

Green Hill Solar Farm

EN010170

Environmental Statement

Appendix 12.4: Archaeological

Geophysical Survey Reports

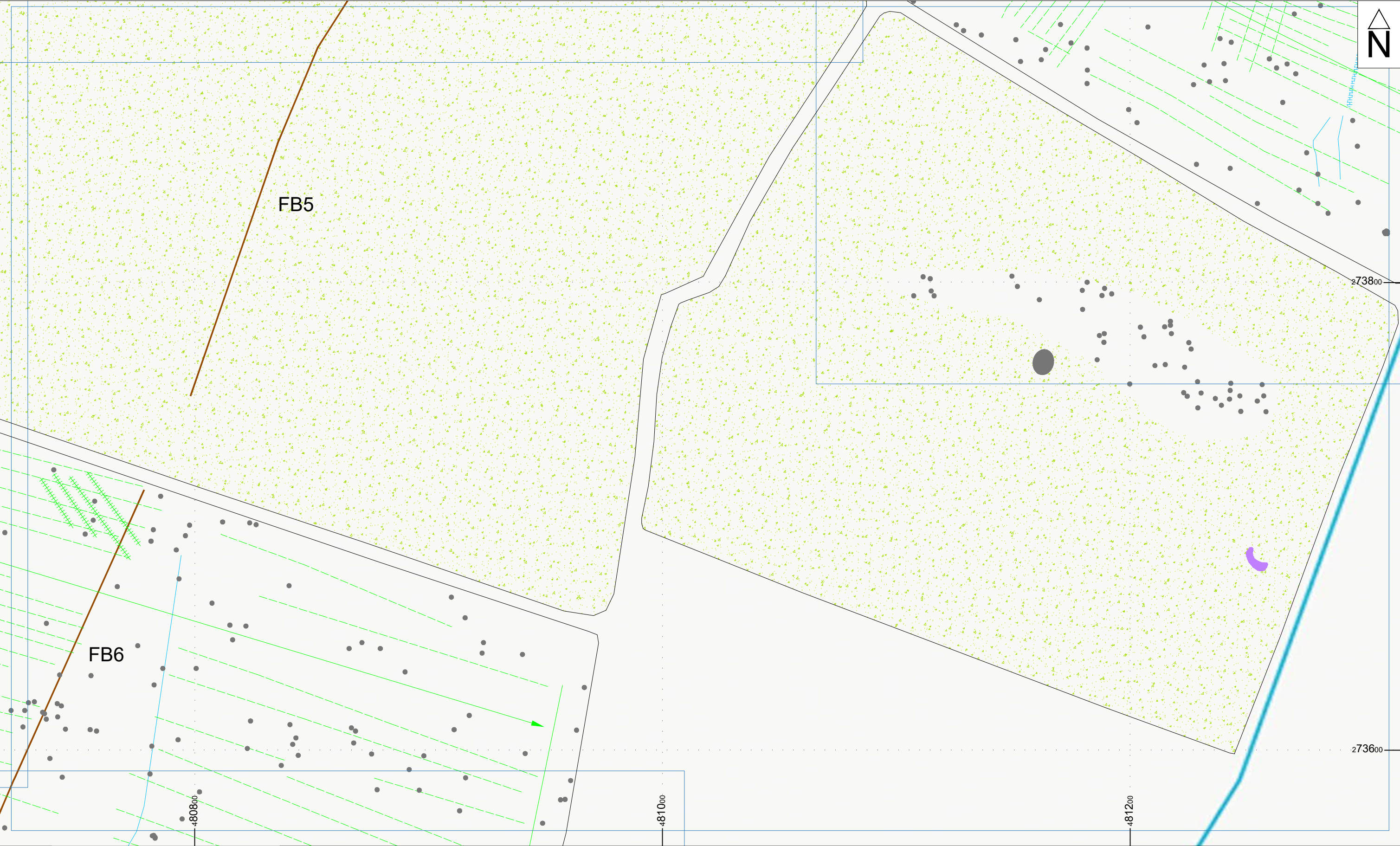
(Part 2 of 10)

Prepared by: Lanpro

Date: May 2025

Document Reference: APP/GH6.3.12.4

APFP Regulation 5(2)(a)





© ASWYAS 2024.
Archaeological Services W Y A S,
Nepshaw Lane South, Morley, LS27 7JQ
Tel: 0113 535 3007 Email: archaeology@wyjs.org.uk www.aswyas.com

Project ID: XK77_EXG23 Area A

Interpretation of magnetometer data; Sector 11

Reproduced from the Ordnance Survey mapping with the permission of the Controller of His Majesty's Stationery Office.
© Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings.
Wakefield Metropolitan District Council licence 100019574, 2024.

Fig. 37

Title

SECTOR BOUNDARY

Interpretation

	FERROUS		RIDGE & FURROW		GEOLOGY
	GREEN WASTE		AGRICULTURAL		UNCERTAIN
	FIELD DRAIN		FORMER FIELD BOUNDARY		

0

50m

1:1500 @ A3



Title

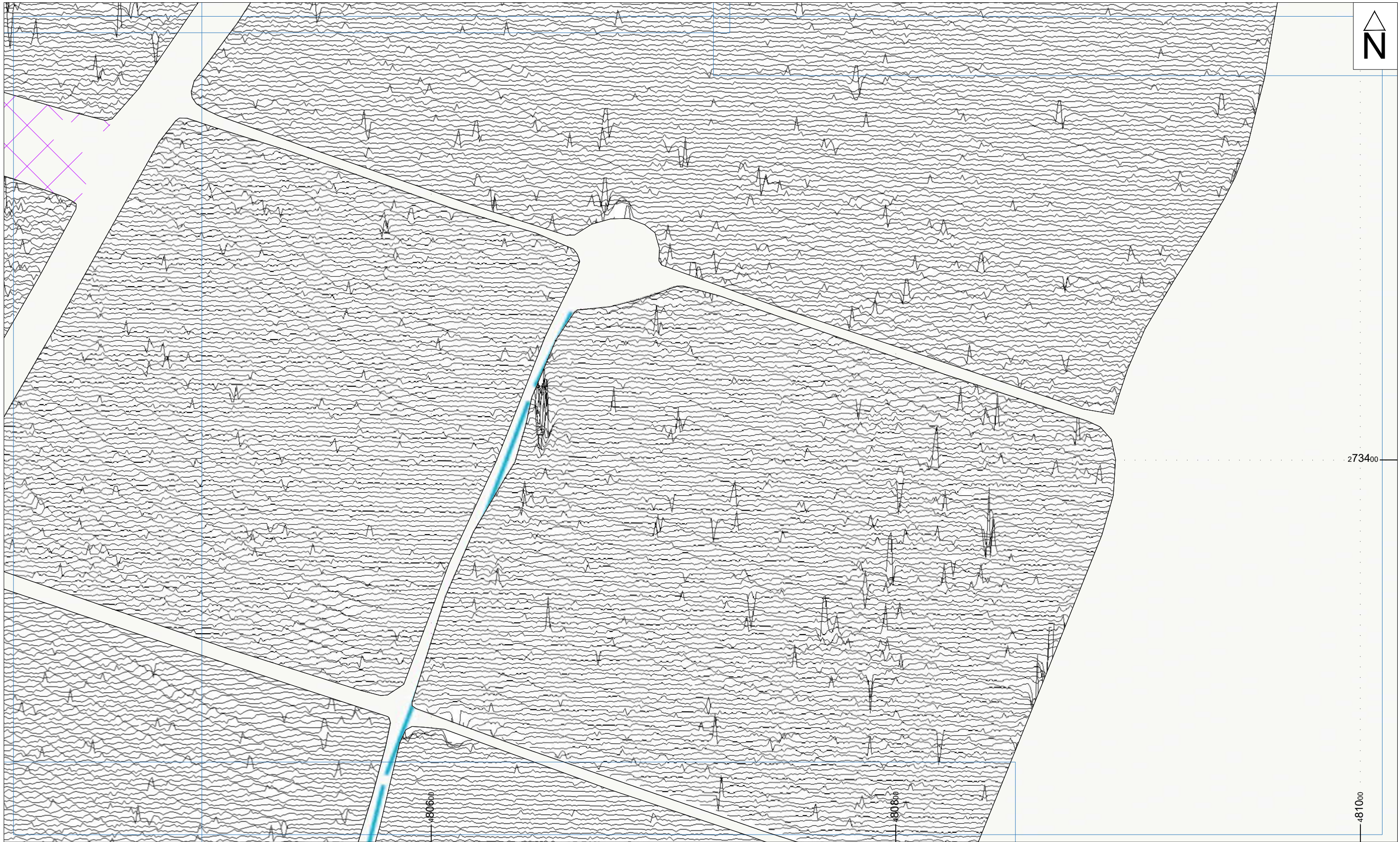
 SECTOR BOUNDARY



0 50m

1:1500 @ A3

Fig. 38





© ASWYAS 2024.
Archaeological Services W Y A S,
Nepshaw Lane South, Morley, LS27 7JQ
Tel: 0113 535 3007 Email: archaeology@wyjs.org.uk www.aswyas.com

Project ID: XK77_EXG23 Area A

XY trace plot of minimally processed magnetometer data;
Sector 12

Reproduced from the Ordnance Survey mapping with the permission of the Controller of His Majesty's Stationery Office.
© Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings.
Wakefield Metropolitan District Council licence 100019574, 2024.

