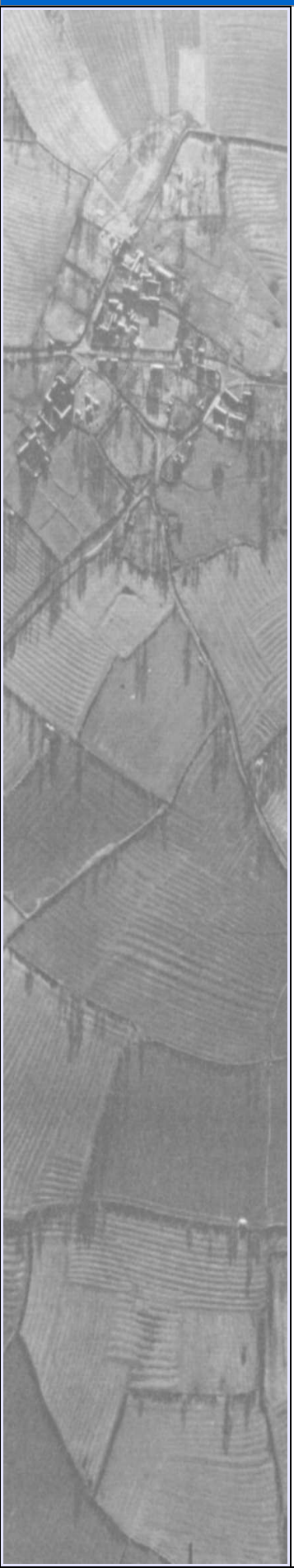


Melksham Link
Wilts & Berks Canal
Wiltshire

MAGNETOMETER SURVEY REPORT

for

Wilts & Berks Canal Trust

David Sabin and Kerry Donaldson

February 2015

Ref. no. 586

ARCHAEOLOGICAL SURVEYS LTD

Melksham Link
Wilts & Berks Canal
Wiltshire

Magnetometer Survey Report

for

Wilts & Berks Canal Trust

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

Survey dates – 7th to 9th, 12th to 16th & 29th January and 2nd to 4th February 2015

Ordnance Survey Grid Reference – **ST 89959 61034 to ST 89982 63804**

Archaeological Surveys Ltd
1 West Nolands, Nolands Road, Yatesbury, Calne, Wiltshire, SN11 8YD
Tel: 01249 814231 Fax: 0871 661 8804
Email: info@archaeological-surveys.co.uk
Web: www.archaeological-surveys.co.uk

CONTENTS

LIST OF FIGURES

LIST OF TABLES

SUMMARY

A detailed magnetometer survey was undertaken by Archaeological Surveys Ltd, over a 3km long corridor of land between the Kennet and Avon Canal in Semington to the River Avon in Melksham, Wiltshire. The survey corridor has been outlined for a new route of the Wilts & Berks Canal. The survey identified a number of geophysical anomalies that indicate the presence of archaeological features within three survey areas in the northern part of the site. These include a small number of linear ditches, pits, rectilinear enclosures and possible pit alignments in Areas 10, 11 and 12. Many of the survey areas contain weakly positive linear and discrete responses, and although some may relate to further cut features, many are too short, fragmented or lack a coherent morphology preventing confident interpretation. A number of relatively recently removed field boundaries and former ridge and furrow can be seen in a several survey areas as can evidence for a zone of temporary wartime structures at the southern end of Area 12.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys Ltd was commissioned by the Wilts & Berks Canal Trust, to undertake a magnetometer survey of a 3km corridor of land between the Kennet and Avon Canal at Semington and the River Avon at Melksham. The area has been outlined for the construction of a new section of the Wilts & Berks Canal between the two waterways. The site is subject to a planning application W/12/0108/FUL and is to include construction of the new 9m wide canal, four locks, new access route to Berryfield and a number of new road and pedestrian bridges.

1.1.2 The geophysical survey was carried out in accordance with a Written Scheme of Investigation (WSI) produced by Archaeological Surveys (2015) and approved by Rachel Foster, Assistant County Archaeologist for Wiltshire 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 development of the site. The methodology is considered an efficient and effective approach to archaeological prospection.

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

Survey.

1.3 Site location, description and survey conditions

1.3.1 The site is located between the Kennet and Avon canal in Semington and the River Avon in Melksham. It extends northwards through Outmarsh Farm towards Berryfield, around Boundary Farm and northwards again immediately west of the A350. It crosses over 3km of land with its width generally varying between 35m and 80m but also with some larger sections along the route. It is located between Ordnance Survey National Grid Reference (OS NGR) ST 89959 61034 in the south to ST 89982 63804 in the north, see Figures 01 and 02.

1.3.2 The geophysical survey covers approximately 25ha within 14 separate land parcels. Areas 1, 2, 4, 5, 12 and 13 contained an emerging crop, Areas 3, 6, 7, 8, 9, 10 & 11 were pasture and Area 14 bare soil.

1.3.3 The ground conditions across the site were frequently difficult to traverse due to standing water in pasture areas and very sticky soil in arable areas. Survey was abandoned on several days with much of the southern part of the site only surveyable after hard frosts. Weather conditions during the survey were variable with periods of heavy rain and high winds.

1.4 Archaeological potential and site observations

1.4.1 An historic environment desk-based assessment has been carried out by AC Archaeology (2013). It outlines that there are a number of non-designated heritage assets along and adjacent to the proposed route. To the north west of Boundary Farm, are a number of ring ditches identified from aerial photos which lie just beyond the proposed route (immediately west of Area 11). Much of the route lies within fields that contain evidence for ridge and furrow cultivation. At the northern edge of the route, adjacent to the River Avon, a number of Palaeolithic flints and a possible Late Bronze Age hoard have been recovered.

1.4.2 The Wilts & Berks Canal was set up to transport coal from the Somerset coalfield and 52 miles were constructed between Semington Junction on the Kennet and Avon Canal and Abingdon on the River Thames between 1795 and 1810. The original route was constructed to the east of the proposed route and has been built over in many parts since it was formally abandoned by an Act of Parliament in 1914. The line of the Devizes Branch Railway (1857-1966) crosses the line of the proposed route just to the north of Outmarsh Farm.

1.4.3 At the southern edge of Area 12, to the north of Boundary Farm, is evidence from an aerial photograph taken in 1945 for temporary structures and adjacent hardstanding arranged in a quadrangle around open space. Similar structures can be seen to the south west at Boundary Farm and also at Berryfield

indicating temporary wartime accommodation and these are also likely to be associated with the RAF School of Instrument Training at Bowerhill. They do not appear on any subsequent aerial photographs or mapping.

1.4.4 The surface conditions within the arable fields were frequently suitable for the observation of cultural material. The soil within arable land towards the northern end of the site (Area 12) was notable as it was less clayey and had a greater sand/gravel content than other fields along the route. In addition, a sharp break of slope denotes a terrace edge confirming the River Terrace Deposits in this area. Numerous flint fragments were noted on the terrace edge, several had been subject to retouch but were not particularly diagnostic. A short distance to the south of the terrace edge, a single sherd of coarse ware typical of late prehistoric or early Roman-British material was also noted.

1.4.5 The survey was carried out immediately adjacent to a type 28a anti-tank gun emplacement (Area 2). The structure appeared to be in generally good condition and was being used for storing posts etc. It relates to part of a large WWII defence area in the vicinity of Semington.

1.5 Geology and soils

1.5.1 The underlying solid geology across the majority of the site is mudstone from the Oxford Clay formation with sandy mudstone from the Kellaways Formation at the southern extent. These are overlain with sand and gravel river terrace deposits, with some head deposits near Outmarsh Farm in the south and alluvial deposits at the northern edge (BGS, 2014).

1.5.2 The overlying soil on the river terrace gravels is from the Badsey 1 association and is a typical brown calcareous earth. It consists of a well drained, calcareous, fine, loamy soil over limestone gravel. At the northern and southern ends of the route the soils are recorded as from the Fladbury 1 association and are pelo-alluvial gleys. They consist of stoneless, clay soils variably affected by groundwater and at risk of flooding (Soil Survey of England and Wales, 1983).

1.5.3 Magnetometry survey carried out across similar soils has produced variable results. River terrace sands and gravels can produce useful contrast between cut features and the surrounding soils; however, it is also possible for naturally formed features to be present and at times these can be difficult to distinguish from those with an anthropogenic origin. The underlying geology and soils are 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 are factors associated with the formation of localised fields. Additional details are set out below and within Appendix A.

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

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

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

2.2 Equipment configuration, data collection and survey detail

2.2.1 The detailed magnetic survey was carried out using a SENSYS MAGNETO®MXPDA 5 channel cart-based system. The instrument has 5 fluxgate gradiometers spaced 0.5m apart with readings recorded at 20 Hz. The gradiometers have a range of recording data between 0.1nT and 10,000nT. They are linked to a Leica GS10 RTK GPS with data recorded by SENSYS MAGNETO®MXPDA software on a rugged PDA computer system.

