper printing.

2.3.5 Graphic raster images in bitmap format (.BMP) are initially prepared in ArcheoSurveyor. Regardless of survey orientation, data captured along each traverse are displayed and processed by ArcheoSurveyor from left to right. Prior to displaying against base mapping, raster graphics require a rotation to restore north to the top of the image upon insertion into AutoCAD.

2.3.6 The raster images are combined with base mapping using ProgeCAD Professional 2009 and AutoCAD LT 2007, creating DWG file formats. All images are externally referenced to the CAD drawing in order to maintain good graphical quality. Quality can be compromised by rotation of graphics in order to allow the data to be orientated with respect to grid north; this is considered acceptable as the survey results are effectively georeferenced allowing relocation of features using GPS, resection method etc.

2.3.7 A digital archive is produced with this report, see Appendix D below. The main archive is held at the offices of Archaeological Surveys Ltd.

3 RESULTS

3.1 General assessment of survey results

3.1.1 The detailed magnetic survey was carried out over a total of two survey areas covering approximately 3ha. For the purposes of this report, the areas represent separate datasets named Areas 1 and 2.

3.1.2 Magnetic anomalies located can be generally classified as positive and negative anomalies of an uncertain origin, anomalies with a natural origin, strong discrete dipolar anomalies relating to ferrous objects and strong multiple dipolar linear anomalies relating to buried services or pipelines.

3.2 Statement of data quality

3.2.1 Data are considered representative of the magnetic anomalies present within the site. A small area of magnetic disturbance was encountered adjacent to a modern steel-framed barn. Minor positional correction was applied to the data and small errors were likely to be related to very strong winds and saturated ground conditions. Due to waterlogged and boggy ground, a small portion of the western party of Area 1 was unsurveyable.

3.3 Data interpretation

3.3.1 The list of sub-headings below attempts to define a number of separate categories that reflect the range and type of features located during the survey. A basic explanation of the characteristics of the magnetic anomalies is set out for each category in order to justify interpretation, a basic key is indicated to allow cross referencing to the abstraction and interpretation plot. CAD layer names are included to aid reference to associated digital files (.dwg/.dxf). Sub-headings are then used to group anomalies with similar characteristics for each survey area.

Report sub-heading CAD layer names and plot colour	**Description and origin of anomalies**
Anomalies with an uncertain origin AS-ABST MAG POS LINEAR UNCERTAIN AS-ABST MAG NEG LINEAR UNCERTAIN AS-ABST MAG POS DISCRETE UNCERTAIN AS-ABST MAG POS AREA UNCERTAIN 	The category applies to a range of anomalies where there is not enough evidence to confidently suggest an origin. Anomalies in this category may well be related to archaeologically significant features, but equally relatively modern features, geological/pedological features and agricultural features should be considered. Positive anomalies are indicative of magnetically enhanced soils that may form the fill of 'cut' features or may be produced by accumulation within layers or 'earthwork' features;

	soils subject to burning may also produce positive anomalies. Negative anomalies are produced by material of comparatively low magnetic susceptibility such as stone and subsoil.
Anomalies associated with magnetic debris AS-ABST MAG STRONG DIPOLAR	Strong discrete dipolar anomalies are responses to ferrous objects within the topsoil.
Anomalies with a modern origin AS-ABST MAG SERVICE	Fluxgate sensors may respond erratically and with hysteresis adjacent to strong magnetic sources. Buried services may produce characteristic multiple dipolar anomalies dependant upon their construction.
Anomalies with a natural origin AS-ABST MAG NATURAL FEATURES	Naturally formed magnetic anomalies are are caused by localised variability in the magnetic susceptibility of soils, subsoils and other drift or solid geologies. Anomalies may be amorphous, linear or curvilinear and may appear 'ditch-like' or discrete. Increased depth of topsoil within shallow geological cracks can often have a linear or rectilinear appearance. The latter are almost impossible to distinguished from pit-like anomalies with an anthropogenic origin.

