WYAS Archaeological Services

Normanton Larches

Nottinghamshire

Geophysical Survey

Report no. 3738
March 2022

Client: Pierrepont Estates Management Limited

Normanton Larches
Nottinghamshire

Geophysical Survey

Summary

A geophysical (magnetometer) survey was undertaken on approximately 101 hectares of land located to the east of Blyth Road, Normanton Larches, Nottinghamshire. Anomalies of both a definite and a possible archaeological origin have been detected suggestive of settlement and correspond to cropmark evidence. Former field boundaries and modern ploughing have also been recorded. Large parts of some of the fields have possibly been subjected to green waste manuring and has resulted in widespread magnetic disturbance. Based on the geophysical survey alone the archaeological potential of the Site is deemed to be high in the north-west and low elsewhere.

WYAS
Archaeological Services

Report Information

Client:	Pierrepont Estates Management Limited
Address:	Estate Office, Thoresby Park, Newark. Nottinghamshire
Report Type:	Geophysical Survey
Location:	Normanton Larches
County:	Nottinghamshire
Grid Reference:	SK 6526 7527
Period(s) of activity:	?Romano-British - modern
Report Number:	3738
Project Number:	X759
Site Code:	NMT21
OASIS ID:	archaeol11-505282
Date of fieldwork:	February 2022
Date of report:	March 2022
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Ver	Author(s)	Reviewer	Approver	Date
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1 Introduction

Archaeological Services ASWYAS has been commissioned by Pegasus Group on behalf of Pierrepont Estates Management Limited to undertake a geophysical survey at land at Normanton Larches, Nottinghamshire. This was undertaken in line with current best practice (CIfA 2014; Schmidt *et al.* 2015). The survey was carried out between 14th and 22nd February 2022 to provide additional information on the archaeological resource of the Site.

Site location, topography and land-use

The Site is located at SK 6526 7527 (approximate centre), comprising *c.* 101ha over six areas situated approximately 7km to the southeast of Worksop (see Fig. 1).

The Site is situated to the east of Blyth Road within arable land and at the time of survey the ground cover was of a young crop or had recently been harvested (see Plates 1-12). It is bounded to the north and east by woodland and the river Poulter, to the south by West Drayton Avenue.

The above Ordnance Datum (aOD) varies from approximately 37m aOD in the northwest to approximately 28m aOD in the southeast.

Soils and geology

The recorded bedrock geology comprises Chester Formation - Sandstone, Pebbly (gravelly). Sedimentary Bedrock formed approximately 247 to 250 million years ago in the Triassic Period. Superficial deposits in the south of the Site have been recorded as Till, Mid Pleistocene - Diamicton, sand and gravel. Superficial deposits across the north of the Site are not present (BGS 2022). Soils of the area are described as freely draining slightly acid sandy soils (Soilscape 10) (CSAI 2022).

2 Archaeological Background

The archaeological background below is taken from online resources (Heritage Gateway, Historic England Aerial Archaeology Mapping Explorer) within a 1km radius from the centre of the Site.

Extensive cropmarks have been recorded within and surrounding the Site as shown on the Aerial Archaeology Mapping Explorer by Historic England (HE 2022).

The Nottinghamshire HER records the north-western field (Area 1) of the Site as a settlement at Bracken Hill (HER M4537) and consists of a complex of at least 6 rectangular enclosures and parallel linear features associated with brickwork plan fields probably of Roman date.

The south-eastern field of the Site (Area 4) has been recorded as a possible enclosure (HER L4536) and includes a small horseshoe shaped feature and linear north-south and east-west cropmarks.

Approximately 500m to the west of the Site are cropmarks showing a small enclosure, field boundaries and a double ditched trackway, possibly of a Roman date (HER M4474).

To the immediate north of the Site, and to the north of the river Poulter are cropmarks showing two adjoining rectangular enclosures and associated field boundaries (HER L4441) and a complex of rectangular, sub rectangular, circular enclosures and trackways (HER L4440).

The north-eastern field of the Site (Area 5) is recorded as the deserted medieval village of Normanton in Bothamsall (HER M4495). Extensive fieldwalking and local enquiry in the proximity of Normanton Larches Farm revealed no surface indication or local knowledge of an early village.

Normanton was a settlement in Domesday book, in the hundred of Bassetlaw and in the county of Nottinghamshire. It had no recorded population which was sometimes the case for abandoned settlements. The tenant in chief in 1066 was King Edward (OD 2022).

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 cart-based survey was undertaken using an eight channel SenSYS MX V3 system containing eight FGM650 sensors. Readings are taken every 20MHz (between 0.05 and 0.1m). Data were recorded onto a device, using a Carlson GNSS Smart antenna, for centimetre accuracy. These readings were stored in the memory of the instrument and

downloaded for processing and interpretation. DLMGPS and MAGNETO software, alongside 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 1:7500 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 30 inclusive at a scale of 1:1500. Figure 31 shows the cropmark data over the greyscale magnetometer data at a scale of 1:7500.

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 30)

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 plough-soil.

A number of the survey areas have widespread magnetic disturbance which is likely to be a result of 'green manuring'. The green waste is produced from organic and biodegradable household waste as a fertiliser and soil conditioner. However, up to 0.25% of this material can be from non-organic waste including metal fragments and batteries (Gerrard et al 2015). The result of this is a 'speckled' appearance and unfortunately will have masked the majority of anomalies, if present.

Large circular areas of magnetic disturbance seen in Areas 4 and 5 are due to the locations of electricity pylons. Smaller areas of disturbance in Areas 1 and 5 (**F1**) may be associated with bore holes. The HER record for M4495 mentioned that bore hole activity was taking place in Area 5 and may have therefore extended into Area 1.

Magnetic disturbance along the limits of the survey areas are due to be linked to metal fencing within the field boundaries and interference from the adjacent roads and modern trackways.

Fragments of a linear dipolar trend crossing Area 3 from the north-east to south-west is likely to be associated with a buried service.

Geological anomalies

The survey has detected a handful 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 adjacent to the field boundaries where the topsoil may have resulted in a 'dumping' effect.

To some degree, ploughing has also spread magnetic material across the site making it difficult to determine any coherent patterns. Fragmented, negative linear responses have also been interpreted as geological in origin. They likely represent desiccation cracks in the subsurface due to evaporated water that was once deposited in the soil.

The 'speckled' appearance of the data could also be a product of the underlying Chester sandstone formation and the weathering of the bedrock.

Within the survey data there are clear low magnitude sinuous linear trends (Area 2) that would also suggest they are natural in origin perhaps associated with former streams.

Agricultural anomalies

Former field boundaries (**FFB1**-**FFB4**) have been recorded in Areas 2, 4 and 5 which are recorded on First Edition Ordnance Survey mapping dating from 1897 and are still seen on the mapping dated 1967 (NLS 2022). Google Earth imagery shows **FFB1** was removed

between 2017-2020, **FFB2** in 2015 and **FFB3** and **FFB4** in 2017. Boundary **FFB3** formed part of an area of woodland known as Round Wood.

The historic mapping shows further boundaries and an area of woodland (Oval Clump, in Area 1) within the survey area but these have not been detected in the dataset.

Parallel linear trends can be seen within all areas and are associated with modern ploughing. Only a selection of these have been highlighted on the interpretation diagrams to show the direction of the plough lines.

Uncertain anomalies

Linear anomalies have been recorded throughout which have an uncertain origin. Those in Area 1 (**U1**) appear to be on a north-east to south-west band. Whilst an archaeological origin is preferred due to the nearby settlement complex a geological origin is also possible.

The same can be said about anomalies **U2** and **U3** in Area 4 due to their location within the cropmarks. Anomaly **U4** in Area 5 is very straight and an agricultural origin may be more likely for this. Given the putative evidence for the deserted medieval village of Normanton in Bothamsall (HER M4495) these features could be part of a wider agricultural landscape from this period.

Possible and definite archaeological anomalies

Anomalies of both a definite and possible archaeological origin have been recorded within the dataset, unfortunately due to the possible green waste disturbance and ploughing the majority of the cropmarks within the area have not been recorded.

The most prominent of these are the features recorded in Area 1 at **A1** and **P1**. The definite archaeological responses correspond with the cropmark data (HER M4537), and although fragmented, the pattern of the enclosures can still be seen. The possible archaeological anomalies are likely to be associated with the complex but are weaker in magnetic strength and have no corroborative cropmark evidence. The anomalies are typical of what would be expected of a Romano-British enclosure recorded in the wider landscape.

A short ditch length (**A2**) in the south of Area 3 corresponds with the cropmark evidence (HER L4536). A further ditch (**A3**) in Area 4 is part of the same complex. Unfortunately no further anomalies have been recorded which correlate to the cropmarks.

Possible archaeological anomalies (**P2** and **P3**) in Area 4 may be associated with the above complex but do not correspond to the cropmarks.

The archaeological and potential archaeological anomalies are in places fairly week and this is presumed to be due to a lock of contrasting material held within the fills of the archaeological features against the natural geology.

5 Conclusions

The geophysical survey has detected a number of magnetic anomalies associated with archaeological and possible archaeological origins in the forms of settlement features in which some of them correspond to cropmark evidence.

Former field boundaries and modern ploughing can be seen throughout. Unfortunately, there are large areas of magnetic disturbance which may be associated with green waste fertilising and has masked any features that may be present.

Large circular areas of magnetic disturbance are due to the location of electricity pylons whilst other areas of disturbance around the periphery of the fields are due to metal fencing within the boundaries.

Geological anomalies have been recorded due to variations within the soils. Uncertain anomalies within the dataset may have an archaeological origin although a geological or agricultural cause is also likely.

Based on the results of the geophysical survey the archaeological potential of the Site is deemed to be high in Area 1 (the north-western extent of the Site) and low elsewhere.

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 an eight channel Sensys MX V3 system containing eight FGM650 sensors was also used which was towed across the area using an ATV. Readings were taken every 20MHz (between 0.05 and 0.1m). Data was be recorded onto a device, using a Carlson GNSS Smart antenna, for centimetre accuracy. These readings were stored in the memory of the instrument and downloaded for processing and interpretation.

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 and metadata

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 2022) 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 Nottinghamshire Historic Environment Record).