2.2.2 Data are collected along a series of parallel survey transects wherever possible. 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.

2.3 Data processing and presentation

2.3.1 Magnetic data collected by the MAGNETO®MXPDA cart-based system are initially prepared and automatically compensated using SENSYS MAGNETO®DLMGPS software. Georeferenced raw data are then exported in ASCII format for further analysis and display using TerraSurveyor.

2.3.2 The data are collected at ±10000nT and clipped for display at ±20nT. Data are resampled to a resolution of effectively 0.5m between tracks and 0.15m along each survey track. Appendix C contains specific information concerning the survey and data attributes and is derived directly from TerraSurveyor. Reference should be made to Appendix B for further information on any

processes, such as clipping, carried out on the data.

2.3.3 A TIFF 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.

2.3.4 The raster images are combined with base mapping using ProgeCAD Professional 2014, creating DWG 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 GPS, resection method, etc.

2.3.5 An abstraction and interpretation is offered for all geophysical anomalies located by the survey. A brief summary of each anomaly, with an appropriate reference number, is set out in list form within the results (Section 3) to allow a rapid and objective assessment of features within each survey area. Anomalies are abstracted using colour coded points, lines and polygons. All plots are scaled to landscape A3 for paper printing.

2.3.6 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 14 survey areas covering approximately 25ha.

3.1.2 Magnetic anomalies located can be generally classified as positive linear and discrete positive responses of archaeological potential, positive and negative anomalies of an uncertain origin, anomalies relating to land management, linear anomalies of an agricultural origin, anomalies with a natural 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 below with subsequent discussion in Section 4.

3.2 Statement of data quality

3.2.1 Data are considered representative of the magnetic anomalies present within the site. There are no significant defects within the dataset. Localised areas of magnetic disturbance and debris have the potential to obscure weak anomalies.

3.3 Data interpretation

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

Report sub-heading CAD layer names and plot colour	Description and origin of anomalies
Anomalies with archaeological potential AS-ABST MAG POS LINEAR ARCHAEOLOGY AS-ABST MAG POS DISCRETE ARCHAEOLOGY AS-ABST MAG POS ARCHAEOLOGY	Anomalies have the characteristics (mainly morphological) of a range of archaeological features such as pits, ring ditches, enclosures, etc..
Anomalies with an uncertain origin AS-ABST MAG POS LINEAR UNCERTAIN AS-ABST MAG NEG LINEAR UNCERTAIN AS-ABST MAG POS DISCRETE UNCERTAIN AS-ABST MAG POS UNCERTAIN	The category applies to a range of anomalies where there is not enough evidence to confidently suggest an origin. Anomalies in this category may well be related to archaeologically significant features, but equally relatively modern features, geological/pedological features and agricultural features should be considered. Positive anomalies are indicative of magnetically enhanced soils that may form the fill of 'cut' features or may be produced by accumulation within layers or 'earthwork' features; soils subject to burning may also produce positive anomalies. Negative anomalies are produced by material of comparatively low magnetic susceptibility such as stone and subsoil.
Anomalies relating to land management AS-ABST MAG BOUNDARY AS-ABST MAG LAND DRAIN	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 a ceramic land drain. They can be formed of just parallel positive linear anomalies, or often as broad negative responses when associated with extant drainage channels.
Anomalies with an agricultural origin AS-ABST MAG AGRICULTURAL AS-ABST MAG RIDGE AND FURROW	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.
Anomalies with a natural origin AS-ABST MAG NATURAL FEATURES	Naturally formed magnetic anomalies are are caused by localised variability in the magnetic susceptibility of soils, subsoils and other drift or solid geologies. Anomalies may be amorphous, linear or curvilinear and may appear 'fluvial' or discrete; the latter are almost impossible to distinguished from pit-like anomalies with an anthropogenic origin. Fluvial, glacial and periglacial processes may be responsible for their formation within drift material and subsoil. Igneous and metamorphic activity can lead to anomalies within more solid geology.
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

AS-ABST MAG DEBRIS AS-ABST MAG STRONG DIPOLAR 	magnitude. It often occurs where there has been dumping or ground make-up and is 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, or hearths 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 AS-ABST MAG DISTURBANCE AS-ABST MAG SERVICE 	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 such 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 and with hysteresis adjacent to strong magnetic sources. Buried services may produce characteristic multiple dipolar anomalies dependant upon their construction.

Table 1: List and description of interpretation categories

3.4 List of anomalies - Area 1

Area centred on OS NGR 389812 161142, see Figures 07 & 08.

Anomalies with an uncertain origin

(1) – A positive linear anomaly extends across part of the survey area. It is possible that this relates to an unmapped extension for the field boundary to the north east.

(2) – The survey area contains a number of weakly positive and negative linear anomalies. It is possible that they relate to former ridge and furrow but their origin is uncertain.

Anomalies associated with magnetic debris

(3) – The survey area contains zones of magnetically variable responses which are likely to relate to natural features within the underlying soils and geology.

Anomalies associated with magnetic debris

(4) – Small patches of magnetic debris are evident at the southern end of the survey area. They may be a response to dumped magnetically thermoremnant material, such as brick and tile, that has been used for ground consolidation.

Anomalies with a modern origin

(5) – Two strong, multiple dipolar, linear anomalies have been located within the survey area. These relate to a buried oil pipeline extending north west to south east

along the long axis of the survey area, and another service extending north east to south west near south eastern end of the survey area.

3.5 List of anomalies - Area 2

Area centred on OS NGR 389724 161356, see Figures 09 &10.

Anomalies with an uncertain origin

(6) – The survey area contains a small number of discrete positive responses. They are 10-20nT in magnitude, indicating that they are moderately enhanced features. It is possible that they are anthropogenic in origin, but their archaeological potential is uncertain.

Anomalies associated with land management

(7) – The survey area contains several series of parallel weakly dipolar anomalies that are indicative of ceramic land drains.

Anomalies associated with magnetic debris

(8) – Patches of magnetic debris can be seen at the north eastern corner next to Outmarsh Farm buildings and along the eastern edge adjacent to a WWII pill box.

Anomalies with a modern origin

(9) – The oil pipeline seen in Area 1 also extends across the southern edge of Area 2. Another buried service is located parallel with it, 75m to the north east.

3.6 List of anomalies - Area 3

Area centred on OS NGR 389792 161517, see Figures 09 &10.

Area 3 contains magnetic debris and widespread ferrous and magnetically thermoremnant objects within the topsoil. Inspection chambers were noted along the northern edge of the survey area.

3.7 List of anomalies - Area 4

Area centred on OS NGR 389786 161706, see Figures 11 & 12.

Anomalies associated with land management

(10) – A series of parallel linear anomalies can be seen within the survey area. These appear to relate to land drains.

Anomalies associated with magnetic debris

(11) – Patches of magnetic debris can be seen at the south eastern and north western corners of the survey area. These relate to magnetically thermoremnant material that has been used for ground consolidation. Modern ferrous debris and Carboniferous limestone were visible on the field surface near the southern end of the area.

Anomalies with a modern origin

(12) – A short section of a strong, multiple dipolar linear anomaly can be seen extending northwards for 35m. It may relate to a short section of pipe, or possibly a buried piece of wire fencing.

3.8 List of anomalies - Area 5

Area centred on OS NGR 389803 162020, see Figures 13 & 14.

Anomalies with an uncertain origin

(13) – Located close to the northern edge of the survey area is a negative linear anomaly. There are several discrete pit-like responses located close by.

(14) – A number of discrete positive responses can be seen within the survey area, with a cluster towards the south western edge. It is not possible to determine if they relate to pit-like responses or if they are associated with the widespread magnetic debris that can be seen across the entire site.

(15) – A positive linear and possible curvilinear anomaly are located in the centre of the survey area. It is not possible to determine if they relate to cut features.

Anomalies with a modern origin

(16) – A buried service can be seen extending north to south at the north eastern edge of the survey area.

3.9 List of anomalies - Area 6

Area centred on OS NGR 389979 162180, see Figures 15 & 16.

Anomalies with an uncertain origin

(17) – A number of weakly positive responses are evident within the survey area. They may have an association with the ridge and furrow, but this is not certain.

Anomalies with an agricultural origin

(18) – The survey area contains a series of parallel linear anomalies that relate to ridge and furrow.

Anomalies associated with magnetic debris

(19) – At the northern edge of the survey area is a patch of strong magnetic debris. It has a fairly regular shape and may indicate a former structure although none is mapped during the 19th or 20th centuries.

3.10 List of anomalies - Area 7

Area centred on OS NGR 389993 162474, see Figures 17 & 18.

Anomalies with an uncertain origin

(20) - The survey area contains a number of very weakly positive short linear anomalies and several discrete positive responses. Due to the weak response and lack of coherent morphology it is not possible to determine if they relate to cut features.