Table 2: List and description of interpretation categories

3.4 List of anomalies - Area 1

Area centred on OS NGR 361061 153837, see Figures 03 to 05.

Anomalies with an uncertain origin

(1) – Positive linear anomalies form an “H” shaped feature that appears to have a morphology similar to rectilinear enclosures. However, these anomalies, as with the majority of those adjacent, are on a similar orientation to responses caused by the underlying geology (8) and a geological origin should be considered. The magnetic response is generally higher that anomalies clearly of natural origin, although generally <10nT.

(2) – Positive and negative linear anomalies, parallel with anomaly (1) may also extend north eastwards. Again these anomalies form a pattern of rectilinear elements, possibly indicative of enclosure ditches, although a geological origin is also possible given the orientation.

(3) – Positive curvilinear anomalies in the north eastern part of the survey area. These curving anomalies still generally contain elements that reflect the orientation of anomalies (1) and (2) and also (8), and although they may indicate cut features, it is also possible that they relate to responses to an increased depth of topsoil within cracks in the underlying limestone.

(4) – Two “L” shaped positive linear anomalies appear again to relate to ditch-like features. Their orientation is similar to adjacent anomalies of natural origin and as a consequence they cannot be confidently interpreted.

(5) – Discrete positive anomalies located in the north eastern part of the survey

area appear to relate to pit-like features with a response of up to 30nT. Situated adjacent to anomalies (1) to (4), it is possible that they are associated.

(6) – A positive curvilinear anomaly and several linear anomalies are located in the north western part of the survey area. It is not possible to determine if they relate to cut features, or to the underlying geology.

(7) – The central part of the survey area contains numerous weak discrete responses that appear as pit-like features. Located within the zone of geological anomalies is appears that they may also have a natural origin.

Anomalies with a natural origin

(8) – A band of positive linear and rectilinear anomalies crosses the site with a south west to north east orientation. These anomalies are a response to the increased depth of topsoil within cracks in the underlying Lias limestone. Problems with interpreting the majority of the other anomalies within the site are due to their similar orientation to these natural features.

Anomalies associated with magnetic debris

(9) – Strong, discrete, dipolar anomalies are a response to ferrous objects within the topsoil.

3.5 List of anomalies - Area 2

Area centred on OS NGR 360896 153843, see Figures 03 to 05.

Anomalies with an uncertain origin

(10) – Several very weakly positive anomalies have been located. Their origin is uncertain.

4 DISCUSSION

4.1.1 The results of the survey clearly indicate the widespread nature of naturally formed anomalies created by soil filled cracks within the underlying limestone. This natural process probably involves a regular series of natural cracks, perhaps created early in the formation of the rock due to shrinkage, that are then widened due to weathering and chemical erosion. Subsequently, or as part of a continuing process, soil particles migrate down into the cracks and magnetic contrast is created due to the comparatively high magnetic

susceptibility of the soil and the very low magnetic susceptibility of the Lias limestone. The higher magnetic susceptibility of the soil may relate to fixing and concentration of iron compounds and is likely to associated with weathering of the solid geology.

4.1.2 The detailed magnetometer survey located a number of positive linear, rectilinear and discrete anomalies towards the north eastern edge of the survey area. While the morphology of these anomalies may suggest cut features, such as ditches, enclosures and pits, their orientation is similar to the north west to south east alignment of jointing and cracks within the underlying Lias limestone geology. The soils here are shallow, onto bedrock with the response to the cracks being to an increased depth of topsoil within them. The general pattern of the geological cracks is very similar to other anomalies (1) to (5), seen in the northern part of the survey area, and therefore a geological origin for these anomalies cannot be ruled out.

