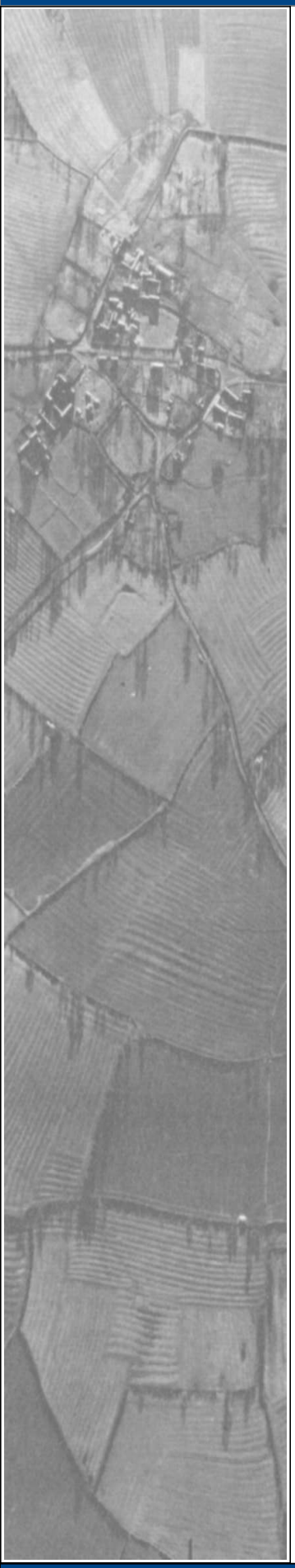

Stanton Park
Stanton Fitzwarren
Swindon

MAGNETOMETER SURVEY REPORT

for

Swindon Borough Council

Kerry Donaldson & David Sabin

July 2022

Ref. no. J901

ARCHAEOLOGICAL SURVEYS LTD

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Swindon Borough Council

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Ordnance Survey Grid Reference – **SU 17815 89625**

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CONTENTS

SUMMARY....1

1 INTRODUCTION....1

1.1 Survey background....1

1.2 Survey objectives and techniques....1

1.3 Standards, guidance and recommendations for the use of this report....2

1.4 Site location, description and survey conditions....2

1.5 Site history and archaeological potential....4

1.6 Geology and soils....4

2 METHODOLOGY....4

2.1 Technical synopsis....4

2.2 Equipment configuration, data collection and survey detail....5

2.3 Data processing and presentation....6

3 RESULTS....8

3.1 General assessment of survey results....8

3.2 Statement of data quality and factors influencing the interpretation of anomalies....8

3.3 Data interpretation....8

3.4 List of anomalies - Area 1 (Badger Field)....9

3.5 List of anomalies - Area *2 (Railway Field)*....10

3.6 List of anomalies - Area 3 (Villa Field)....12

3.7 List of anomalies - Area *4 (South Field 1)*....12

3.8 List of anomalies - Area 6 (Parkland)....13

3.9 List of anomalies - Area 7 (South Field 2)....15

4 CONCLUSION....16

5 REFERENCES.....17

Appendix A – basic principles of magnetic survey.....18

Appendix B – data processing notes.....18

Appendix C – survey and data information.....19

Appendix D – digital archive.....20

Appendix E – CAD layers for abstraction and interpretation plots.....20

Appendix F – copyright and intellectual property.....21

LIST OF FIGURES

Fig 01 Map of survey area (1:25 000)

Fig 02 Referencing information (1:4000)

Fig 03 Greyscale plot of minimally processed magnetometer data (1:4000)

Fig 04 Abstraction and interpretation of magnetic anomalies (1:4000)

Fig 05 Greyscale plot of minimally processed magnetometer data – Areas 1 to 3 (1:1250)

Fig 06 Greyscale plot of filtered magnetometer data – Areas 1 to 3 (1:1250)

Fig 07 Abstraction and interpretation of magnetic anomalies – Areas 1 to 3 (1:1250)

Fig 08 Greyscale plot of minimally processed magnetometer data – Area 4 (1:1250)

Fig 09 Greyscale plot of filtered magnetometer data – Area 4 (1:1250)

Fig 10 Abstraction and interpretation of magnetic anomalies – Area 4 (1:1250)

Fig 11 Greyscale plot of minimally processed magnetometer data – Area 6 (1:1500)

Fig 12 Abstraction and interpretation of magnetic anomalies – Area 6 (1:1500)

Fig 03 Greyscale plot of minimally processed magnetometer data – Area 7 (1:1500)

Fig 14 Greyscale plot of filtered magnetometer data – Area 7 (1:1500)

Fig 15 Abstraction and interpretation of magnetic anomalies – Area 7 (1:1500)

LIST OF PLATES

Plate 1: Survey Area 6 looking south west to Areas 4 and 7.....3

LIST OF TABLES

Table 1: List and description of interpretation categories.....9

Table 2: Archive metadata.....20

Table 3: CAD layering.....21

SUMMARY

A geophysical survey was carried out over 28ha within six separate areas at Stanton Park, Swindon, ahead of proposed tree planting scheme by Swindon Borough Council. Just beyond the north western part of the site lie the scheduled remains of a Roman villa, and the survey has located a number of anomalies that are highly likely to be associated with it. These include a square, double-ditched enclosure that could have some ritual function as well as evidence for enclosures, pits and a ring ditch that are associated with settlement likely from the Iron Age into the Roman periods. Within the area of parkland to the east are two linear ditches that appear to have been truncated by later boundaries and possible quarrying. A number of pit-like features have also been located, although it is not clear if they are associated with tree throw pits/removal, former quarrying or if they have some archaeological potential. Ridge and furrow and a response to existing and former parkland tracks have also been recorded. Elsewhere, the survey areas contain ridge and furrow and a small number of linear anomalies, many of which appear likely to be associated with drainage. The infilled branch line cutting in the southern part of the site is associated with highly magnetic debris relating to steel and iron objects.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by Swindon Borough Council to undertake a magnetometer survey of an area of land at Stanton Park in order to assess the archaeological potential of land ahead of a proposed tree planting scheme. The wider c28ha site was surveyed in order to gain a fuller understanding of the archaeological potential of the site as a whole and inform the final planting scheme within the park, although one area, Area 5, was not accessible due to the presence of wildflowers. To the north of the survey area and within Stanton Park lies the scheduled monument *Roman villa 530m west of Stanton House* (List entry no: 1016328). The survey was extended into the field containing the monument but avoided the scheduled area.

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 potential tree planting within parts of the site. The methodology is considered an efficient and effective approach to archaeological prospection.

1.2.2 Geophysical survey can provide useful information on the archaeological potential of a site; however, the outcome of any survey relies on a number of factors and as a consequence results can vary. The success in meeting the

aims and objectives of a survey is, therefore, often impossible to predetermine.

1.3 Standards, guidance and recommendations for the use of this report

1.3.1 Archaeological Surveys Ltd is a Registered Organisation with the Chartered Institute for Archaeologists and both company directors are Members of the Chartered Institute for Archaeologists (MCIfA) and have therefore been assessed for their technical competence and ethical suitability and abide by the CIfA Codes of Conduct. The survey and report follow the recommendations set out by: European Archaeological Council (2015) *Guidelines for the Use of Geophysics in Archaeology;* Institute for Archaeologists (2002) *The use of Geophysical Techniques in Archaeological Evaluations.* The work has been carried out to the Chartered Institute for Archaeologists (2014) (updated 2020) *Standard and Guidance for Archaeological Geophysical Survey.*

1.3.2 Archaeological Surveys Ltd provide a detailed geophysical survey report and it is recommended that where possible the contents should be considered in full. The Summary provides a brief overview of the results with more detail available in the Discussion and/or Conclusion. The *List of anomalies* within the Results provides a detailed assessment of the anomalies within separate categories which can be useful in inferring a level of confidence to the interpretation. Quality and factors influencing the interpretation of anomalies is also set out within the results.

1.3.3 It is recommended that the full report should always be considered when using data and interpretation plots; where this is not possible, in the field for example, the abstraction and interpretation plots should retain their colour coding and be used with a corresponding legend.

1.4 Site location, description and survey conditions

1.4.1 The site is located at Stanton Park, Stanton Fitzwarren on the north eastern edge of Swindon. It is centred on Ordnance Survey National Grid Reference (OS NGR) SU 17815 89625 see Figs 01 and 02.