Anomalies with an agricultural origin

(21) – A series of parallel linear anomalies relate to ridge and furrow within the site.

Anomalies associated with magnetic debris

(22) – Magnetic debris within the south west corner may relate to an infilled pond.

3.11 List of anomalies - Area 8

Area centred on OS NGR 390052 162664, see Figures 17 & 18.

Anomalies associated with land management

(23) - A positive linear anomaly and associated magnetic debris is located parallel with and 30m south west of the northern field boundary. An associated anomaly also extends south westwards. They relate to former field boundaries removed after 1960 and before 1972. The anomalies correlate with a bank and ditch.

(24) – Negative linear anomalies relate to drainage ditches within the survey area.

Anomalies with an agricultural origin

(25) – Two series of parallel linear anomalies relating to ridge and furrow are located within the site.

Anomalies associated with magnetic debris

(26) – The north east and south west corners contain magnetic debris. The south west corner appears to relate to an infilled pond, the north east corner may relate to dumped magnetically thermoremant material used for ground consolidation.

3.12 List of anomalies - Area 9

Area centred on OS NGR 389872 162646, see Figures 17 & 18.

Anomalies with an uncertain origin

(27) – A discrete positive response is located in the north western part of the survey area. It is not possible to determine the origin of this pit-like feature, it has a response of 17nT and there are a great many strong, discrete, dipolar anomalies within the survey area and an association is possible.

Anomalies associated with magnetic debris

(28) – A linear zone of magnetic debris at the eastern edge of the survey area may relate to a former path, possibly associated with the wartime use of the site, but none is recorded.

Anomalies with a modern origin

(29) – A buried service or pipe extends across the eastern part of the survey area.

3.13 List of anomalies - Area 10

Area centred on OS NGR 389940 162802, see Figures 19 & 20.

Anomalies of archaeological potential

(30) – The central part of the survey area contains a number of positive linear anomalies and a discrete positive response. They range from 1nT to 5nT and appear to relate to cut features with archaeological potential.

(31) – Positive linear anomalies are located at the western edge of the survey area.

Although one is parallel with the adjacent track,it is possible that they relate to cut features with an archaeological origin. Other linear anomalies immediately to the west may also be associated, but they are very weak and indistinct.

Anomalies with an uncertain origin

(32) – The survey area contains a number of weakly positive anomalies. These generally have a response of 0.6nT and are either short or lack a coherent morphology. However, these may also relate to cut features with an archaeological origin.

Anomalies with a modern origin

(33 & 34) – The western part of the survey area contains a buried service or pipe that extends in a north westerly direction (33). Further west there is either a service that extends along the southern edge and then along the western edge (34), or there are two services.

3.14 List of anomalies - Area 11

Area centred on OS NGR 389748 162858, see Figures 19 & 20.

Anomalies of archaeological potential

(35) – An "L" shaped positive linear anomaly appears to relate to an enclosure or boundary ditch with an archaeological origin. There also appears to be a continuation eastwards of the southern linear anomaly.

(36) – A linear series of discrete positive responses (5-8nT) in the northern part of the survey area appear to relate to an alignment of pits.

Anomalies with an uncertain origin

(37) – Two weakly positive curvilinear responses are located within the confines of Anomaly (35). As they are weak and indistinct, it is not possible to determine if they relate to cut features; however, given their location, an archaeological origin should be considered.

(38) – A broad positive anomaly extends across the survey area. It may relate to a former boundary feature, although none is mapped in this position.

Anomalies with an agricultural origin

(39) – Two parallel negative linear anomalies can bee seen within the survey area. This type of response may have been caused by vehicle tracks, but this is not certain. A positive linear anomaly is oriented parallel with them to the east.

3.15 List of anomalies - Area 12

Area centred on OS NGR 389894 163240, see Figures 21 – 24.

Anomalies of archaeological potential

(40) – In the northern part of the survey area is a fragmented positive linear anomaly. It is likely to have been truncated by the ridge and furrow and may relate to a former enclosure ditch.

(41) – To the north of (40) there are other positive linear anomalies that may be associated.

(42) – A linear series of discrete positive responses that appear to relate to an alignment of pits.

Anomalies with an uncertain origin

(43) – In the northern part of the survey area are a number of short positive linear and discrete positive responses. The area lies on a river terrace and it is not possible to determine if they are of natural or anthropogenic origin.

(44) – In the southern part of the site there are a number of positive linear anomalies and a discrete positive response. They may relate to cut features, such as ditches and pits, but this is not certain.

Anomalies associated with land management

(45) – At the northern edge of the survey area are a number of positive linear responses, and patches of magnetic debris that are associated with a former field boundary that was removed during the 20th century.

(46) – In the centre of the survey area is a line of strong, discrete, dipolar anomalies which is a response to a former boundary removed in the 20th century.

(47) – At the south western edge of the survey area are a number of positive linear anomalies that relate to field boundaries removed in the 20th century.

Anomalies with an agricultural origin

(48) – The survey area contains a number of series of parallel linear anomalies that relate to former ridge and furrow.

Anomalies associated with magnetic debris

(49) – At the southern end of the survey area are a number of zones of magnetic debris. These are associated with former temporary structures and hardstanding that existed on the site during WWII.

Anomalies with a modern origin

(50) – A strong, multiple dipolar, linear anomaly extends in a "U" shape at the southern edge of the survey area. This relates to a buried service associated with the temporary wartime structures.

3.16 List of anomalies - Area 13

Area centred on OS NGR 389906 163555, see Figures 25 & 26.

Anomalies with an uncertain origin

(51) – The survey area contains a positive curvilinear anomaly and some sinuous responses. These are likely to relate to former fluvial features.

Anomalies associated with magnetic debris

(52) – Magnetic debris at the eastern edge is likely to relate to material used for ground consolidation.

3.17 List of anomalies - Area 14

Area centred on OS NGR 389921 163685, see Figures 25 & 26.

Anomalies with an uncertain origin

(53) – The survey area contains a large number of very weakly positive and negative anomalies. Many of them have a linear and rectilinear layout, others are more amorphous. Although it is possible that these relate to naturally formed features, the linearity does suggest an anthropogenic origin, such as former water meadows.

Anomalies associated with magnetic debris

(54) – A sinuous zone of very strongly magnetic debris is a response to ferrous and other magnetically thermoremnant material used to infill the course of the River Avon during the 1970s. Other zones which relate to spreads of this material can be seen nearby.

4 DISCUSSION

4.1.1 In the southern part of the site at Outmarsh Farm, Area 1, just to the north of the Kennet and Avon canal, contains a number of positive and negative linear anomalies. One of these may relate to a former land boundary, and several may relate to ridge and furrow. Zones of magnetically variable responses appear to relate to natural features within the underlying soil and geology.

4.1.2 Areas 2 and 4 contain evidence for land drains and magnetic debris associated with dumped material. Discrete positive responses in Areas 2 and 5 may indicate pit-like features, although their origin is uncertain. Area 6 contains ridge and furrow and a patch of strongly magnetic debris, which may indicate a former unmapped structure. Several of the survey areas in the southern part of the site contain buried services or pipelines.

4.1.3 To the north of Berryfield, Area 7 contains ridge and furrow and a number of short and fragmented positive linear and discrete anomalies. It is not possible to determine if they relate to cut features. Area 8 contains a former land boundary and ridge and furrow, with extant field drains/ditches that contained water at the time of survey. Area 9 has a service and magnetic debris, and it is possible that these are associated with the wartime use of the site.

4.1.4 Areas 10, 11 and 12 contain anomalies with archaeological potential that include linear ditches and pits in Area 10 and enclosure ditches and possible pit alignments in Areas 11 and 12. A number of recently removed field boundaries and ridge and furrow can also be seen in Area 12, which is located on a river terrace, immediately west of the A350.

4.1.5 At the northern edge of the site in Area 14, the infilled channel of the River Avon is evident as a zone of strongly magnetic debris. Elsewhere there are spreads of this material. There are a number of weakly positive and negative anomalies, which can often indicate former fluvial features; however, these have a linear and rectilinear morphology which may indicate an anthropogenic origin, such as former water meadow channels.

5 CONCLUSION

5.1.1 The detailed magnetometer survey located a number of anomalies that relate to archaeological features within the northern half of the survey corridor. Within Area 10, to the north east of Boundary Farm, are a number of positive linear and discrete anomalies that appear to relate to cut features, such as ditches and pits with an archaeological origin. Other positive anomalies within the same survey area may also be associated, but these are generally weaker

and poorly defined.

5.1.2 In Area 11, to the north of Boundary Farm, there is evidence for a rectilinear boundary or enclosure ditch and a possible pit alignment. Within this field, further to the west, there are a number of linear ditches and ring ditches that have been recorded from aerial photographs, and it is possible that these features are associated. Approximately 400m to the north, within Area 12, is a positive linear or rectilinear anomaly that may relate to another enclosure that has been truncated by ridge and furrow. To the north of this appears to be another alignment of pits, which also have archaeological potential.