4.1.3 The regular rectilinear morphology of the naturally formed cracks has created problems in the confident interpretation of the magnetometry results. The dimensions of the naturally formed anomalies are very similar to those associated with features of anthropogenic origin; both the width of the anomaly and the rectilinear features represented could easily be misinterpreted. Effectively, the process that forms the anomalies is very similar regardless of whether they are man-made or natural. In addition, if shallow rock is removed during the formation of ditches and enclosures etc., it is possible that natural splits or cleavages within the rock determine the orientation of the development of anthropogenically produced features.

4.1.4 As a consequence of the above caveats, it has not been possible to confidently interpret linear, rectilinear and discrete anomalies in the north eastern part of Area 1. These anomalies were separated from others more obviously natural in origin, and classified as *uncertain in origin,* for a number of reasons:

(a) – the anomalies are generally stronger than those clearly related to cracks (linear elements generally <10nT, discrete anomalies <18nT, obvious cracks <5nT);

(b) – the width of the anomalies appears somewhat broader than the cracks, though this may be as a consequence of their generally higher magnitude;

(c) – there are clearly several negative linear anomalies adjacent to the positive linear and rectilinear elements and these may represent former wall footings;

(d) – the full extent of the anomalies is not contained within the survey area so it is not possible to determine whether they belong to extensive features of archaeological potential or a continuation of slightly different naturally formed features.

5 CONCLUSION

5.1.1 The survey results have indicated the presence of widespread magnetic anomalies across the site. However, the majority are clearly related to cracks within the shallow Lias limestone that is located at shallow depth. A group of anomalies within the north eastern part of the site have been interpreted as uncertain origin. These appear to have slightly different characteristics to anomalies obviously natural in origin, although it cannot be confidently determined whether they are anthropogenically produced or represent slightly different but naturally formed features.

5.1.2 A cautious approach has been adopted to interpretation of the results as the region has been demonstrated to be rich in both prehistoric and Romano-British remains. Factors influencing the uncertainty of interpretation have been set out in the above discussion.

6 REFERENCES

British Geological Survey, 2012. *Geology of Britain viewer, 1:50 000 scale [online]* available from http://maps.bgs.ac.uk/geologyviewer/ [accessed 14/8/2012].

Broomhead, R. A., 2012. *Chewton Fields Farm, Chewton Mendip, Somerset. An Archaeological Desktop Assessment.* Unpublished typescript report.

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Appendix A – basic principles of magnetic survey

Iron minerals are always present to some degree within the topsoil and enhancement associated with human activity is related to increases in the level of magnetic susceptibility and thermoremnant material.

Magnetic susceptibility is an induced magnetism within a material when it is in the presence of a magnetic field. This can be thought of as effectively permanent due to the presence of the Earth's magnetic field.

Thermoremnant magnetism occurs when ferrous material is heated beyond a specific temperature known as the Curie Point. Demagnetisation occurs at this temperature with re-magnetisation by the Earth's magnetic field upon cooling.

Enhancement of magnetic susceptibility can occur in areas subject to burning and complex fermentation processes on biological material; these are frequently associated with human settlement. Thermoremnant features include ovens, hearths, and kilns. In addition thermoremnant material such as tile and brick may also be associated with human activity and settlement.

Silting and deliberate infilling of ditches and pits with magnetically enhanced soil can create an area of enhancement compared with surrounding soils and subsoils into which the feature is cut. Mapping enhanced areas will produce linear and discrete anomalies allowing an assessment and characterisation of hidden subsurface features.

It should be noted that areas of negative enhancement can be produced from material having lower magnetic properties compared to the topsoil. This is common for many sedimentary bedrocks and subsoils which were often used in the construction of banks and walls etc. Mapping these 'negative' anomalies may also reveal archaeological features.

Magnetic survey or magnetometry can be carried out using a fluxgate gradiometer and may be referred to as gradiometry. The gradiometer is a passive instrument consisting of two fluxgate sensors mounted vertically 1m apart. The instrument is carried about 30cm above the ground surface and the upper sensor measures the Earth's magnetic field as does the lower sensor but this is influenced to a greater degree by any localised buried field. The difference between the two sensors will relate to the strength the magnetic field created by the buried feature. If no enhanced feature is present the field measured by both sensors will be similar and the difference close to zero.

