WYAS Archaeological Services

Land off Foxdenton Lane

Foxdenton

Oldham, Greater Manchester

Geophysical Survey

Report no. 3600
June 2021

Client: Countryside Properties

Land off Foxdenton Road, Foxdenton, Oldham, Greater Manchester

Geophysical Survey

Summary

A geophysical (magnetometer) survey was undertaken on approximately 4.4 hectares of land located to the north of Foxdenton Road, Foxdenton, Oldham, Greater Manchester. Anomalies possibly associated with the existing post-medieval farm buildings at Matthew Fold have been recorded along with former field boundaries. Magnetic disturbance relate to metal fencing within the boundaries and adjacent roads/tracks. A service pipe has also been recorded. Geological anomalies have been recorded throughout due to variations within the sandy soils. No anomalies of archaeological origin earlier that a post-medieval date have been recorded.

WYAS Archaeological Services

Report Information

Client:	Countryside Properties
Report Type:	Geophysical Survey
Location:	Land off Foxdenton Road, Foxdenton
County:	Oldham, Greater Manchester
Grid Reference:	SD 89742 04699
Period(s) of activity:	Post-medieval
Report Number:	3600
Project Number:	XB09
Site Code:	FDT21
OASIS ID:	archaeol11-501972
Date of fieldwork:	June 2021
Date of report:	June 2021
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Illustrations:	Emma Brunning
Photography:	Site staff
Report:	Emma Brunning and David Williams BA MCIfA

Authorisation for distribution: ----------

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1 Introduction

Archaeological Services ASWYAS has been commissioned by Lanpro Services on behalf of Countryside Properties to undertake a geophysical survey at land off Foxdenton Lane, Foxdenton, Oldham, Greater Manchester. This was undertaken in line with current best practice (CIfA 2014; Schmidt *et al.* 2015). The survey was carried out on the 11th June 2021 to provide additional information on the archaeological resource of the Site.

Site location, topography and land-use

The Site is located at SD 9754 2588 (Fig. 1), comprising c. 4.4ha over pasture fields. It is bound to the north and west by a water course and woodland, to the east by Broadway (A663) and to the south by Foxdenton Lane (B6189). Newman R.C. College lies to the southeast whilst housing associated with Chilton Avenue lie to the northeast. The Ordnance Datum (aOD), lies between 111m aOD in the northeast and 105m aOD in the southwest. Gaps in the data are where it was unsuitable for survey due to trees and overgrowth.

Soils and geology

The underlying bedrock of the site belongs to the Pennine Lower Coal Measures Formation consisting of a sedimentary bedrock comprising mudstone, siltstone and sandstone. This formed approximately 318 to 319 million years ago in the Carboniferous Period. Superficial deposits of Devension till are also recorded on the site which formed up to 2 million years ago in the Quaternary Period (BGS 2021). The soils of this area comprise freely draining slightly acid sandy soils (soilscape 6) (CSAI 2021).

2 Archaeological Background

Research was conducted into the potential archaeological background from available online sources and previous investigations within a 1km radius, from the centre of the survey area.

In the centre of the Site, the remains of Matthew Fold a former farmhouse is depicted on the first edition map of 1848. To either side of the Site there are the locations of in filled sand pits, also depicted on the historic maps.

Foxdenton Farmhouse is located to the southwest of the Site and is a Grade II listed building (1068093) of an 18th to 19th century date.

Also to the southwest of the Site lies Foxdenton Hall which is an early 18th century two storey house which reuses features and stonework from a building of 1620. It is Grade II* listed (1356429) (HE 2021).

To the north of the Site lies a disused railway which was once the Middleton Junction and Oldham Branch of the Lancashire and Yorkshire Railway.

Previous investigations in the area include a historic building survey of Ferney Field Farm which lies to the northwest of the current survey area and a geophysical survey to the southwest of Ferney Field Farm. The majority of the anomalies detected during the geophysical survey can be attributed to the agricultural use of the site, including ridge and furrow cultivation of possible medieval or post medieval date, a former field boundary, and land drains (Wooler and Railton 2014).

3 Aims, Methodology and Presentation

The aims and objectives of the programme of geophysical survey were to gather sufficient information to establish the presence/absence, character and extent, of any archaeological remains within the specific area and to inform an assessment of the archaeological potential of the site. To achieve this aim, a magnetometer survey covering all amenable parts of the Site was undertaken (see Fig. 2).

The general objectives of the geophysical survey were:

- to provide information about the nature and possible interpretation of any magnetic anomalies identified;
- to therefore determine the presence/absence and extent of any buried archaeological features; and
- to prepare a report summarising the results of the survey.

Magnetometer survey

The site grid was laid out using a Trimble VRS differential Global Positioning System (Trimble R6 model). The survey was undertaken using Bartington Grad601 magnetic gradiometers. These were employed taking readings at 0.25m intervals on zig-zag traverses 1.0m apart within 30m by 30m grids, so that 3600 readings were recorded in each grid. These readings were stored in the memory of the instrument and later downloaded to computer for processing and interpretation. Bespoke in-house software was used to process and present the data. Further details are given in Appendix 1.

Reporting

A general site location plan, incorporating the 1:50000 Ordnance Survey (OS) mapping, is shown in Figure 1. Figure 2 displays processed magnetometer data at a scale of 1:2000 whilst Figure 3 shows an overview of the interpretation at the same scale. Processed and minimally processed data, together with interpretation of the survey results are presented in Figures 4 to 9 inclusive at a scale of 1:1000.

Technical information on the equipment used, data processing and survey methodologies are given in Appendix 1. Technical information on locating the survey area is provided in Appendix 2. Appendix 3 describes the composition and location of the archive. A copy of the completed OASIS form is included in Appendix 4.

The survey methodology, report and any recommendations comply with guidelines outlined by the European Archaeological Council (Schmidt *et al*. 2015) and by the Chartered Institute for Archaeologists (CIfA 2014). All figures reproduced from Ordnance Survey mapping are with the permission of the controller of Her Majesty's Stationery Office (© Crown copyright).