Area 1

filename	X759_1.xcp
instument	Sensys DLMGPS
units	nT
survey coordinates:	
SW	464897.306, 374997.688
NE	465422.255, 375632.846
dummy value	2047.5
source GPS points	16185604
survey size	531 m x 640 m
x and y interval	1m
stats:	
max	2134.223
min	-1155.42
std dev	7.56
mean	-0.00
median	-0.04
composite area	33.984 ha
surveyed area	22.459 ha
program	TerraSurveyorPre Version:3.0.37.12
GPS based processes	Base Layer
	Interpolate: X & Y Doubled.

Area 2

filename	X759_2.xcp
instument	Sensys DLMGPS
units	nT
survey coordinates:	
SW	464935.634, 374493.816
NE	465384.500, 375030.792
dummy value	2047.5
source GPS points	16185604
survey size	531 m x 640 m
x and y interval	1m
stats:	
max	2134.223
min	-1155.42
std dev	7.56
mean	-0.00
median	-0.04
composite area	33.984 ha
surveyed area	22.459 ha
program	TerraSurveyorPre Version:3.0.37.12
GPS based processes	Base Layer
	Interpolate: X & Y Doubled.

Area 3

filename	X759_3.xcp
instument	Sensys DLMGPS
units	nT
survey coordinates:	
SW	465283.545, 374523.222
NE	465633.895, 374965.510
dummy value	2047.5
source GPS points	6883694
survey size	359 m x 448 m
x and y interval	1m
stats:	
max	555.19
min	-1003.72
std dev	11.07
mean	-0.16
median	-0.08
composite area	16.083 ha
surveyed area	10.618 ha
program	TerraSurveyorPre Version:3.0.37.12
GPS based processes	Base Layer
	Interpolate: X & Y Doubled.

Area 5

filename	X759_5.xcp
instument	Sensys DLMGPS
units	nT
survey coordinates:	
SW	465519.026, 375072.726
NE	465841.418, 375574.478
dummy value	2047.5
source GPS points	8187509
survey size	321 m x 505 m
x and y interval	1m
stats:	
max	1112.44
min	-2205.80
std dev	19.56
mean	0.00
median	-0.07
composite area	16.211 ha
surveyed area	12.366 ha
program	TerraSurveyorPre Version:3.0.37.12
GPS based processes	Base Layer
	Interpolate: X & Y Doubled.

Area 4

filename	X759_4.xcp
instument	Sensys DLMGPS
units	nT
survey coordinates:	
SW	465514.582, 374536.774
NE	466156.687, 375042.649
dummy value	2047.5
source GPS points	13892459
survey size	649 m x 510 m
x and y interval	1m
stats:	
max	2293.70
min	-885.11
std dev	19.29
mean	0.29
median	-0.07
composite area	33.099 ha
surveyed area	19.442 ha
program	TerraSurveyorPre Version:3.0.37.12
GPS based processes	Base Layer
	Interpolate: X & Y Doubled.

Area 6

filename	X759_6.xcp
instument	Sensys DLMGPS
units	nT
survey coordinates:	
SW	465767.245, 375032.673
NE	466404.278, 375605.465
dummy value	2047.5
source GPS points	9794169
survey size	645 m x 572 m
x and y interval	1m
stats:	
max	706.60
min	-218.74
std dev	9.45
mean	0.36
median	-0.09
composite area	36.894 ha
surveyed area	14.825 ha
program	TerraSurveyorPre Version:3.0.37.12
GPS based processes	Base Layer
	Interpolate: X & Y Doubled.

Appendix 4: Oasis form

Summary for archaeol11-505282

OASIS ID (UID)	archaeol11-505282
Project Name	Geophysical Survey at Normanton Larches
Sitename	
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	14-Feb-2022 - 22-Feb-2022
Location	Normanton Larches NGR : SK 65260 75270 LL : 53.2704134352611, -1.02292240073345 12 Fig : 465260,375270
Administrative Areas	Country : England County : Nottinghamshire District : Bassetlaw Parish : Elkesley
Project Methodology	The cart-based survey was undertaken using an eight channel SenSYS MX V3 system containing eight FGM650 sensors. Readings are taken every 20MHz (between 0.05 and 0.1m). Data were recorded onto a device, using a Carlson GNSS Smart antenna, for centimetre accuracy. These readings were stored in the memory of the instrument and downloaded for processing and interpretation. DLMGPS and MAGNETO software, alongside bespoke in-house software was used to process and present the data.
Project Results	A geophysical (magnetometer) survey was undertaken on approximately 101 hectares of land located to the east of Blyth Road, Normanton Larches, Nottinghamshire. Anomalies of both a definite and a possible archaeological origin have been detected suggestive of settlement and correspond to cropmark evidence. Former field boundaries and modern ploughing have also been recorded. Large parts of some of the fields have possibly been subjected to green waste manuring and has resulted in widespread magnetic disturbance. Based on the geophysical survey alone the archaeological potential of the Site is deemed to be high in the northwest and low elsewhere.
Keywords	Rectangular Enclosure - UNCERTAIN - FISH Thesaurus of Monument Types
Funder	
HER	Nottinghamshire HER - unRev - STANDARD
Person Responsible for work	Emma, Brunning
HER Identifiers	
Archives	

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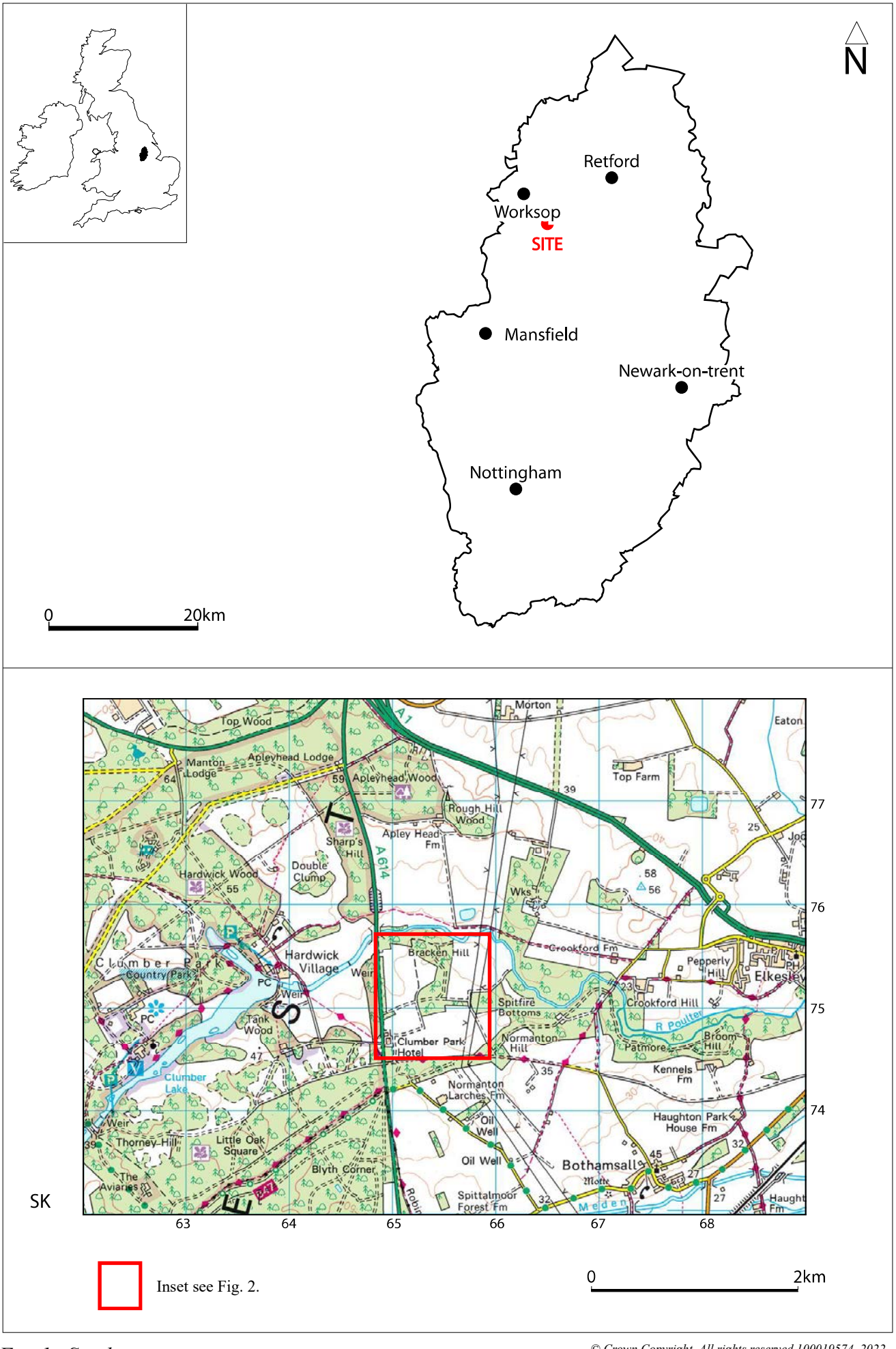
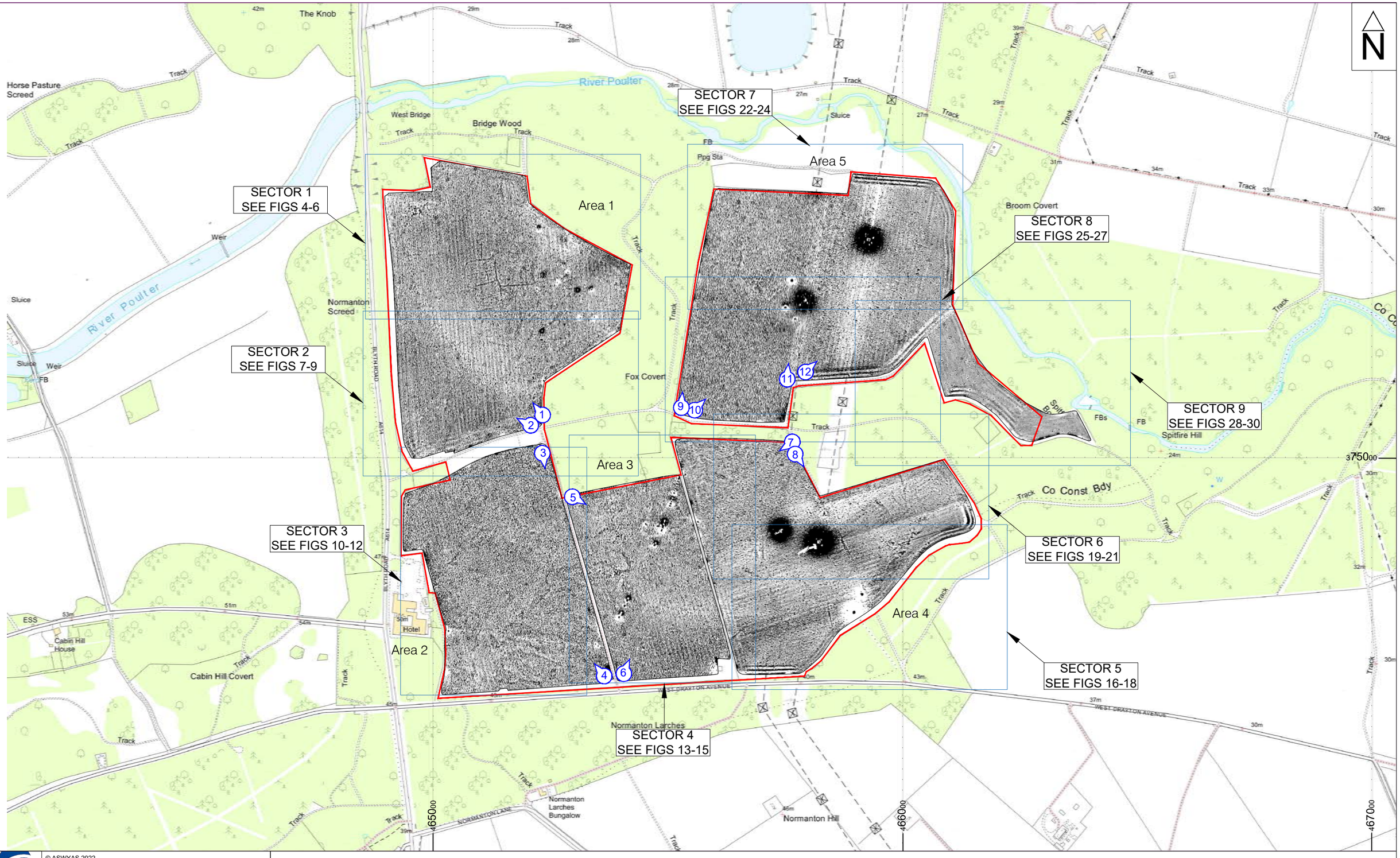