Fig. 39

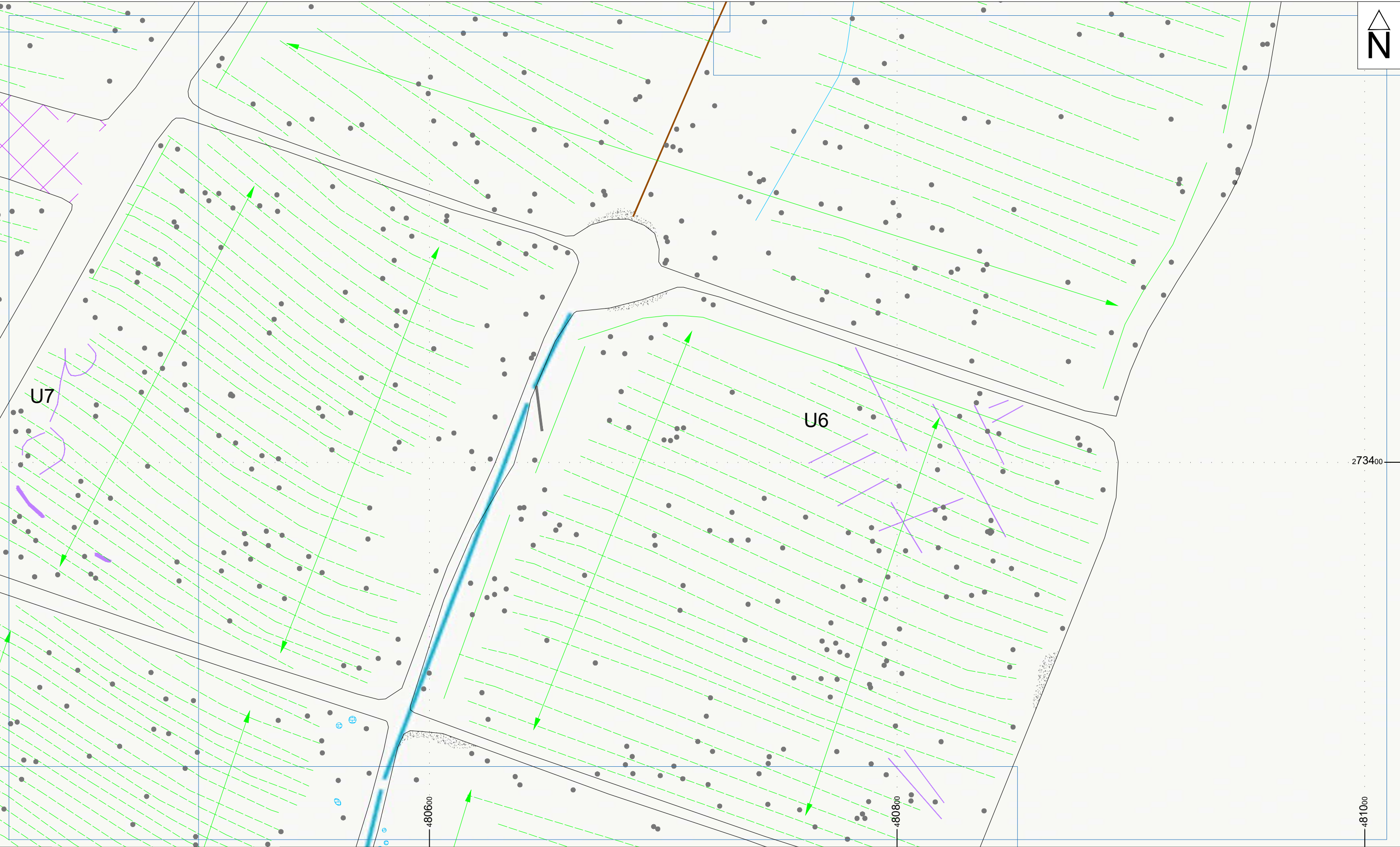
Title

SECTOR BOUNDARY

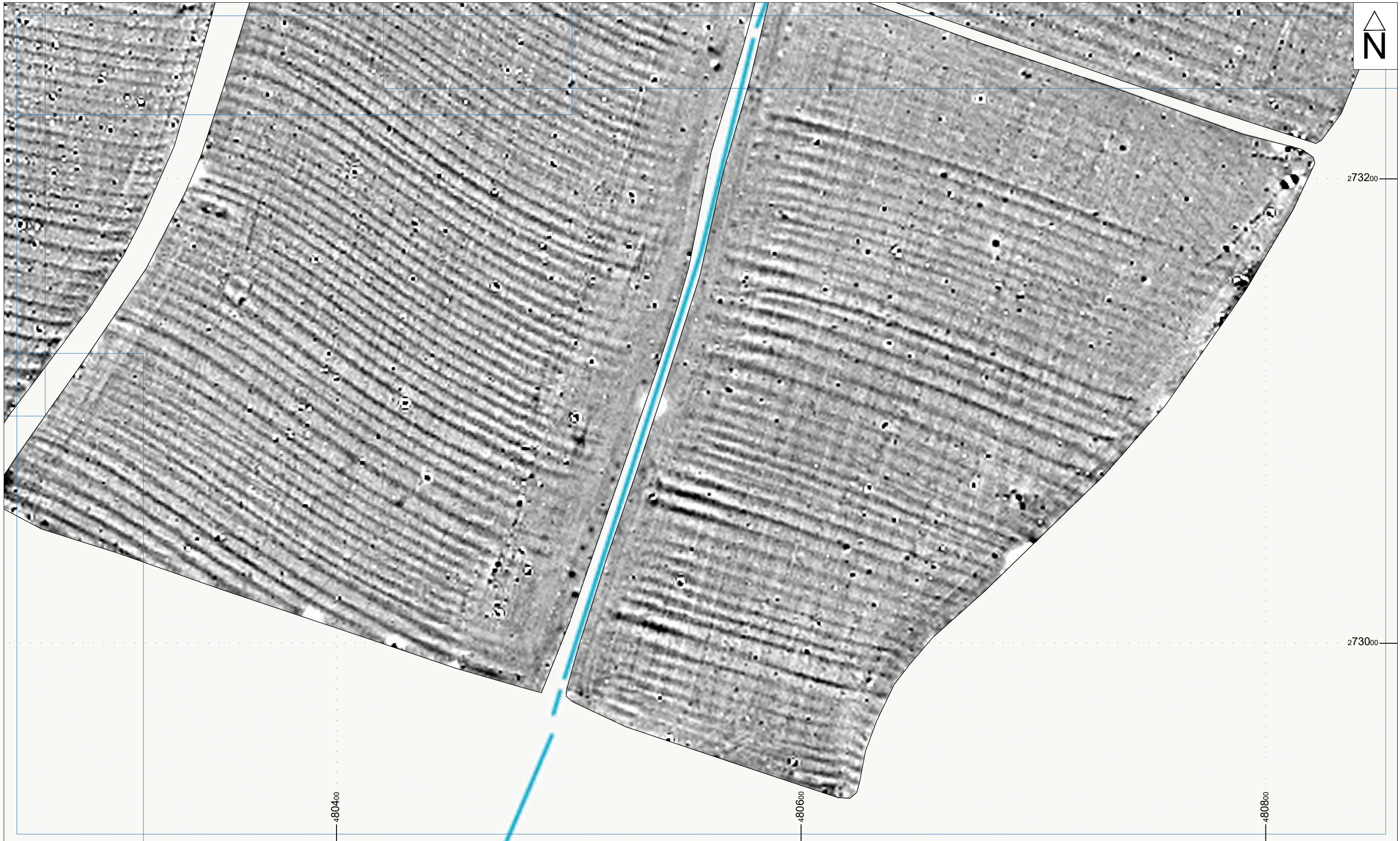
15.0 nT/cm

0 50m

1:1500 @ A3



Title		Interpretation			
	SECTOR BOUNDARY		FERROUS		RIDGE & FURROW
	SERVICE PIPE		AGRICULTURAL		GEOLOGY
	MAGNETIC DISTURBANCE		FORMER FIELD BOUNDARY		UNCERTAIN









© ASWYAS 2024.
Archaeological Services W Y A S,
Nepshaw Lane South, Morley, LS27 7JQ
Tel: 0113 535 3007 Email: archaeology@wyjs.org.uk www.aswyas.com

Project ID: XK77_EXG23 Area A

Interpretation of magnetometer data; Sector 13

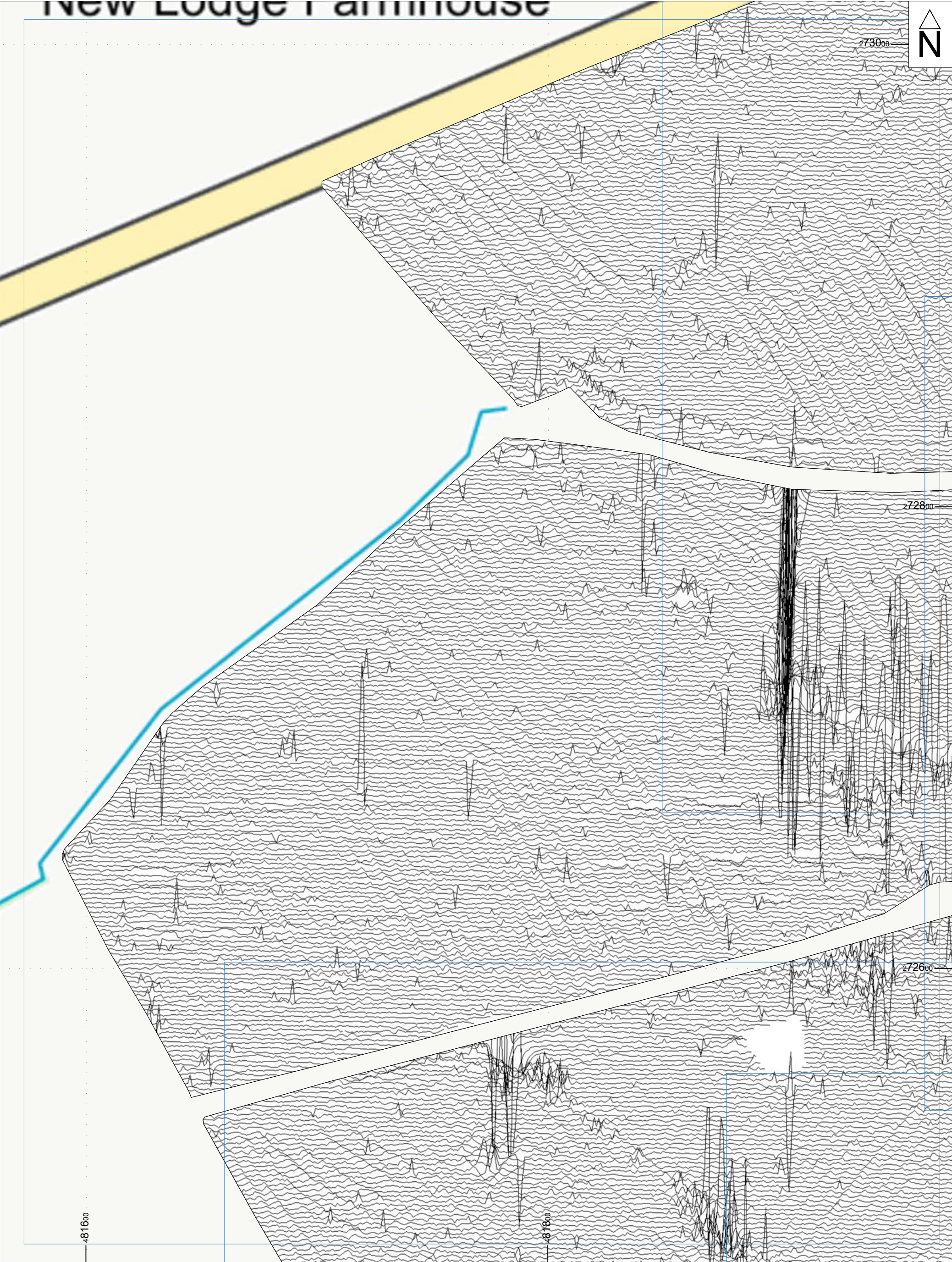
Reproduced from the Ordnance Survey mapping with the permission of the Controller of His Majesty's Stationery Office.
© Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings.
Wakefield Metropolitan District Council licence 100019574, 2024.