There are a number of factors that may affect the magnetic survey and these include soil type, local geology and previous human activity. Situations arise where magnetic disturbance associated with modern services, metal fencing, dumped waste material etc., obscures low magnitude fields associated with archaeological features.

Appendix B – data processing notes

Clipping

Minimum and maximum values are set and replace data outside of the range with those values. Extreme values are removed improving colour or greyscale contrast associated with data values that may be archaeologically significant. It has been found that clipping data to ranges between ±5nT and ±1nT often improves the appearance of features associated with archaeology. Different ranges are applied to data in order to determine the most suitable for anomaly abstraction and display.

Zero Median/Mean Traverse

The median (or mean) of each traverse is calculated ignoring data outside a threshold value, the median (or mean) is then subtracted from the traverse. The process is used to equalise slight differences between the set-up and stability of gradiometer sensors and can remove striping. The process can remove archaeological features that run along a traverse so data analysis is also carried out prior its application.

De-stagger

Compensates for small positional errors within data collection by shifting the position of the readings along each traverse by a specified amount. Data lost at the end of each traverse are extrapolated from adjacent value in the same row.

Deslope

Corrects for striping and distortion caused by metal objects/services etc.. The process calculates a curve based on a polynomial best fit mathematical function for each traverse. This curve is then subtracted from the actual data.

Edge Match

Calculates the mean of the 2 lines (rows or columns) of data either side of the edge to match. It then subtracts the difference between the means from all datapoints in the selected area.

FFT (Fast Fourier Transform) spectral filtering

A mathematical process used to determine the frequency components of a traverse. Repetitive features, such as plough marks, produce characteristic spectral zones that can be suppressed allowing greyscale images to appear clearer.

Appendix C – survey and data information

Area 1 raw magnetometer data

COMPOSITE
Filename: J430-mag-Area1-raw.xcp
Instrument Type: Bartington (Gradiometer)
Units: nT
Surveyed by: on 16/08/2012
Assembled by: on 16/08/2012
Collection Method: ZigZag
Sensors: 2 @ 1.00 m spacing.
Dummy Value: 32702.00

Dimensions
Composite Size (readings): 960 x 300
Survey Size (meters): 240.00m x 300.00 m
Grid Size: 30.00 m x 30.00 m
X Interval: 0.25 m
Y Interval: 1.00 m

Stats
Max: 30.00
Min: -30.00
Std Dev: 4.45
Mean: 0.09
Median: -0.01
Composite Area: 7.20 ha
Surveyed Area: 2.95 ha

