

**Land North of Broughton Road
Banbury
Oxfordshire**

MAGNETOMETER SURVEY REPORT

for

Lone Star Land

Kerry Donaldson & David Sabin

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ARCHAEOLOGICAL SURVEYS LTD

**Land North of Broughton Road
Banbury
Oxfordshire**

MAGNETOMETER SURVEY REPORT

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Lone Star Land

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SUMMARY

Detailed magnetometry was carried out by Archaeological Surveys Ltd within a 1ha land parcel to the north of Broughton Road on the western edge of Banbury in Oxfordshire. The results indicate the presence of spreads of soil containing very strongly magnetic material of modern origin in the central and eastern parts of the site, and more weakly positive and negative anomalies in the west. The results infer the potential for some ground make-up over much of the area with the potential also for deeper ground disturbance in the western part of the site. Anomalies related to former ridge and furrow were located near the south western corner suggesting little disturbance in this area. The efficacy of the geophysics has been affected by ferrous contamination, ground make-up and disturbance.

1 INTRODUCTION

1.1 *Survey background*

- 1.1.1 Archaeological Surveys Ltd was commissioned by the Environmental Dimension Partnership, on behalf of Lone Star Land, to undertake a magnetometer survey of a small field to the north of Broughton Road on the western edge of Banbury, Oxfordshire. The survey was carried out in order provide information on the archaeological potential of land likely to be disturbed by a proposed area of biodiversity net gain.
- 1.1.2 The geophysical survey was carried out in accordance with a Written Scheme of Investigation (WSI) produced by Archaeological Surveys (2025) and issued to Victoria Green, Oxfordshire County Council Archaeologist and archaeological advisor for Cherwell District Council.

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 any groundworks or planting associated with the area of biodiversity net gain. 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 (CIfA) 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.
- 1.3.4 Where targeting of anomalies by excavation is to be carried out, care should be taken to place trenches over solid lines or features visible on the abstraction and interpretation plots. Archaeological Surveys abstraction and interpretation avoids the use of dashed or dotted line formats, and broken or fragmented lines used in interpretive plots may well correspond closely with truncation of archaeological features.
- 1.3.5 Magnetic anomalies may relate to features within the topsoil, subsoil or within the underlying solid or superficial geology. Anomalies are created by contrasting magnetic susceptibility; however, this is not necessarily consistent with changes in soil texture or colour and may not be contained within well defined features. Magnetic contrast and the magnitude of anomalies does not necessarily correlate with the volume or thickness of magnetic material present. The vertical component of the magnetic field is measured by the magnetometer and this falls rapidly with distance from the sensor, it may not be possible to distinguish weak features within the topsoil from deeper features containing more magnetic material.
- 1.3.6 Interpretation of anomalies relies on detailed analysis of the data. The morphology of anomalies and their magnitude are important factors in the interpretation process. Wherever possible, supporting information is used, e.g.

LiDAR, early mapping and desk-based assessments. However, anomalies often cannot be confidently interpreted without intrusive investigation and as such are categorised as of uncertain origin; this classification may include anomalies relating to archaeological features.

1.4 *Site location, description and survey conditions*

- 1.4.1 The site is located approximately 200m north of Broughton Road immediately to the west of Banbury. It is centred on Ordnance Survey National Grid Reference (OS NGR) SP 43730 39865, see Figs 01 and 02.
- 1.4.2 The geophysical survey covers approximately 1ha of agricultural land within a single field. The land slopes down steeply towards the south from approximately 155m AODN along the northern field boundary to 145m AODN along the southern boundary. The ground cover was variable and included long grass within the western part of the site, soil with slight grass cover within the central zone and short grass within the eastern part of the site. It was evident that some degree of soil spreading had taken place although the amount of ground make-up was unclear and likely to vary considerably across the site. The south western part of the field appeared to lie outside of the area of potential make-up and ground disturbance. The north eastern part of the field was bounded by steel Heras fencing and steel containers associated with active building works to the north. A small patch of rough land appears to separate the site from residential dwellings to the east. Land to the south and west is agricultural and with the exception of the north eastern part of the field, boundaries are hedgerows with mature trees.
- 1.4.3 The ground conditions across the site were generally considered to be suitable for the collection of magnetometry data. However, survey was difficult in places due to deep ruts and the steep slope, in addition the field margins were overgrown and contained numerous fallen branches which impeded survey slightly. Considerable magnetic disturbance relating to the steel fencing and containers, adjacent to the north eastern part of the site, was noted and survey was avoided in close proximity to these objects. Where the soil surface was visible, both magnetically thermoremanent and ferrous objects of modern origin were observed. Weather conditions during the survey were fine.