The figures in this report have been produced following analysis of the data in processed formats and over a range of different display levels. All figures are presented to most suitably display and interpret the data from this site based on the experience and knowledge of Archaeological Services staff.

4 Results and Discussion (see Figures 4 to 9)

Ferrous anomalies and magnetic disturbance

Ferrous anomalies, as individual 'spikes', or as large discrete areas are typically caused by ferrous (magnetic) material, either on the ground surface or in the plough-soil. Little importance is normally given to such anomalies, unless there is any supporting evidence for an archaeological interpretation, as modern ferrous debris or material is common on rural sites, often being present as a consequence of manuring or tipping/infilling. There is no obvious pattern or clustering to their distribution in this survey to suggest anything other than a random background scatter of ferrous debris in the soil.

The eastern section of the survey area (**F1**) (to the west of Broadway) is magnetically disturbed. This disturbance may be associated with the construction of the road which happened sometime between 1922 and 1954 according to the historic mapping (OM 2021). The college building to the south was built in 2011 and building materials associated with this may also account for some of the magnetic disturbance.

Further magnetic disturbance has been recorded at **F2** which also corresponds with a partial field boundary. The areas of disturbance at **F3** and **F4** are likely to be associated with the adjacent track leading to Matthew Fold and metal fencing within the boundaries.

In the north of the Site a linear dipolar response has been recorded which is likely to be a buried service following the line of a footpath shown on historical mapping dating from 1848 (OM 2021).

A rectangular shaped area of disturbance (**D1**) in the northeast of the Site has been interpreted as a rubble spread and measures approximately 32m by 30m. The disturbance continues to the east. There is nothing visible on the available historic maps or aerial imagery in this vicinity to compare the response with. It is unfortunate that areas of overgrowth hindered data collection in this area.

Similar disturbance is visible at **D2** which roughly corresponds to outbuildings associated with Matthew Fold and recorded on historic mapping dating from 1848 (OM 2021). The map of 1954 states this area as *ruins*.

Geological anomalies

The survey has detected a number of anomalies that have been interpreted as geological in origin. It is thought that the responses have been detected because of the variation in the composition and depth of the deposits of superficial material in which they derive. These are particularly evident surrounding the former sand pit in the south of the Site (**G1**).

Strong magnetic responses (**G2**) lie to the north of a strong linear response, correspond with a footpath. Responses **G2** are likely to be associated with the variations in the soils at this point.

Agricultural anomalies

A number of former field boundaries have been detected in which some are recorded on first edition Ordnance Survey mapping dating from 1848 (OM 2021). The boundary at **FB1** is one of these and continues to be seen on the historic mapping until at least 1990. Boundary (**FB2**) is also shown on the 1848 map but has been removed by 1909.

Other boundaries within the dataset do not correlate with any available mapping and are therefore likely to pre date 1848. They do, however, either following the same alignment as recorded field boundaries or link other field boundaries.

A magnetically strong linear response (**FP1**) has been recorded and corresponds to a footpath marked on the historic mapping and can be seen on aerial images.

5 Conclusions

The geophysical survey has detected a number of magnetic anomalies possibly associated with the post-medieval Matthew Fold farmstead buildings and field boundaries. No anomalies potentially dating to before the post-medieval period have been recorded.

Magnetic disturbance relate to metal fencing within the boundaries and adjacent roads/tracks. A service pipe has also been recorded. Geological anomalies have been recorded throughout due to variations within the sandy soils.