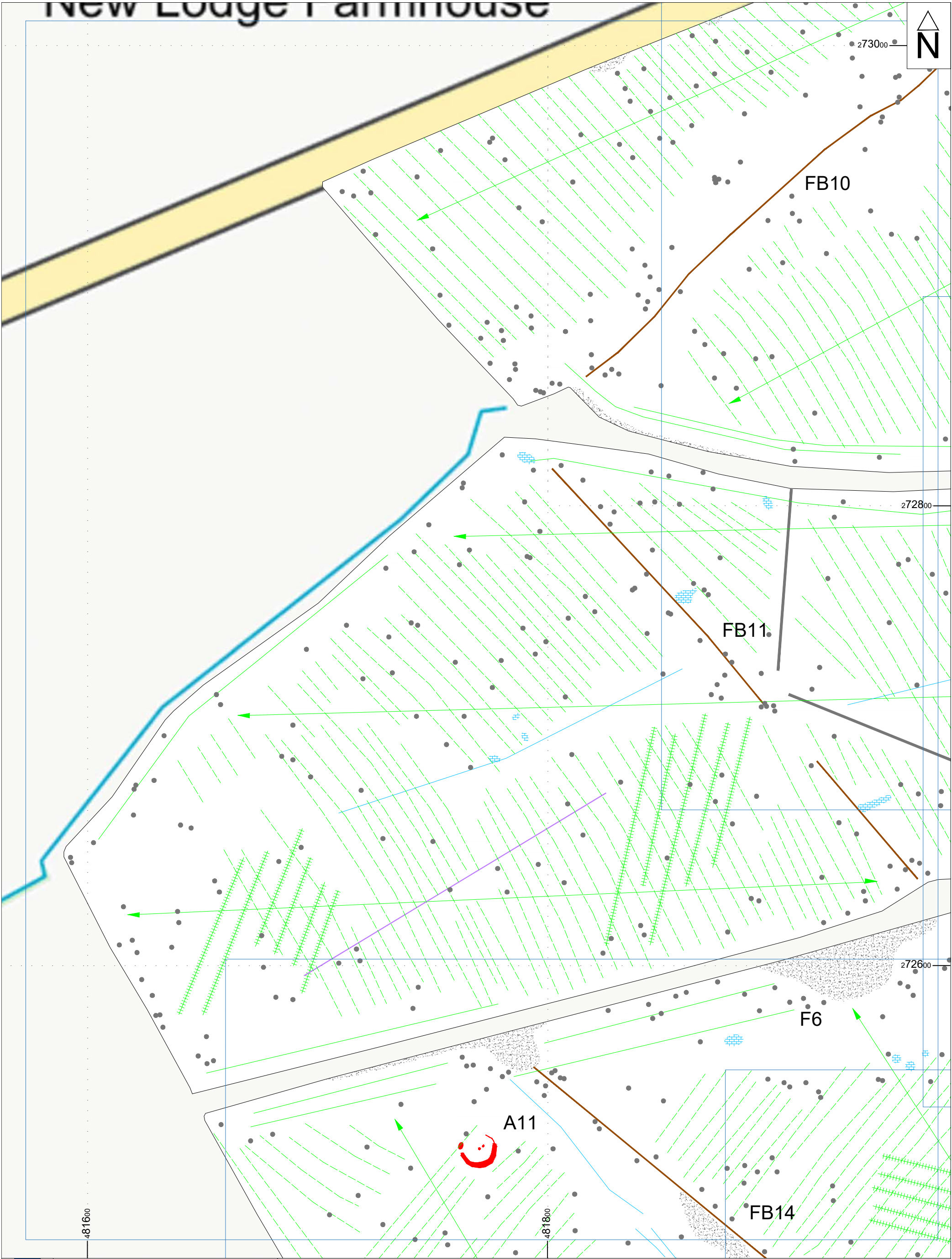
Fig. 43

Title		Interpretation			
	SECTOR BOUNDARY		FERROUS		RIDGE & FURROW
			MAGNETIC DISTURBANCE		AGRICULTURAL
			FIELD DRAIN		GEOLOGY
					UNCERTAIN

0 50m
1:1500 @ A3







Interpretation					
	FERROUS		RIDGE & FURROW		UNCERTAIN
	SERVICE PIPE		AGRICULTURAL		ARCHAEOLOGY
	MAGNETIC DISTURBANCE		FORMER FIELD BOUNDARY		
	FIELD DRAIN		GEOLOGY		





© ASWYAS 2024.
Archaeological Services W Y A S,
Nepshaw Lane South, Morley, LS27 7JQ
Tel: 0113 535 3007 Email: archaeology@wyjs.org.uk www.aswyas.com

Project ID: XK77_EXG23 Area A

Processed greyscale magnetometer data; Sector 15

Reproduced from the Ordnance Survey mapping with the permission of the Controller of His Majesty's Stationery Office.
© Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings.
Wakefield Metropolitan District Council licence 100019574, 2024.