Fig. 1. Site location



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Project ID: X759_NMT22

Survey location showing processed magnetometer data

Fig. 2

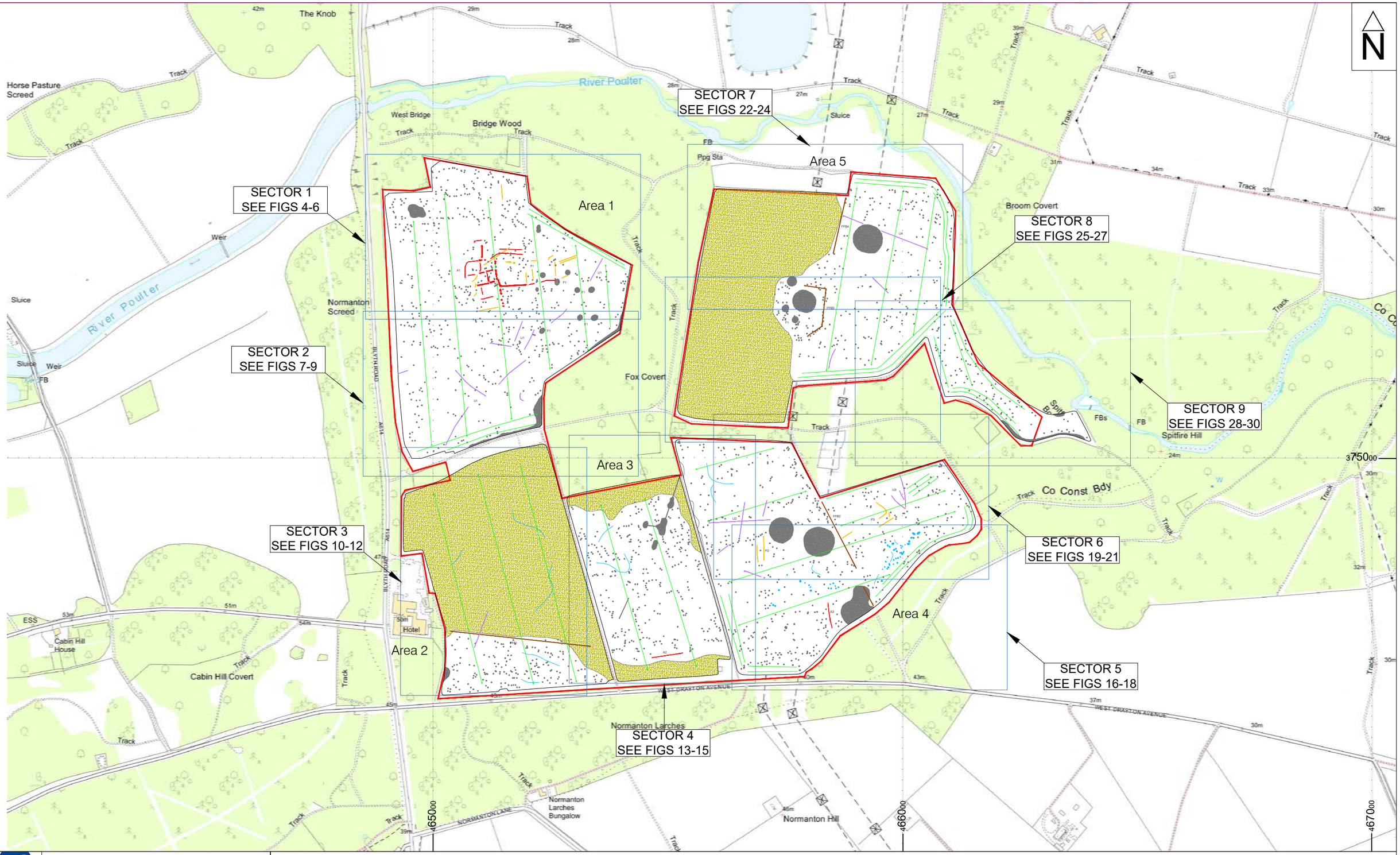
Title

	SURVEY AREA
	SECTOR BOUNDARY
1	PHOTO LOCATIONS

nT -1.0 2.0

0 200m

1:7500 @ A3



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Overall interpretation of magnetometer data

Fig. 3

Title

- SURVEY AREA
- SECTOR BOUNDARY

Interpretation

- FERROUS
- SERVICE PIPE
- MAGNETIC DISTURBANCE
- AGRICULTURAL
- ?GREEN WASTE
- FORMER FIELD BOUNDARY
- GEOLOGY
- UNCERTAIN
- ARCHAEOLOGY?
- ARCHAEOLOGY

0 200m

1:7500 @ A3

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Processed greyscale magnetometer data; Sector 1

Fig. 4

Title

SECTOR BOUNDARY

nT -1.0 2.0

0 50m

1:1500 @ A3

N

Area 1

3756 00

3754 00

650 00

652 00

654 00

Track

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XY trace plot of minimally processed magnetometer data; Sector 1