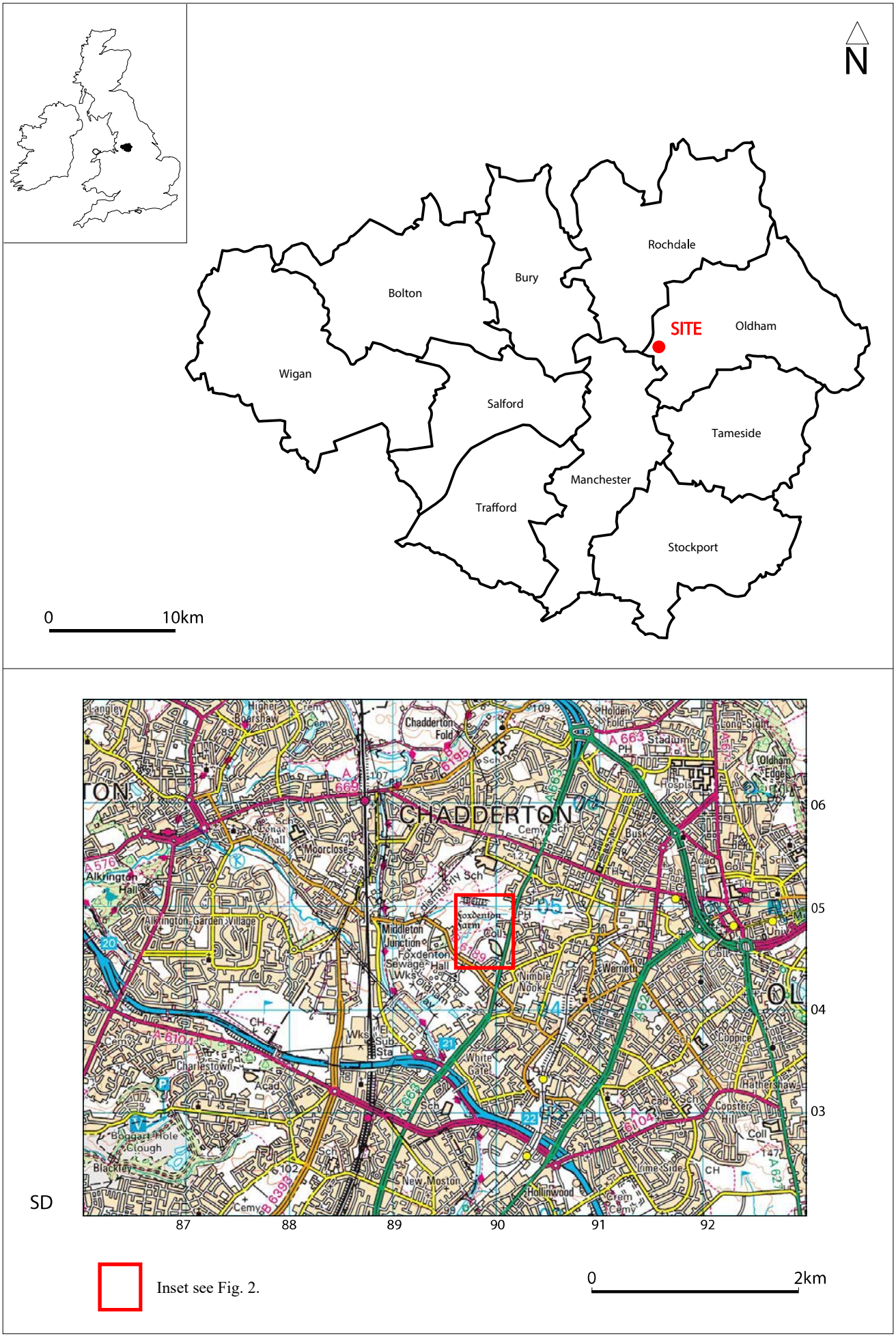

Fig. 1. Site location

SECTOR 1
SEE FIGS 4-6

SECTOR 2
SEE FIGS 7-9

1
2
3
4
5
6
7
8

N

4048000
4046000
3896000
3898000
3900000
3902000

Foxdenton Farm

Blessed John Henry Newman RC College (Sch)

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Survey location showing processed magnetometer data

Fig. 2

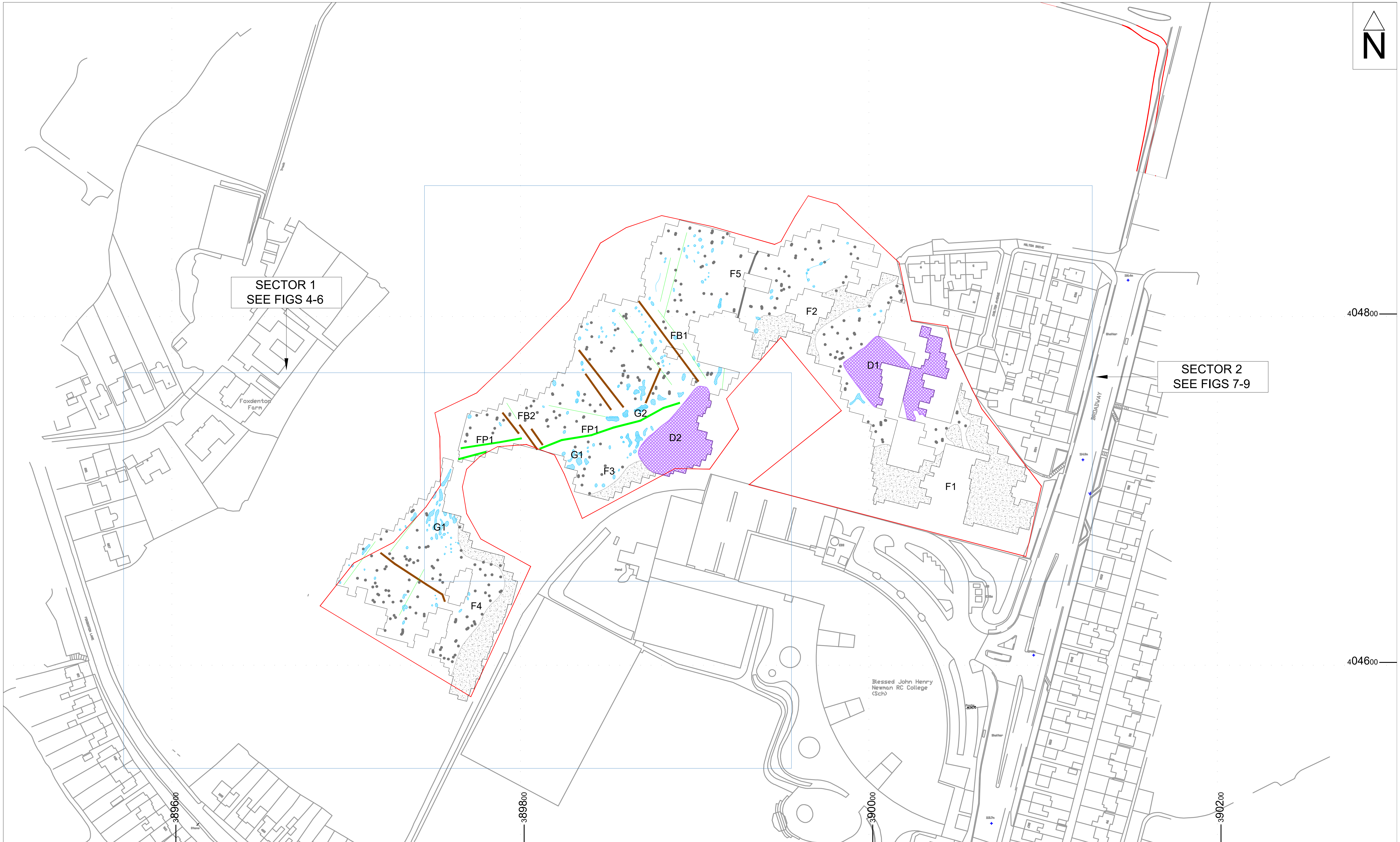
Title

- SURVEY AREA
- SECTOR BOUNDARY
- UNSUITABLE FOR SURVEY
- 1 PHOTO LOCATIONS

nT -1.0 2.0

0 100m

1:2000 @ A3



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Overall interpretation of magnetometer data