PROGRAM
Name: ArcheoSurveyor
Version: 2.5.16.0

Processes: 2
1 Base Layer
2 Clip from -30.00 to 30.00 nT

Source Grids: 42
1 Col:0 Row:2 grids\19.xgd
2 Col:0 Row:3 grids\20.xgd
3 Col:0 Row:4 grids\21.xgd
4 Col:0 Row:5 grids\22.xgd
5 Col:1 Row:1 grids\23.xgd
6 Col:1 Row:2 grids\24.xgd
7 Col:1 Row:3 grids\25.xgd
8 Col:1 Row:4 grids\26.xgd
9 Col:1 Row:5 grids\27.xgd
10 Col:2 Row:1 grids\28.xgd
11 Col:2 Row:2 grids\29.xgd
12 Col:2 Row:3 grids\30.xgd
13 Col:2 Row:4 grids\31.xgd
14 Col:2 Row:5 grids\32.xgd
15 Col:3 Row:0 grids\37.xgd
16 Col:3 Row:1 grids\38.xgd
17 Col:3 Row:2 grids\33.xgd
18 Col:3 Row:3 grids\34.xgd
19 Col:3 Row:4 grids\35.xgd
20 Col:3 Row:5 grids\36.xgd
21 Col:3 Row:6 grids\16.xgd
22 Col:3 Row:7 grids\17.xgd
23 Col:3 Row:8 grids\18.xgd
24 Col:4 Row:0 grids\39.xgd
25 Col:4 Row:1 grids\40.xgd
26 Col:4 Row:6 grids\13.xgd
27 Col:4 Row:7 grids\14.xgd
28 Col:4 Row:8 grids\15.xgd
29 Col:5 Row:0 grids\41.xgd
30 Col:5 Row:1 grids\42.xgd
31 Col:5 Row:6 grids\09.xgd
32 Col:5 Row:7 grids\10.xgd
33 Col:5 Row:8 grids\11.xgd
34 Col:5 Row:9 grids\12.xgd
35 Col:6 Row:6 grids\05.xgd
36 Col:6 Row:7 grids\06.xgd
37 Col:6 Row:8 grids\07.xgd
38 Col:6 Row:9 grids\08.xgd
39 Col:7 Row:6 grids\01.xgd
40 Col:7 Row:7 grids\02.xgd
41 Col:7 Row:8 grids\03.xgd
42 Col:7 Row:9 grids\04.xgd

Area 1 processed magnetometer data

COMPOSITE
Filename: J430-mag-Area1-proc.xcp

Stats
Max: 3.00
Min: -3.00
Std Dev: 1.49
Mean: 0.07
Median: 0.00
Composite Area: 7.20 ha
Surveyed Area: 2.95 ha

PROGRAM
Name: ArcheoSurveyor
Version: 2.5.16.0

Processes: 7
1 Base Layer
2 DeStripe Median Traverse: Grids: All
3 Clip from -3.00 to 3.00 nT
4 De Stagger: Grids: 22.xgd Mode: Outbound By: 1 intervals
5 De Stagger: Grids: 21.xgd Mode: Outbound By: 1 intervals
6 De Stagger: Grids: 32.xgd Mode: Outbound By: 1 intervals
7 Clip from -3.00 to 3.00 nT

Area 2 raw magnetometer data

COMPOSITE

Filename: J430-mag-Area2-raw.xcp
Instrument Type: Bartington (Gradiometer)
Units: nT
Surveyed by: on 16/08/2012
Assembled by: on 16/08/2012
Dummy Value: 32702.00

Dimensions
Composite Size (readings): 120 x 30
Survey Size (meters): 30.00m x 30.00 m
Grid Size: 30.00 m x 30.00 m
X Interval: 0.25 m
Y Interval: 1.00 m

Stats
Max: 30.00
Min: -30.00
Std Dev: 3.98
Mean: -0.88
Median: -0.31
Composite Area: 0.09 ha
Surveyed Area: 0.08 ha

Processes: 2
1 Base Layer
2 Clip from -30.00 to 30.00 nT

Source Grids: 1
1 Col:0 Row:0 grids\01.xgd

Area 2 processed magnetometer data

COMPOSITE
Filename: J430-mag-Area2-proc.xcp

Stats
Max: 3.00
Min: -3.00
Std Dev: 1.21
Mean: -0.02
Median: 0.00
Composite Area: 0.09 ha
Surveyed Area: 0.08 ha

Processes: 4
1 Base Layer
2 Clip from -30.00 to 30.00 nT
3 DeStripe Median Traverse: Grids: All
4 Clip from -3.00 to 3.00 nT

Appendix D – digital archive

Archaeological Surveys Ltd hold the primary digital archive at Castle Combe, Wiltshire (see inside cover for address). Data are backed-up onto an on-site data storage drive and at the earliest opportunity data are copied to CD ROM for storage on-site and off-site.

Surveys are reported on in hardcopy (recycled paper) using A4 for text and A3 for plots (all plots are scaled for A3). The distribution of both hardcopy report and digital data is considered the responsibility of the Client unless explicitly stated in the survey Brief, Written Scheme of Investigation or other contractual agreement.