Plate 1: Survey area looking north west

1.5 Site history and archaeological potential

1.5.1 A previous geophysical survey was carried out within land immediately to the north and partially to the south and within a narrow strip within the eastern part of the current survey (Sumo Geophysics, 2021) with a further survey covering the two fields immediately south (Sumo Geophysics, 2022). The survey to the north located a number of ring ditches, relating to Iron Age round houses, as well as a number of pits and other cut features. A service and a small number of anomalies of uncertain origin were located within the eastern part of the current survey area, with ridge and furrow within the fields to the north and south, but not within the current survey area. Subsequent archaeological investigations by Border Archaeology in 2022 and 2023 on the land immediately to the north of the site identified occupation from the Bronze Age and Iron Age as well as a number of Anglo Saxon burials. In the wider vicinity, a geophysical survey carried out within an area 150m to 650m to the north west located a number of late prehistoric large curvilinear boundary ditches, pit alignments, ring ditches and pits (Archaeological Surveys, 2022).

1.6 Geology and soils

1.6.1 The underlying solid geology across the site is from the Whitby Mudstone Formation (BGS, 2025).

1.6.2 The overlying soil across the survey area is from the Denchworth association (712b) and is a pelo-stagnogley consisting of a slowly permeable, seasonally waterlogged, clayey soil (Soil Survey of England and Wales, 1983). It is

possible that the mapped soil type is overlain in some parts of the site by soil derived from a different association.

- 1.6.3 The underlying geology and soils are frequently associated with low magnetic contrast and low levels of magnetic susceptibility. However, 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 magnetic 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 positive magnetic anomalies that can be mapped by magnetic prospecting. In addition, where soil is displaced by material of comparatively low magnetic susceptibility, such as many types of sedimentary rock, anomalies of negative value may occur which could be indicative of structural remains.
- 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. Each 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 recorded range of $\pm 3000\text{nT}$, and resolution is approximately 0.1nT . They are linked to a Leica GS10 RTK GNSS with data recorded by SENSYS MonMX software on a rugged notebook 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 $<100\text{s}$.

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 $\pm 3000\text{nT}$ and clipped for display at $\pm 10\text{nT}$. Data are interpolated to a resolution of effectively 0.5m between tracks and 0.15m along each survey track.
- 2.3.4 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.
- 2.3.5 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. 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.
- 2.3.6 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.
- 2.3.7 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.
- 2.3.8 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 the survey area.
- 2.3.9 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 within a small field and covers approximately 1ha.
- 3.1.2 Magnetic anomalies located can be generally classified as positive and negative anomalies of an uncertain origin, 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. Anomalies located within the survey area have been numbered and are described in 3.4 below.