5.1.3 In the southern part of the site, around Outmarsh Farm, many of the survey areas contain land drains and modern services with a number of positive and negative anomalies that are too short, weak or poorly defined for their origin to be ascertained.

5.1.4 Several of the survey areas contain anomalies relating to ridge and furrow and also to recently removed field boundaries. There is also evidence for more modern use of the site with a number of strongly magnetic responses associated with former wartime structures at the southern end of Area 12.

6 REFERENCES

Archaeological Surveys, 2015. *Melksham Link, Wilts & Berks Canal, Geophysical Survey Written Scheme of Investigation.* Unpublished typescript document.

AC Archaeology, 2013. *Melksham Link – a proposed canal linking the River Avon at Melksham with the Kennet and Avon Canal at Semington, Historic Environment Assessment.* Document No: ACW/564/1/1.

British Geological Survey, 2014. *Geology of Britain viewer, 1:50 000 scale [online]* available from http://mapapps.bgs.ac.uk/geologyofbritain/home.html [accessed 06/01/2015].

English Heritage, 2008. *Geophysical survey in archaeological field evaluation. Research and Professional Service Guideline No.1.* 2nd ed. Swindon: English Heritage.

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

Institute for Archaeologists, 2011. *Standard and Guidance for archaeological geophysical survey.* IfA, University of Reading.

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 field. The difference between the two sensors will relate to the strength 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. It has been found that clipping data to ranges between ±20nT and ±10nT often improves the appearance of features associated with archaeology. Different ranges are applied to data in order to determine the most suitable for anomaly abstraction and display.

High Pass Filtering

A mathematical process used to remove low frequency anomalies relating to survey tracks and modern agricultural features.

Appendix C – survey and data information

Area 1

COMPOSITE
Path: C:\Business\Jobs\J586 Melksham Link Canal\Data\Area 1\comps\
Filename: J586-mag-Area1-proc.xcp
Description: Imported as Composite from: J586-mag-Area1.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 389669.080367552, 161266.224596804 m
Southeast corner: 389957.380367552, 161045.574596804 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 624100

Dimensions
Composite Size (readings): 1922 x 1471
Survey Size (meters): 288 m x 221 m
Grid Size: 288 m x 221 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 22.10
Min: -22.00
Std Dev: 11.84
Mean: -0.05
Median: -0.05
Composite Area: 6.3613 ha
Surveyed Area: 1.6161 ha

Processes: 1
1 Base Layer

GPS based Proce3
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 Clip from -20.00 to 20.00 nT

Area 2

COMPOSITE
Path: C:\Business\Jobs\J586 Melksham Link Canal\Data\Area 2\comps\
Filename: J586-mag-Area2-proc.xcp
Description: Imported as Composite from: J586-mag-Area2.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 389614.219630567, 161475.388336272 m
Southeast corner: 389800.519630567, 161235.538336272 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 494100

Dimensions
Composite Size (readings): 1242 x 1599
Survey Size (meters): 186 m x 240 m
Grid Size: 186 m x 240 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 10.00
Min: -10.00
Std Dev: 4.68
Mean: -0.04
Median: 0.07
Composite Area: 4.4684 ha
Surveyed Area: 1.6832 ha

Processes: 3
1 Base Layer
2 Clip from -20.00 to 20.00 nT
3 Clip from -10.00 to 10.00 nT

GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 High pass Uniform (median) filter: Window dia: 300
4 Clip from -30.00 to 30.00 nT

Area 3

COMPOSITE
Path: C:\Business\Jobs\J586 Melksham Link Canal\Data\Area 3\comps\
Filename: J586-mag-Area3-proc.xcp
Description: Imported as Composite from: J586-mag-Area3.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 389746.675228736, 161532.044631968 m
Southeast corner: 389832.625228736, 161502.794631968 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 56300

Dimensions
Composite Size (readings): 573 x 195
Survey Size (meters): 86 m x 29.3 m
Grid Size: 86 m x 29.3 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 20.00
Min: -20.00
Std Dev: 9.15
Mean: -0.61
Median: -0.11
Composite Area: 0.2514 ha
Surveyed Area: 0.17178 ha

Processes: 2
1 Base Layer
2 Clip from -20.00 to 20.00 nT

GPS based Proce3
1 Base Layer.
2 Unit Conversion Layer (to OSGB36).
3 Clip from -30.00 to 30.00 nT

Area 4

COMPOSITE
Path: C:\Business\Jobs\J586 Melksham Link Canal\Data\Area 4\comps\
Filename: J586-mag-Area4-proc.xcp
Description: Imported as Composite from: J586-mag-Area4.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 389743.075582112, 161840.099985805 m
Southeast corner: 389831.875582112, 161569.799985805 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 576300

Dimensions
Composite Size (readings): 592 x 1802
Survey Size (meters): 88.8 m x 270 m
Grid Size: 88.8 m x 270 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 10.00
Min: -10.00
Std Dev: 3.98
Mean: 0.01
Median: -0.02
Composite Area: 2.4003 ha
Surveyed Area: 1.4883 ha

Processes: 2
1 Base Layer
2 Clip from -10.00 to 10.00 nT

GPS based Proce3
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 Clip from -30.00 to 30.00 nT

Area 5

COMPOSITE
Path: C:\Business\Jobs\J586 Melksham Link Canal\Data\Area 5\comps\
Filename: J586-mag-Area5-proc.xcp
Description: Imported as Composite from: J586-mag-Area5.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 389744.804076558, 162188.485543641 m
Southeast corner: 389904.554076558, 161835.235543641 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 685600

Dimensions
Composite Size (readings): 1065 x 2355
Survey Size (meters): 160 m x 353 m
Grid Size: 160 m x 353 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 10.00
Min: -10.00
Std Dev: 3.71
Mean: -0.15
Median: 0.00
Composite Area: 5.6432 ha
Surveyed Area: 2.2285 ha

Processes: 3
1 Base Layer
2 Clip from -20.00 to 20.00 nT
3 Clip from -10.00 to 10.00 nT

GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 High pass Uniform (median) filter: Window dia: 300
4 Clip from -30.00 to 30.00 nT

Area 6

COMPOSITE
Path: C:\Business\Jobs\J586 Melksham Link Canal\Data\Area 6\comps\
Filename: J586-mag-Area6-proc.xcp
Description: Imported as Composite from: J586-mag-Area6.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 389908.773552032, 162249.547401537 m
Southeast corner: 390052.773552032, 162124.267401537 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 291200

Dimensions
Composite Size (readings): 1200 x 1044
Survey Size (meters): 144 m x 125 m
Grid Size: 144 m x 125 m
X Interval: 0.12 m
Y Interval: 0.12 m

Stats
Max: 33.15
Min: -33.00
Std Dev: 9.00
Mean: 0.14
Median: -0.05
Composite Area: 1.804 ha
Surveyed Area: 0.95196 ha

Processes: 1
1 Base Layer

GPS based Proce3
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 Clip from -30.00 to 30.00 nT

Area 7

COMPOSITE
Path: C:\Business\Jobs\J586 Melksham Link Canal\Data\Area 7\comps\
Filename: J586-mag-Area7-proc.xcp
Description: Imported as Composite from: J586-mag-Area7.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 389883.439236783, 162548.332360598 m
Southeast corner: 390085.789236783, 162421.882360598 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 613500

Dimensions
Composite Size (readings): 1349 x 843
Survey Size (meters): 202 m x 126 m
Grid Size: 202 m x 126 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 22.10
Min: -22.00
Std Dev: 5.88
Mean: 0.17
Median: 0.03
Composite Area: 2.5587 ha
Surveyed Area: 1.6954 ha

Processes: 1
1 Base Layer

GPS based Proce5
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 Clip from -30.00 to 30.00 nT
4 High pass Uniform (median) filter: Window dia: 300
5 Clip from -20.00 to 20.00 nT

Area 8

COMPOSITE
Path: C:\Business\Jobs\J586 Melksham Link Canal\Data\Area 8\comps\
Filename: J586-mag-Area8-proc.xcp
Description: Imported as Composite from: J586-mag-Area3.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 389965.436797199, 162765.483889486 m
Southeast corner: 390180.536797199, 162549.483889486 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 426600

Dimensions
Composite Size (readings): 1434 x 1440
Survey Size (meters): 215 m x 216 m
Grid Size: 215 m x 216 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 33.15
Min: -33.00
Std Dev: 11.57
Mean: -0.12
Median: 0.04
Composite Area: 4.6462 ha
Surveyed Area: 1.0194 ha

Processes: 1
1 Base Layer

GPS based Proce3
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 Clip from -30.00 to 30.00 nT