Fig. 3

Title

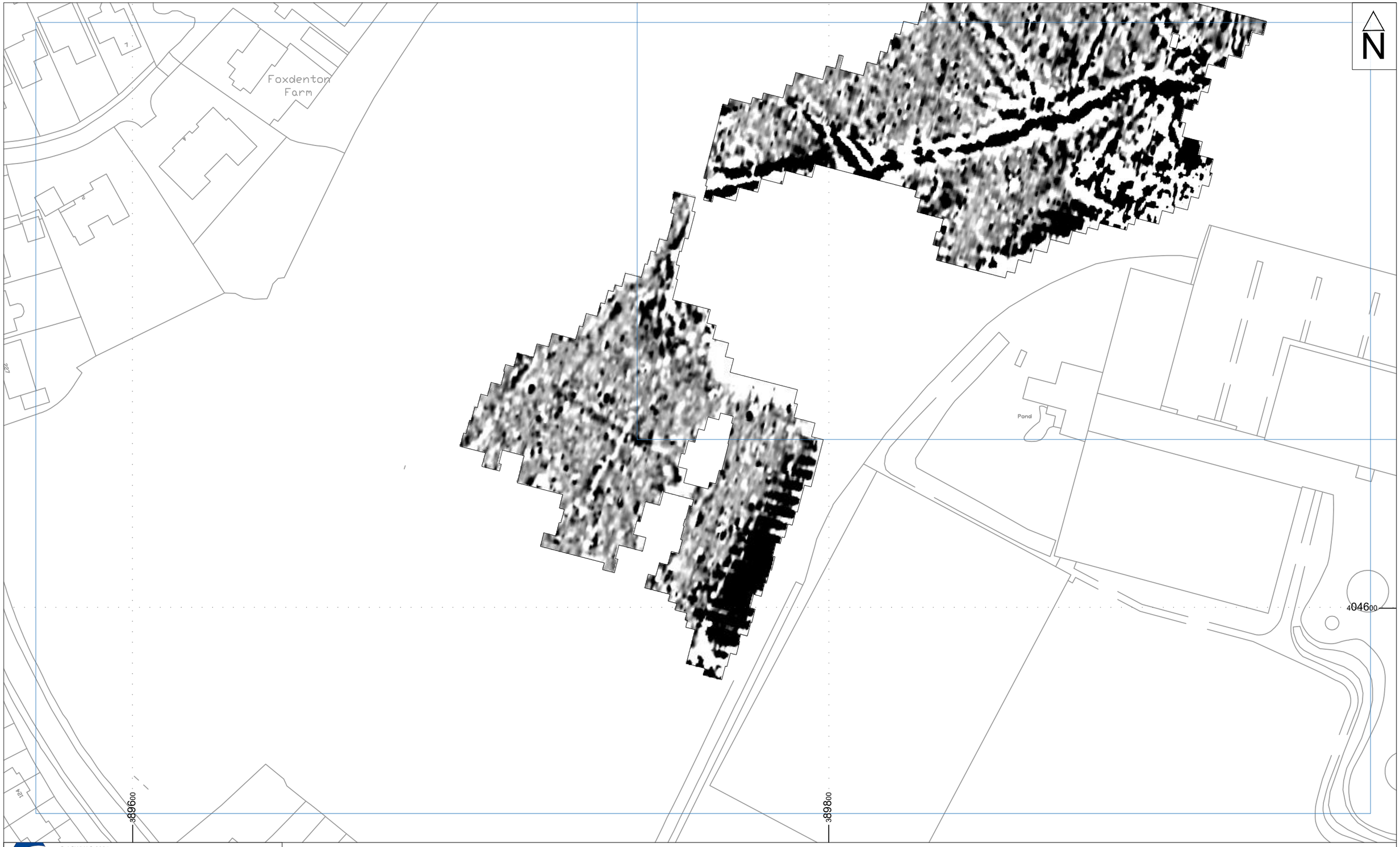
- SURVEY AREA
- SECTOR BOUNDARY

Interpretation

- FERROUS
- SERVICE PIPE
- MAGNETIC DISTURBANCE
- FOOTPATH
- AGRICULTURAL
- FORMER FIELD BOUNDARY
- GEOLOGY
- GEOLOGY
- DEMOLITION SPREAD?

0 100m

1:2000 @ A3



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Processed magnetometer data; Sector 1