1.4.2 The geophysical survey covers approximately 28ha within six survey areas labelled 1 (Badger Field), 2 (Railway Field) and 3 (Villa Field) in the north western part of the site and 4 (South Field 1), 6 (Parkland) & 7 (South Field 2) in the east. Area 5 was a 1ha block that contained wildflowers and was not accessible. Area 3 in the north western part of the site was surveyed in order to gain a fuller understanding between anomalies located in Area 2 and the scheduled villa site to the north.

1.4.3 All of the survey areas, with the exception of Area 6 (Parkland), contained tall grass and native plants. The density of the ground cover was variable but in general produced difficult conditions for surveying due to the requirement for

the gradiometer sensors to be close to the ground. Area 6 contained sheep at the time of survey, and the majority of the ground cover was grazed grass; however, survey was impeded by clumps of thistles and nettles growing under and around trees within this area. High magnitude magnetic disturbance associated with steel fencing was encountered along the eastern side of Area 6 and survey was avoided within this part of the site. Other sources of magnetic disturbance identified during the course of the work include steel wire and mesh fencing and steel water troughs, severe disturbance present within the southern part of Area 7 relates to the ferrous content of material use to infill a former railway cutting.

1.4.4 The site is generally gently undulating land, Areas 1 and 2 tend to slope down gently towards the south east with the exception of the northern part of Area 2 and Area 3 which slope down towards the north. Areas 4 and 6 tend to slope down gently towards the north west, Area 7 contains a low hill in the central southern part of the field with land sloping down most notably along the western side.

1.4.5 All of the survey areas are accessible by the public and survey was avoided at certain times in the most popular parts of the site, mainly Areas 4 and 7. The continual presence of dogs running freely within the site, the number of walkers and groups of school children precluded the use of a towed array and all data were collected using hand-pushed cart systems.

1.4.6 Weather conditions during the survey were variable but mainly fine.

Plate 1: Survey Area 6 looking south west to Areas 4 and 7

1.5 Site history and archaeological potential

1.5.1 The site lies just south of the Scheduled Monument, *Roman villa 530m west of Stanton House* (List entry no: 1016328). Wall foundations and two tessellated pavements were discovered during construction of the Swindon & Highworth Branch Railway (1879-81) and a small scale excavation in 1969 revealed the remains of a bath house consisting of at least three rooms and a stoke-hole. Geophysical survey in 1997 indicated a range of associated features over an area of 110m by 100m with further excavations outside of the scheduled area in 1998 revealing a number of features including a trackway. The site lies within the parkland of Stanton House with 19th century mapping indicating the presence of parkland drives in the north eastern part of the site (Area 6). The southern part of the site (Area 7) is mapped as containing a spur from the Highworth Branch Line to the Vickers Armstrong aircraft factory in the 1940s.

1.6 Geology and soils

1.6.1 The underlying geology within the majority of the site is limestone from the Stanford Limestone Formation. Sandstone, siltstone and mudstone from the Hazelbury Bryan and Kingston Formation is located along the western edges and within a narrow band separating the South Field from the Parkland and around the margins of the Badger Field (Area 1) and Railway Field (Area 2) in the north western part of the site (BGS, 2017).

1.6.2 The overlying soil across the Stanford Limestone Formation is from the Sherborne association and is a brown rendzina. It consists of a shallow, well drained, brashy, calcareous, clay soil over limestone. The soil overlying the Hazelbury Bryan and Kingston Formation is from the Evesham 2 association, which is a typical calcareous pelosol and consists of slowly permeable, calcareous, clayey soil (Soil Survey of England and Wales, 1983).

1.6.3 Magnetometry carried out over similar limestone geology and soil has produced good results and cut features of archaeological potential may be located where human activity has altered the magnetic characteristics of the soil sufficiently. The underlying geology and soils are, therefore, considered acceptable for magnetic survey.

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 (also known as thermoremanence) are factors associated

with the formation of localised fields.

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). Additional details are set out in 2.2 below and within Appendix A.

2.2 Equipment configuration, data collection and survey detail

2.2.1 The detailed magnetic survey was carried out using a SENSYS MAGNETO®MXPDA 5 channel cart-based system. The instrument has 5 fluxgate gradiometers (FGM650) spaced 0.5m apart with readings recorded at 20Hz. The cart is pushed at walking speed and not towed. A bespoke hand-pushed cart allowing traversing through dense ground cover was used in Areas 1 and 2. Each gradiometer sensor is not zeroed in the field as the vertical axis alignment is precisely fixed leaving sensor offsets that are removed during data processing. The fixing of the vertical alignment ensures the sensors are not unduly influenced by localised magnetic fields and that the vertical component of a magnetic anomaly is measured. The gradiometers have a measurement range of ±8000nT, although the recorded range is ±3000nT, and resolution is around 0.1nT. They are linked to a Leica GS10 RTK GNSS with data recorded by SENSYS MAGNETO®MXPDA software on a rugged PDA computer system.

2.2.2 Due to the fixed offsets within the fluxgate sensors, as a result of the manufacturing and tensioning process, the survey data do not provide a visually useful dataset until a zero median traverse algorithm is applied. It is recognised that this has the potential to affect some anomalies detrimentally by removing linear features orientated parallel to survey transects. However, this has not been noted as a particular problem with the system due to the high resolution data collection, generally long length of traverses and variability within the magnetic characteristics of a linear anomaly.

2.2.3 Data are collected along a series of parallel survey transects to achieve 100% coverage of the surveyable land. The length of each transect is variable and relates to the size of the survey area and other factors including ground

conditions. A visual display allows accurate placing of transects and helps maintain the correct separation between adjacent traverses. Data are not collected within fixed grids and data points are considered to be random even though the data are collected in a systematic manner covering all accessible areas (Aspinall, Gaffney and Schmidt, 2009).

2.2.4 Fluxgate sensors are highly sensitive to temperature change and this manifests as drift during the course of a survey. This can be particularly noticeable during the morning as temperatures rise and the equipment warms or cools. Sensor drift within the course of a traverse will appear as a line trending from negative to positive after processing with a zero median traverse algorithm. To remove the potential for temperature drift, data were collected after a 20 minute stabilisation period and traverses were limited to a time of generally <100s.

2.3 Data processing and presentation

2.3.1 Magnetic data collected by the MAGNETO®MXPDA cart-based system are initially prepared using SENSYS MAGNETO®DLMGPS software. The software effectively allocates a geographic position for each data point and can compensate for fixed offsets present within the FGM650 sensors. The offsets are positive or negative values present on all fluxgate gradiometer sensors. Some systems use manual or electronic balancing to effectively zero the sensors; however, this is a short term measure that is prone to drift through temperature changes and vibration and can easily be incorrectly set due to localised magnetic fields. The FGM650 sensors are very accurately aligned to the vertical magnetic gradient and are highly stable showing negligible drift on long traverses. The offset values are removed using TerraSurveyor software.

2.3.2 Survey tracks are analysed and georeferenced raw data (UTM Z30N) are then exported in ASCII format for further analysis and display within TerraSurveyor. The removal of the offset values (compensation) of the sensors is also carried out in TerraSurveyor using a zero median traverse function. Data are then considered to be minimally processed. Note: without the zero median traverse function it is not possible to create a meaningful data plot as all sensors have a different offset value. Although a zero median traverse algorithm can remove anomalies aligned with the survey tracks, in practice this rarely occurs due to the use of long traverses, high resolution measurement and variability within the magnetic susceptibility of long linear features.

2.3.3 The minimally processed data are collected between limits of ±3000nT and clipped for display at ±3nT. Data are interpolated to a resolution of effectively 0.5m between tracks and 0.15m along each survey track.

2.3.4 Additional data processing has been carried out for Areas, 1, 4 & 7 in the form of high pass filtering. This effectively removes low frequency variation along a traverse that has been caused by large magnetic bodies, cultivation or rapid temperature change.

2.3.5 Additional data processing has been carried out for Areas 2 & 3 in the form of low pass filtering. This effectively removes high frequency variation along a traverse that has been caused by uneven ground and associated vibration. Data treated to additional processing have been compared to unprocessed data to ensure that no significant anomalies have been removed.