Area 9

COMPOSITE
Path: C:\Business\Jobs\J586 Melksham Link Canal\Data\Area 9\comps\
Filename: J586-mag-Area9-proc.xcp
Description: Imported as Composite from: J586-mag-Area9.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 389786.041323232, 162747.318360856 m
Southeast corner: 389990.041323232, 162578.118360856 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 398800

Dimensions
Composite Size (readings): 1360 x 1128
Survey Size (meters): 204 m x 169 m
Grid Size: 204 m x 169 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 22.10
Min: -22.00
Std Dev: 8.27
Mean: -0.19
Median: -0.01
Composite Area: 3.4517 ha
Surveyed Area: 1.1337 ha

Processes: 1
1 Base Layer

GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 High pass Uniform (median) filter: Window dia: 300
4 Clip from -20.00 to 20.00 nT

Area 10

COMPOSITE
Path: C:\Business\Jobs\J586 Melksham Link Canal\Data\Area 10\comps\
Filename: J586-mag-Area10-proc.xcp
Description: Imported as Composite from: J586-mag-Area10.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 389780.336552546, 162828.351615349 m
Southeast corner: 390098.786552546, 162738.651615349 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 455100

Dimensions
Composite Size (readings): 2123 x 598
Survey Size (meters): 318 m x 89.7 m
Grid Size: 318 m x 89.7 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 33.15
Min: -33.00
Std Dev: 11.47
Mean: 0.27
Median: 0.12
Composite Area: 2.8565 ha
Surveyed Area: 1.2237 ha

Processes: 1
1 Base Layer

GPS based Proce3
1 Base Layer.
2 Unit Conversion Layer (Lat/Long to OSGB36).
3 Clip from -30.00 to 30.00 nT

Area 11

COMPOSITE
Path: C:\Business\Jobs\J586 Melksham Link Canal\Data\Area 11\comps\
Filename: J586-mag-Area11-proc.xcp
Description: Imported as Composite from: J586-mag-Area11.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 389708.798110491, 162932.317924329 m
Southeast corner: 389800.898110491, 162783.217924329 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 301900

Dimensions
Composite Size (readings): 614 x 994
Survey Size (meters): 92.1 m x 149 m
Grid Size: 92.1 m x 149 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 20.00
Min: -20.00
Std Dev: 4.95
Mean: 0.21
Median: 0.02
Composite Area: 1.3732 ha
Surveyed Area: 0.91202 ha

Processes: 2
1 Base Layer
2 Clip from -20.00 to 20.00 nT

GPS based Proce5
1 Base Layer.
2 Unit Conversion Layer (to OSGB36).
3 Clip from -20.00 to 20.00 nT
4 High pass Uniform (median) filter: Window dia: 300
5 Clip from -20.00 to 20.00 nT

Area 12

COMPOSITE
Path: C:\Business\Jobs\J586 Melksham Link Canal\Data\Area 12\comps\
Filename: J586-mag-Area12-proc2.xcp
Description: Imported as Composite from: J586-mag-Area12.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 389746.464095158, 163568.188515492 m
Southeast corner: 389966.514095158, 162907.138515492 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 2001200

Dimensions
Composite Size (readings): 1467 x 4407
Survey Size (meters): 220 m x 661 m
Grid Size: 220 m x 661 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 22.10
Min: -22.00
Std Dev: 8.15
Mean: -0.35
Median: -0.04
Composite Area: 14.546 ha
Surveyed Area: 5.4301 ha

Processes: 1
1 Base Layer

GPS based Proce3
1 Base Layer.
2 Unit Conversion Layer (to OSGB36).
3 Clip from -20.00 to 20.00 nT

Area 13

COMPOSITE
Path: C:\Business\Jobs\J586 Melksham Link Canal\Data\Area 13\comps\
Filename: J586-mag-Area13-proc.xcp
Description: Imported as Composite from: J586-mag-Area13.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 389869.803799162, 163601.986786482 m
Southeast corner: 389944.083799162, 163503.946786482 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 130700

Dimensions
Composite Size (readings): 619 x 817
Survey Size (meters): 74.3 m x 98 m
Grid Size: 74.3 m x 98 m
X Interval: 0.12 m
Y Interval: 0.12 m

Stats
Max: 33.15
Min: -33.00
Std Dev: 8.22
Mean: -0.18
Median: -0.04
Composite Area: 0.72824 ha
Surveyed Area: 0.37448 ha

Processes: 1
1 Base Layer

GPS based Proce4

1 Base Layer.
2 Unit Conversion Layer (to OSGB36).
3 High pass Uniform (median) filter: Window dia: 300
4 Clip from -30.00 to 30.00 nT

Area 14

COMPOSITE
Path: C:\Business\Jobs\J586 Melksham Link Canal\Data\Area 14\comps\
Filename: J586-mag-Area14-proc.xcp
Description: Imported as Composite from: J586-mag-Area14.asc
Instrument Type: Sensys DLMGPS
Units: nT
UTM Zone: 30U
Survey corner coordinates (X/Y):
Northwest corner: 389814.760034774, 163789.470438677 m
Southeast corner: 389980.210034774, 163594.620438677 m
Direction of 1st Traverse: 90 deg
Collection Method: Parallel
Sensors: 1
Dummy Value: 32702

Source GPS Points: 689600

Dimensions
Composite Size (readings): 1103 x 1299
Survey Size (meters): 165 m x 195 m
Grid Size: 165 m x 195 m
X Interval: 0.15 m
Y Interval: 0.15 m

Stats
Max: 33.15
Min: -33.00
Std Dev: 12.30
Mean: 0.00
Median: -0.04
Composite Area: 3.2238 ha
Surveyed Area: 1.9181 ha

Processes: 1
1 Base Layer

GPS based Proce4
1 Base Layer.
2 Unit Conversion Layer (to OSGB

36).
3 High pass Uniform (median) filter: Window dia: 300
4 Clip from -30.00 to 30.00 nT

Appendix D – digital archive

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

Surveys are reported on in hardcopy (recycled paper) using A4 for text and A3 for plots (all plots are scaled for A3). A printed copy and PDF of the report will be issued to the Wiltshire Historic Environment Record and a PDF uploaded to Online AccesS to the Index of archaeological investigations (OASIS).

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

- TerraSurveyor version 3.0.23.0 (geophysical data analysis),
- SENSYS MAGNETO®ARCH version 1.00-04(geophysical data analysis),
- ProgeCAD Professional 2014 (report graphics),
- OpenOffice.org 3.0.1 Writer (document text),
- PDF Creator version 0.9 (PDF)
- Solid PDF Creator version 8 (PDF archive).

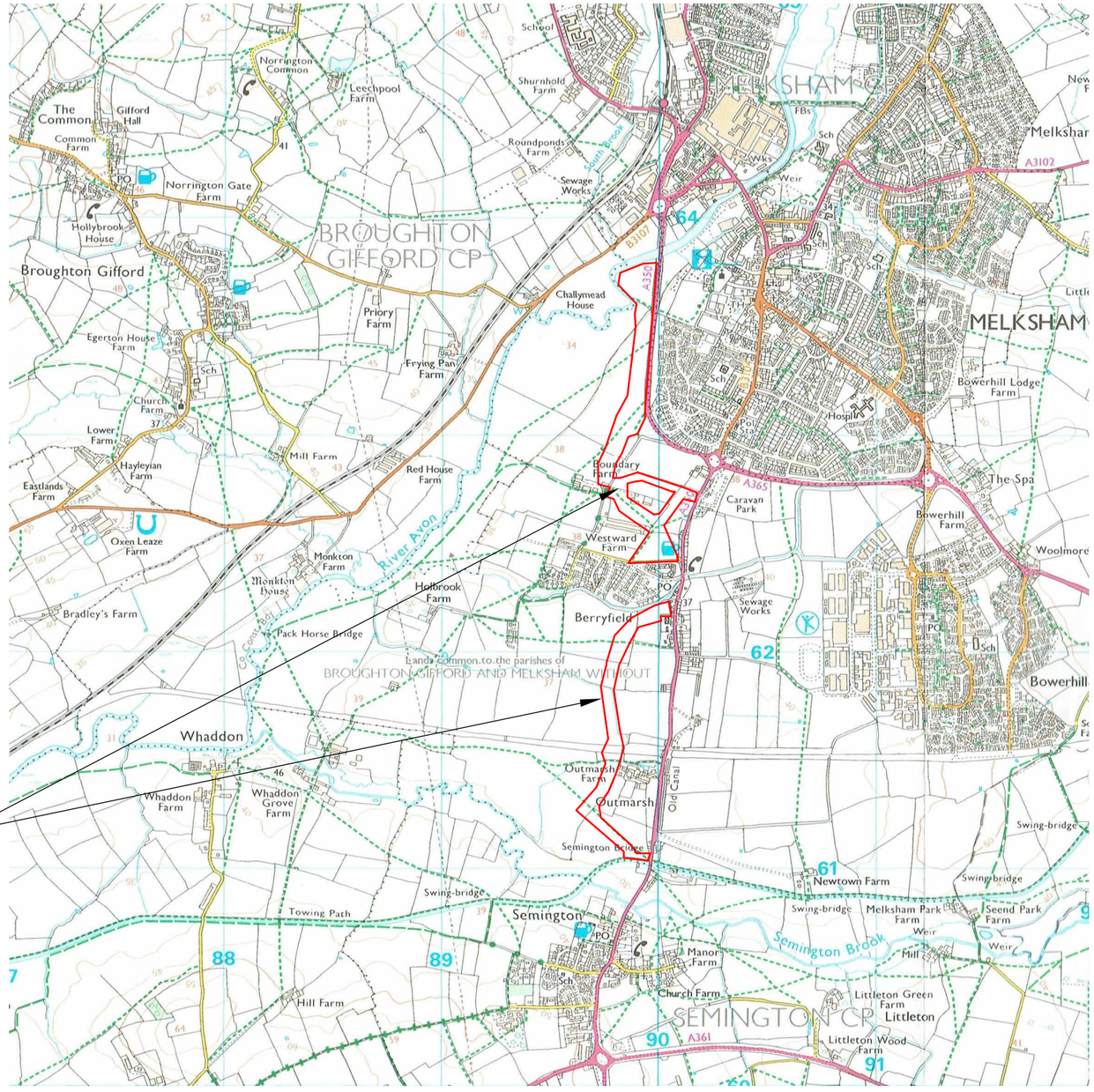
Digital data produced by the survey and report include the following files:

- TerraSurveyor grid and composite files for all geophysical data,
- CSV files for raw and processed composites,
- geophysical composite file graphics as TIF images,
- CAD DWG files in 2007 version,
- report text as OpenOffice.org ODT file,
- report text as PDF / PDF/A,
- PDFs of all figures.

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Map of survey area



Survey location

Survey location

Site located between OS NGR
ST 89959 61034 &
ST 89982 63804

SCALE 1:25 000

0m 500m 1000m

SCALE TRUE AT A3

FIG 01

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Location of development area

Development boundary

SCALE 1:10 000

0m 100 200 300 400 500m

SCALE TRUE AT A3

FIG 02

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Greyscale plot of processed magnetometer data - southern section (Areas 1-6)

Areas 2, 4 & 5: +10nT to -10nT

Areas 1 & 3: +20nT to -20nT

Area 6: +30nT to -30nT

SCALE 1:5000

0m 50 100 150 200 250m

SCALE TRUE AT A3

FIG 03

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Abstraction and interpretation of magnetometer anomalies - southern section (Areas 1-6)

Area 1

Area 2

Area 3

Area 4

Area 5

Area 6

N

- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - ridge and furrow
- Positive linear anomaly - possible land drain
- Negative linear anomaly - material of low magnetic susceptibility
- Discrete positive response - possible pit-like feature
- Positive anomaly - magnetically enhanced material
- Variable magnetic response - of natural origin
- 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 1:5000

0m 50 100 150 200 250m

SCALE TRUE AT A3

FIG 04

Area 14

Area 13

Area 12

Area 11

Area 10

Area 9

Area 8

Area 7

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Greyscale plot of minimally processed magnetometer data - northern section (Areas 7-14)

Areas 7, 9, 11 & 12: +20nT to -20nT

Areas 8, 10, 13 & 14: +30nT to -30nT

SCALE 1:5000

0m 50 100 150 200 250m

SCALE TRUE AT A3

FIG 05

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Abstraction and interpretation of magnetometer anomalies - northern section (Areas 7-14)

- Positive linear anomaly - cut feature of archaeological potential
- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - ridge and furrow
- Positive linear anomaly - possible land drain
- Positive linear anomaly - possible former field boundary
- Negative linear anomaly - material of low magnetic susceptibility
- Discrete positive response - cut feature of archaeological potential
- Discrete positive response - possible pit-like feature
- Positive anomaly - magnetically enhanced material
- Negative anomaly - material of low magnetic susceptibility
- 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 1:5000

0m 50 100 150 200 250m

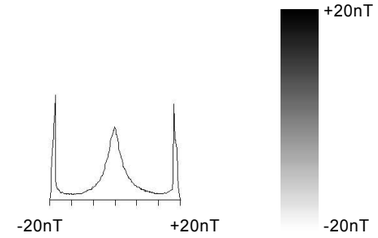
SCALE TRUE AT A3

FIG 06

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Greyscale plot of minimally processed magnetometer data - Area 1



Slurry Pit

Pond

N

39.2m

554

545

Area 1

SCALE 1:1250

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 07

Slurry Pit

Pond

N

39.2m

554

545

Area 1

1

2

3

4

5

6

7

9

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Abstraction and interpretation of magnetometer anomalies - Area 1

- Positive linear anomaly - possible ditch-like feature
- Negative linear anomaly - material of low magnetic susceptibility
- Variable magnetic response - of natural origin
- 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 1:1250

0m 10 20 30 40 50m

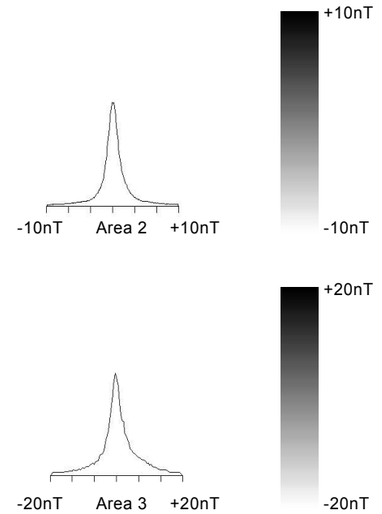
SCALE TRUE AT A3

FIG 08

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Greyscale plot of minimally processed magnetometer data



Area 3

Area 2

Track

Fence

Issues

N

Cattle Grid

Pond

Outmarsh Farm

Outmarsh

Slurry Pit

Pond

SCALE 1:1250

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 09

Area 3

Area 2

Track

Fence

Issues

N

Cattle Grid

Pond

Outmarsh Farm

Outmarsh

Slurry Pit

Pond

8

6

9

7

3

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Abstraction and interpretation of magnetometer anomalies - Areas 2 & 3

- Discrete positive response - possible pit-like feature
- Positive linear anomaly - possible land drain
- 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 1:1250

0m 10 20 30 40 50m

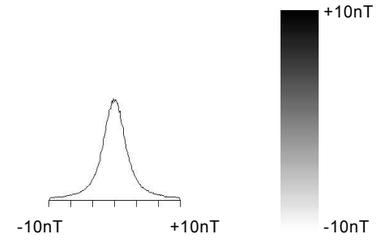
SCALE TRUE AT A3

FIG 10

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Greyscale plot of minimally processed magnetometer data - Area 4

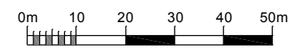


N

Area 4

Issues

SCALE 1:1250



SCALE TRUE AT A3

FIG 11

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Abstraction and interpretation of magnetometer anomalies - Area 4