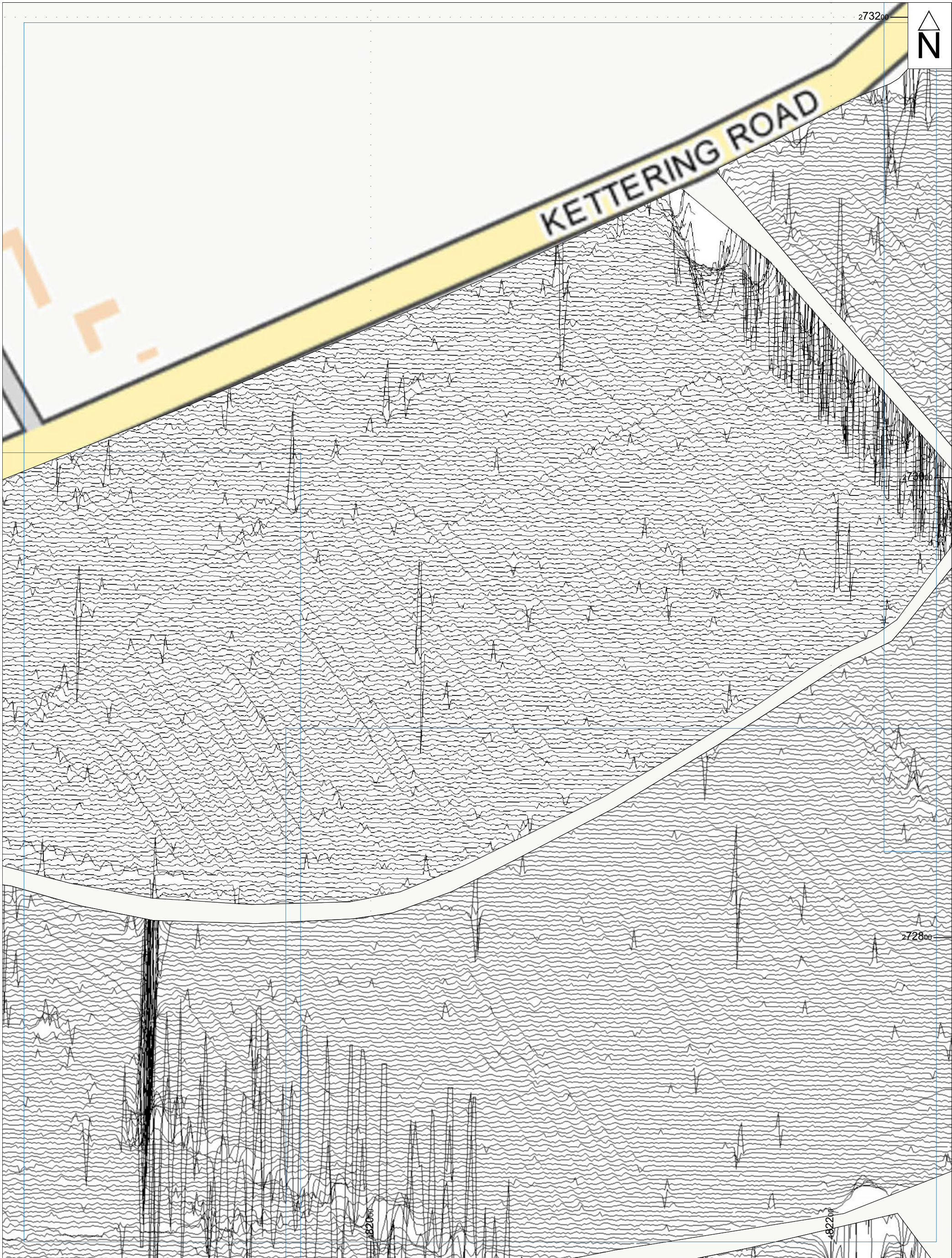
Fig. 47

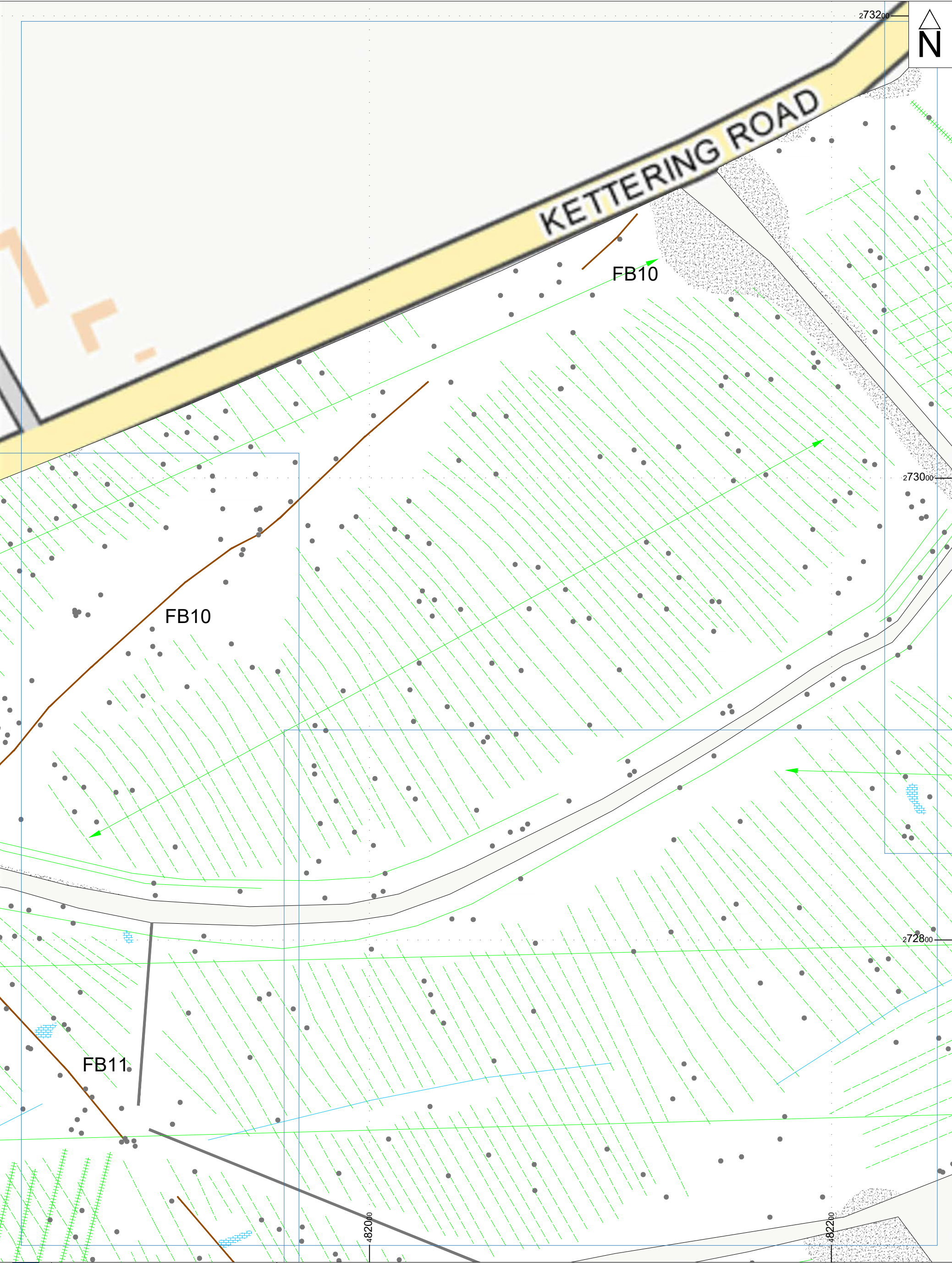
Title

SECTOR BOUNDARY



1:1500 @ A3







© ASWYAS 2024.
Archaeological Services W Y A S,
Nepshaw Lane South, Morley, LS27 7JQ
Tel: 0113 535 3007 Email: archaeology@wyjs.org.uk www.aswyas.com

Project ID: XK77_EXG23 Area A

Interpretation of magnetometer data; Sector 15

Reproduced from the Ordnance Survey mapping with the permission of the Controller of His Majesty's Stationery Office.
© Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings.
Wakefield Metropolitan District Council licence 100019574, 2024.

Fig. 49

Interpretation			
	FERROUS		RIDGE & FURROW
	SERVICE PIPE		AGRICULTURAL
	MAGNETIC DISTURBANCE		FORMER FIELD BOUNDARY
	FIELD DRAIN		GEOLOGY

0 50m

1:1500 @ A3





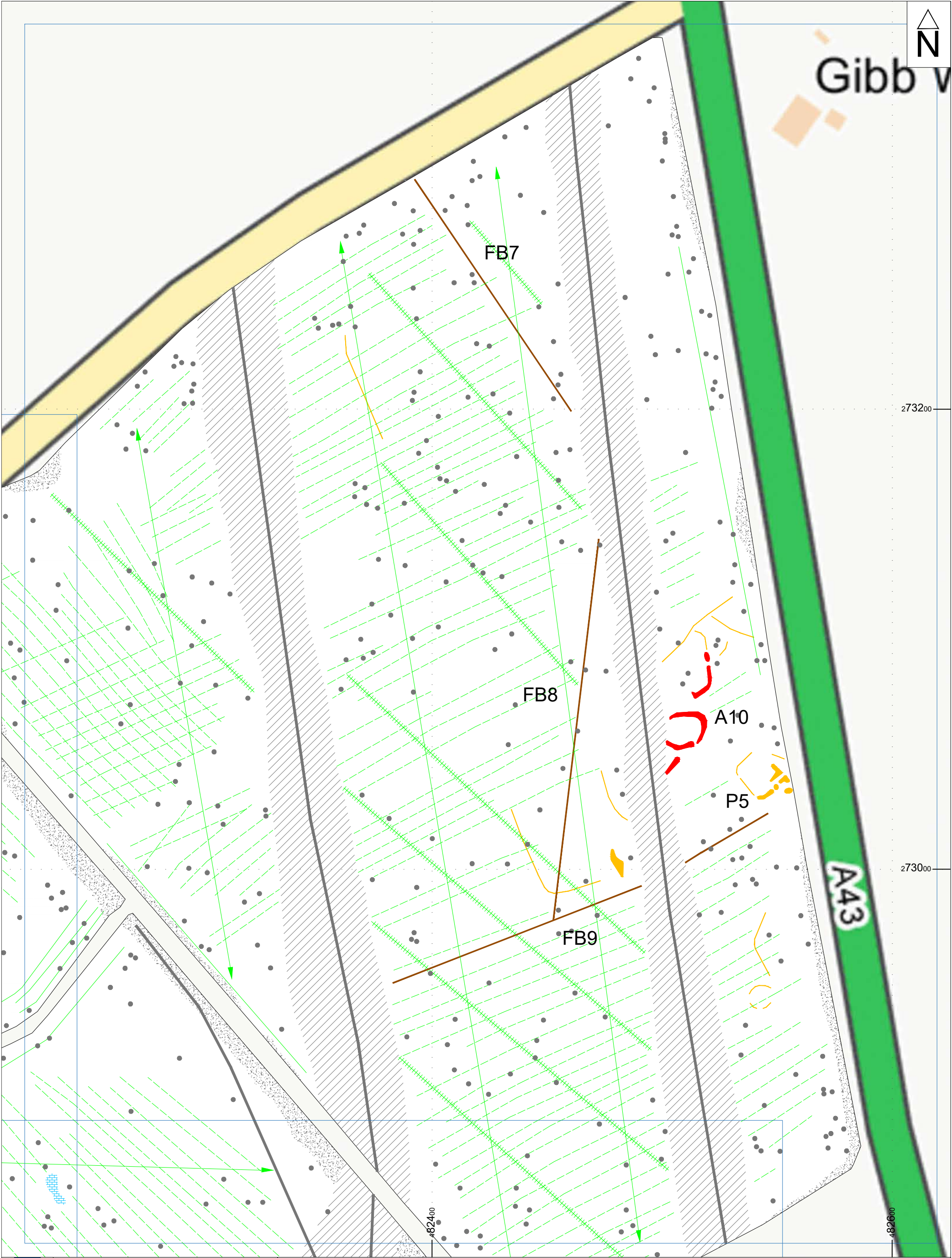
Title

SECTOR BOUNDARY

15.0 nT/cm

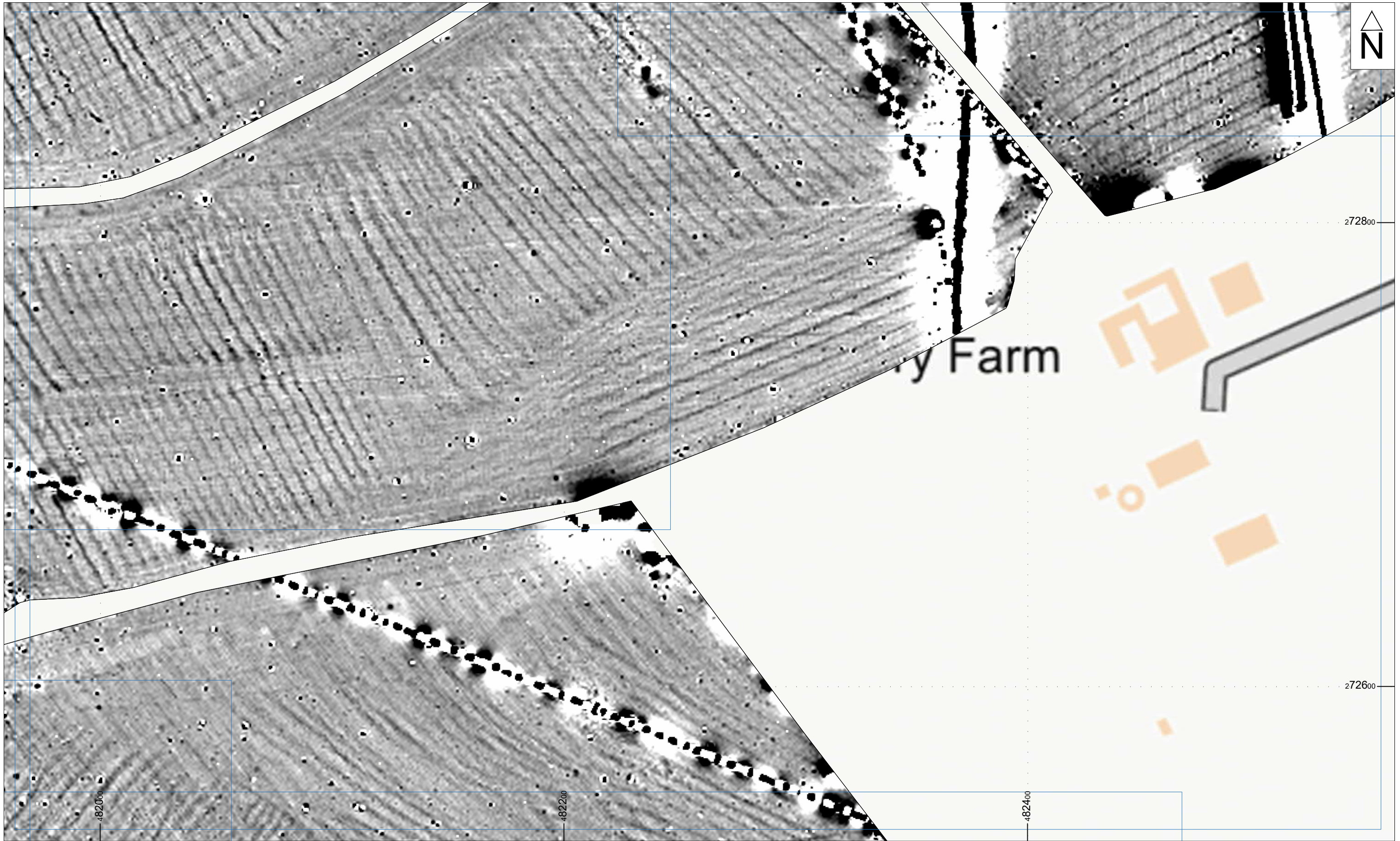
0 50m

1:1500 @ A3



Interpretation

	FERROUS		RIDGE & FURROW		ARCHAEOLOGY?
	SERVICE PIPE		AGRICULTURAL		ARCHAEOLOGY
	MAGNETIC DISTURBANCE		FORMER FIELD BOUNDARY		
	FIELD DRAIN		GEOLOGY		