2.3.6 Appendix C contains metadata concerning the survey and data attributes and is derived directly from TerraSurveyor. Reference should be made to Appendix B for further information on processing.

2.3.7 A TIF file is produced by TerraSurveyor software along with an associated world file (.TFW) that allows automatic georeferencing (OSGB36 datum) when using GIS or CAD software. The main form of data display used in the report is the minimally processed greyscale plot. With regard to the Sensys MXPDA, minimally processed data are considered by the manufacturer to be data that are compensated by SENSYS MAGNETO DLMGPS software, see 2.3.1 and 2.3.2. Note: traceplots are not considered to be appropriate as they do not provide an accurate or useful assessment of the magnetic anomalies due to the very high density of data collection. In addition, traceplots cannot be meaningfully plotted against base mapping and in areas of complexity traces may be lost or highly confused. Traceplots may be used to demonstrate characteristic magnetic profiles across discrete features where it is considered beneficial.

2.3.8 The raster images are combined with base mapping using ProgeCAD Professional 2021, creating DWG (2018) file formats. All images are externally referenced to the CAD drawing in order to maintain good graphical quality. The CAD plots are effectively georeferenced facilitating relocation of features using GNSS, resection method, etc.

2.3.9 An abstraction and interpretation is drawn and plotted for all geophysical anomalies located by the survey. Anomalies are abstracted using colour coded points, lines and polygons. All plots are scaled to landscape A3 for paper printing. Appendix E sets out CAD layer names with colour and graphic content for each interpretation category, see 3.3.

2.3.10 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.

2.3.11 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 six survey areas covering approximately 28ha. Area 5 could not be surveyed due to the presence of wildflowers.

3.1.2 Magnetic anomalies located can be generally classified as positive responses of archaeological potential, positive and negative linear anomalies of an uncertain origin, anomalies associated with land management, anomalies associated with quarrying, linear anomalies of an agricultural origin, areas of magnetic debris and disturbance, strong discrete dipolar anomalies relating to ferrous objects and strong multiple dipolar linear anomalies relating to buried services or pipelines.

3.1.3 Anomalies located within each survey area have been numbered and are described in 3.4 to 3.9 below.

3.2 Statement of data quality and factors influencing the interpretation of anomalies

3.2.1 Data are considered representative of the magnetic anomalies present within the site. There are no significant defects within the dataset.

3.2.2 Magnetic disturbance is generally very localised and related to above ground modern ferrous objects and buried services; it is unlikely to have obscured anomalies of archaeological potential. Disturbance associated with a linear zone of magnetic debris within Area 7 is associated with ferrous material within the infill of a former railway cutting which is considered likely to have completely truncated any archaeological features during its construction.

3.2.3 Clear magnetic contrast associated with archaeological features within Area 2 attests to useful magnetic contrast between the fill of former cut features and the natural geology or subsoil into which they are cut. Linear anomalies associated with former ridge and furrow cultivation across many of the survey areas also infers useful magnetic contrast.

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 general explanation of the characteristics of the magnetic anomalies is set out for each category in order to justify interpretation, see Table 1.

Interpretation category	Description and origin of anomalies
Anomalies with archaeological potential	Anomalies have the characteristics (mainly morphological) of a range of archaeological features such as pits, ring ditches, enclosures, etc. The category is used where there is a high level of confidence

	which may be due to additional supporting information where morphology is unclear or uncharacteristic.
Anomalies with an uncertain origin	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. Morphology may be unclear or uncharacteristic and there may be a lack of additional supporting information. 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 relating to land management	Anomalies are mainly linear and may be indicative of the magnetically enhanced fill of cut features (i.e. ditches). The anomalies may be long and/or form rectilinear elements and they may relate to topographic features or be visible on early mapping. Associated agricultural anomalies (e.g. headlands, plough marks and former ridge and furrow) may support the interpretation. Land drains can appear in a classic herringbone pattern of interconnected multiple dipolar linear anomalies, or as parallel linear anomalies. The multiple dipolar response indicates ceramic land drains.
Anomalies with an agricultural origin	The anomalies are often linear and form a series of parallel responses or are parallel to extant land boundaries. Where the response is broad, former ridge and furrow is likely; narrow response is often related to modern ploughing. This category does not include agricultural features of early date or considered to be of archaeological potential (e.g. animal stockades, enclosures, farmsteads, etc).
Anomalies associated with magnetic debris	Magnetic debris often appears as areas containing many small dipolar anomalies that may range from weak to very strong in magnitude. They often occur where there has been dumping or ground make-up and are related to magnetically thermoremnant materials such as brick or tile or other small fragments of ferrous material. This type of response is occasionally associated with kilns, furnace structures, hearths and nail spreads from former wooden structures or rooves and may, therefore, be archaeologically significant. It is also possible that the response may be caused by natural material such as certain gravels and fragments of igneous or metamorphic rock. Strong discrete dipolar anomalies are responses to ferrous objects within the topsoil.
Anomalies with a modern origin	The magnetic response is often strong and dipolar indicative of ferrous material and may be associated with extant above surface features such as wire fencing, cables, pylons etc. Often a significant area around these features has a strong magnetic flux which may create magnetic disturbance; such disturbance can effectively obscure low magnitude anomalies if they are present. Fluxgate sensors may respond erratically adjacent to strong magnetic sources. Buried services may produce characteristic multiple dipolar anomalies dependant upon their construction.
Anomalies associated with ground disturbance/quarrying	Magnetically variable anomalies which may be negative indicating a response to geology/drift deposits and/or positive indicating an increased depth of topsoil. Very strongly magnetic anomalies are a response to highly magnetic material of modern origin which can be used to infill a quarry depression. It should be considered that former quarry pits may be of archaeological potential.

Table 1: List and description of interpretation categories

3.4 List of anomalies - Area 1 (Badger Field)

Area centred on OS NGR 417560 189820, see Figs 05 – 07.

Anomalies with an uncertain origin

(1) – A positive linear anomaly is located in the southern part of Area 1. It cannot be clearly seen to extend south westwards into Area 2 and its origin is uncertain.

(2) – Two discrete, positive anomalies can also be seen in the southern part of Area 1 and are also uncertain in origin.

Anomalies with an agricultural origin

(3) – A series of parallel linear anomalies relate to former ridge and furrow cultivation.

(4) – A negative linear anomaly around the south eastern edge of the field relates to more modern agricultural activity.

3.5 List of anomalies - Area 2 (Railway Field)

Area centred on OS NGR 417430 189810, see Figs 05 – 07.

Anomalies of archaeological potential

(5) – A double-ditched square enclosure, 46m by 46m is locate at the northern end of Area 2. There is a 4-5m gap between the outer and inner ditches with a line of six small positive discrete anomalies between the ditches on the northern side, with others along the east, and it is possible that these relate to post holes. Both the outer and inner ditches have a magnetically variable response of less than 1nT on the north eastern corners to 10-20nT on the north western and south eastern corners and what appears to be a deliberate 2.6m wide entrance facing west. Although there are a number of internal features (5) the morphology of the double-ditched enclosure may suggest a ritual function.

(6) – A number of positive linear, rectilinear and discrete anomalies are located within and between the square double-ditches (5). They relate to cut features, rather than structural remains and several appear to cut the square ditches.

(7 & 8) – A positive linear anomaly (7) extends eastwards from the south eastern corner of the enclosure (5), but cannot be clearly seen to extend into Area 1 to the east. A number of positive linear and rectilinear anomalies (8) are located close to and appear to overlie the north eastern corner of enclosure (5), but again do not appear to extend northwards into Area 3.

(9) – A group of rectilinear enclosures are located to the west of the double-ditched square enclosure (5). They appear to be associated with rectilinear anomaly (6) within the interior of the square enclosure and are on the same west south west to east north east and south south east to north north west orientation. A number of pits and/or areas of burning are located within the confines of the enclosures and their morphology indicates that they relate to Roman and possibly Iron Age settlement. The 1925 Ordnance Survey map indicates that a Roman building was located within the north western corner of Area 2 within this group of enclosures. Whether there was a building in this position, or if it is a mapping error for the location of the villa which is recorded as the scheduled area between 80 and 190m to the north, is unclear. The positive anomalies indicate cut features, rather than structural remains, but the presence of structural features cannot be ruled out within this area as it may be that they do not have a magnetic response.