This report has been prepared using the following software on a Windows XP platform:

- ArcheoSurveyor version 2.5.16.0 (geophysical data analysis),
- ProgeCAD Professional 2009 (report graphics),
- AutoCAD LT 2007 (report figures),
- OpenOffice.org 3.0.1 Writer (document text),
- PDF Creator version 0.9 (PDF archive).

Digital data produced by the survey and report include the following files:

- ArcheoSurveyor grid and composite files for all geophysical data,
- CSV files for raw and processed composites,
- geophysical composite file graphics as Bitmap images,
- AutoCAD DWG files in 2000 and 2007 versions,
- report text as OpenOffice.org ODT file,
- report text as Word 2000 doc file,
- report text as rich text format (RTF),
- report text as PDF,
- PDFs of all figures.

Survey location

N

Archaeological Surveys Ltd

Geophysical Survey
Chewton Fields Farm
Ston Easton
Somerset

Map of survey area

Survey location

Site centred on OS NGR
ST 61065 53840

SCALE 1:25 000

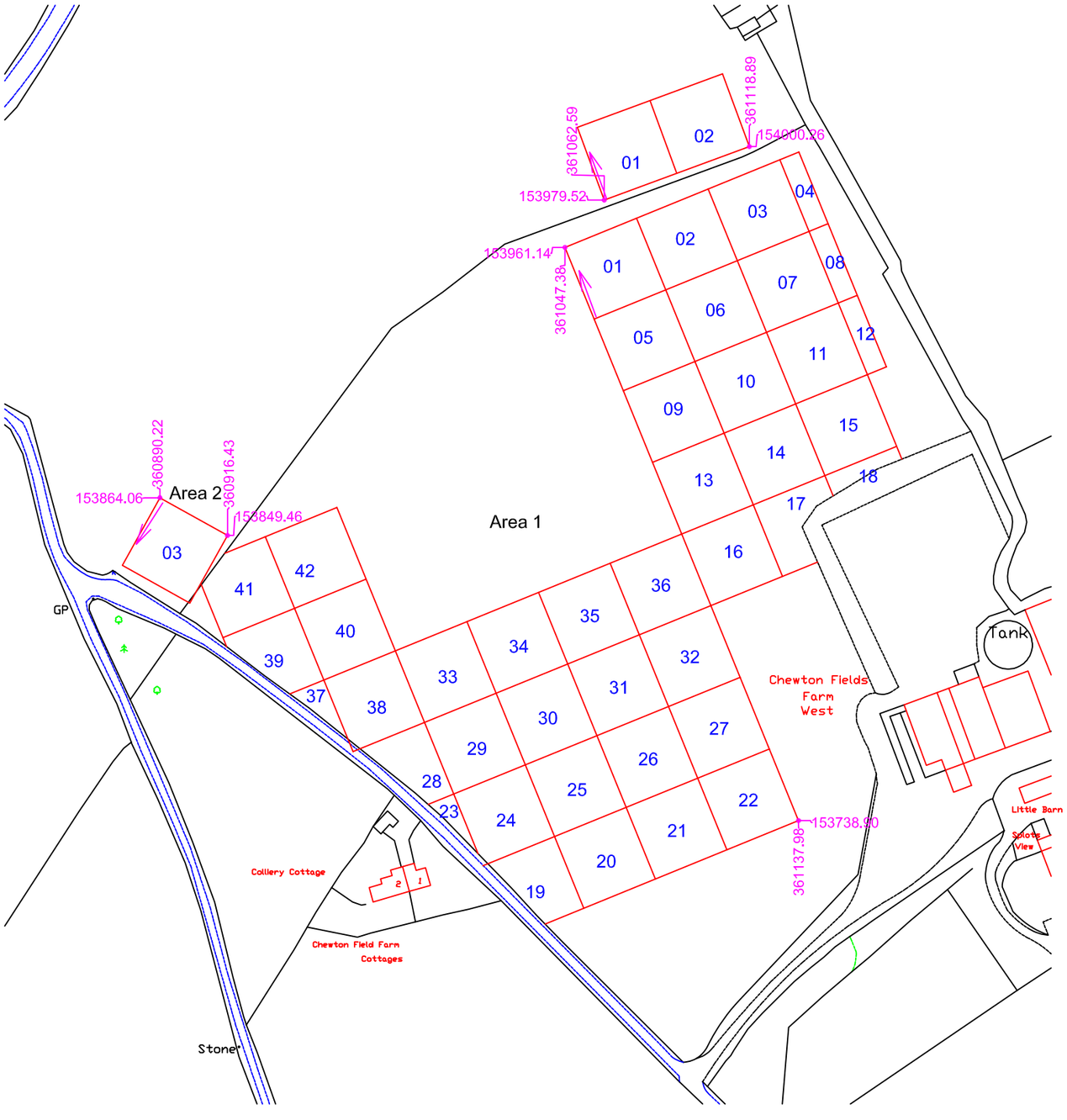
0m 500m 1000m

SCALE TRUE AT A3

FIG 01

Archaeological Surveys Ltd

Geophysical Survey
Chewton Fields Farm
Ston Easton
Somerset



Referencing information

Grid coordinates based on Ordnance Survey OSGB36 datum

Grids set out using RTK GPS with Leica SmartNet correction data RTCMv2 format OSTN02 transformation