3.2 *Data quality and factors affecting the interpretation or formation 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 debris is dense and widespread covering much of the site, the exception being a zone towards the south west corner that is comparatively free of high magnitude anomalies. The density and magnitude of the magnetic anomalies associated with the debris is sufficient to obscure anomalies related to cut features over approximately half of the site which would include mainly the eastern and northern parts.
- 3.2.3 Within the western part of the site linear anomalies associated with former agricultural activity disappear along a distinct edge which could relate to the extent of soil spreading but may also relate to truncation. It is, however, possible that if the fill of former cut features is sufficiently magnetically enhanced, there is potential for their location if any burial by overlying soil or truncation is relatively shallow.
- 3.2.4 The presence of anomalies associated with former agricultural activity does infer that the soils are capable of enhanced magnetic susceptibility and 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 an uncertain origin	The category applies to a range of anomalies where <u>there is not enough evidence to confidently suggest an origin</u> . Anomalies in this category <u>may well be related to archaeologically significant features, but equally relatively modern features, geological/pedological features and agricultural features should be considered</u> . 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 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 <u>does not include agricultural features of early date or considered to be of archaeological potential</u> (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 thermoremanent materials such as brick or tile or other small fragments of ferrous material. 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	Magnetically variable anomalies which may be negative indicating a response to geology 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 or is associated with ground make-up

Table 1: List and description of interpretation categories

3.4 List of anomalies

Area centred on OS NGR 443730 239865, see Fig 03.

Anomalies with an uncertain origin

(1 & 2) – The western part of the site contains a number of amorphous and discrete positive (1) and negative (2) anomalies. This part of the site has a defined edge (3) relating to ground disturbance. The positive anomalies are a response to magnetically enhanced material, the negative to material with low magnetic susceptibility. They could relate to discrete dumps of topsoil (1) and subsoil (2) from the adjacent development or possibly extraction. However, there is a lack of modern ferrous material, as seen in the east of the site (5), and so the age and origin of the anomalies is uncertain.

Anomalies associated with ground disturbance

(3) – A negative linear anomaly defines the edge of anomalies (1) & (2) and this relates to an edge of ground disturbance in the western and central parts of the site. It appears that spoil has been deposited within this area; however, it is not clear if there has been only dumping or if there has been extraction as the ridge and furrow

(4) to the south appears to have been truncated by the ground disturbance, but it may be that it has been more deeply buried.

Anomalies with an agricultural origin

(4) – Ridge and furrow can be seen in the south western part of the survey area. It has been truncated by a service and appears to have been truncated by the edge of the ground disturbance (3), but a dumping of overburden may have obscured it further north.

Anomalies associated with magnetic debris

(5) – Very strongly magnetic debris is evident within the eastern and central parts of the site. This is a response to modern ferrous and other magnetically thermoremanent material such as brick/tile within a large area of topsoil.

Anomalies with a modern origin

(6) – Two strong, multiple dipolar, linear anomalies relate to buried services.

4 CONCLUSION

- 4.1.1 The geophysical survey located widespread strongly magnetic material of modern origin within the eastern and central parts of the site with weakly positive and negative anomalies in the west.
- 4.1.2 There is a clear edge that appears to indicate truncation of ridge and furrow in the south western part of the site; however, it is not clear if there has also been subsequent ground make-up and that the original surface is buried and still largely undisturbed across much of the site with possibly only localised areas of truncation. It is not possible to determine if the site has archaeological potential due to unknown amounts of make-up or truncation and soil spreads containing significant levels of modern ferrous contamination.

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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 thermoremanent 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. Thermoremanent 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. Thermoremanent features include ovens, hearths, and kilns. In addition thermoremanent 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.

Zero Median/Mean Traverse - destripe

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

Filename:	J1038-mag-proc.xcp	Survey Size (meters):	202 m x 181 m	PROGRAM	
Instrument Type:	Sensys DLMGPS	X&Y Interval:	0.15 m	Name:	TerraSurveyor
Units:	nT	Source GPS Points:	Active: 784151, Recorded:	Version:	3.0.37.0
UTM Zone:	30U	784157		GPS based Proce4	
Survey corner coordinates (X/Y):	OSGB36	Stats		1 Base Layer:	
Northwest corner:	392071.10, 162152.02 m	Max:	3.32	2 Unit Conversion Layer (UTM to OSGB36).	
Southeast corner:	392272.85, 161970.97 m	Min:	-3.30	3 DeStripe Median Traverse:	
Collection Method:	Parallel	Std Dev:	1.29	4 Clip from -3.00 to 3.00 nT	
Sensors:	5	Mean:	0.00		
Dummy Value:	32702	Median:	0.03		
Dimensions		Composite Area:	3.6527 ha		
		Surveyed Area:	2.2975 ha		