Fig. 5

Title

SECTOR BOUNDARY

15.0 nT/cm

0 50m

1:1500 @ A3

N

Area 1

A1

P1

F1

F1

U1

Track

375600

375400

465000

465200

465400

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Project ID: X759_NMT22

Interpretation of magnetometer data; Sector 1

Fig. 6

Title

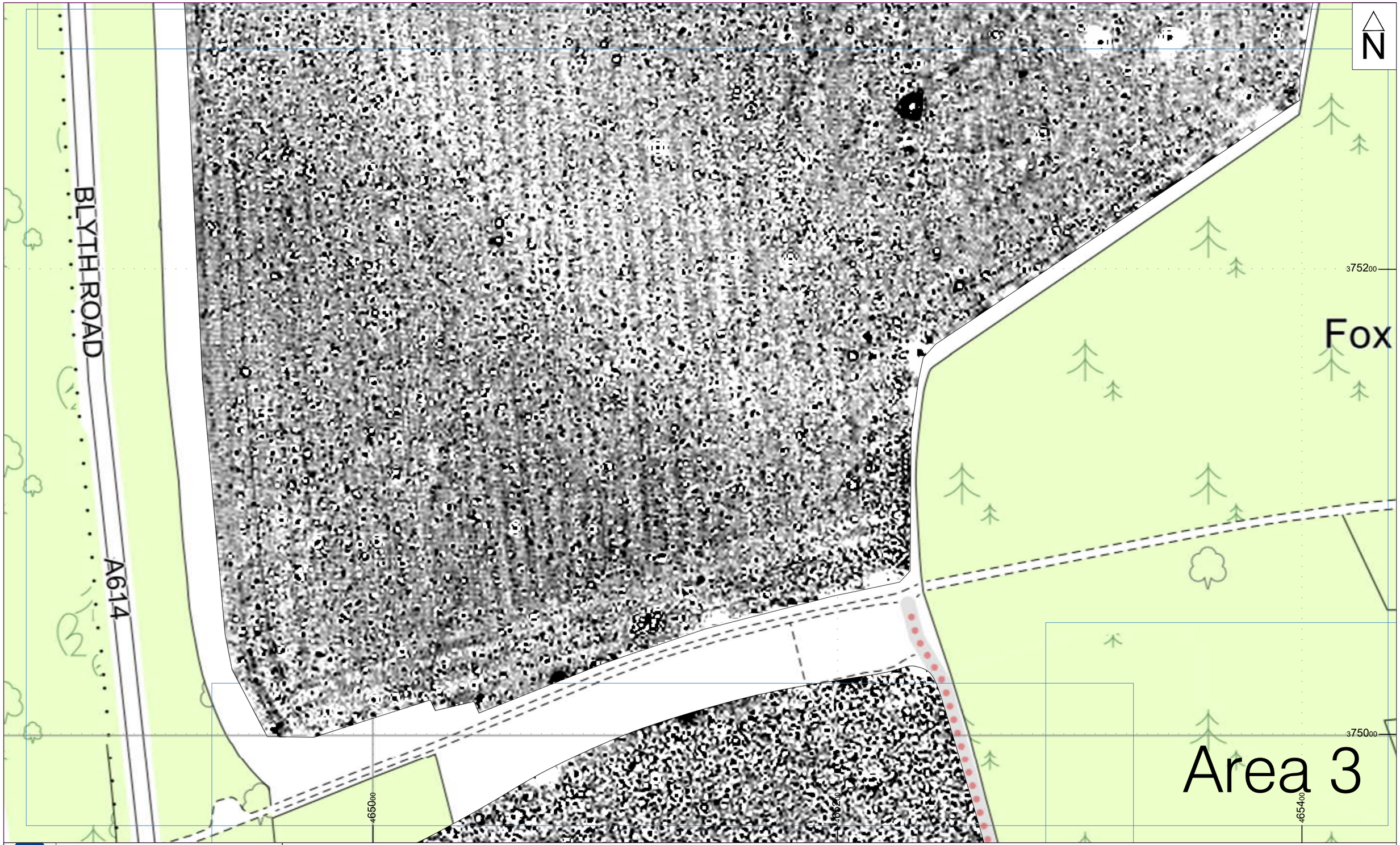
- SECTOR BOUNDARY

Interpretation

- FERROUS
- MAGNETIC DISTURBANCE
- AGRICULTURAL
- UNCERTAIN
- ARCHAEOLOGY?
- ARCHAEOLOGY

0 50m

1:1500 @ A3



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Processed greyscale magnetometer data; Sector 2

Fig. 7

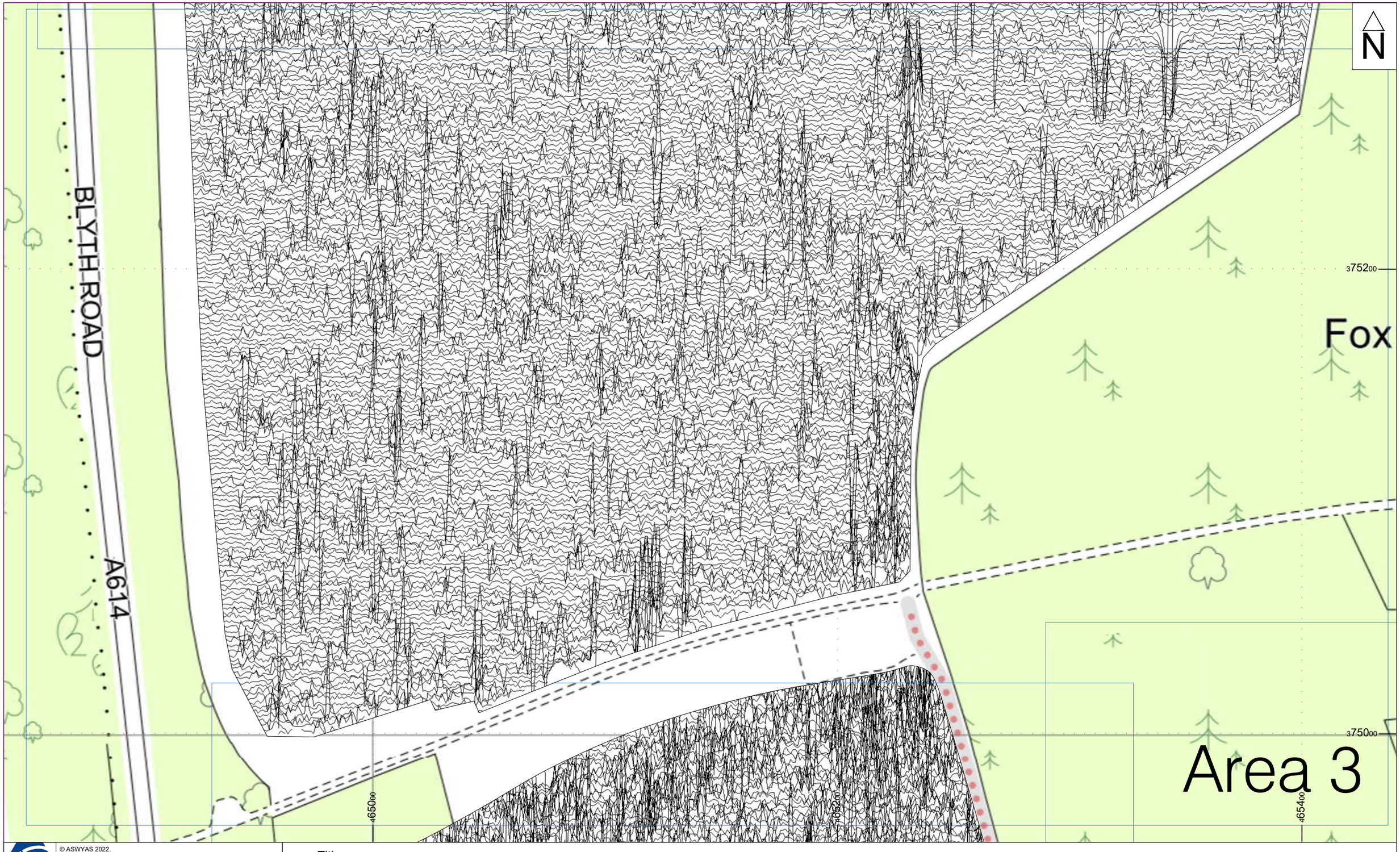
Title

SECTOR BOUNDARY

nT -1.0 2.0

0 50m

1:1500 @ A3



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XY trace plot of minimally processed magnetometer data; Sector 2

Fig. 8

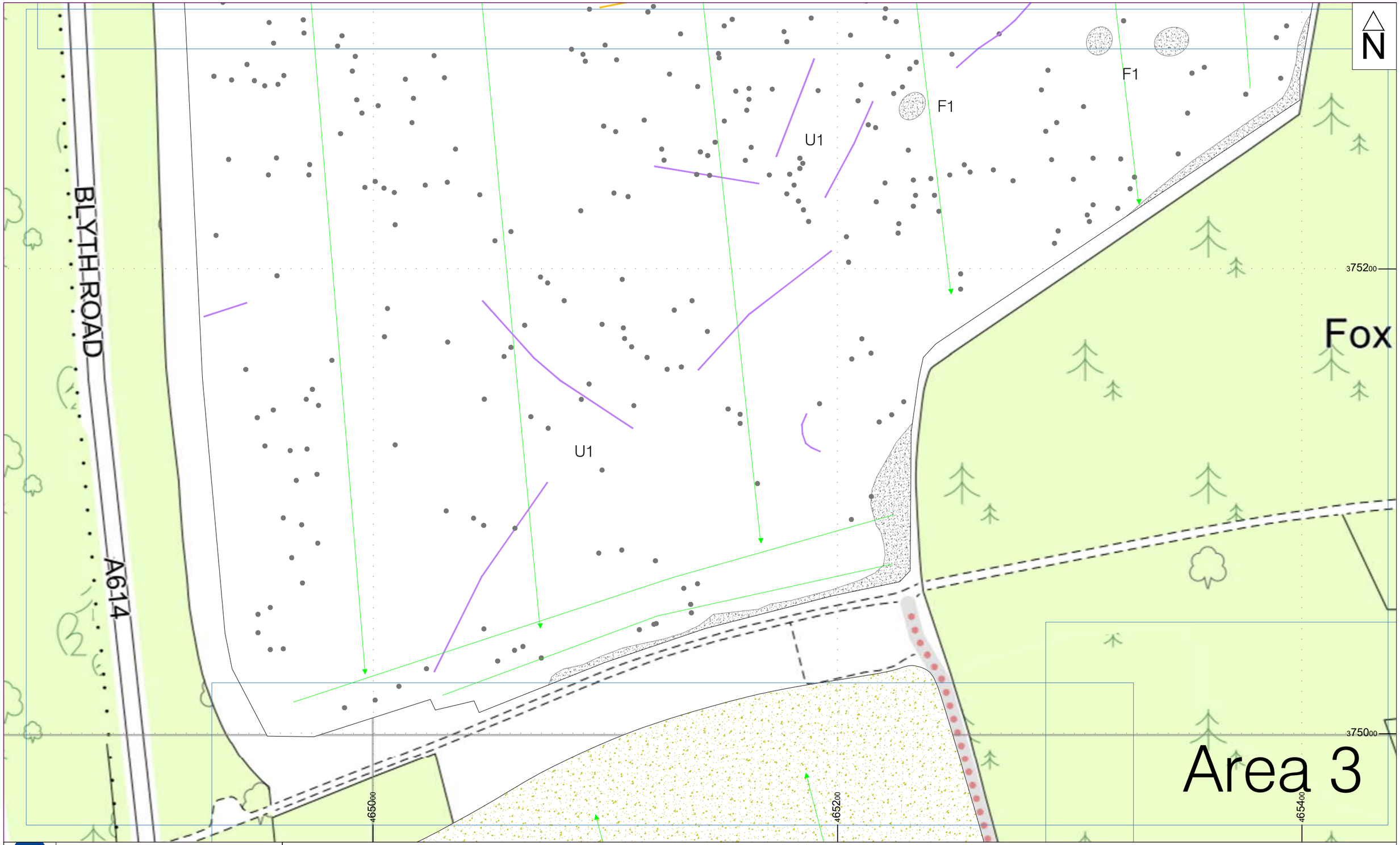
Title

SECTOR BOUNDARY

15.0 nT/cm

0 50m

1:1500 @ A3



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Interpretation of magnetometer data; Sector 2

Fig. 9

Title

SECTOR BOUNDARY

Interpretation

FERROUS

AGRICULTURAL

UNCERTAIN

MAGNETIC DISTURBANCE

?GREEN WASTE

0 50m

1:1500 @ A3

N

Area 2

50m

Hotel

43m

3748$_{00}$

4650$_{00}$

4652$_{00}$

4746$_{00}$

4482$_{00}$

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Processed greyscale magnetometer data; Sector 3

Fig. 10

Title

SECTOR BOUNDARY

-1.0 2.0
nT

0 50m

1:1500 @ A3

N

3748$_{00}$

50m

Hotel

Area 2

4650$_{00}$

43m

4652$_{00}$

4482$_{00}$

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XY trace plot of minimally processed magnetometer data; Sector 3