Survey grid size = 30m

→ Survey start and traverse direction

01 Grid reference number and filename

SCALE 1:2000

0m 20 40 60 80 100m

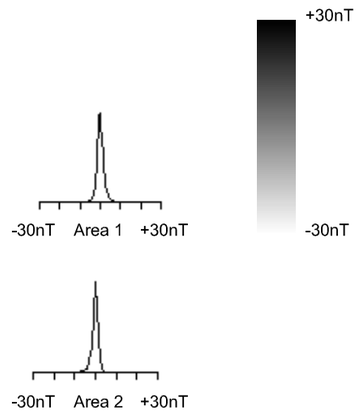
SCALE TRUE AT A3

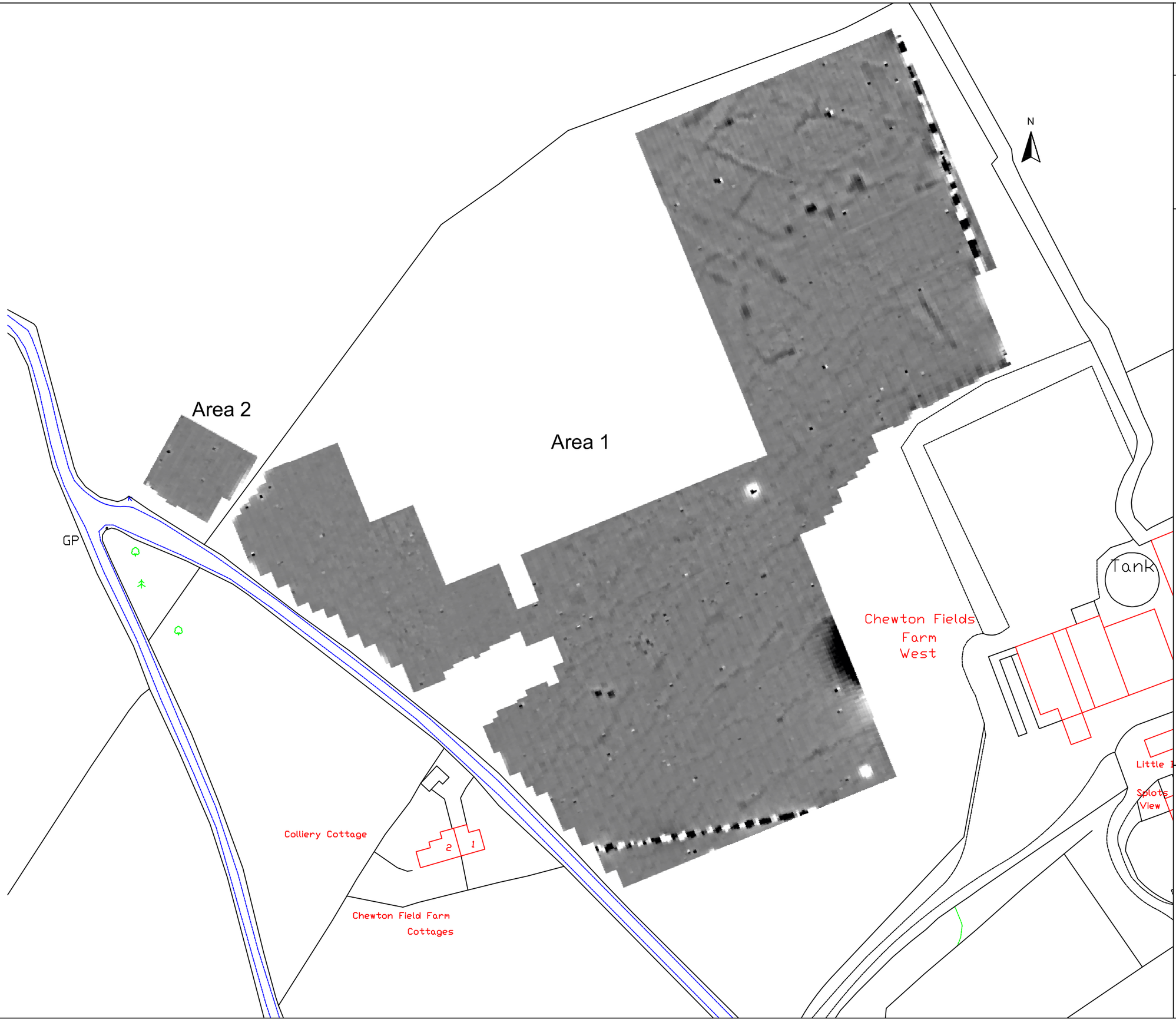
FIG 02

Archaeological Surveys Ltd

Geophysical Survey
Chewton Fields Farm
Ston Easton
Somerset

Greyscale plot of raw magnetometer data





SCALE 1:1250

0m 10 20 30 40 50m

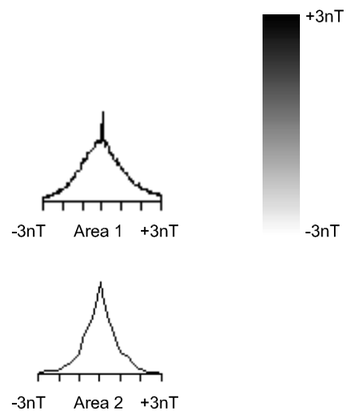
SCALE TRUE AT A3

FIG 03

Archaeological Surveys Ltd

Geophysical Survey
Chewton Fields Farm
Ston Easton
Somerset

Greyscale plot of processed magnetometer data



SCALE 1:1250

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 04

Archaeological Surveys Ltd

Geophysical Survey
Chewton Fields Farm
Ston Easton
Somerset

Abstraction and interpretation of magnetometer anomalies

Area 1

Area 2

N

GP

Tank

Chewton Fields Farm West

Colliery Cottage

Chewton Field Farm Cottages

Little I

Splots View

1 2 3 4 5 6 7 8 9 10

- Positive linear anomaly - possible ditch-like feature
- Positive linear anomaly - of geological origin
- Negative linear anomaly - material of low magnetic susceptibility
- Discrete positive response - possible pit-like feature
- Positive anomaly - magnetically enhanced material
- Strong multiple dipolar linear anomaly - pipeline / cable / service
- Strong dipolar anomaly - ferrous object

SCALE 1:1250

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 05