Fig. 4

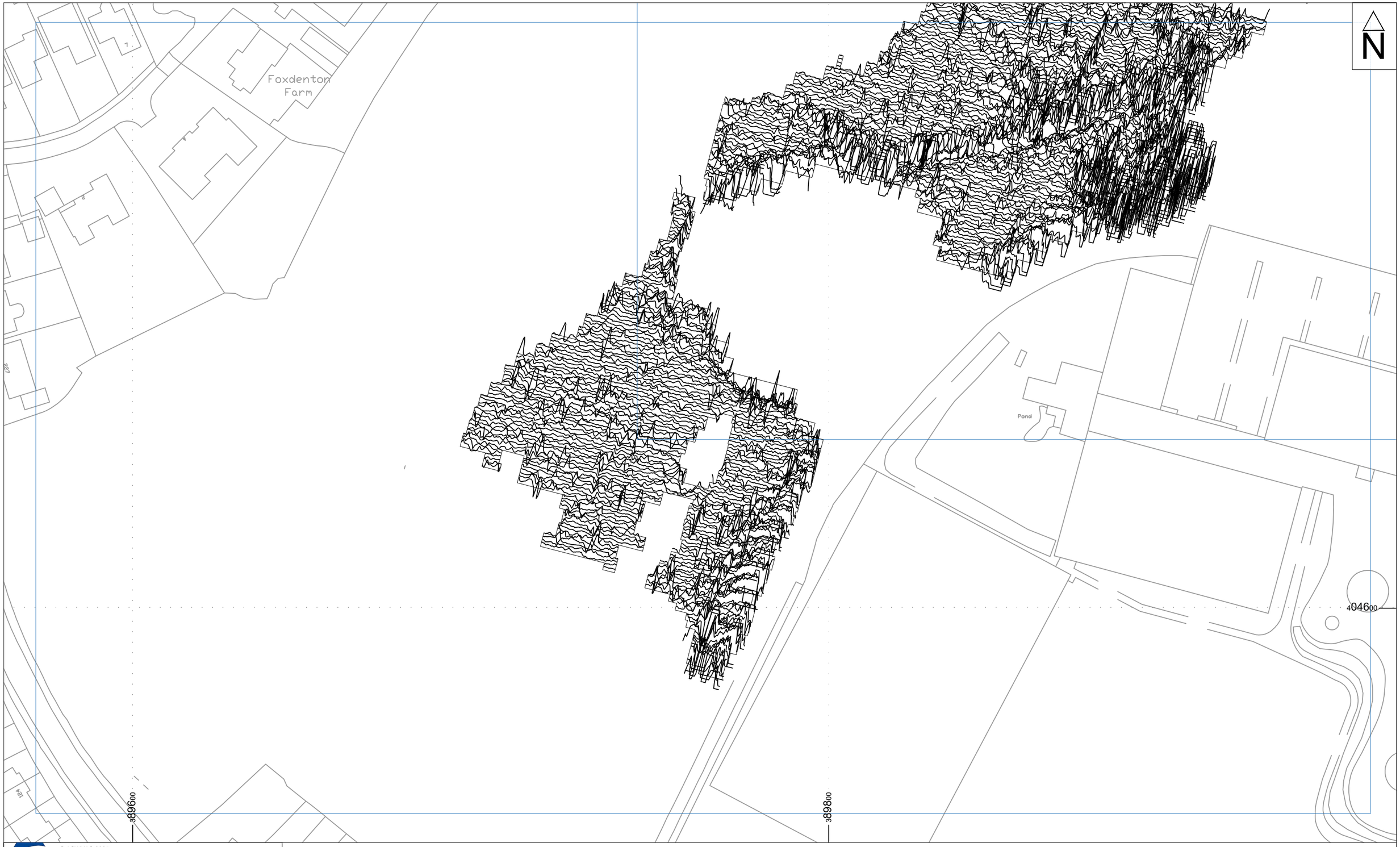
Title

SECTOR BOUNDARY

nT -1.0 2.0

0 50m

1:1000 @ A3



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XY trace plot of minimally processed data; Sector 1

Fig. 5

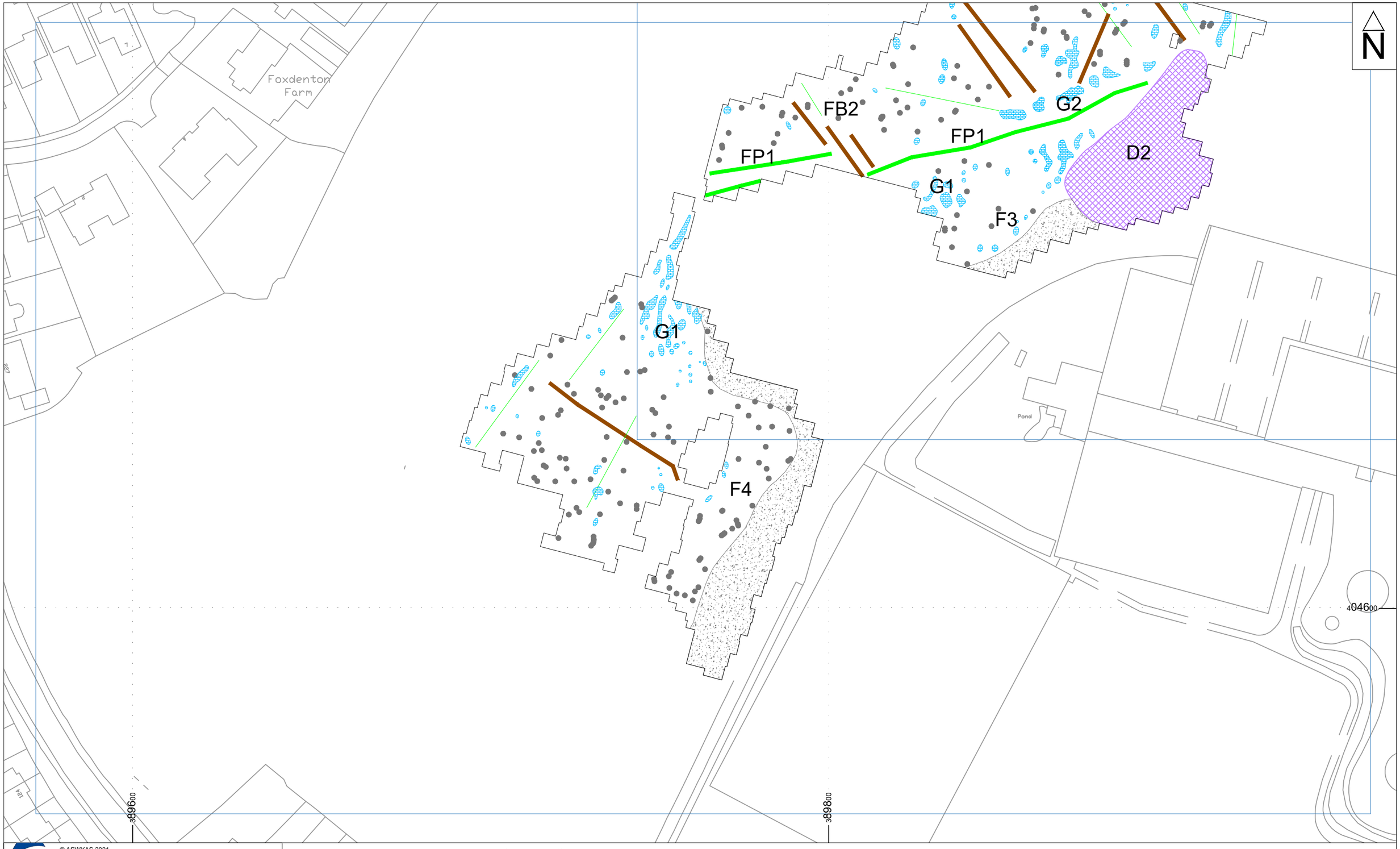
Title

SECTOR BOUNDARY

15.0 nT/cm

0 50m

1:1000 @ A3



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Interpretation of magnetometer data; Sector 1