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 draft copy will be supplied to the Oxfordshire county archaeological officer for comment and the agreed final copy supplied in PDF format to the Oxfordshire Historic Environment Record. The report will also be uploaded to OASIS, the online system for reporting archaeological investigations and linking research outputs and archives and the digital data will be archived with the Archaeology Data Service.

Archive contents:

File type	Naming scheme	Description
Data	J1037-mag-[area number/name].asc J1037-mag-[area number/name].xcp J1037-mag-[area number/name]-proc.xcp	Raw data as ASCII CSV TerraSurveyor raw data TerraSurveyor minimally processed data
Graphics	J1037-mag-[area number/name]-proc.tif	Image in TIF format
Drawing	J1037-[version number].dwg	CAD file in 2018 dwg format
Report	J1037 report.odt	Report text in LibreOffice odt format

Table 2: Archive metadata

Appendix E– copyright and intellectual property

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Land North of Broughton Road
Banbury
Oxfordshire**

Map of survey area



● Survey location

Site centred on OS NGR
SP 43730 39865

SCALE 1:25 000

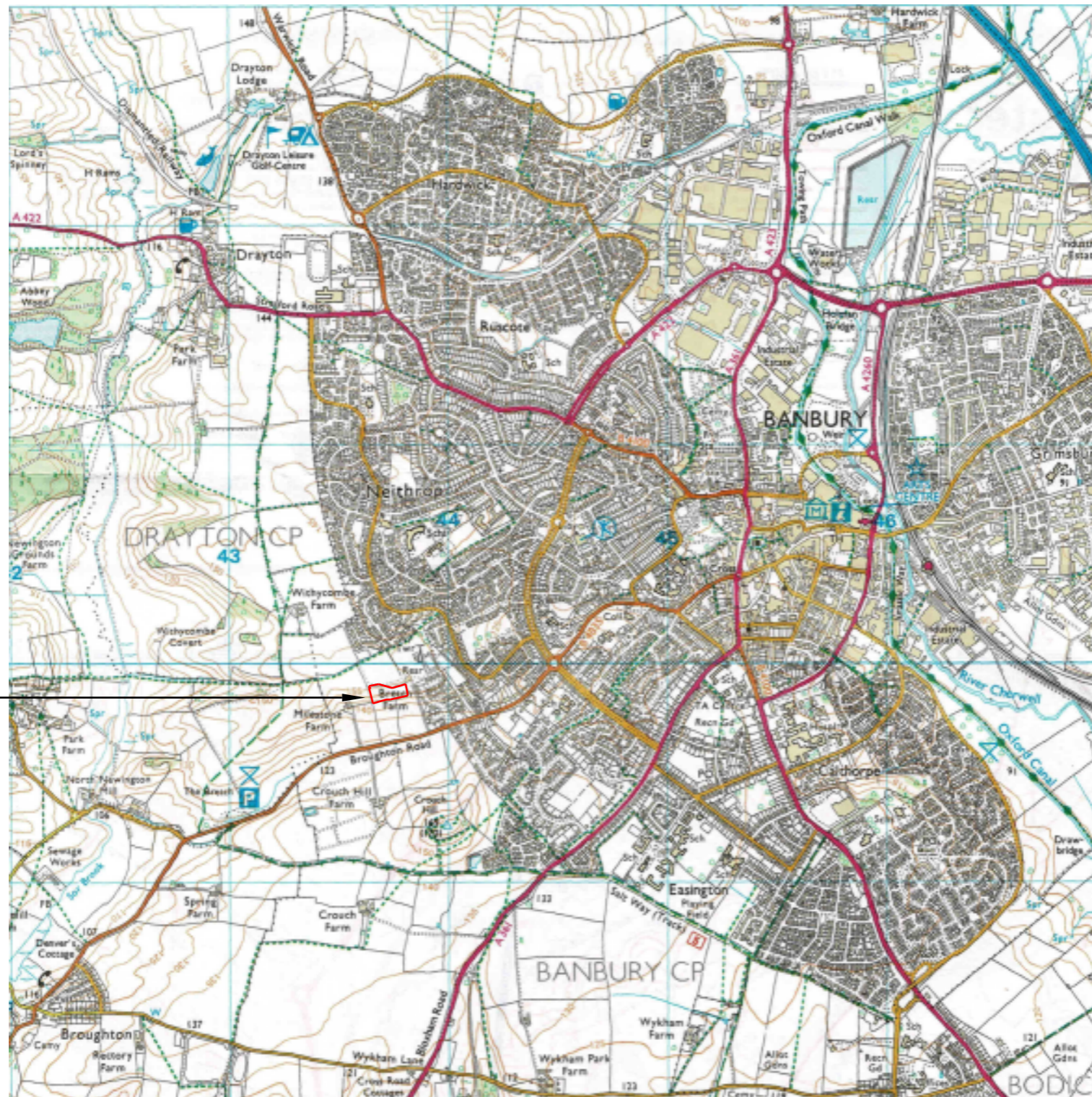


SCALE TRUE AT A3

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FIG 01



Survey location

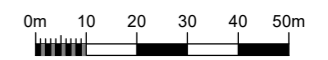
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Referencing information