© ASWYAS 2024.
Archaeological Services W Y A S,
Nepshaw Lane South, Morley, LS27 7JQ
Tel: 0113 535 3007 Email: archaeology@wyjs.org.uk www.aswyas.com

Project ID: XK77_EXG23 Area A

Processed greyscale magnetometer data; Sector 17

Reproduced from the Ordnance Survey mapping with the permission of the Controller of His Majesty's Stationery Office.
© Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings.
Wakefield Metropolitan District Council licence 100019574, 2024.

Fig. 53

Title

 SECTOR BOUNDARY

nT

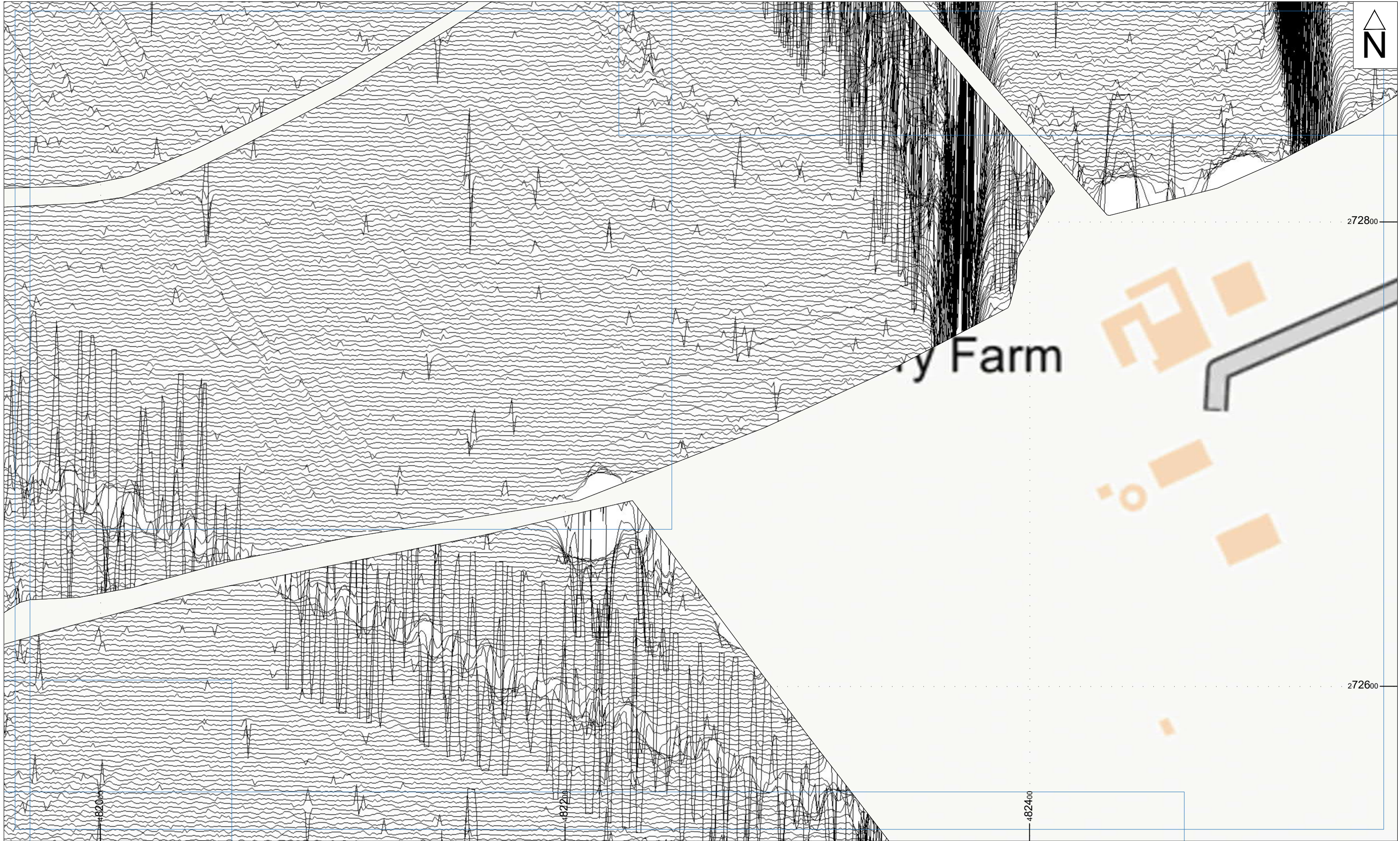
-1.0

2.0

0

50m

1:1500 @ A3



Title

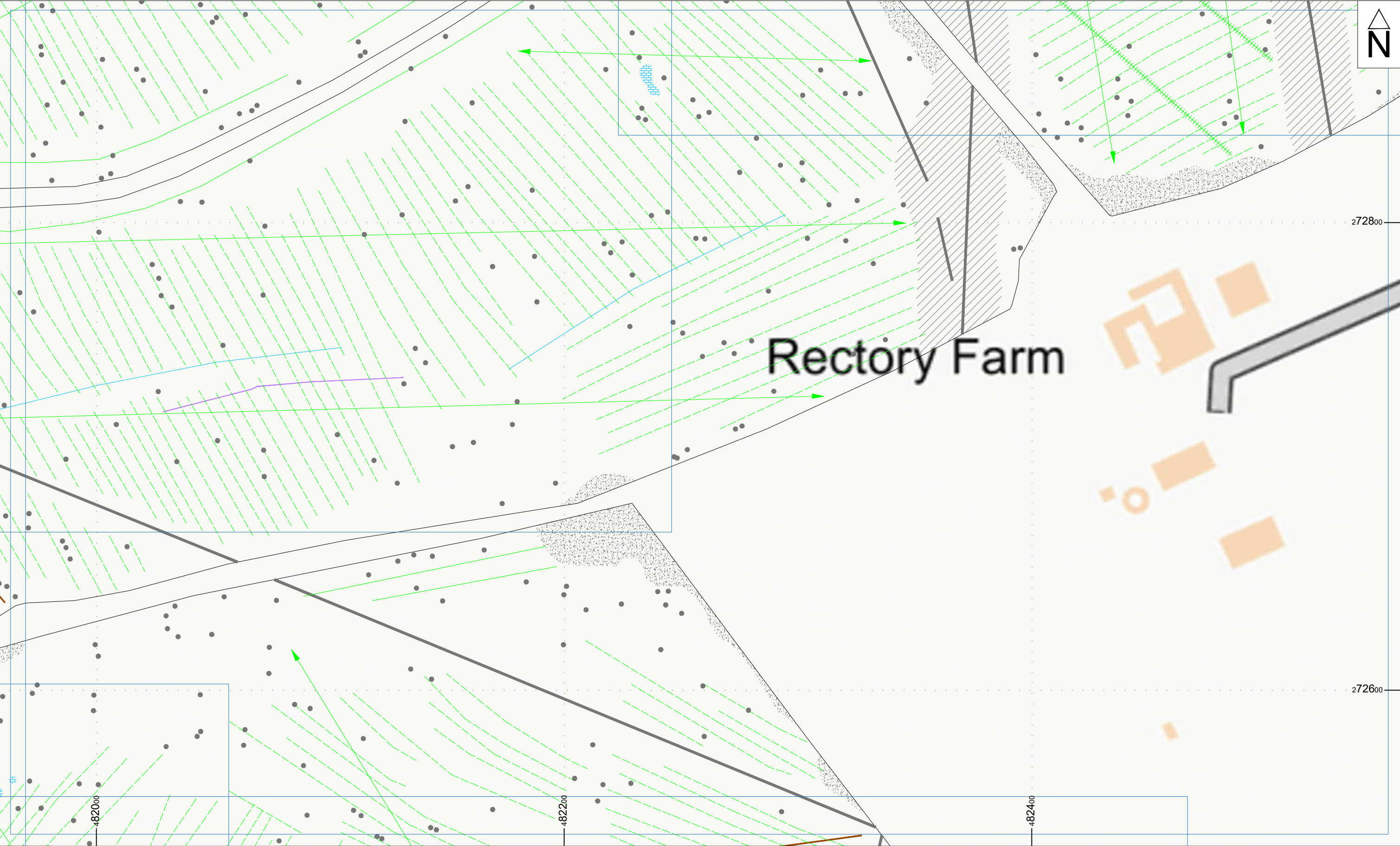
 SECTOR BOUNDARY

15.0 nT/cm

0 50m

1:1500 @ A3

Fig. 54





© ASWYAS 2024.
Archaeological Services W Y A S,
Nepshaw Lane South, Morley, LS27 7JQ
Tel: 0113 535 3007 Email: archaeology@wyjs.org.uk www.aswyas.com

Project ID: XK77_EXG23 Area A

Interpretation of magnetometer data; Sector 17

Reproduced from the Ordnance Survey mapping with the permission of the Controller of His Majesty's Stationery Office.
© Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings.
Wakefield Metropolitan District Council licence 100019574, 2024.