Fig. 6

Title

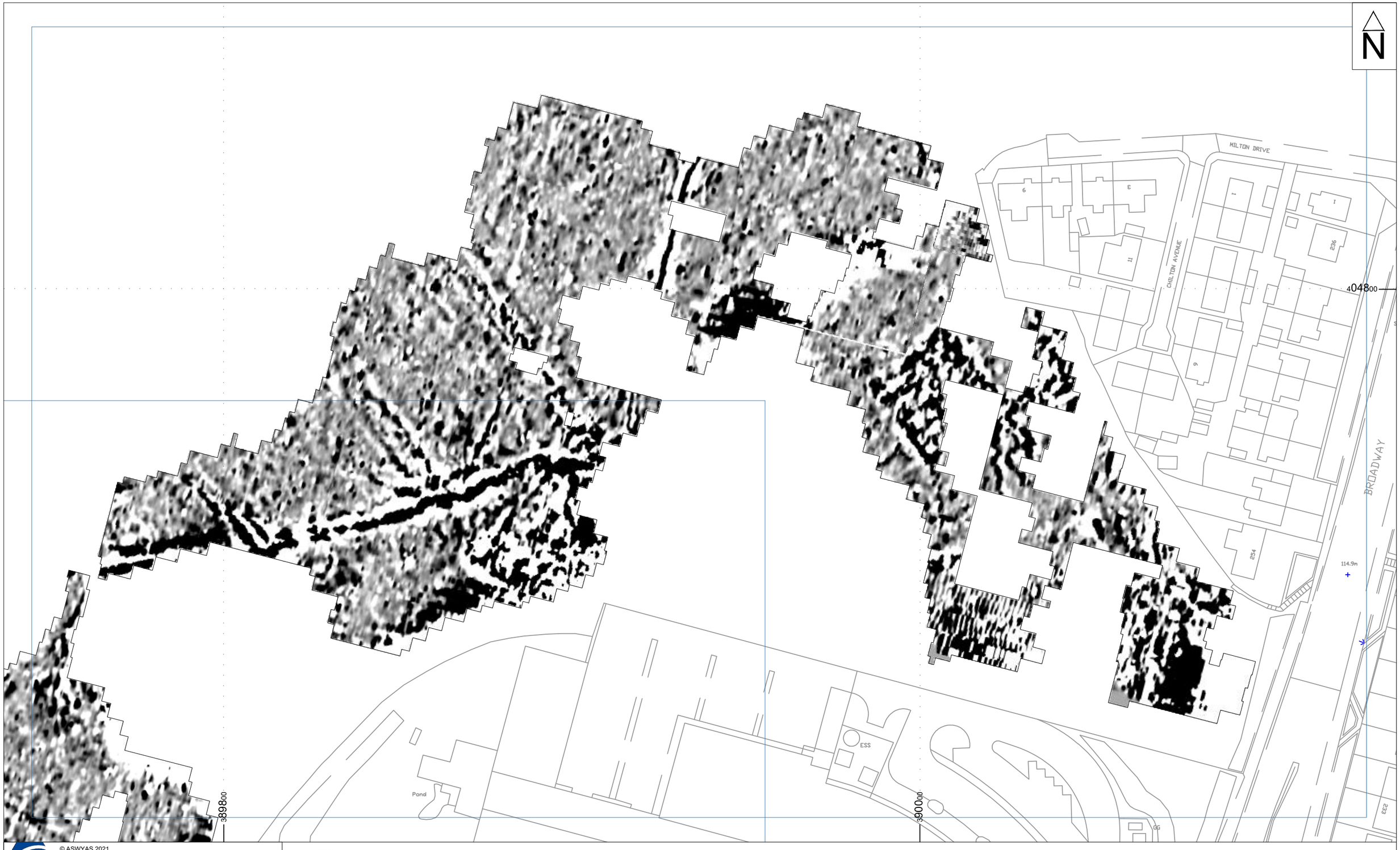
- SECTOR BOUNDARY

Interpretation

- FERROUS
- MAGNETIC DISTURBANCE
- FOOTPATH
- AGRICULTURAL
- FORMER FIELD BOUNDARY
- GEOLOGY
- DEMOLITION SPREAD?

0 50m

1:1000 @ A3



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Processed magnetometer data; Sector 2