Fig. 11

Title

SECTOR BOUNDARY

15.0 nT/cm

0 50m

1:1500 @ A3

N

Area 2

Hotel

50m

43m

FFB1

3748$_{00}$

3746$_{00}$

4482$_{00}$

4650$_{00}$

4652$_{00}$

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XY trace plot of minimally processed magnetometer data; Sector 3

Fig. 11

Interpretation

- FERROUS
- AGRICULTURAL
- UNCERTAIN
- MAGNETIC DISTURBANCE
- ?GREEN WASTE
- FORMER FIELD BOUNDARY
- GEOLOGY

0 50m

1:1500 @ A3

Area 3

N

3750$_{00}$

3748$_{00}$

3746$_{00}$

4482$_{00}$

4534$_{00}$

4656$_{00}$

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Processed greyscale magnetometer data; Sector 4

Fig. 13

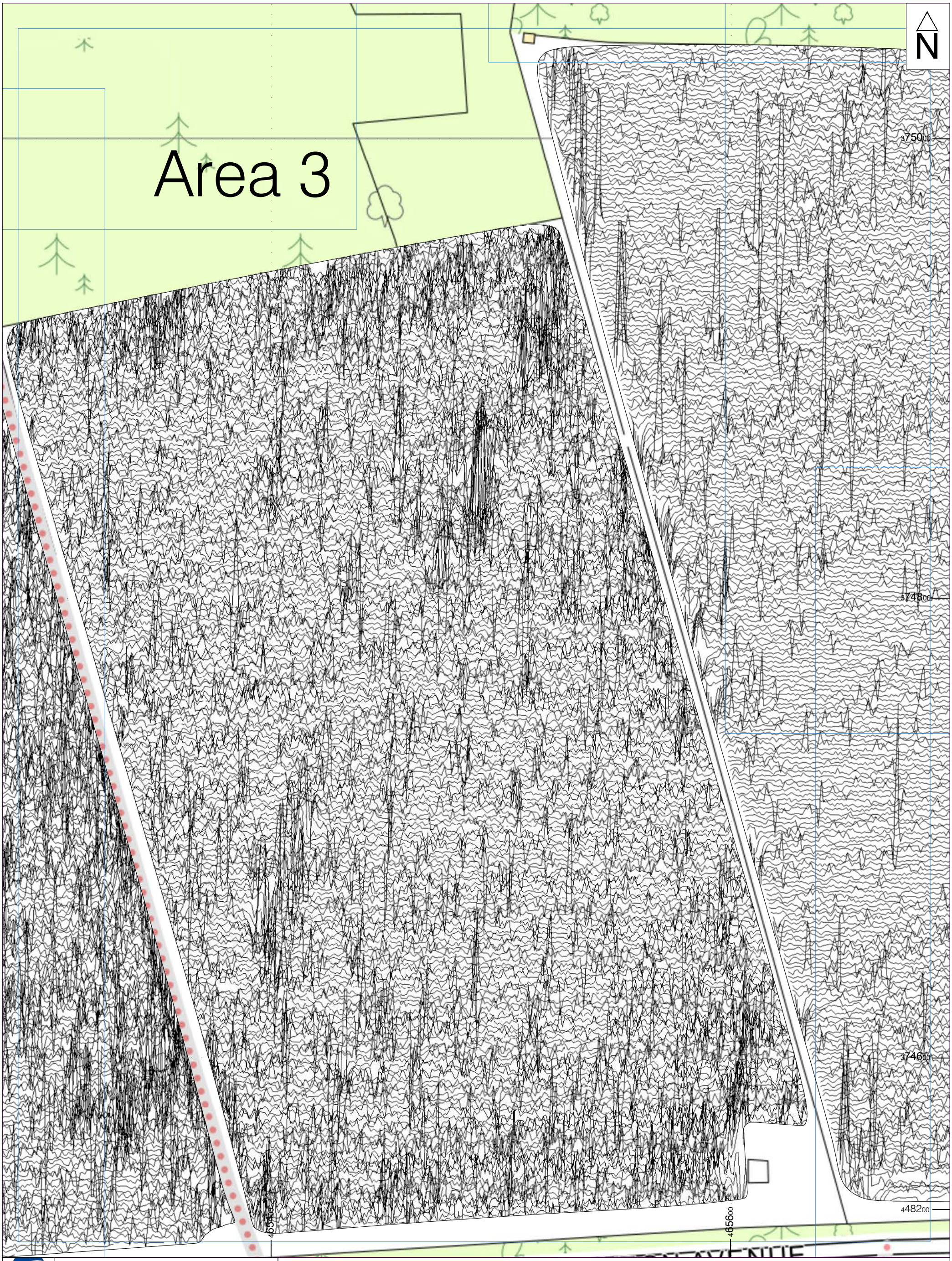
Title

SECTOR BOUNDARY

-1.0 2.0
nT

0 50m

1:1500 @ A3



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XY trace plot of minimally processed magnetometer data; Sector 4

Fig. 14

Title

SECTOR BOUNDARY

15.0 nT/cm

0 50m

1:1500 @ A3

Area 3

N

3750$_{00}$

U2

3748$_{00}$

A2

3746$_{00}$

4654$_{00}$

4656$_{00}$

4482$_{00}$

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Interpretation of magnetometer data;
Sector 4

Fig. 15

Interpretation

- FERROUS
- SERVICE PIPE
- MAGNETIC DISTURBANCE
- AGRICULTURAL
- ?GREEN WASTE
- FORMER FIELD BOUNDARY
- GEOLOGY
- UNCERTAIN
- ARCHAEOLOGY

0 50m

1:1500 @ A3

N

Track

Area 4

40m

43m

3748$_{00}$

3746$_{00}$

465$_{800}$

466$_{000}$

466$_{200}$

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Processed greyscale magnetometer data; Sector 5

Fig. 16

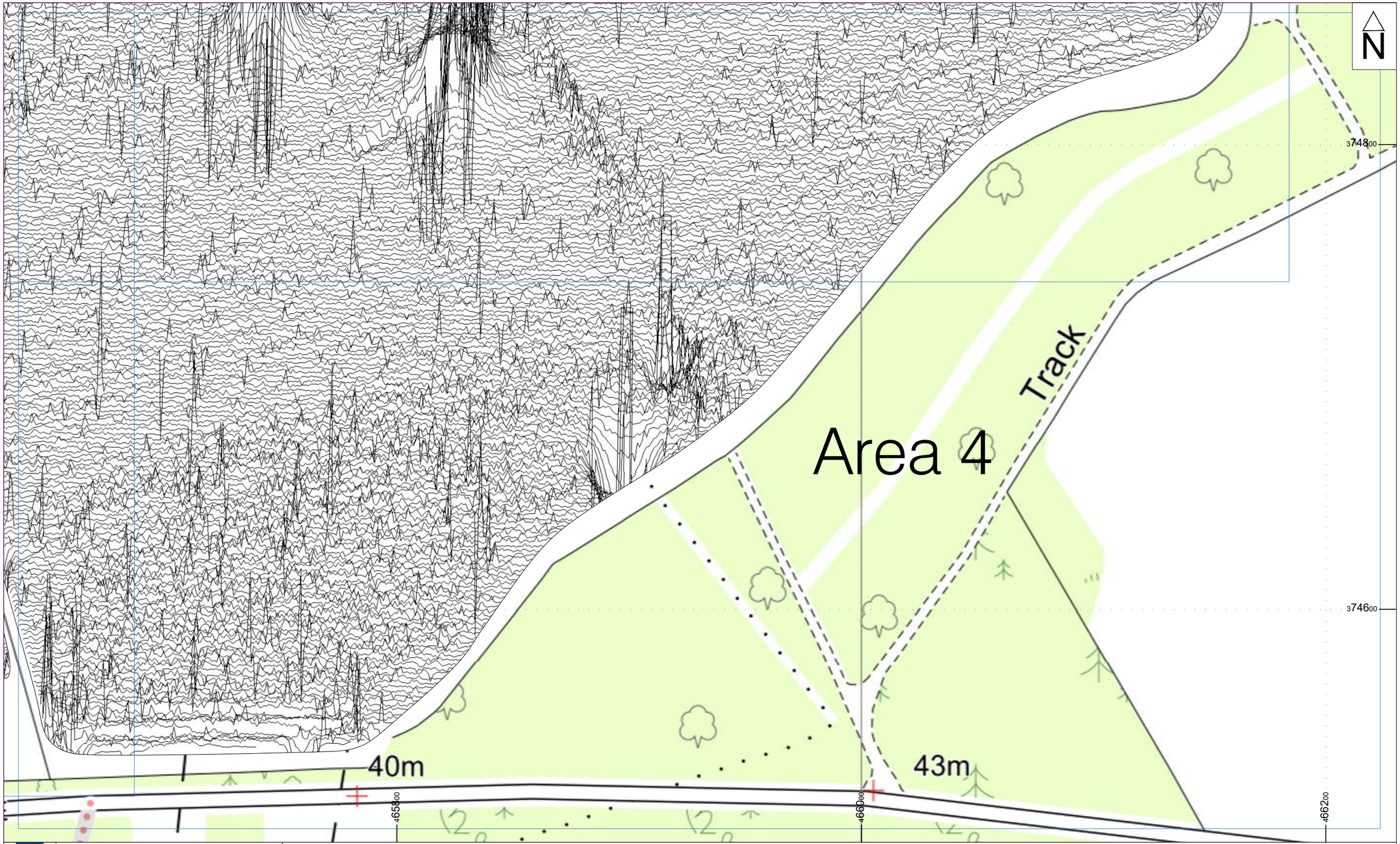
Title

SECTOR BOUNDARY

nT -1.0 2.0

0 50m

1:1500 @ A3



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XY trace plot of minimally processed magnetometer data; Sector 5