Fig. 55

Title

 SECTOR BOUNDARY

Interpretation

 FERROUS

 SERVICE PIPE

 MAGNETIC DISTURBANCE

 FIELD DRAIN

 RIDGE & FURROW

 AGRICULTURAL

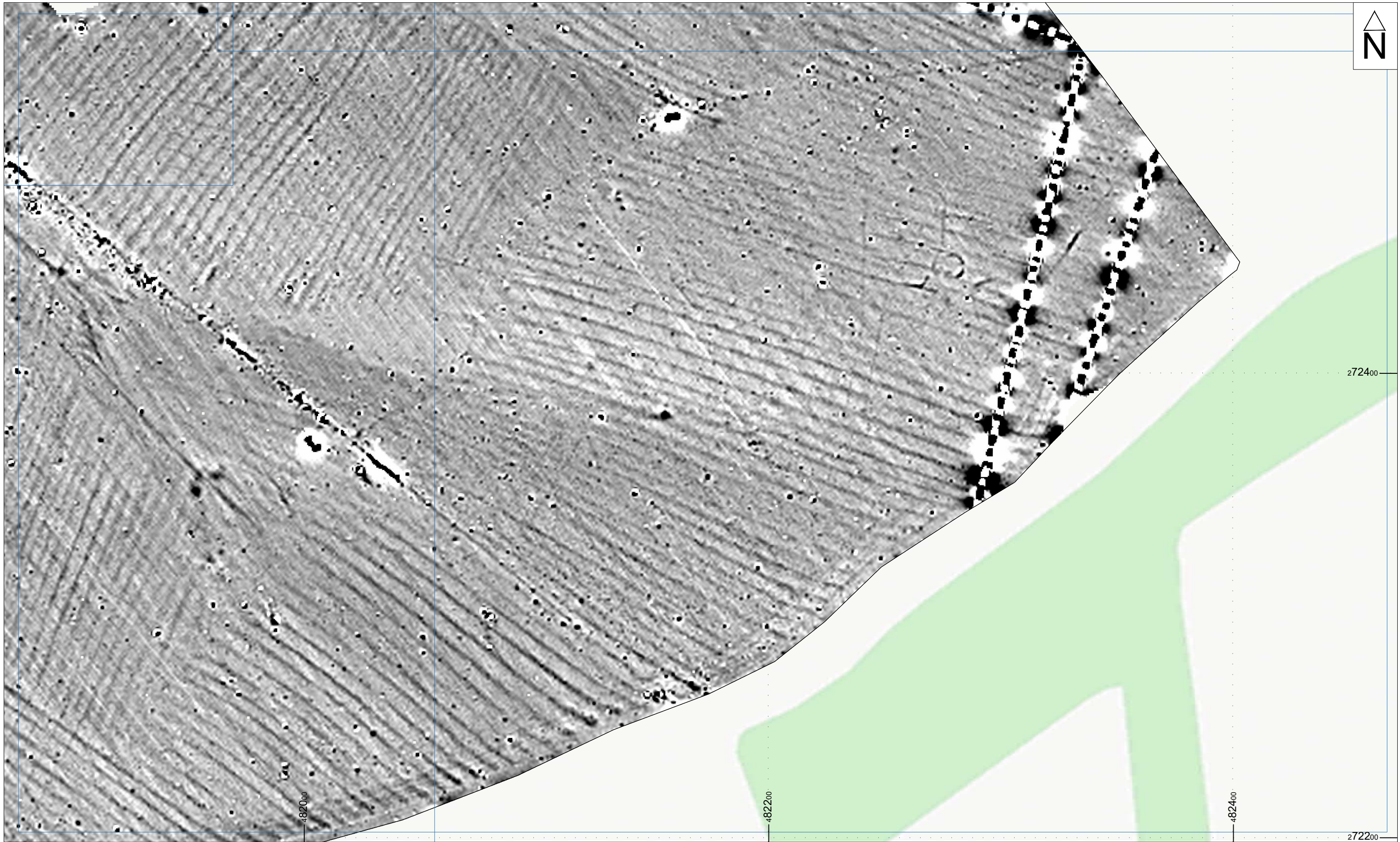
 GEOLOGY

 UNCERTAIN

0

50m

1:1500 @ A3



Title

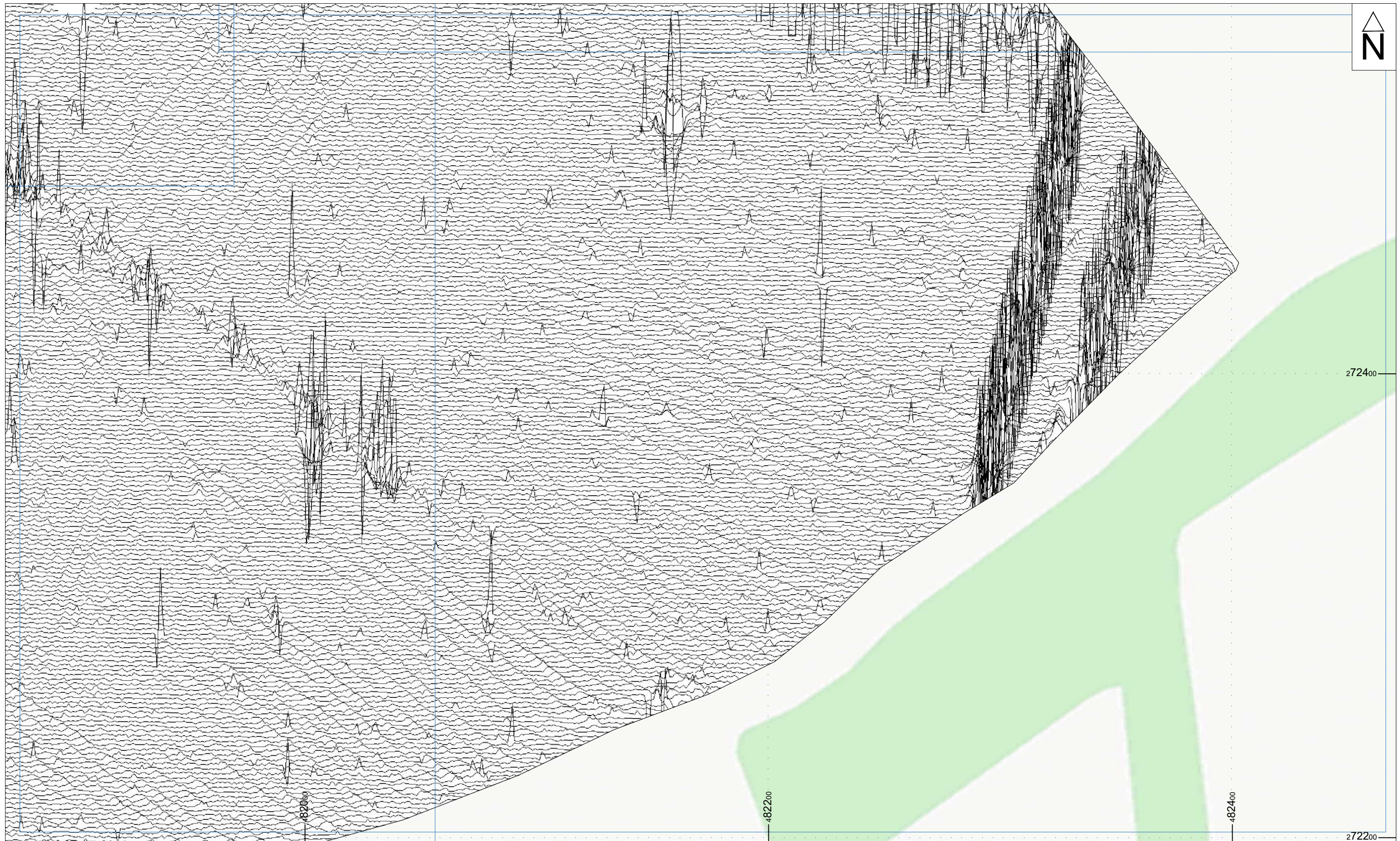
 SECTOR BOUNDARY

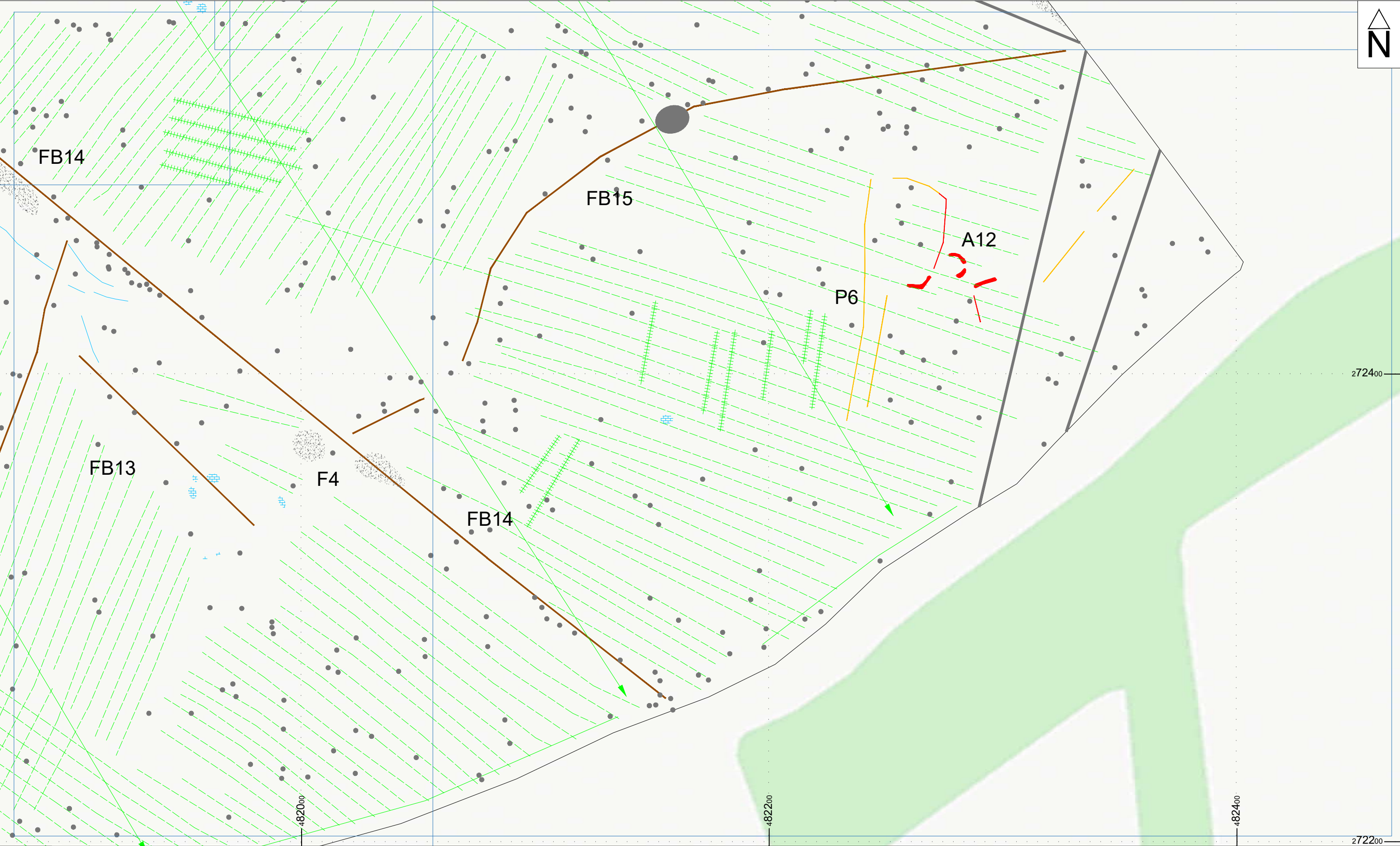


0 50m

1:1500 @ A3

Fig. 56







© ASWYAS 2024.
Archaeological Services W Y A S,
Nepshaw Lane South, Morley, LS27 7JQ
Tel: 0113 535 3007 Email: archaeology@wyjs.org.uk www.aswyas.com