Fig. 7

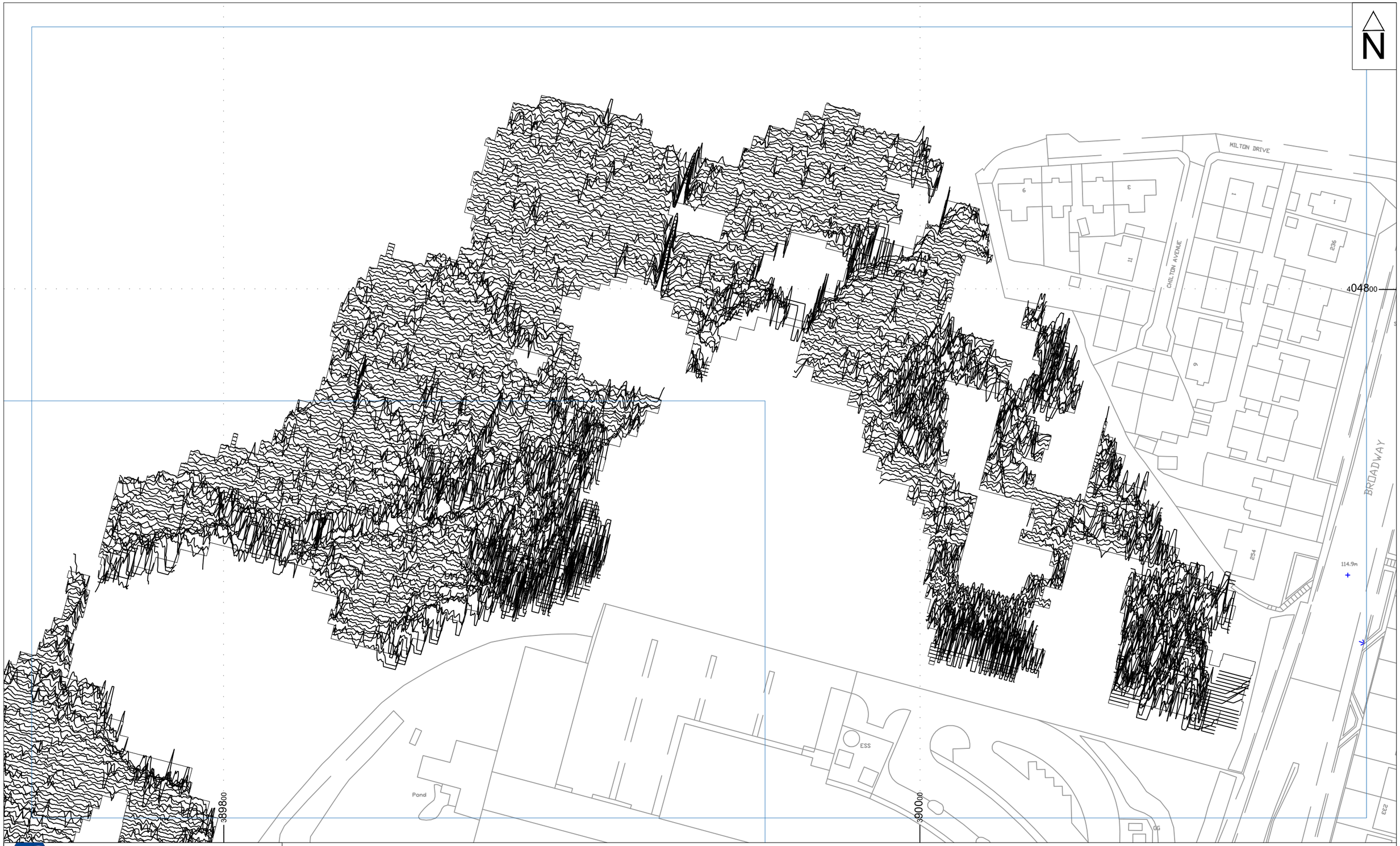
Title

SECTOR BOUNDARY

nT -1.0 2.0

0 50m

1:1000 @ A3



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XY trace plot of minimally processed data; Sector 2

Fig. 8

Title

SECTOR BOUNDARY

15.0 nT/cm

0 50m

1:1000 @ A3

N

F5

F2

FB1

D1

FB2

G2

FP1

FP1

D2

G1

F3

F1

G1

MILTON DRIVE

CHILTON AVENUE

BROADWAY

404800

114.9m

Pond

ESS

389800

390000

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Interpretation of magnetometer data; Sector 2

Fig. 9

Title

SECTOR BOUNDARY

Interpretation

FERROUS	FOOTPATH	GEOLOGY
SERVICE PIPE	AGRICULTURAL	GEOLOGY
MAGNETIC DISTURBANCE	FORMER FIELD BOUNDARY	DEMOLITION SPREAD?

0 50m

1:1000 @ A3

Plate 1. General view of survey area, facing northeast

Plate 2. General view of survey area, facing north

Plate 3. General view of survey area, facing east

Plate 4. General view of survey area, facing southeast

Plate 5. General view of survey area, facing southeast

Plate 6. General view of survey area, facing southwest

Plate 7. General view of survey area, facing northwest

Plate 8. General view of survey area, facing east

Appendix 1: Magnetic survey - technical information

Magnetic Susceptibility and Soil Magnetism

Iron makes up about 6% of the Earth's crust and is mostly present in soils and rocks as minerals such as maghaemite and haemetite. These minerals have a weak, measurable magnetic property termed magnetic susceptibility. Human activities can redistribute these minerals and change (enhance) others into more magnetic forms. Areas of human occupation or settlement can then be identified by measuring the magnetic susceptibility of the topsoil because of the attendant increase (enhancement) in magnetic susceptibility. If the enhanced material subsequently comes to fill features, such as ditches or pits, localised isolated and linear magnetic anomalies can result whose presence can be detected by a magnetometer (fluxgate gradiometer).

In general, it is the contrast between the magnetic susceptibility of deposits filling cut features, such as ditches or pits, and the magnetic susceptibility of topsoils, subsoils and rocks into which these features have been cut, which causes the most recognisable responses. This is primarily because there is a tendency for magnetic ferrous compounds to become concentrated in the topsoil, thereby making it more magnetic than the subsoil or the bedrock. Linear features cut into the subsoil or geology, such as ditches, that have been silted up or have been backfilled with topsoil will therefore usually produce a positive magnetic response relative to the background soil levels. Discrete feature, such as pits, can also be detected. The magnetic susceptibility of a soil can also be enhanced by the application of heat and the fermentation and bacterial effects associated with rubbish decomposition. The area of enhancement is usually quite large, mainly due to the tendency of discard areas to extend beyond the limit of the occupation site itself, and spreading by the plough.

Types of Magnetic Anomaly

In the majority of instances anomalies are termed 'positive'. This means that they have a positive magnetic value relative to the magnetic background on any given site. However some features can manifest themselves as 'negative' anomalies that, conversely, means that the response is negative relative to the mean magnetic background.

Where it is not possible to give a probable cause of an observed anomaly a '?' is appended.

It should be noted that anomalies interpreted as modern in origin might be caused by features that are present in the topsoil or upper layers of the subsoil. Removal of soil to an archaeological or natural layer can therefore remove the feature causing the anomaly.