Positive linear anomaly - possible land drain

Magnetic debris - spread of magnetically thermoremnant/ferrous material

Magnetic disturbance from ferrous material

Strong multiple dipolar linear anomaly - pipeline / cable / service

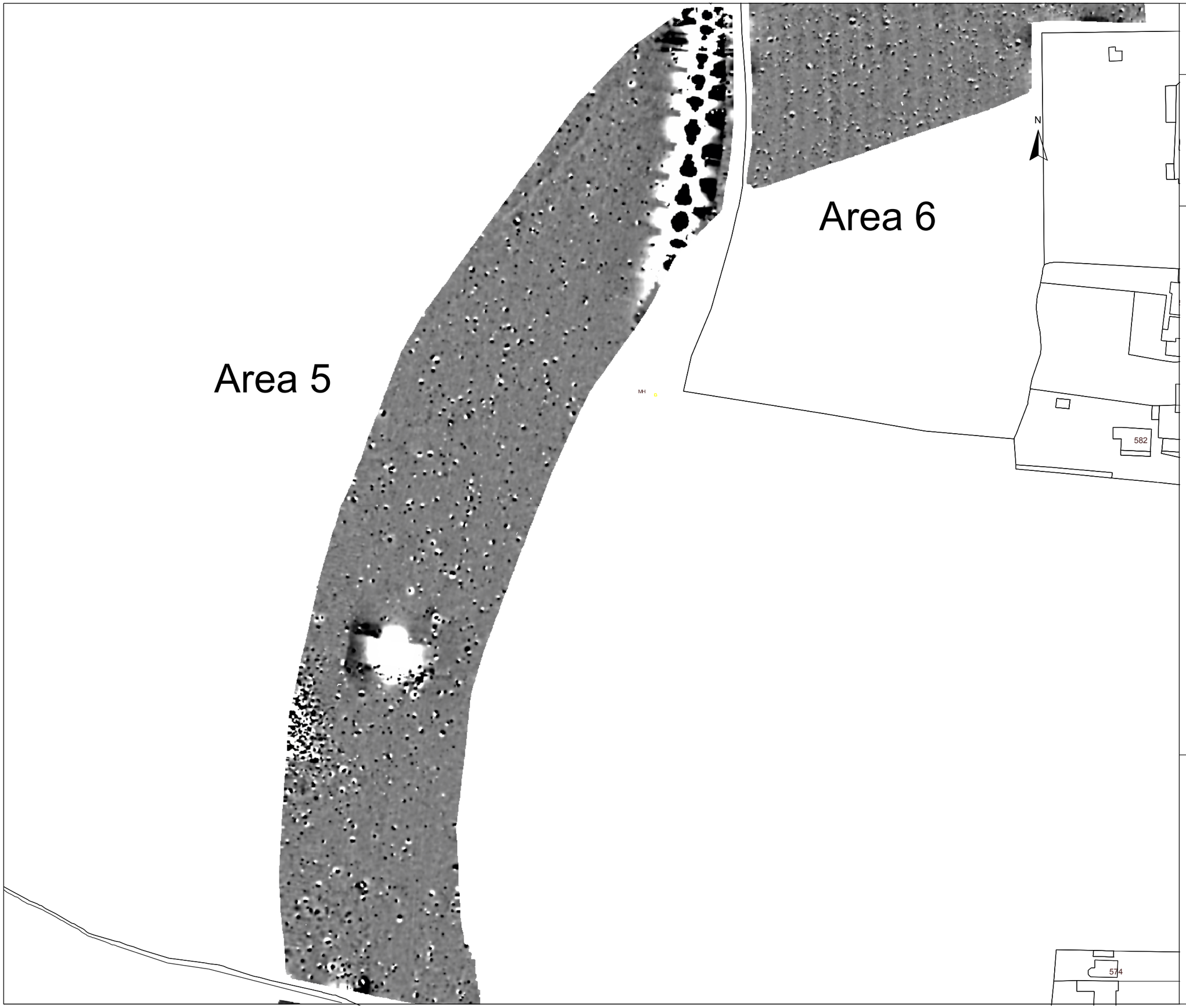
Strong dipolar anomaly - ferrous object

SCALE 1:1250

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 12



Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Greyscale plot of minimally processed magnetometer data - Area 5

+10nT
-10nT
-10nT
+10nT

SCALE 1:1250

0m 10 20 30 40 50m

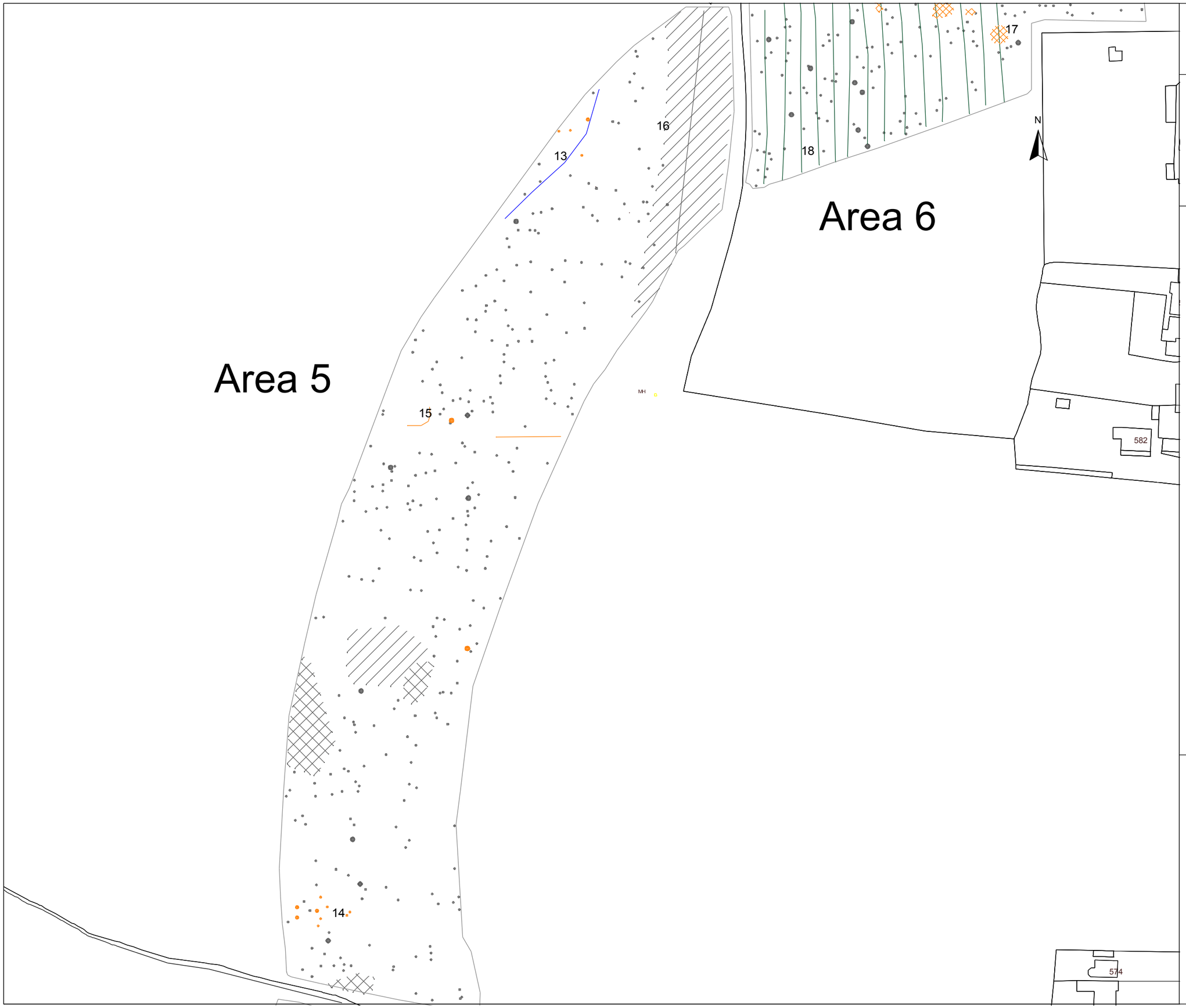
SCALE TRUE AT A3

FIG 13

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Abstraction and interpretation of magnetometer anomalies - Area 5



- Positive linear anomaly - possible ditch-like feature
- 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 multiple dipolar linear anomaly - pipeline / cable / service
- Strong dipolar anomaly - ferrous object

SCALE 1:1250

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 14

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Greyscale plot of minimally processed magnetometer data - Area 6

+10nT

-10nT +10nT

-10nT

Area 6

a 5

Berryfield

Playground

Fence

Conifers

Hall

LB

37.4m

Shelter

N

SCALE 1:1250

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 15

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Abstraction and interpretation of magnetometer anomalies - Area 6

- Linear anomaly - ridge and furrow
- Positive anomaly - magnetically enhanced material
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Strong dipolar anomaly - ferrous object

SCALE 1:1250

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 16

Area 6

a 5

Berryfield

Playground

Fence

Hall

Conifers

LB

37.4m

Shelter

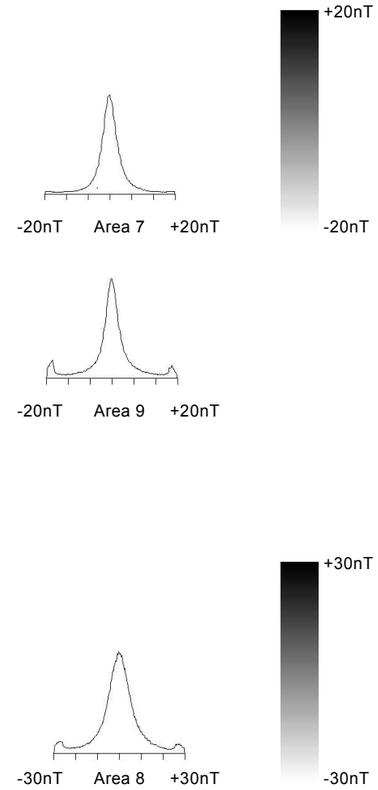
MH

44 66 72 73 73a 74 74a 75 78A 89 92 37 85 83 106 108 110 112 492 597 596 596a 595a 595b 493a 493b 494 496 595 594 496a 496b 496c 592 497 588 587a 502 584 582 506 512 514 19 17 18 16 13 15

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Greyscale plot of minimally processed magnetometer data - Areas 7, 8 & 9



SCALE 1:1250

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 17

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Abstraction and interpretation of magnetometer anomalies - Areas 7, 8, & 9

Area 10

Area 9

Area 8

Area 7

Track

Fence

Poultry Houses

Highcroft F

SEMINGTON ROAD

BERRYFIELD LANE

N

37.8m

- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - ridge and furrow
- Positive linear anomaly - possible land drain
- Positive linear anomaly with associated magnetic debris - 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 multiple dipolar linear anomaly - pipeline / cable / service
- Strong dipolar anomaly - ferrous object