(10) – A positive curvilinear anomaly is situated within the group of rectilinear enclosures (9). It does, however, appear to have been truncated by at least one rectilinear feature indicating that it pre-dates it. This type of anomaly can be

associated with an Iron Age round house, and it is possible that there are further examples in the vicinity, but they are not well defined.

(11) – An L-shaped positive response appears to be surrounded by and divided by negative linear and rectilinear anomalies. Such anomalies could indicate a response to former structural remains, with the negative response to walling foundation and the positive to magnetically enhanced occupation and burnt material within the interior; however, although it is situated 10m to the south of the enclosures (9), it appears to be outside of the main area of settlement and apart from one pit or area of burning located 15m to the south east, it does not appear to be directly associated with any other features. This type of anomaly could also have been caused by former quarrying, although it is very regular in shape.

(12) – Located at the southern end of the survey area are three sides of a former ditched enclosure. It appears to contain a small number of pit-like features, with another linear group on the outside to the north west. It lies 135m south east of the main archaeological features (5-10) without much evidence of intense activity in between except for some quarrying (14).

Anomalies with an uncertain origin

(13) – A positive linear anomaly is located at the south western corner of Area 2. As only a short section has been located, it is difficult to confidently determine the origin of the anomaly, but it appears likely that it continues to the north west and south and relates to a ditch-like feature and an archaeological origin is possible. Other weaker linear anomalies can be seen within the central part of Area 2 and their origin is uncertain.

Anomalies associated with quarrying

(14) – A number of irregularly shaped, magnetically variable responses can be seen in the south eastern part of the site. The response is usually associated with former quarrying, in this case it appears to be targeting the Hazlebury Bryan Formation limestone, and there is no evidence for modern ferrous infill or any surface expression indicating that the quarry pits are of some antiquity, and could be a source of construction material for the Roman buildings further north in the scheduled area.

Anomalies with an agricultural origin

(15) – The survey area contains two series of parallel linear anomalies, parallel with the existing field boundaries which relate to former agricultural activity.

Anomalies associated with magnetic debris

(16) – Strong, discrete, dipolar anomalies relate to buried ferrous and other magnetically thermoremnant objects, such as brick/tile within the topsoil. All of the survey areas contain similar responses.

Anomalies with a modern origin

(17) – Magnetic disturbance is evident along the northern field boundary and this has partially obscured the weaker archaeological features in places.

3.6 List of anomalies - Area 3 (Villa Field)

Area centred on OS NGR 417400 189950, see Figs 05 – 07.

Anomalies of archaeological potential

(18) – An L-shaped, positive rectilinear anomaly appears to be a continuation of enclosures (9) seen within Area 2 to the south.

(19) – A weakly positive rectilinear feature is not well defined, but is likely to be of archaeological potential.

Anomalies with an uncertain origin

(20) – A group of amorphous, magnetically variable anomalies is located in the south eastern part of the survey area. Such a response could be related to former quarrying, the site is situated on the sandstone, siltstone and mudstone of the Hazelbury Bryan and Kingston Formation.

Anomalies associated with magnetic debris

(21) – A patch of magnetic debris relates to a zone of magnetically thermoremnant and ferrous material. The survey area contains numerous and widespread fragments of this material, usually associated with modern dumping.

3.7 List of anomalies - Area 4 (South Field 1)

Area centred on OS NGR 418070 189540, see Figs 07 – 09.

Anomalies with an uncertain origin

(22) – A small, positive curvilinear anomaly could relate to a cut feature but its morphology is not clearly defined. The survey area contains a small number of discrete, pit-like anomalies, but these, along with the curvilinear response, could be related to tree-throw pits.

(23) – Two negative linear anomalies can be seen in the north eastern corner of Area 4, it is not possible to determine their origin.

Anomalies associated with land management

(24) – A positive linear anomaly relates to a formerly mapped field boundary, which is still extant as a shallow linear depression in the field.

Anomalies with an agricultural origin

(25) – A series of parallel linear anomalies relates to former ridge and furrow.

3.8 List of anomalies - Area 6 (Parkland)

Area centred on OS NGR 418000 189785, see Figs 10 – 11.

Anomalies of archaeological potential

(26) – A positive linear anomaly appears to relate to a cut, linear ditch. It is possible that it may have joined anomaly (27), but it appears to have been truncated by anomaly (28) in this location. The anomaly has some complexity and looks in part like it is associated with broad boundary feature (34); however, it is very weak and poorly defined further west.

(27) – A positive linear anomaly that could be associated with anomaly (26). Although it can only be seen as a positive response for approximately 60m, it could continue further south as a negative response.

Anomalies with an uncertain origin

(28) – A rectangular, magnetically variable response appears to have truncated anomaly (26). It is possible that this anomaly relates to former quarrying; however, it does not contain any modern ferrous material within the fill and there is no surface expression indicating that it is of some antiquity.

(29) – The survey area contains a number of positive discrete and amorphous responses with a concentration towards the central and north eastern part of the site. Some of these anomalies are likely to be associated with the removal of former parkland trees; however, the concentrations of pits in linear groups or clusters are spaced 1.8-4m apart. It is not clear if they are associated with any former features within the parkland or if they relate to cut, pit-like features which could have archaeological potential.

(30) – A broad, positive linear response is located towards the north western edge of the survey area. It appears that it may have been truncated by the former and existing trackways within the parkland. It has a similar orientation to anomaly (27) and several negative linear anomalies (31) and the response is indicative of a former broad boundary feature.

(31) – The survey area contains a number of negative linear anomalies many of which have an almost north to south orientation, similar to linear anomaly (27) and broad positive response (30). It is not clear if the anomalies relate to former agricultural activity at right angles across the trend of the ridge and furrow. Some appear to extend north and south of the parkland trackway, possibly indicating an association, such as drainage gullies, although it could relate to trackway material spread through ploughing. There are a small number of negative curvilinear anomalies and their origin is also uncertain.

Anomalies associated with land management

(32) – A positive linear anomaly, associated with magnetic debris and strong, discrete, dipolar responses relates to a former field boundary, mapped during the early 20th century.

(33) – A complex series of parallel positive and negative linear anomalies extend through the centre of the site. It corresponds to an earthwork feature within the field, that appears as a broad bank in the north, and a series of smaller banks and ditches in the south. The ridge and furrow appears to abut it in the south east, but go over it in the north and the response suggests a broad boundary feature that pre-dates the parkland.

(34) – A series of parallel positive and negative linear anomalies, similar to and parallel with anomaly (33), appears to relate to a further boundary feature that is overlain by the parkland track at the northern end.

(35) – Negative linear anomalies relate to existing and former parkland tracks/drives.

Anomalies with an agricultural origin

(36) – The survey area contains evidence for ridge and furrow on different orientations.

Anomalies with a modern origin

(37) – A multiple dipolar linear anomaly extends through the parkland. There is a small southerly extension in the south western corner and it extends north eastwards where it splits to the north and south east. This type of anomaly indicates a response to a buried service/pipe.

3.9 List of anomalies - Area 7 (South Field 2)

Area centred on OS NGR 417865 189355, see Figs 12 – 15.

Anomalies with an uncertain origin

(38) – Situated in the south western corner of Area 7 are two weakly positive linear anomalies that appear to join. It is not clear if they relate to cut, ditch-like features, or if they are a response to two agricultural marks on different orientations.

(39) – A number of weakly positive linear anomalies cross the northern part of the survey area. It is possible that they have an association with land drainage.

(40) – A negative linear anomaly extends across much of the survey area. It appears to have truncated the earlier ridge and furrow and may relate to land drainage.

Anomalies associated with land management

(41) – Two negative linear anomalies join to form a T-shaped feature. Although no land boundaries have been mapped, they appear to relate to boundary or drainage ditches.

Anomalies with an agricultural origin

(42) – The survey area contains anomalies associated with former ridge and furrow cultivation.

Anomalies associated with magnetic debris

(43) – Very strongly magnetic debris has been used to infill the former branch line that extended across the south eastern part of the survey area in the early to mid 20th century.