Fig. 17

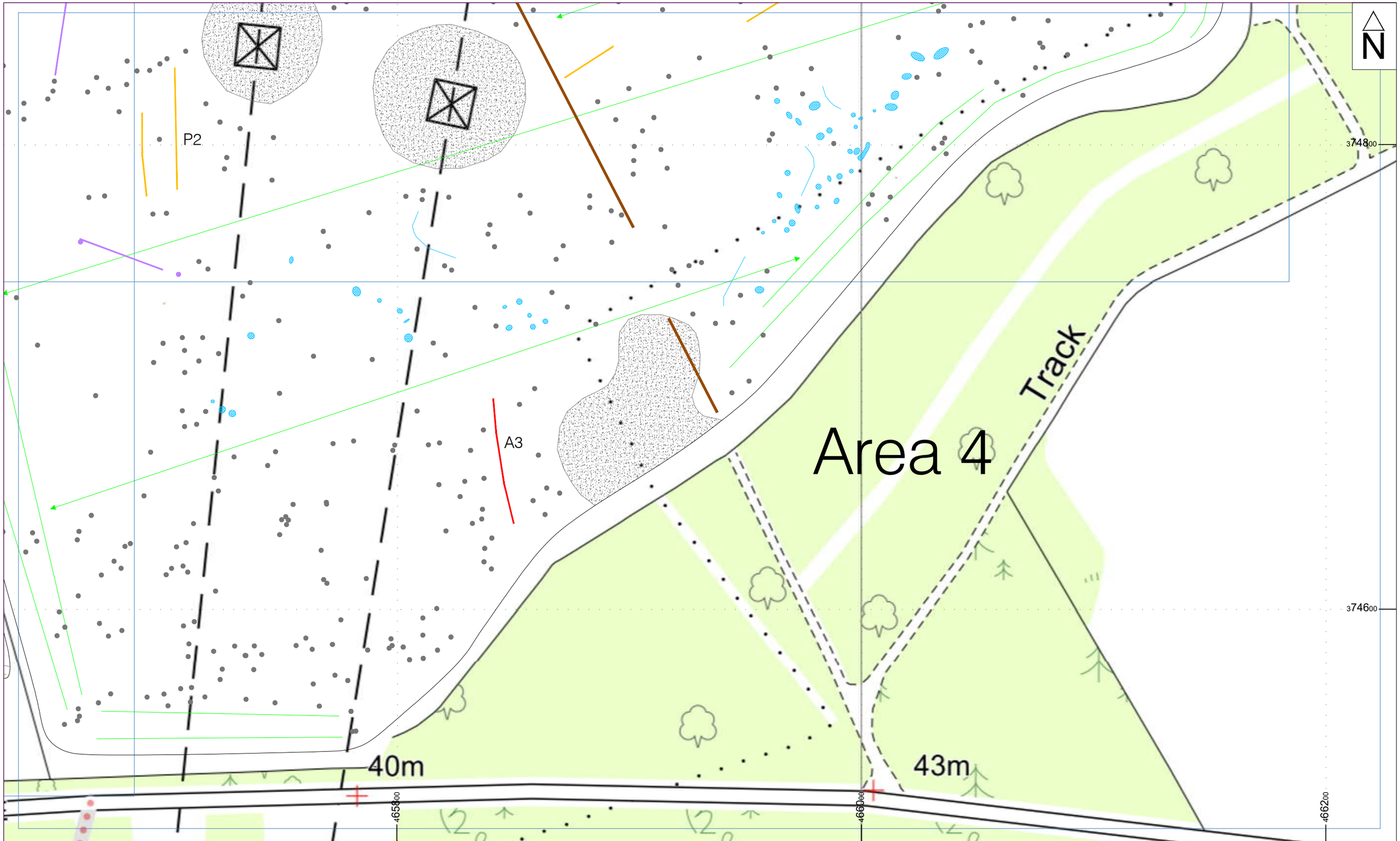
Title

SECTOR BOUNDARY

15.0 nT/cm

0 50m

1:1500 @ A3



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Interpretation of magnetometer data; Sector 5

Fig. 18

Title

- SECTOR BOUNDARY

Interpretation

- FERROUS
- MAGNETIC DISTURBANCE
- AGRICULTURAL
- ?GREEN WASTE
- FORMER FIELD BOUNDARY
- GEOLOGY
- UNCERTAIN
- ARCHAEOLOGY?
- ARCHAEOLOGY

0 50m

1:1500 @ A3

Track

N

3750 00

3748 00

466 00

466 80 00

466 60 00

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Processed greyscale magnetometer data; Sector 6

Fig. 19

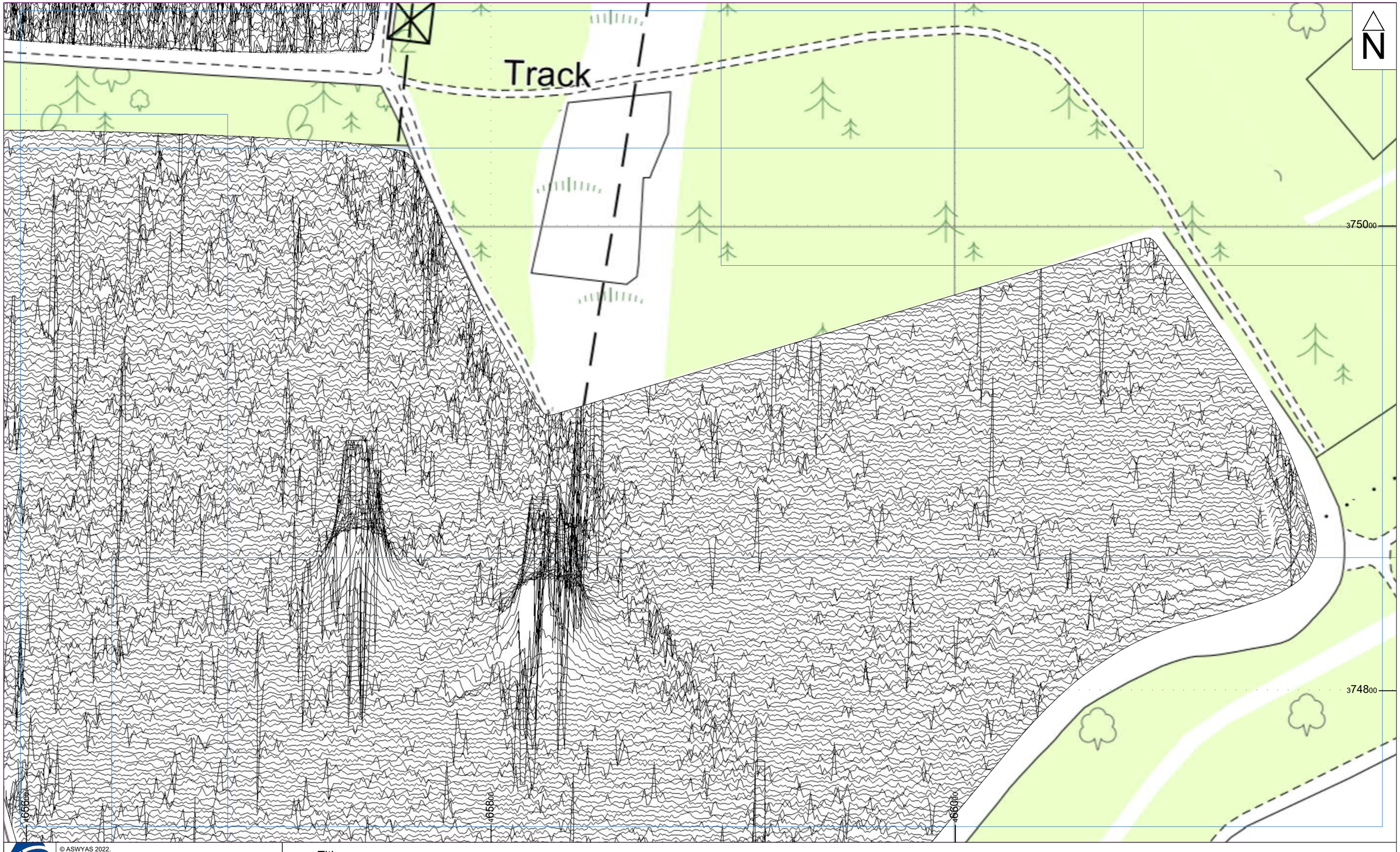
Title

SECTOR BOUNDARY

-1.0 2.0
nT

0 50m

1:1500 @ A3



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XY trace plot of minimally processed magnetometer data; Sector 6