SCALE 1:1250

0m 10 20 30 40 50m

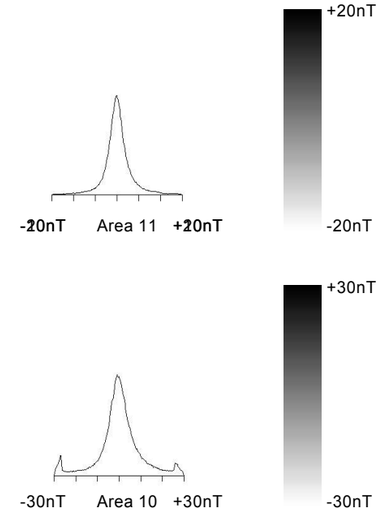
SCALE TRUE AT A3

FIG 18

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Greyscale plot of minimally processed magnetometer data - Areas 10 & 11



SCALE 1:1250

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 19

Area 11

Area 10

Area 9

Boundary Farm

Track

Track

A 350

N

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Abstraction and interpretation of magnetometer anomalies - Areas 10 & 11

- Positive linear anomaly - cut feature of archaeological potential
- Positive linear anomaly - possible ditch-like feature
- Negative linear anomaly - material of low magnetic susceptibility
- Discrete positive response - cut feature of archaeological potential
- Positive anomaly - magnetically enhanced material
- Strong dipolar anomaly - ferrous object

SCALE 1:1250

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 20

ERN WAY
A 350
11
N
Track
49
50
37
35
36
39
38
Area 11
31
33
30
32
34
Area 10
Boundary Farm
Track
27
Fence
23
Area 9

Area 12

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Greyscale plot of minimally processed magnetometer data - Area 12 south

+20nT

-20nT +20nT -20nT

SCALE 1:1250

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 21

Area 12

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Abstraction and interpretation of magnetometer anomalies - Area 12 south

- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - ridge and furrow
- Positive linear anomaly - possible former field boundary
- Discrete positive response - possible pit-like feature
- 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 1:1250

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 22

46
48
47
48
44
49
50
Fence
Marsh
Track
A 350
A 350
WESTERN WAY
LABURNUM DRIVE
LABURNUM DRIVE
CRESCENT
HORNBEAM
PINE
CLOSE
ESS
WES
N
6
5
39
58
4
23
31
29
8
3
1
17
21
46
13
13a
18
27
17
12
9
2
1
5
11

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Greyscale plot of minimally processed magnetometer data - Area 12 north

+20nT

-20nT +20nT

-20nT

N

WESTERN WAY

ALDER WAY

CHESTNUT MEWS

LARCH CLOSE

WILLOW CL

HAZELWOOD ROAD

BEECH AVE

LIME

CEDA

AVE

LB

ESS

SCALE 1:1250

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 23

Area 13

Area 12

WESTERN WAY

ALDER WAY

CHESTNUT MEWS

CLOSE

LARCH

WILLOW CL

HAZELWOOD ROAD

BEECH AVE

N

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Abstraction and interpretation of magnetometer anomalies - Area 12 north

- Positive linear anomaly - cut feature of archaeological potential
- Positive linear anomaly - possible ditch-like feature
- Linear anomaly - ridge and furrow
- Positive linear anomaly - possible former field boundary
- Discrete positive response - cut feature of archaeological potential
- Discrete positive response - possible pit-like feature
- 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

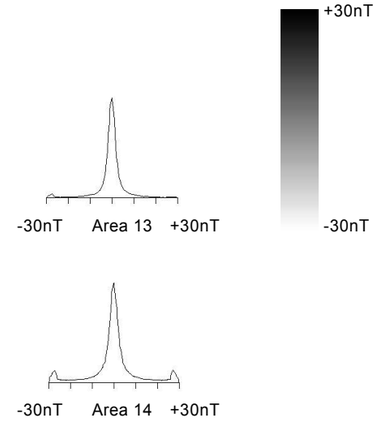
SCALE TRUE AT A3

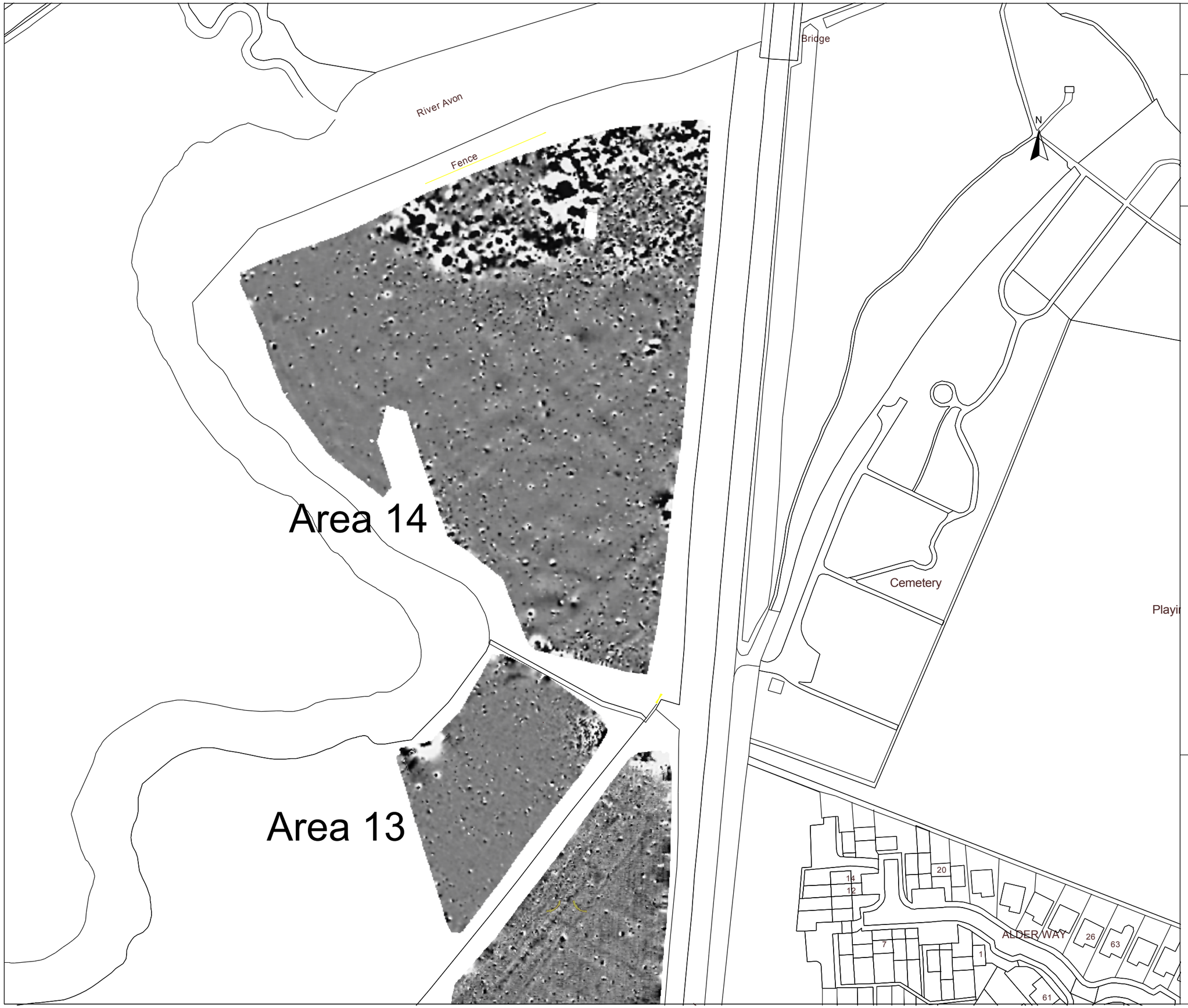
FIG 24

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Greyscale plot of minimally processed magnetometer data - Areas 13 & 14





SCALE 1:1250

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 25

Archaeological Surveys Ltd

Geophysical Survey
Melksham Link
Wilts & Berks Canal
Wiltshire

Abstraction and interpretation of magnetometer anomalies - Areas 13 & 14

River Avon

Fence

Bridge

N

54

53

51

52

45

Area 14

Area 13

Cemetery

Playi

ALDER WAY

20

14

12

7

1

26

63

61

- Positive linear anomaly - possible ditch-like feature
- Discrete positive response - possible pit-like feature
- Positive anomaly - magnetically enhanced material
- Negative anomaly - material with low magnetic susceptibility
- Magnetic debris - spread of magnetically thermoremnant/ferrous material
- Strong dipolar anomaly - ferrous object

SCALE 1:1250

0m 10 20 30 40 50m

SCALE TRUE AT A3

FIG 26