The types of response mentioned above can be divided into five main categories that are used in the graphical interpretation of the magnetic data:

Isolated dipolar anomalies (iron spikes)

These responses are typically caused by ferrous material either on the surface or in the topsoil. They cause a rapid variation in the magnetic response giving a characteristic 'spiky' trace. Although ferrous archaeological artefacts could produce this type of response, unless there is supporting evidence for an archaeological interpretation, little emphasis is normally given to such anomalies, as modern ferrous objects are common on rural sites, often being present as a consequence of manuring.

Areas of magnetic disturbance

These responses can have several causes often being associated with burnt material, such as slag waste or brick rubble or other strongly magnetised/fired material. Ferrous structures such as pylons, mesh or barbed wire fencing and buried pipes can also cause the same disturbed response. A modern origin is usually assumed unless there is other supporting information.

Linear trend

This is usually a weak or broad linear anomaly of unknown cause or date. These anomalies are often caused by agricultural activity, either ploughing or land drains being a common cause.

Areas of magnetic enhancement/positive isolated anomalies

Areas of enhanced response are characterised by a general increase in the magnetic background over a localised area whilst discrete anomalies are manifest by an increased response on two or three successive traverses. In neither instance is there the intense dipolar response characteristic exhibited by an area of magnetic disturbance or of an 'iron spike' anomaly (see above). These anomalies can be caused by infilled discrete archaeological features such as pits or post-holes or by kilns. They can also be caused by pedological variations or by natural infilled features on certain geologies. Ferrous material in the subsoil can also give a similar response. It can often therefore be very difficult to establish an anthropogenic origin without intrusive investigation or other supporting information.

Linear and curvilinear anomalies

Such anomalies have a variety of origins. They may be caused by agricultural practice (recent ploughing trends, earlier ridge and furrow regimes or land drains), natural geomorphological features such as palaeochannels or by infilled archaeological ditches.

Methodology: Gradiometer Survey

The main method of using the fluxgate gradiometer for commercial evaluations is referred to as ***detailed survey*** and requires the surveyor to walk at an even pace carrying the instrument within a grid system. A sample trigger automatically takes readings at predetermined points, typically at 0.25m intervals, on traverses 1m apart. These readings are stored in the memory of the instrument and are later dumped to computer for processing and interpretation.

During this survey a Bartington Grad601 magnetic gradiometer was used taking readings on the 0.1nT range, at 0.25m intervals on zig-zag traverses 0.5m apart within 30m by 30m square grids. The instrument was checked for electronic and mechanical drift at a common point and calibrated as necessary. The drift from zero was not logged.

The gradiometer data have been presented in this report in processed greyscale format. The data in the greyscale images have been interpolated and selectively filtered to remove the effects of drift in instrument calibration and other artificial data constructs and to maximise the clarity and interpretability of the archaeological anomalies.

Appendix 2: Survey location information

An initial survey station was established using a Trimble VRS differential Global Positioning System (Trimble R6 model). The data was geo-referenced using the geo-referenced survey station with a Trimble RTK differential Global Positioning System (Trimble R6 model). The accuracy of this equipment is better than 0.01m. The survey grids were then super-imposed onto a base map provided by the client to produce the displayed block locations. However, it should be noted that Ordnance Survey positional accuracy for digital map data has an error of 0.5m for urban and floodplain areas, 1.0m for rural areas and 2.5m for mountain and moorland areas. This potential error must be considered if co-ordinates are measured off hard copies of the mapping rather than using the digital co-ordinates.

Archaeological Services WYAS cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party.

Appendix 3: Geophysical archive

The geophysical archive comprises:-

- an archive disk containing compressed (WinZip 8) files of the raw data, report text (Microsoft Word 2000), and graphics files (Adobe Illustrator CS2 and AutoCAD 2008) files; and
- a full copy of the report.

At present the archive is held by Archaeological Services WYAS although it is anticipated that it may eventually be lodged with the Archaeology Data Service (ADS). Brief details may also be forwarded for inclusion on the English Heritage Geophysical Survey Database after the contents of the report are deemed to be in the public domain (i.e. available for consultation in the Greater Manchester Historic Environment Record).

Appendix 4: Oasis form

Summary for archaeol11-501972

OASIS ID (UID)	archaeol11-501972
Project Name	Geophysical Survey at Land off Foxdenton Road
Activity type	Geophysical Survey, MAGNETOMETRY SURVEY
Project Identifier(s)	
Planning Id	
Reason For Investigation	Planning: Pre application
Organisation Responsible for work	Archaeological Services WYAS
Project Dates	11-Jun-2021 - 11-Jun-2021
Location	Land off Foxdenton Road NGR : SD 89742 04699 LL : 53.5388357172565, -2.1562526418301 12 Fig : 389742,404699
Administrative Areas	Country : England County : Greater Manchester District : Oldham Parish : Oldham, unparished area
Project Methodology	The site grid was laid out using a Trimble VRS differential Global Positioning System (Trimble R6 model). The survey was undertaken using Bartington Grad601 magnetic gradiometers. These were employed taking readings at 0.25m intervals on zig-zag traverses 1.0m apart within 30m by 30m grids, so that 3600 readings were recorded in each grid. These readings were stored in the memory of the instrument and later downloaded to computer for processing and interpretation.
Project Results	A geophysical (magnetometer) survey was undertaken on approximately 4.4 hectares of land located to the north of Foxdenton Road, Foxdenton, Oldham, Greater Manchester. Anomalies associated with 18th century buildings have been recorded along with former field boundaries. Magnetic disturbance relate to metal fencing within the boundaries and adjacent roads/tracks. A service pipe has also been recorded. Geological anomalies have been recorded throughout due to variations within the sandy soils. No anomalies of an early archaeological origin have been recorded.
Keywords	

HER	Greater Manchester HER - noRev - LITE
HER Identfiers	
Archives	

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