Fig. 20

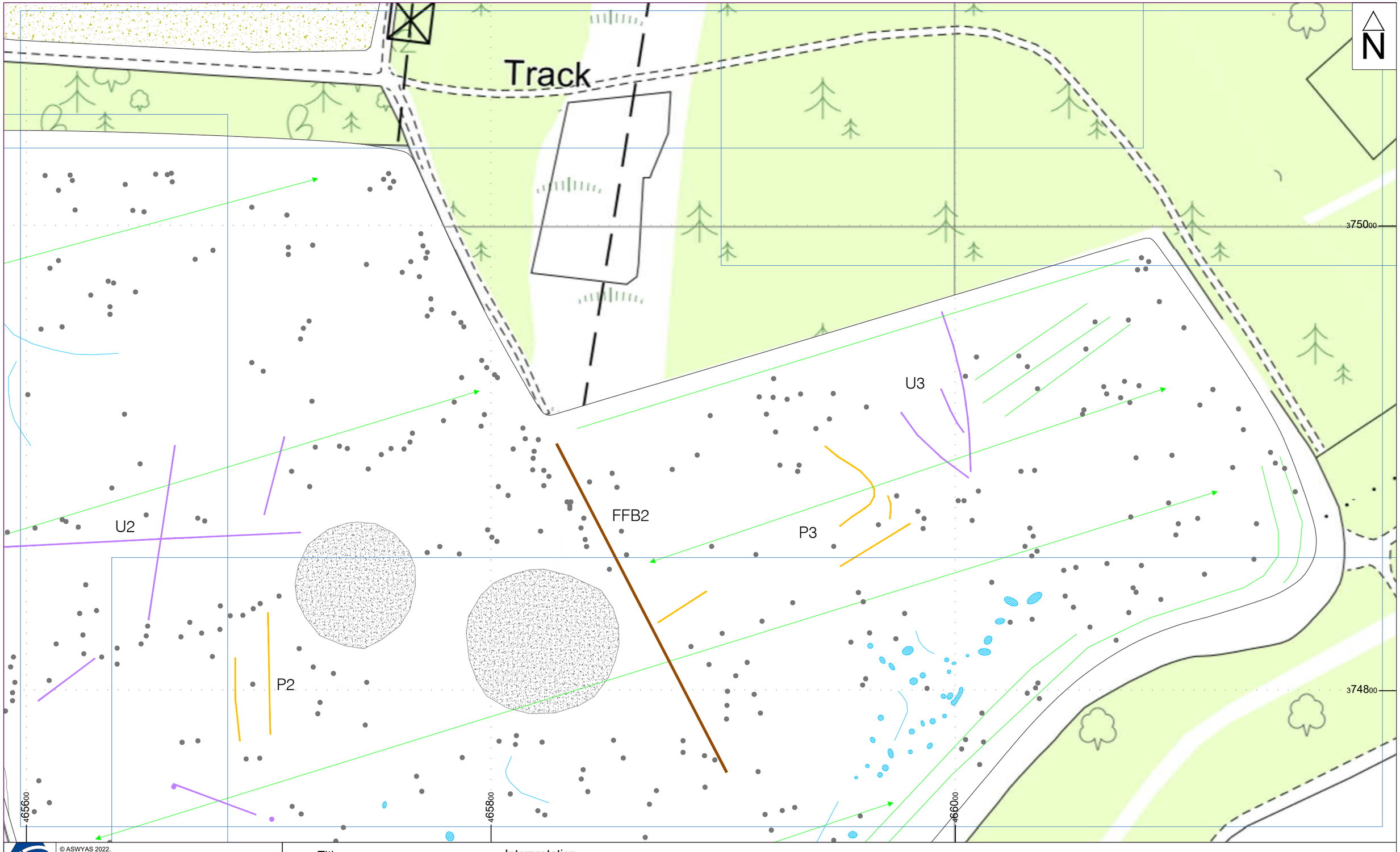
Title

SECTOR BOUNDARY

15.0 nT/cm

0 50m

1:1500 @ A3



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Interpretation of magnetometer data; Sector 6

Fig. 21

Title

- SECTOR BOUNDARY

Interpretation

- FERROUS
- MAGNETIC DISTURBANCE
- AGRICULTURAL
- ?GREEN WASTE
- FORMER FIELD BOUNDARY
- GEOLOGY
- UNCERTAIN
- ARCHAEOLOGY?

0 50m

1:1500 @ A3

Ppg Sta

Area 5

N

375600

375400

460000

465900

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Processed greyscale magnetometer data; Sector 7

Fig. 22

Title

SECTOR BOUNDARY

nT -1.0 2.0

0 50m

1:1500 @ A3

Ppg Sta

Area 5

N

3756^{00}

3754^{00}

4656^{00}

4658^{00}

4660^{00}

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XY trace plot of minimally processed magnetometer data; Sector 7

Fig. 23

Title

SECTOR BOUNDARY

15.0 nT/cm

0 50m

1:1500 @ A3

Area 5

Ppg Sta

N

3756^{00}

3754^{00}

4656^{00}

4658^{00}

4660^{00}

FFB4

U4

F1

FFB3

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Interpretation of magnetometer data; Sector 7

Fig. 24

Title

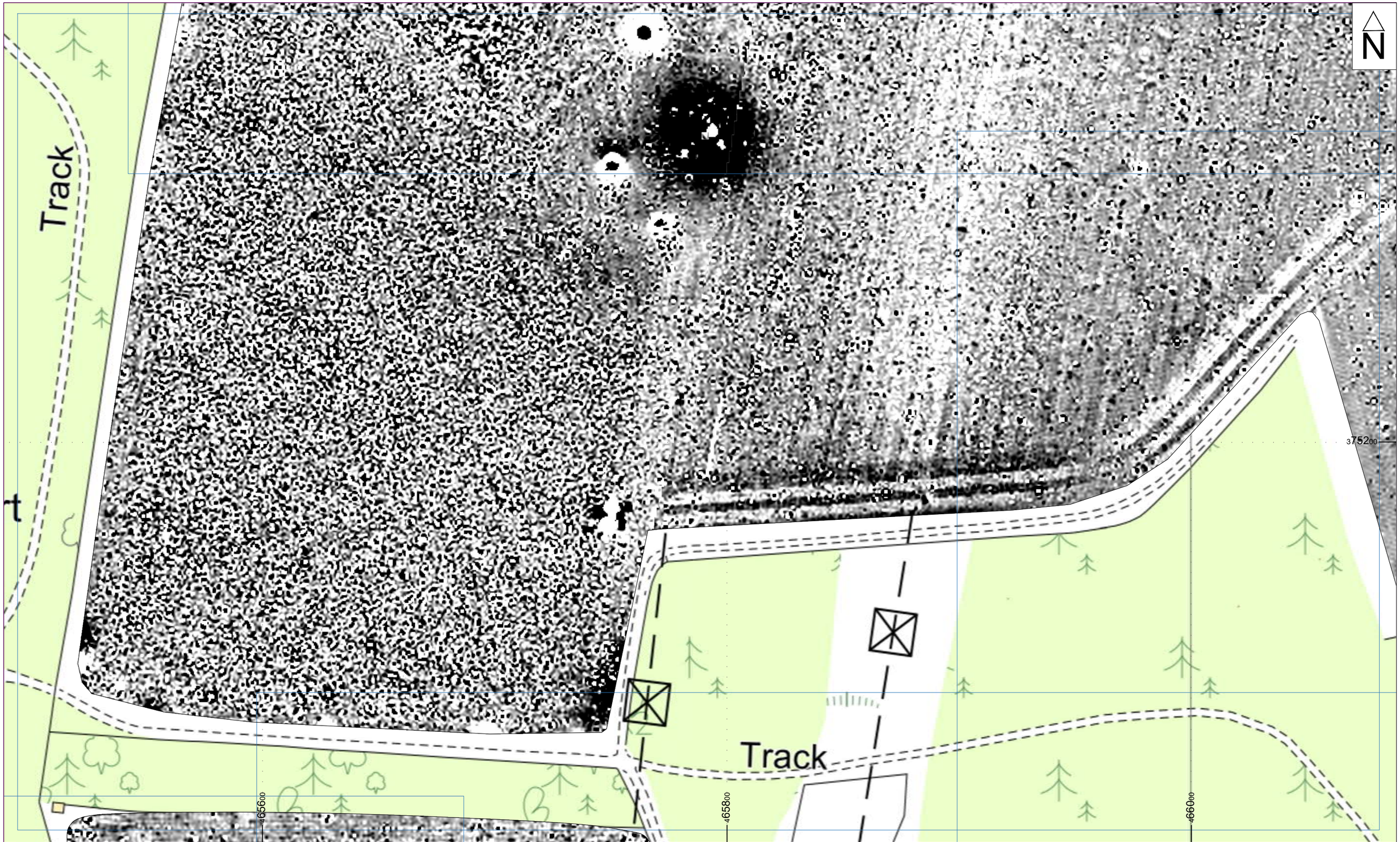
- SECTOR BOUNDARY

Interpretation

- FERROUS
- MAGNETIC DISTURBANCE
- AGRICULTURAL
- FORMER FIELD BOUNDARY
- ?GREEN WASTE
- UNCERTAIN

0 50m

1:1500 @ A3



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Processed greyscale magnetometer data; Sector 8

Fig. 25

Title

SECTOR BOUNDARY

nT -1.0 2.0

0 50m

1:1500 @ A3

N

Track

Track

752000

466000

465800

466000

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XY trace plot of minimally processed magnetometer data; Sector 8

Fig. 26

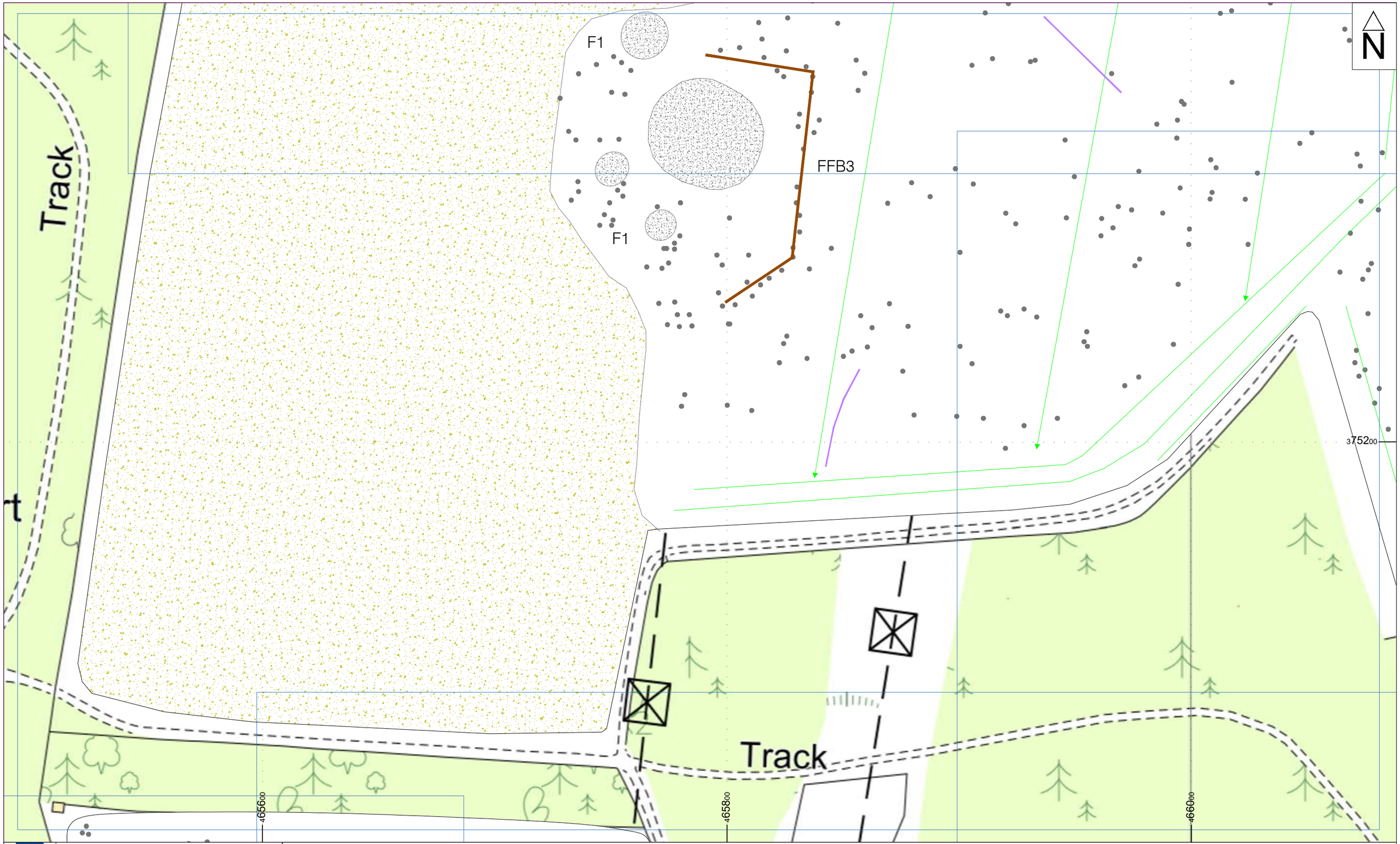
Title

SECTOR BOUNDARY

15.0 nT/cm

0 50m

1:1500 @ A3



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Interpretation of magnetometer data; Sector 8