4 CONCLUSION

4.1.1 The geophysical survey located a number of anomalies in the north western part of Stanton Park that relate to an Iron Age and Romano-British settlement and possible ritual site. These features lie to the south of the scheduled area of the Roman villa 530m west of Stanton House but are likely to be directly associated with it. The anomalies include a square, double-ditched enclosure, which could have a ritual rather than occupation function as well as a series of smaller enclosures and a ring ditch that are likely to relate to settlement.

4.1.2 Within the area of parkland in the north eastern part of the site are two positive linear anomalies that appear to relate to linear ditches, that may have been truncated by later field boundaries. Other anomalies relate to ridge and furrow, parkland tracks and likely tree removal. A number of pit-like features, with several in clusters and linear groups have also been located, but it is not clear if they relate to removed trees, quarry pits or if they have archaeological potential. In the remaining survey areas the results indicate the presence of ridge and furrow as well as a small number of linear anomalies of uncertain origin.

5 REFERENCES

Aspinall, A., Gaffney, C. and Schmidt, A. 2009. *Magnetometry for Archaeologists*. Lanham (US), AltaMira Press.

British Geological Survey, 2017. *Geology of Britain 3D (Beta version), 1:50 000 scale [online]* available from http://mapapps.bgs.ac.uk/geologyofbritain3d/index.html? [accessed 10/6/2022].

Chartered Institute for Archaeologists, 2014 (updated 2020). *Standard and Guidance for archaeological geophysical survey*. CIfA, University of Reading.

European Archaeological Council, 2015. *EAC Guidelines for the Use of Geophysics in Archaeology: Questions to Ask and Points to Consider.* Europae Archaeologia Consilium and Association Internationale sans But Lucratif, Belgium.

Institute for Archaeologists, 2002. *The use of Geophysical Techniques in Archaeological Evaluations*. IfA Paper No. 6. IfA, University of Reading.

Schmidt, A., 2013. *Geophysical Data in Archaeology: A Guide to Good Practice.* Oxbow Books.

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

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 SENSYS gradiometer is a passive instrument consisting of two fluxgate sensors mounted vertically 65cm apart. The instrument is carried about 10-20cm 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 magnetic field. The difference between the two sensors will relate to the strength of the magnetic field created by the buried feature.

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. Different ranges are applied to data in order to determine the most suitable for anomaly abstraction and display.

High Pass Filter

Removes low frequency anomalies within the data that are not considered to be archaeologically significant and may be natural in origin. A window passes over the data, the mean of all the data within the window is subtracted from the centre value. The size of the window is adjusted as is the weighting which may be uniform or Gaussian. The process is used to improve the visibility of anomalies of interest.

Low Pass Filter

Removes high frequency anomalies or 'noise' within datasets and provides a smoother output. A window passes over the data, the mean of all the data within the window is used to replace the centre value. The size of the window is adjusted as is the weighting. The process is used to improve the visibility of anomalies of interest.

Zero Median/Mean Traverse

The median (or mean) of data from 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 differences between the offset values of the gradiometer sensors. The process can remove archaeological features that run along a traverse but with the high resolution datasets created by the Sensys FGM650 sensors and the method of data collection this has not been a notable problem. In fact, the removal of offsets using software avoids carrying out a balancing procedure on site, which inevitably can never be done in magnetically clean conditions and results in improperly aligned fluxgate sensors and/or electronic adjustment values.

Appendix C – survey and data information

Area 1 minimally processed data
Filename: J901-mag-Area1-proc.xcp
Units:
UTM Zone: 30U
Survey corner coordinates (X/Y):OSGB36
Northwest corner: 417512.80, 189921.63 m
Southeast corner: 417619.75, 189708.33 m
Collection Method: Randomised
Sensors: 5
Dummy Value: 32702
Dimensions
Survey Size (meters): 107 m x 213 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 516494, Recorded: 516494
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.78
Mean: 0.02
Median: -0.01
Composite Area: 2.2812 ha
Surveyed Area: 1.4789 ha
PROGRAM
Name: TerraSurveyorPre
Version: 3.0.36.24
GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00

Area 1 filtered data

Stats
Max: 3.32
Min: -3.30
Std Dev: 0.72
Mean: 0.02
Median: -0.02
GPS based Proce5
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 High pass Uniform (median) filter: Window dia: 300
5 Clip from -3.00 to 3.00

Area 2 minimally processed data

Filename: J901-mag-Area2-proc.xcp
Northwest corner: 417346.31, 189924.42m
Southeast corner: 417517.01, 189702.42 m
Dimensions
Survey Size (meters): 171 m x 222 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 1002984, Recorded: 1002984
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.95
Mean: 0.03
Median: 0.00
Composite Area: 3.7895 ha
Surveyed Area: 2.8765 ha
GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00

Area 2 filtered data

Max: 3.32
Min: -3.30
Std Dev: 0.88
Mean: 0.03
Median: 0.01

GPS based Proce5
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 Lo pass Uniform (median) filter: Window dia: 13
5 Clip from -3.00 to 3.00

Area 3 minimally processed data

Filename: J901-mag-Area3-proc.xcp
Northwest corner: 417334.15, 189993.60 m
Southeast corner: 417460.90, 189908.70 m
Dimensions
Survey Size (meters): 127 m x 84.9 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 302311, Recorded: 302311
Stats
Max: 2.21
Min: -2.20
Std Dev: 0.76
Mean: 0.04
Median: 0.01
Composite Area: 1.0761 ha
Surveyed Area: 0.6917 ha
GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 Clip from -2.00 to 2.00

Area 4 minimally processed data

Filename: J901-mag-Area4-proc.xcp
Northwest corner: 417808.92, 189668.54m
Southeast corner: 418208.97, 189352.64 m
Dimensions
Survey Size (meters): 400 m x 316 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 1312592, Recorded: 1312592
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.97
Mean: 0.00
Median: 0.01
Composite Area: 12.638 ha
Surveyed Area: 4.0826 ha
GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00

Area 4 filtered data
Filename: J901-mag-Area4-proc-hpf.xcp
Stats
Max: 3.32
Min: -3.30
Std Dev: 0.91
Mean: 0.01
Median: 0.00
GPS based Proce5
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 High pass Uniform (median) filter: Window dia: 300
5 Clip from -3.00 to 3.00

Area 6 minimally processed data
Filename: J901-mag-Area6-proc.xcp
Northwest corner: 417807.21, 190004.98 m
Southeast corner: 418171.11, 189617.23 m
Dimensions
Survey Size (meters): 364 m x 388 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 2132477, Recorded: 2132477
Stats
Max: 3.32
Min: -3.30
Std Dev: 1.26
Mean: 0.01
Median: 0.01
Composite Area: 14.11 ha
Surveyed Area: 6.9483 ha
GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00

Area 7 minimally processed data
Filename: J901-mag-Area7-proc.xcp
Northwest corner: 417672.46, 189575.00m
Southeast corner: 418094.86, 189157.25 m
Dimensions
Survey Size (meters): 422 m x 418 m
X&Y Interval: 0.15 m
Source GPS Points: Active: 3878044, Recorded: 3878044
Stats
Max: 3.32
Min: -3.30
Std Dev: 1.07
Mean: -0.01
Median: -0.01
Composite Area: 17.646 ha
Surveyed Area: 11.019 ha
GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 Clip from -3.00 to 3.00

Area 7 filtered data

Stats
Max: 3.32
Min: -3.30
Std Dev: 0.97
Mean: 0.00
Median: -0.01
GPS based Proce5
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to UTM).
3 DeStripe Median Traverse:
4 High pass Uniform (median) filter: Window dia: 250
5 Clip from -3.00 to 3.00

Appendix D – digital archive

Archaeological Surveys Ltd hold the primary digital archive at their offices in Wiltshire. 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.

A PDF copy will be supplied to the Wiltshire Historic Environment Record with greyscale images and abstraction layers made available on request. The report will also be uploaded to the Online AccesS to the Index of archaeological investigationS (OASIS).

Archive contents:

File type	Naming scheme	Description
Data	J901-mag-**[area number/name]**.asc J901-mag-**[area number/name]**.xcp J901-mag-**[area number/name]**-proc.xcp	Raw data as ASCII CSV TerraSurveyor raw data TerraSurveyor minimally processed data
Graphics	J901-mag-**[area number/name]**-proc.tif	Image in TIF format
Drawing	J901-**[version number]**.dwg	CAD file in 2018 dwg format
Report	J901 report.odt	Report text in LibreOffice odt format

Table 2: Archive metadata

Appendix E – CAD layers for abstraction and interpretation plots

The table below sets out Archaeological Surveys Ltd CAD layer names with associated colours and graphical content. Where CAD files are available layers may be extracted for further CAD/GIS use. Note: hatched polygon boundaries are contained within layers with the RGB colour code 254, 255, 255 (near white) in order to prevent their visibility.