Project ID: XK77_EXG23 Area A

Interpretation of magnetometer data; Sector 18

Reproduced from the Ordnance Survey mapping with the permission of the Controller of His Majesty's Stationary Office.
© Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings.
Wakefield Metropolitan District Council licence 100019574, 2024.

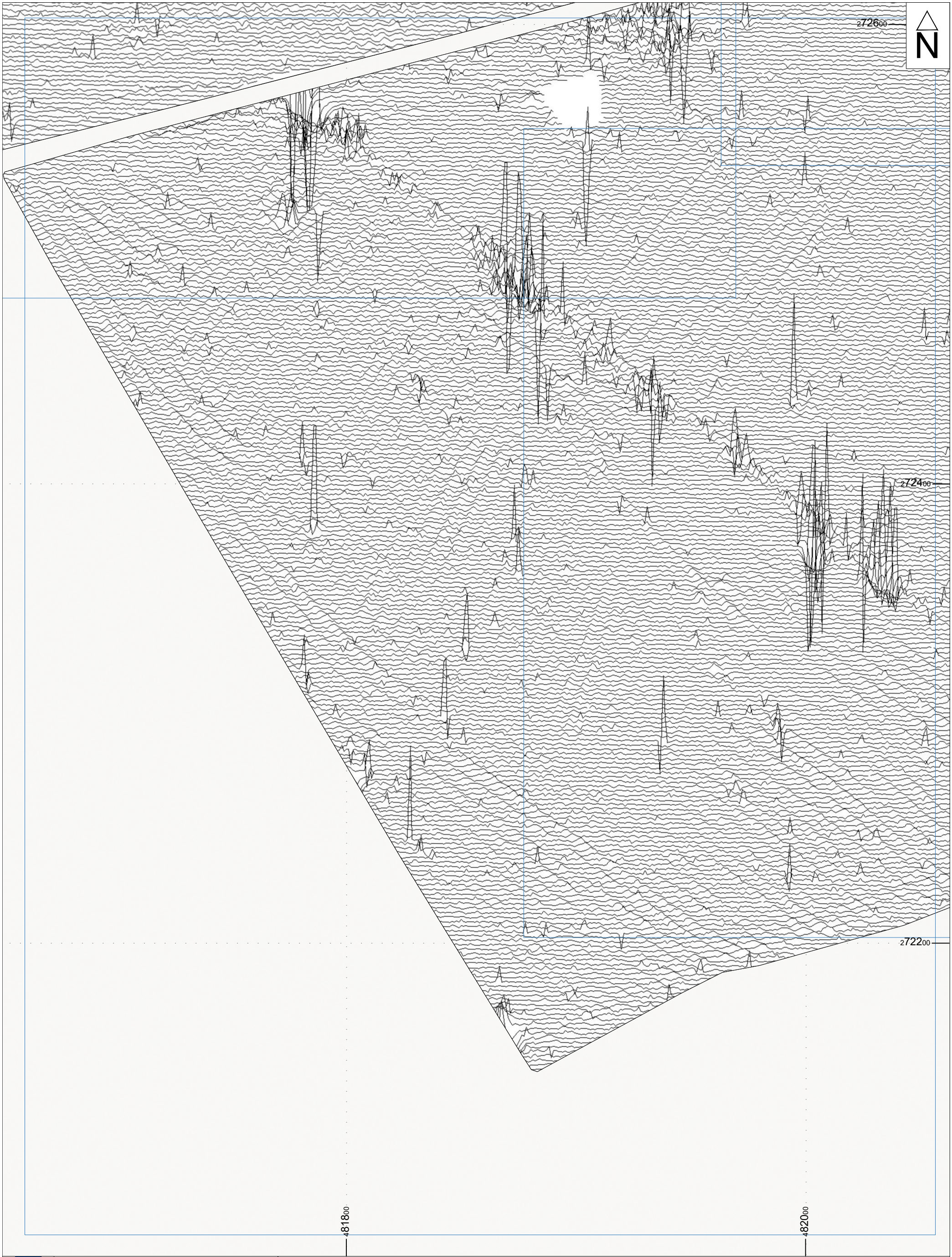
Fig. 58

Title		Interpretation			
	SECTOR BOUNDARY		FERROUS		RIDGE & FURROW
	SERVICE PIPE		AGRICULTURAL		ARCHAEOLOGY?
	MAGNETIC DISTURBANCE		FORMER FIELD BOUNDARY		ARCHAEOLOGY
	FIELD DRAIN		GEOLOGY		

050m

1:1500 @ A3





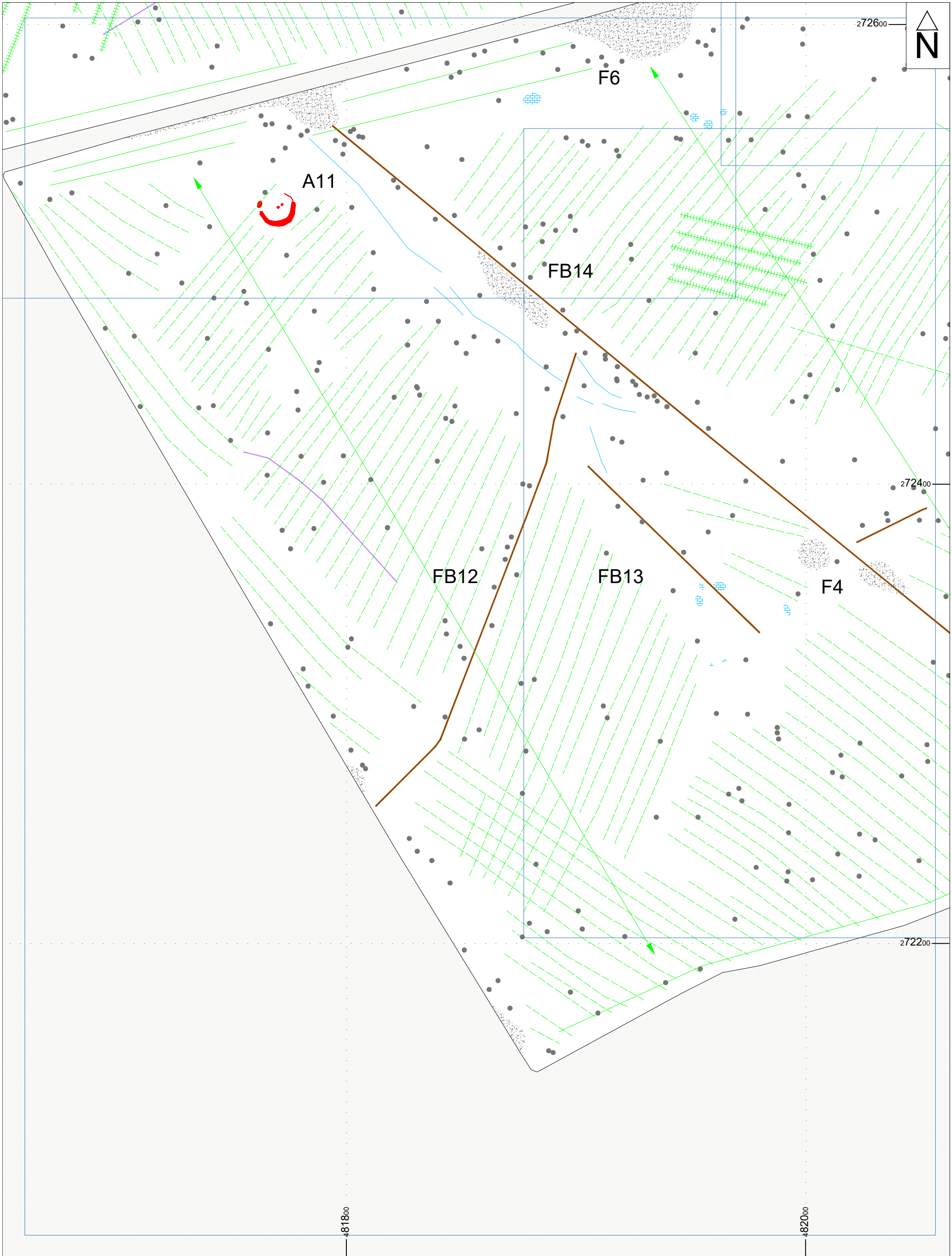




Plate 1. General view of AF1, looking southeast



Plate 2. General view of AF4, looking northeast



Plate 3. General view of AF14, looking east



Plate 4. General view of AF17, looking east



Plate 5. General view of AF18, looking north



Plate 6. General view of AF22, looking north



Plate 7. General view of AF25, looking west



Plate 8. General view of AF28, looking northeast



Plate 9. General view of A2F.1, looking south



Plate 10. General view of A2F.2, looking southwest



Plate 11. General view of A2F.3, looking southwest



Plate 12. General view of A2F.4, looking southwest

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.