Referencing grid to OSGB36 datum at 50m intervals

- 443700 239850
- Survey tracks
- ⋯ Survey track start
- ⋯ Survey track stop

SCALE 1:1500



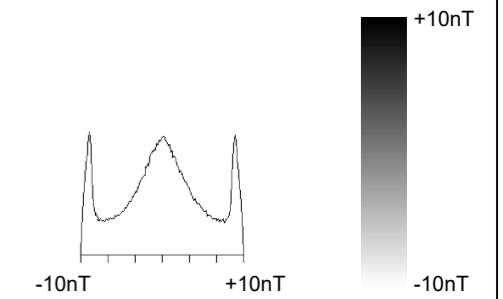
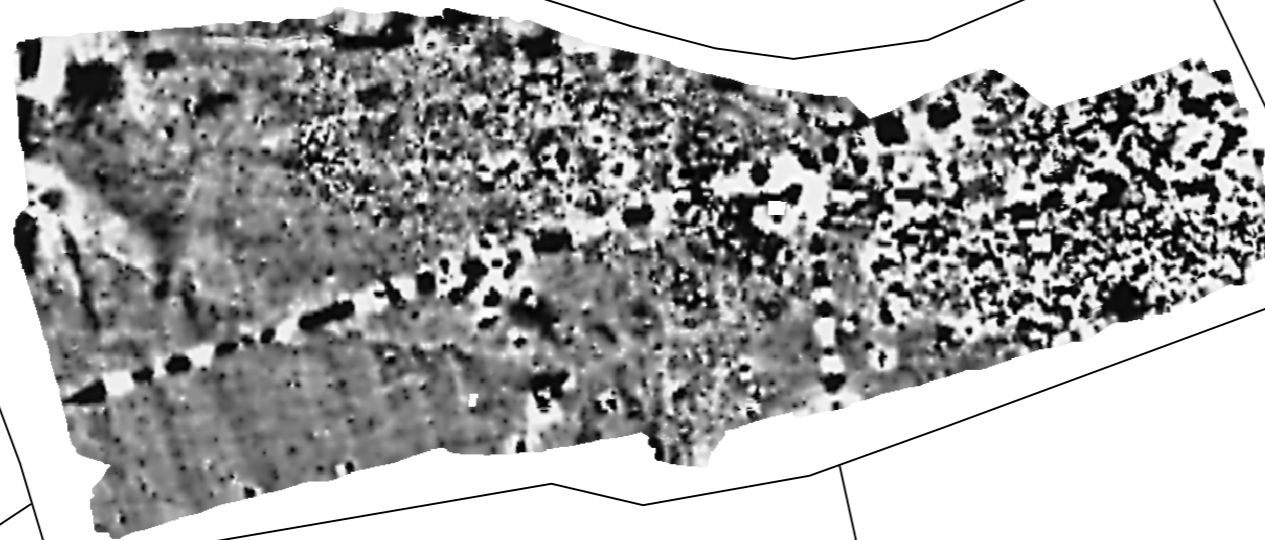
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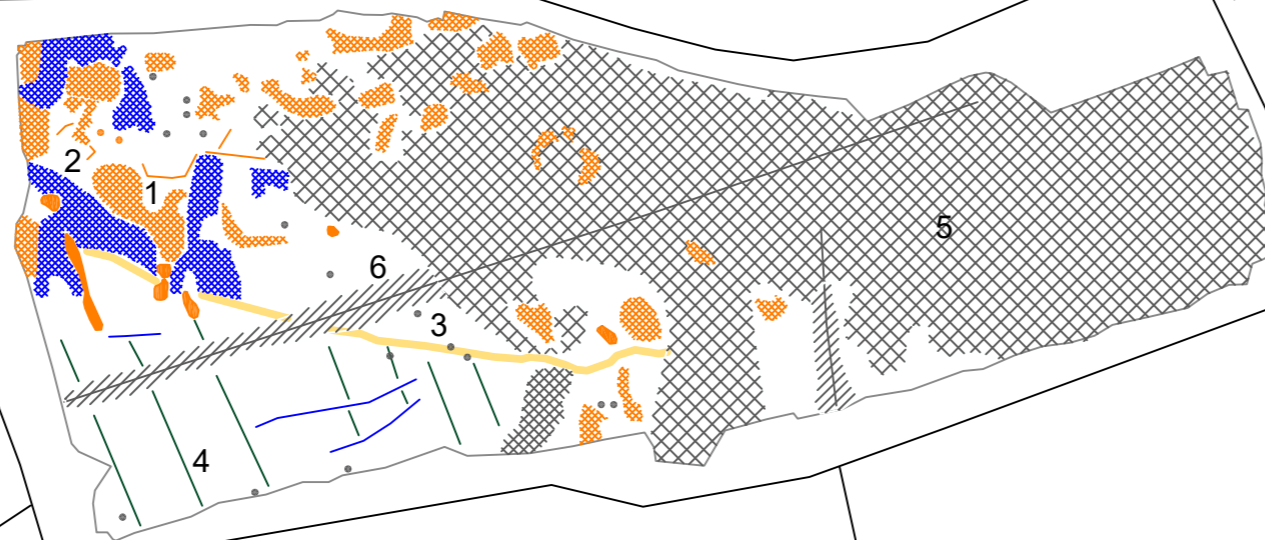
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Greyscale plot of minimally processed magnetometer data & abstraction & interpretation of magnetic anomalies

Greyscale plot of minimally processed magnetometer data

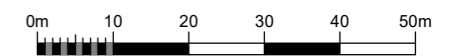


Abstraction & interpretation of magnetic anomalies



- Positive linear anomaly - magnetic enhancement of uncertain origin
- Linear anomaly - ridge and furrow
- Negative linear anomaly - edge of ground make-up/disturbance
- Discrete positive response - magnetic enhancement of uncertain origin
- ▣ Positive anomaly - magnetically enhanced material of uncertain origin
- ▣ Negative anomaly - material of low magnetic susceptibility
- ▣ Magnetic debris - spread of magnetically thermoremanent/ferrous material
- ▨ Magnetic disturbance from ferrous material
- Strong multiple dipolar linear anomaly - pipeline / cable / service
- Strong dipolar anomaly - ferrous object

SCALE 1:1000



SCALE TRUE AT A3

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FIG 03