Report sub-heading and associated CAD layer names	Colour with RGB index		Layer content
Anomalies with archaeological potential			
AS-ABST MAG POS DISCRETE ARCHAEOLOGY		Red 255,0,0	Solid donut, point or polygon (solid)
AS-ABST MAG POS ARCHAEOLOGY		Red 255,0,0	Polygon (cross hatched ANSI37)
AS-ABST MAG POS LINEAR ARCHAEOLOGY		Red 255,0,0	Polyline or polygon (solid)
AS-ABST MAG POS CURVILINEAR RING DITCH		Magenta 255,0,255	Polyline or polygon (solid)
AS-ABST MAG NEG LINEAR ARCHAEOLOGY		127,0,255	Line, polyline or polygon (solid)
AS-ABST MAG POS ENCLOSURE DITCH		127,0,255	Line, polyline or polygon (solid)
Anomalies with an uncertain origin			
AS-ABST MAG POS LINEAR UNCERTAIN		255,127,0	Line, polyline or polygon (solid)
AS-ABST MAG NEG LINEAR UNCERTAIN		Blue 0,0,255	Line, polyline or polygon (solid)
AS-ABST MAG POS DISCRETE UNCERTAIN		255,127,0	Solid donut, point or polygon (solid)
AS-ABST MAG POS UNCERTAIN		255,127,0	Polygon (cross hatched ANSI37)
Anomalies relating to land management			
AS-ABST MAG BOUNDARY		127,0,0	Line, polyline or polygon (solid or cross hatched ANSI37)
AS-ABST MAG PATH/ROAD/TRACK		0, 153,153	Line, polyline or polygon (solid or partly cross hatched ANSI38)
AS-ABST MAG LAND DRAIN		Cyan 0,255,255	Line or polyline
Anomalies with an agricultural origin			

AS-ABST MAG AGRICULTURAL		Green 0,255,0	Line or polyline
AS-ABST MAG RIDGE AND FURROW		0,127,63	Line, polyline or polygon (cross hatched ANSI37)
Anomalies associated with magnetic debris			
AS-ABST MAG DEBRIS		132, 132, 132	Polygon (cross hatched ANSI37)
AS-ABST MAG STRONG DIPOLAR		132, 132, 132	Solid donut, point or polygon (solid)
Anomalies with a modern origin			
AS-ABST MAG DISTURBANCE		132, 132, 132	Polygon (hatched ANSI31)
AS-ABST MAG SERVICE		132, 132, 132	Line or polyline

Table 3: CAD layering

Appendix F – copyright and intellectual property

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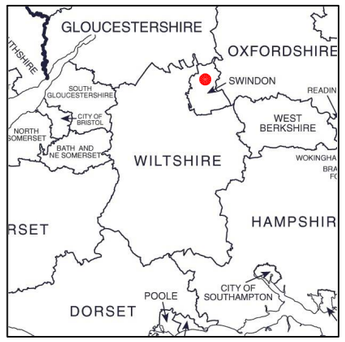
info@archaeological-surveys.co.uk
Tel: 01249 814 231

Survey location

Scheduled Monument

N



● Survey location

Site centred on OS NGR
SU 17815 89625

SCALE 1:25 000

0m 500m 1000m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 01

Archaeological Surveys
Specialist Geophysical Surveyors

Geophysical Survey
Stanton Park
Stanton Fitzwarren
Swindon

Map of survey area

Archaeological Surveys
Specialist Geophysical Surveyors

Geophysical Survey
Stanton Park
Stanton Fitzwarren
Swindon

Referencing information

Referencing grid to OSGB36 datum at 100m intervals

417800 189500

Survey tracks

Survey track start

Survey track stop

SCALE 1:4000

0m 40 80 120 160 200m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 02

Archaeological Surveys
Specialist Geophysical Surveyors

Geophysical Survey
Stanton Park
Stanton Fitzwarren
Swindon

Greyscale plot of minimally processed magnetometer data

Scheduled Monument
Roman villa 530m west of Stanton House

Area 3
Villa Field

Area 2
Railway Field

Area 1
Badger Field

Area 6
Parkland

Area 4
South Field 1

Area 5
Unsurveyable
Wildflowers

Area 7
South Field 2

Fishpond

Stanton House

Woodland

Woodland

Woodland

N

+3nT

-3nT

-3nT Area 1 +3nT

-3nT Area 2 +3nT

-3nT Area 3 +3nT

-3nT Area 4 +3nT

-3nT Area 6 +3nT

-3nT Area 7 +3nT

SCALE 1:4000

0m 40 80 120 160 200m

KTD | DJS | FIG 03

Archaeological Surveys
Specialist Geophysical Surveyors

Geophysical Survey
Stanton Park
Stanton Fitzwarren
Swindon

Abstraction and interpretation of magnetic anomalies

Scheduled Monument
Roman villa 530m west of Stanton House

Area 3
Villa Field

Area 2
Railway Field

Area 1
Badger Field

Area 6
Parkland

Area 4
South Field 1

Area 5
Unsurveyable
Wildflowers

Area 7
South Field 2

Fishpond

Stanton House

Woodland

Trees

N

- Positive linear anomaly - cut feature of archaeological potential
- Positive curvilinear anomaly - ring ditch
- Positive rectilinear anomaly - enclosure ditch
- Positive rectilinear anomaly - double-ditched square enclosure
- Negative anomaly - of archaeological potential
- Linear anomaly - former boundary
- Positive linear anomaly - possible ditch-like feature
- Negative anomaly - of uncertain origin
- Linear anomaly - of agricultural origin
- Linear anomaly - ridge and furrow
- Discrete positive response - cut feature/burnt area of archaeological potential
- Discrete positive response - possible pit-like feature
- Positive anomaly - magnetically enhanced material of archaeological potential
- Negative anomaly - surface/rubble spread
- Variable response - trackway/drive
- Variable magnetic response - former boundary
- Positive response - of uncertain origin
- Magnetically variable response - former quarrying
- Magnetic debris
- Magnetic disturbance from ferrous material
- Strong dipolar anomaly - ferrous object

SCALE 1:4000

0m 40 80 120 160 200m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 04

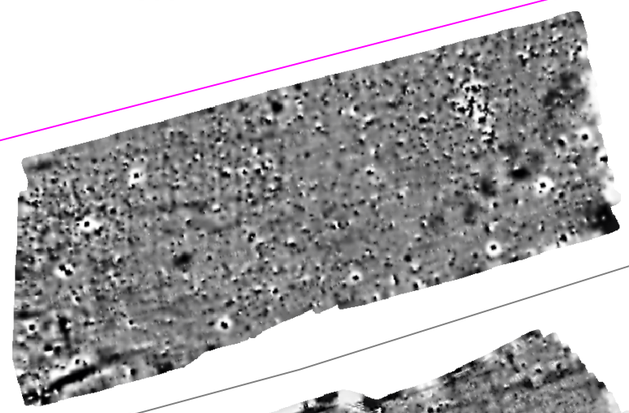
Archaeological Surveys
Specialist Geophysical Surveyors