Fig. 27

Title

- SECTOR BOUNDARY

Interpretation

- FERROUS
- ?GREEN WASTE
- MAGNETIC DISTURBANCE
- UNCERTAIN
- AGRICULTURAL

0 50m

1:1500 @ A3

N

3752 00

FBs

4656 00

4658 00

4660 00

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Processed greyscale magnetometer data; Sector 9

Fig. 28

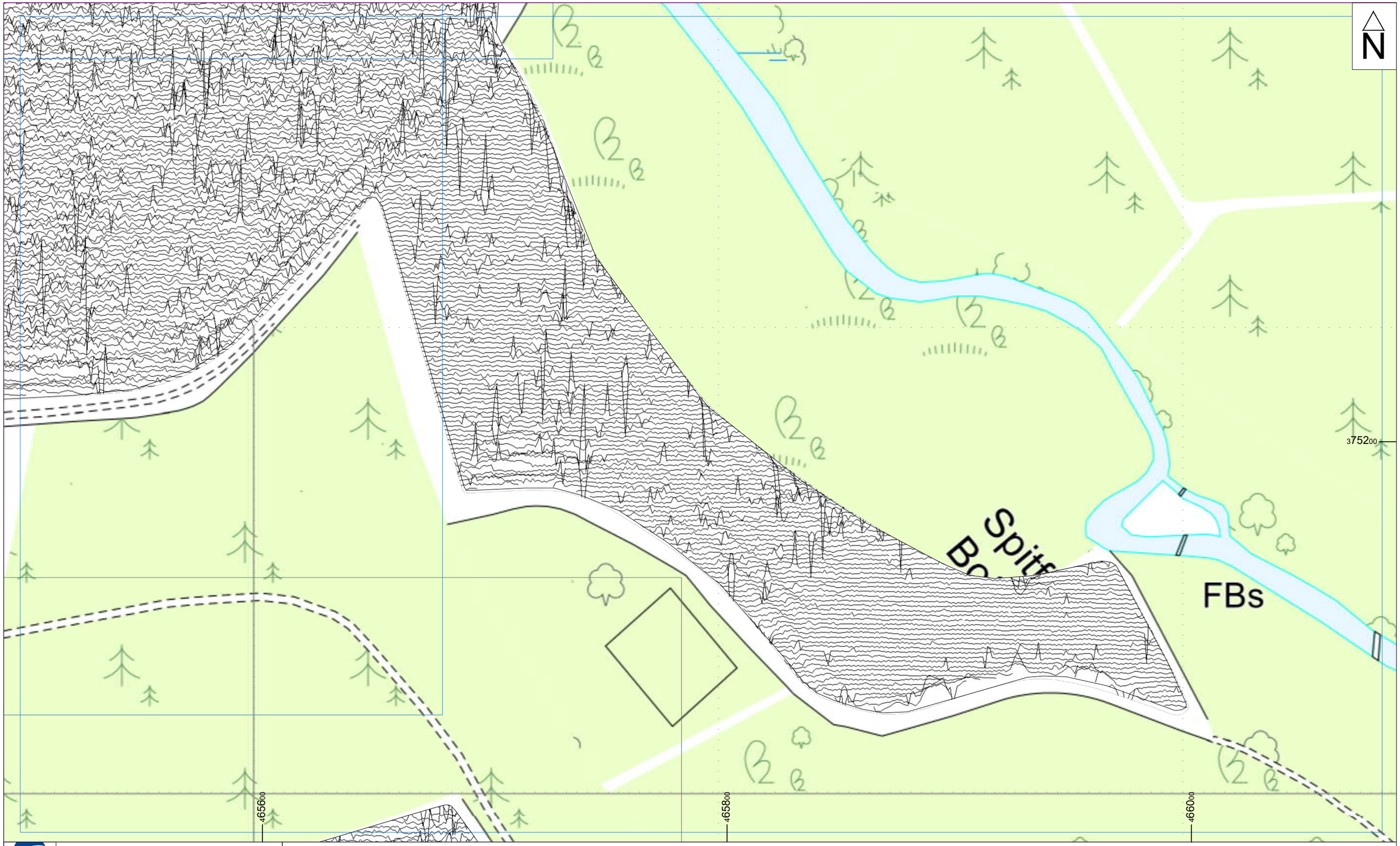
Title

SECTOR BOUNDARY

-1.0 2.0
nT

0 50m

1:1500 @ A3



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XY trace plot of minimally processed magnetometer data; Sector 9

Fig. 29

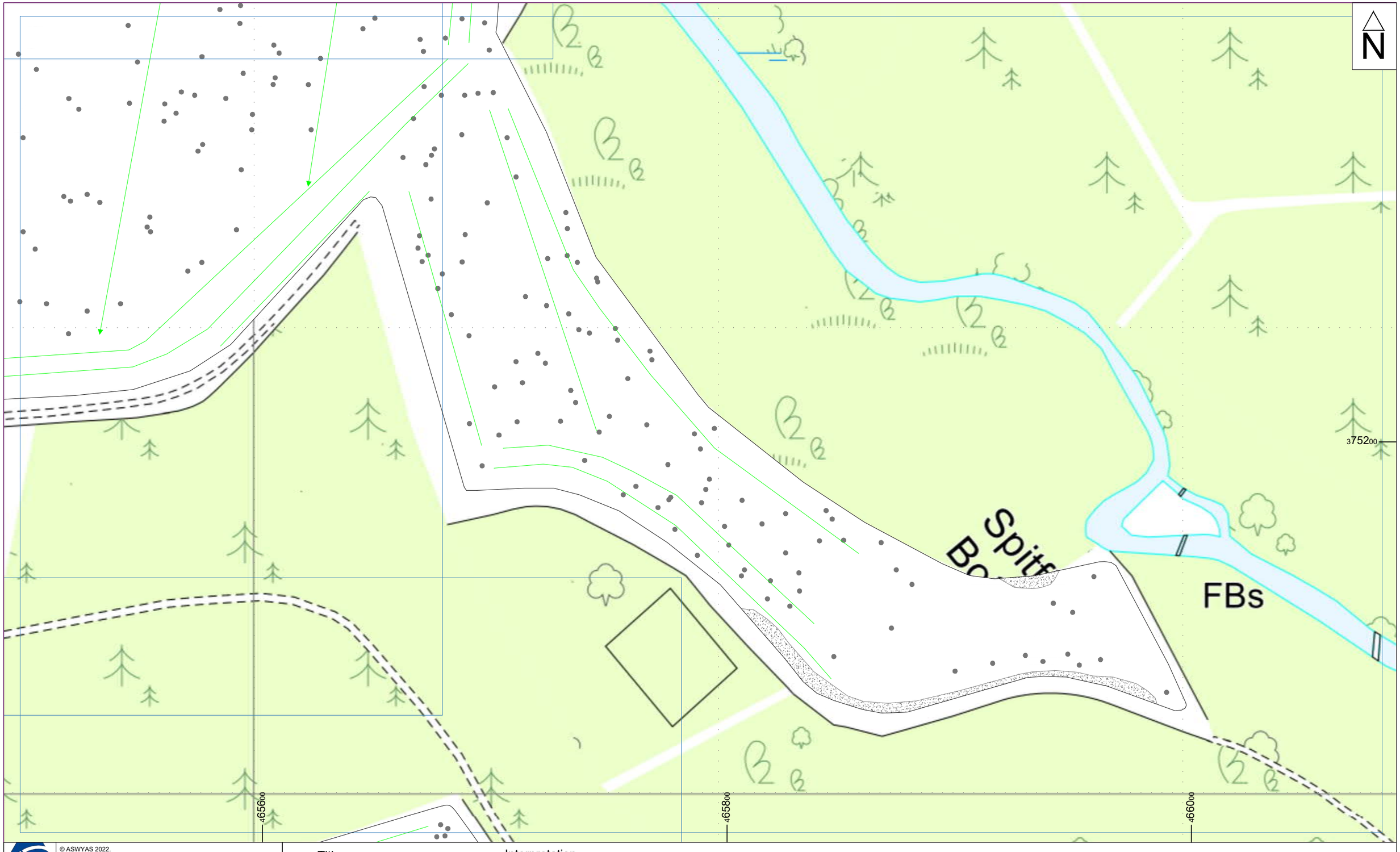
Title

SECTOR BOUNDARY

15.0 nT/cm

0 50m

1:1500 @ A3



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Interpretation of magnetometer data; Sector 9

Fig. 30

Title

- SECTOR BOUNDARY

Interpretation

- FERROUS
- MAGNETIC DISTURBANCE
- AGRICULTURAL

0 50m

1:1500 @ A3

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Cropmarks and processed magnetometer data

Fig. 31

Title

CROPMARKS

nT -1.0 2.0

0 200m

1:7500 @ A3

Plate 1. General view of Area 1, looking northwest

Plate 2. General view of Area 1, looking west

Plate 3. General view of Area 2, looking southeast

Plate 4. General view of Area 2, looking northwest

Plate 5. General view of Area 3, looking southeast

Plate 6. General view of Area 3, looking northeast

Plate 7. General view of Area 4, looking southwest

Plate 8. General view of Area 4, looking northeast

Plate 9. General view of Area 5, looking north

Plate 10. General view of Area 5, looking northeast

Plate 11. General view of Area 5, looking north

Plate 12. General view of Area 5, looking northeast