Geophysical Survey
Stanton Park
Stanton Fitzwarren
Swindon

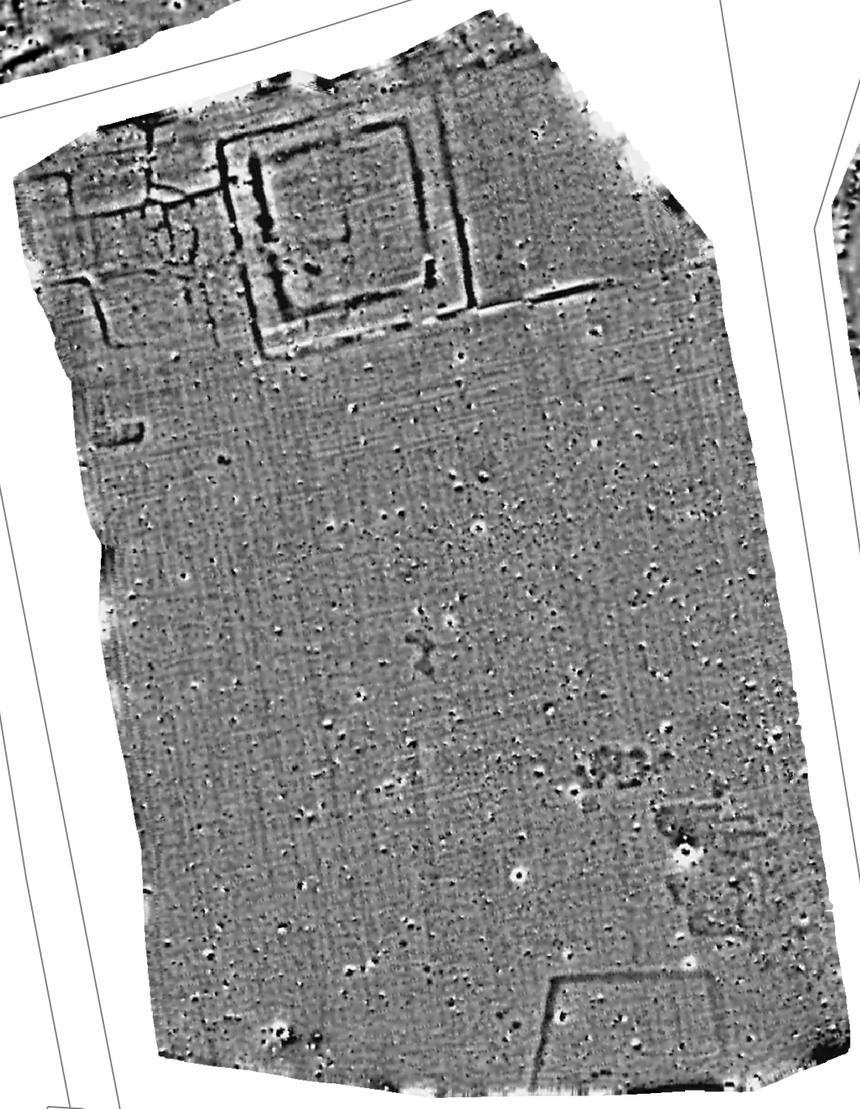
Greyscale plot of minimally processed magnetometer data - Areas 1, 2 & 3

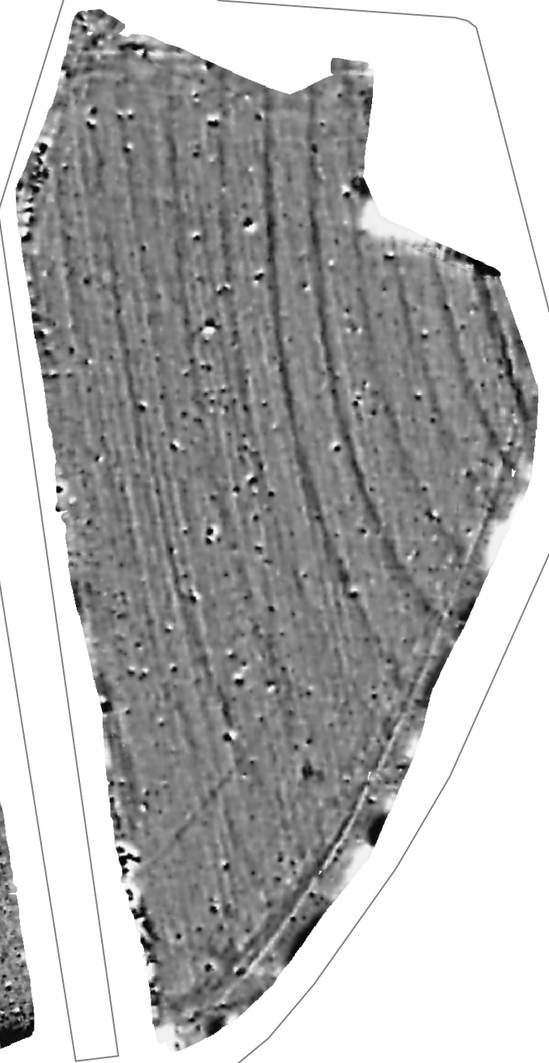
Scheduled Monument

Roman villa 530m west of Stanton House



Area 3
Villa Field



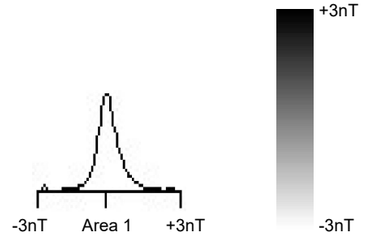


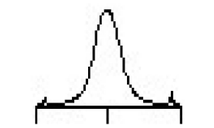
N

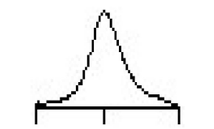
Wood

Area 2
Railway Field

Area 1
Badger Field







SCALE 1:1250

0m 10 20 30 40 50m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 05

Scheduled Monument

Roman villa 530m west of Stanton House

Area 3

Villa Field

N

Area 2

Railway Field

Area 1

Badger Field

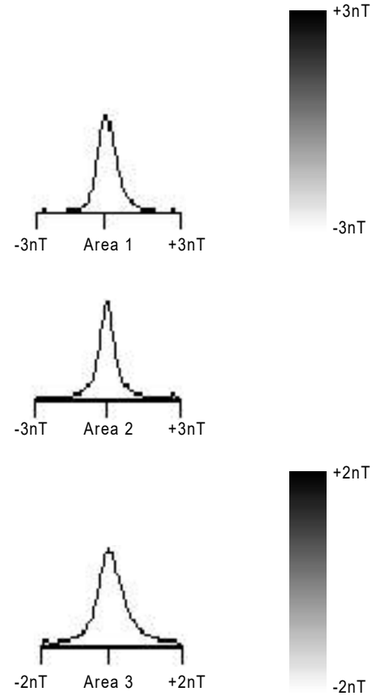
Wood

Archaeological Surveys

Specialist Geophysical Surveyors

Geophysical Survey
Stanton Park
Stanton Fitzwarren
Swindon

Greyscale plot of filtered magnetometer data - Areas 1, 2 & 3



SCALE 1:1250

0m 10 20 30 40 50m

KTD	DJS	FIG 06

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Geophysical Survey
Stanton Park
Stanton Fitzwarren
Swindon

Abstraction and interpretation of magnetic anomalies

Scheduled Monument

Roman villa 530m west of Stanton House

Area 3
Villa Field

Area 1
Badger Field

Area 2
Railway Field

Wood

N

- Positive linear anomaly - cut feature of archaeological potential
- Positive curvilinear anomaly - ring ditch
- Positive rectilinear anomaly - enclosure ditch
- Negative linear anomaly - of archaeological potential
- Positive rectilinear anomaly - double-ditched square enclosure
- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - of agricultural origin
- Linear anomaly - ridge and furrow
- Discrete positive response - cut feature of archaeological potential
- Discrete positive response - possible pit-like feature
- Positive anomaly - magnetic enhancement of archaeological potential
- Positive anomaly - magnetically enhanced material
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance from ferrous material
- Strong dipolar anomaly - ferrous object

SCALE 1:1250

0m 10 20 30 40 50m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 07

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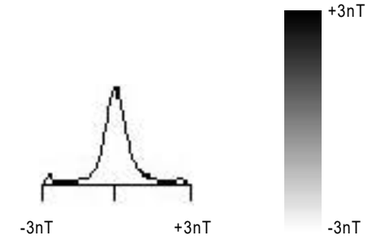
Geophysical Survey
Stanton Park
Stanton Fitzwarren
Swindon

Greyscale plot of minimally processed magnetometer data - Area 4



Trees

Area 4

South Field 1

Woodland

Area 5

Unsurveyable

Wildflowers

N

Trees

SCALE 1:1250

0m 10 20 30 40 50m

KTD	DJS	FIG 08

Archaeological Surveys
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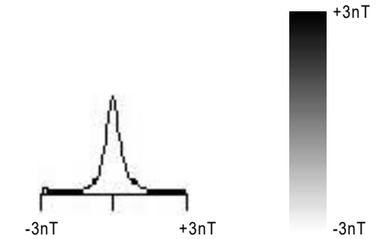
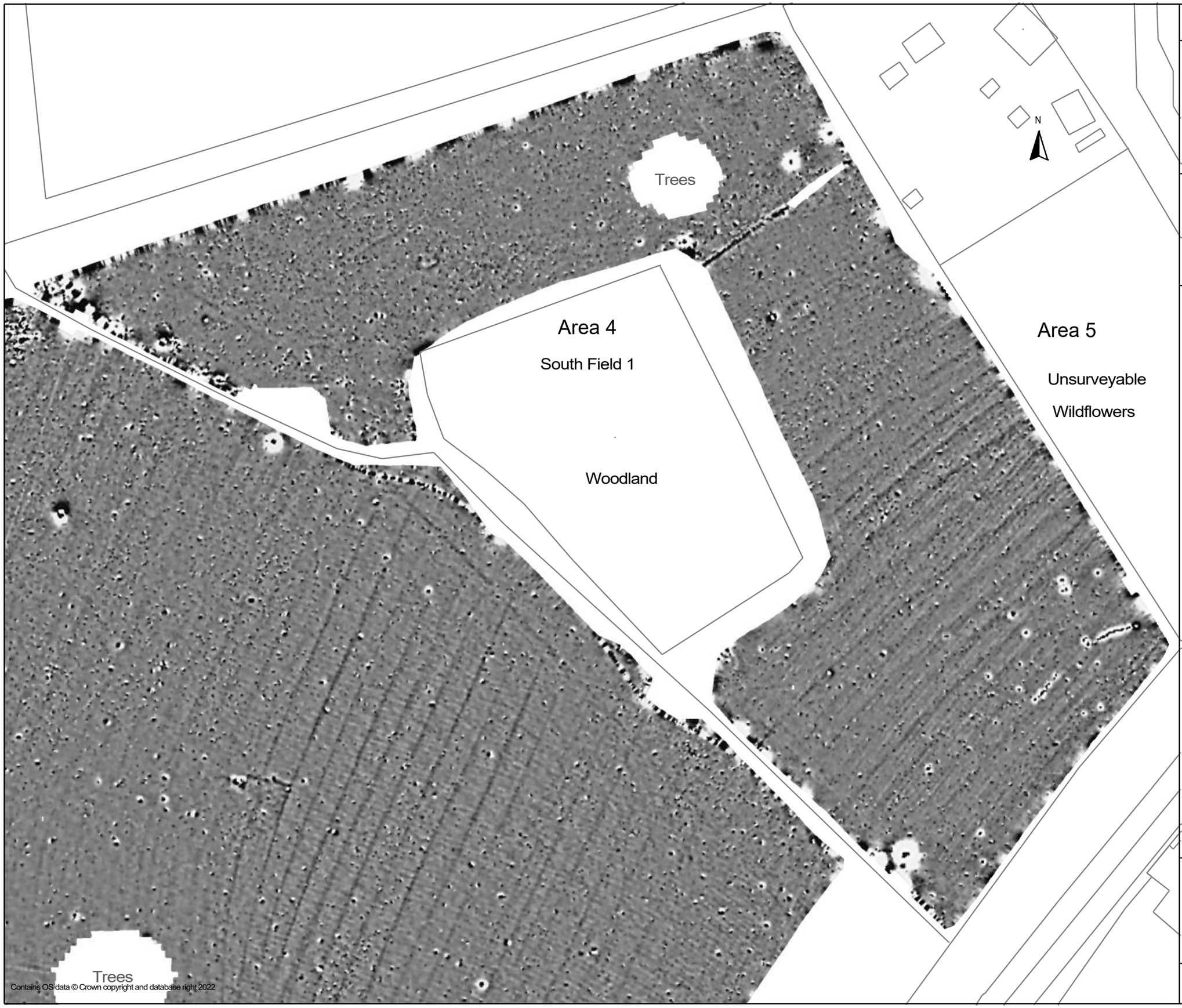
Geophysical Survey
Stanton Park
Stanton Fitzwarren
Swindon

Greyscale plot of filtered magnetometer data - Area 4





SCALE 1:1250

0m 10 20 30 40 50m

KTD	DJS	FIG 09

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Geophysical Survey
Stanton Park
Stanton Fitzwarren
Swindon

Abstraction and interpretation of magnetic anomalies - Area 4

Tree
Tree
36
23
Trees
22
24
Area 4
South Field 1
Area 5
Unsurveyable
Wildflowers
Woodland
39
25
40
N

- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - ridge and furrow
- Positive linear anomaly - former field boundary
- Negative linear anomaly - material of low magnetic susceptibility
- Discrete positive response - possible pit-like feature
- Magnetic disturbance from ferrous 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

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 10

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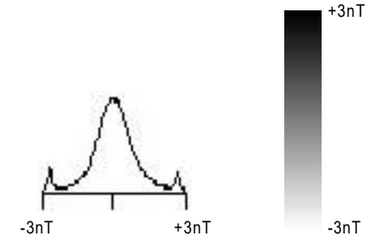
Geophysical Survey
Stanton Park
Stanton Fitzwarren
Swindon

Greyscale plot of minimally processed magnetometer data - Area 6



N

Area 6

Parkland

Trees
Tree

SCALE 1:1500

0m 10 20 30 40 50m

KTD | DJS | FIG 11

Archaeological Surveys
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Geophysical Survey
Stanton Park
Stanton Fitzwarren
Swindon

Abstraction and interpretation of magnetic anomalies - Area 6

Area 6

Parkland

N

Trees
Tree
26
27
28
29
30
31
32
33
34
35
36
37
23
24

- Positive linear anomaly - cut feature of archaeological potential
- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - ridge and furrow
- Positive linear anomaly - former field boundary
- Negative linear anomaly - material of low magnetic susceptibility
- Discrete positive response - possible pit-like feature
- Broad linear anomaly - former boundary feature
- Positive anomaly - magnetically enhanced material
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance from ferrous material
- Strong multiple dipolar linear anomaly - pipeline / cable / service
- Strong dipolar anomaly - ferrous object

SCALE 1:1500

0m 10 20 30 40 50m

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 12

Archaeological Surveys
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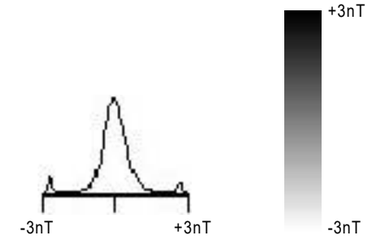
Geophysical Survey
Stanton Park
Stanton Fitzwarren
Swindon

Greyscale plot of minimally processed magnetometer data - Area 7



Area 4

South Field 1

Woodland

N

Area 7

South Field 2

Trees

SCALE 1:1500

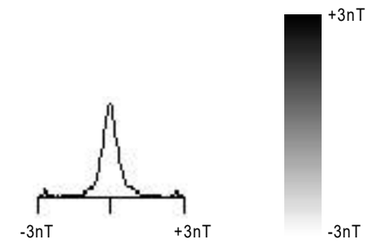
0m 10 20 30 40 50m

KTD	DJS	FIG 13

Archaeological Surveys
Specialist Geophysical Surveyors

Geophysical Survey
Stanton Park
Stanton Fitzwarren
Swindon

Greyscale plot of filtered magnetometer data - Area 7



SCALE 1:1500

0m 10 20 30 40 50m

KTD	DJS	FIG 14

Area 4

South Field 1

Woodland

Area 7

South Field 2

Trees

39

40

42

41

38

43

25

N

Archaeological Surveys

Specialist Geophysical Surveyors

Geophysical Survey
Stanton Park
Stanton Fitzwarren
Swindon

Abstraction and interpretation of magnetic anomalies

- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - ridge and furrow
- Negative linear anomaly - possible former field boundary
- Negative linear anomaly - material of low magnetic susceptibility
- Discrete positive response - possible pit-like feature
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Magnetic disturbance from ferrous material
- Strong dipolar anomaly - ferrous object

SCALE 1:1500

0m 10 20 30 40 50m

SCALE TRUE AT A3

DRAWN BY	CHECKED BY	
KTD	DJS	FIG 15