Appendix 2: Survey location information

Data was recorded onto a device, using a Carlson GNSS BRx7 Smart antenna, for centimetre accuracy. These readings were stored in the memory of the instrument and downloaded for processing and interpretation. The accuracy of the BRx7 is between 0.15cm – 0.8cm. The BRx7 has a built-in tilt sensor to correct collected point coordinates to within 2cm.

The survey data were then super-imposed onto a base map provided by the client to produce the displayed 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 2003), and graphics files (Adobe Illustrator CS6 and AutoCAD 2017) 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 Northamptonshire Historic Environment Record).

Appendix 4: Oasis form

OASIS Summary for archaeol11-526919

OASIS ID (UID)	archaeol11-526919
Project Name	Geophysical Survey at Green Hill Solar Project - Area A
Sitename	Green Hill Solar Project - Area A
Sitecode	EXG23
Project Identifier(s)	
Activity type	Geophysical Survey, MAGNETOMETRY SURVEY
Planning Id	
Reason For Investigation	Planning: Pre application
Organisation Responsible for work	Archaeological Services WYAS
Project Dates	16-Oct-2023 - 05-Jul-2024
Location	Green Hill Solar Project - Area A NGR : SP 80430 73600 LL : 52.35457376116651, -0.820498758331794 12 Fig : 480430,273600
Administrative Areas	Country : England County/Local Authority : West Northamptonshire Local Authority District : West Northamptonshire Parish : Walgrave
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 (gradiometer) survey was undertaken on approximately 173 hectares of land associated with Area A of the Green Hill Solar Project, Wellingborough, Northamptonshire. The majority of the anomalies recorded are agricultural including former field boundaries, medieval/post-medieval ridge and furrow cultivation, modern ploughing and land drains. Archaeological and possible archaeological responses have been recorded in two concentrated areas with scattered anomalies elsewhere. These comprise ring ditches, linear ditches and trends and rectilinear enclosures, indicative of settlement activity over a probable prehistoric to medieval timeframe. Magnetic disturbance within the dataset can be attributed to adjacent tracks and metal fencing within field boundaries and also 'green manuring' in some of the fields. Former ponds and service pipes have also been recorded. Uncertain anomalies recorded within the data may also have an anthropogenic origin. Geological responses seen within the dataset reflect either the topography of the site, possible quarrying or discrete pockets of natural variations. Based on the geophysical survey, the archaeological potential of this Site is deemed to be high where there are areas of activity and low elsewhere.
Keywords	Ring Ditch - LATER PREHISTORIC - FISH Thesaurus of Monument Types Enclosure - LATER PREHISTORIC - FISH Thesaurus of Monument Types

Funder	Private or public corporation Green Hill Solar Park
HER	Northamptonshire SMR - unRev - STANDARD
Person Responsible for work	Emma Brunning
HER Identifiers	
Archives	

Report generated on: 18 Jul 2024, 16:22

Bibliography

- BGS, 2024. [REDACTED] British Geological Survey (viewed July 2024)
- CIfA, 2020. *Standard and Guidance for Archaeological Geophysical Survey*. Chartered Institute for Archaeologists
- Gerrard, J., Caldwell, L and Kennedy, A. 2015. *Green Waste and Archaeological Geophysics*. Archaeological Prospection, Vol 22, Issue 2, 139-142
- GE, 2024. Google Earth Pro 7.3.3.7786
- LandIS, 2024. [REDACTED] Cranfield Soil and Agrifood Institute (viewed July 2024)
- MHCLG, 2019. *National Planning Policy Framework*. Ministry of Housing, Communities and Local Government.
- NLS, 2024. [REDACTED] National Library of Scotland (viewed July 2024)
- Schmidt, A. Linford, P., Linford, N., David, A., Gaffney, C., Sarris, A, and Fassbinder, J. 2015. *EAC Guidelines for the Use of Geophysics in Archaeology*. English Heritage



Appendix B

Green Hill B Geophysical Survey Report



WYAS
**Archaeological
Services**

Green Hill Solar Project

Site B

Northamptonshire

Geophysical Survey

Report no. 4134

April 2024

Client: Green Hill Solar Project



Green Hill Solar Project

Site B

Northamptonshire

Geophysical Survey

Summary

A geophysical (gradiometer) survey was undertaken on approximately 64 hectares of land associated with Site B of the Green Hill Solar Project, Wellingborough, Northamptonshire. The majority of the anomalies recorded are agricultural including former field boundaries, medieval/post-medieval ridge and furrow cultivation, modern ploughing and land drains. Archaeological and possible archaeological responses have been recorded within the south of the area in the form of discrete linear and curvilinear features which may form enclosures. Uncertain anomalies recorded within the data may also have an anthropogenic origin. Geological responses seen within the dataset reflect either the topography of the site, a former water course or discrete pockets of natural variations. Magnetic disturbance can be attributed to adjacent tracks and metal fencing with smaller areas corresponding to infilled ponds or former fencing. Based on the geophysical survey, the archaeological potential of this area is deemed to be moderate in the south where there are areas of activity and low elsewhere.



Report Information

Client: Green Hill Solar Project
Report Type: Geophysical Survey
Location: Grendon
County: Northamptonshire
Grid Reference: SP 7929 6840
Period(s) of activity: ?Prehistoric / medieval / post-medieval
Report Number: 4134
Project Number: XK77
Site Code: EXG23
OASIS ID: archaeol11-524381
Date of fieldwork: October 2023 and February 2024
Date of report: April 2024
Project Management: Emma Brunning BSc MCIfA
Fieldwork: Amy Chatterton BSc MA
Jake Freeman BA
Cameron Whitley BA
Claire Stephens BA MA
Illustrations: Emma Brunning
Photography: Amy Chatterton
Research: Emma Brunning
Report: Emma Brunning

Authorisation for
distribution: _____



© Archaeological Services WYAS 2024
Nepshaw Lane South, Morley, Leeds LS27 7JQ
Telephone: 0113 535 3007
Email: admin@aswyas.com



Document Issue Record

Ver	Author(s)	Reviewer	Approver	Date
1.0	EB	JR	JR	April 24

Contents

Report information	ii
Document Issue Record	iii
Contents.....	iii
List of Figures	iv
List of Plates	iv
1 Introduction	1
Site location, topography and land-use	1
Soils and geology.....	1
2 Archaeological Background.....	1
Prehistoric	1
Iron Age and Romano-British.....	2
Medieval	2
3 Aims, Methodology and Presentation	3
Magnetometer survey	3
Reporting	3
4 Results and Discussion.....	4
Ferrous anomalies and magnetic disturbance	4
Geological anomalies.....	5
Agricultural anomalies.....	5
Uncertain anomalies	5
Possible and definite archaeological anomalies.....	6
5 Conclusions.....	6

Figures

Plates

Appendices

Appendix 1: Magnetic survey - technical information

Appendix 2: Survey location information

Appendix 3: Geophysical archive and metadata

Appendix 4: Oasis form

Bibliography

List of Figures

- 1 Site location (1:50000)
- 2 Location of survey areas (1:5000 @ A3)
- 3 Overall greyscale of processed magnetometer data (1:5000 @ A3)
- 4 Overall interpretation of magnetometer data (1:5000 @ A3)
- 5 Processed greyscale magnetometer data; Sector 1 (1:1500 @ A3)
- 6 XY trace plot of minimally processed magnetometer data; Sector 1 (1:1500 @ A3)
- 7 Interpretation of magnetometer data; Sector 1 (1:1500 @ A3)
- 8 Processed greyscale magnetometer data; Sector 2 (1:1500 @ A3)
- 9 XY trace plot of minimally processed magnetometer data; Sector 2 (1:1500 @ A3)
- 10 Interpretation of magnetometer data; Sector 2 (1:1500 @ A3)
- 11 Processed greyscale magnetometer data; Sector 3 (1:1500 @ A3)
- 12 XY trace plot of minimally processed magnetometer data; Sector 3 (1:1500 @ A3)
- 13 Interpretation of magnetometer data; Sector 3 (1:1500 @ A3)
- 14 Processed greyscale magnetometer data; Sector 4 (1:1500 @ A3)
- 15 XY trace plot of minimally processed magnetometer data; Sector 4 (1:1500 @ A3)
- 16 Interpretation of magnetometer data; Sector 4 (1:1500 @ A3)
- 17 Processed greyscale magnetometer data; Sector 5 (1:1500 @ A3)
- 18 XY trace plot of minimally processed magnetometer data; Sector 5 (1:1500 @ A3)
- 19 Interpretation of magnetometer data; Sector 5 (1:1500 @ A3)
- 20 Processed greyscale magnetometer data; Sector 6 (1:1500 @ A3)
- 21 XY trace plot of minimally processed magnetometer data; Sector 6 (1:1500 @ A3)
- 22 Interpretation of magnetometer data; Sector 6 (1:1500 @ A3)

List of Plates

- 1 General view of BF1, looking northwest
- 2 General view of BF1, looking west
- 3 General view of BF2, looking west
- 4 General view of BF3, looking south
- 5 General view of BF4, looking west
- 6 General view of BF5, looking southeast

1 Introduction

Archaeological Services ASWYAS has been commissioned by Lanpro on behalf of Green Hill Solar Project to undertake a geophysical survey on land for the proposed Green Hill Site B, which is located within the administrative boundary of Wellingborough, Northamptonshire. This report details Site B. This was undertaken in line with current best practice (CIfA 2020; Schmidt *et al.* 2015). The survey was carried out on the 2nd and 19th October 2023 and between the 12th and 14th February 2024 when the land became available.

Site location, topography and land-use

The Site comprises approximately 64ha of arable land across five fields (BF1-BF5). At the time of survey ground conditions consisted of either pasture or a cover crop (Plates 1-6).

The site is located to the north of Moulton and to the south of Holcot, centred at approximately SP 7929 6840. The Site lies between 118m aOD (above Ordnance Datum) in the northwest, and 129m aOD in the southeast.

Soils and geology

Bedrock Geology on the whole comprises Rutland formation – mudstone, a sedimentary bedrock that formed between 170.3 and 166.1 million years ago during the Jurassic period. A small area of Bilsworth limestone formation – limestone has been recorded in BF1 and a band of the Stamford member – sandstone and siltstone interbedded in BF2. Superficial deposits have been recorded across the majority of the Site as belonging to the Oadby Member – Diamicton, a sedimentary superficial deposit that formed between 480 and 423 thousand years ago during the Quaternary period (BGS 2024).

Soils across the Site have been described as Lime-rich loamy and clayey soils with impeded drainage (Soilscape 9) (LandIS 2024).

2 Archaeological Background

The following information is a summary of an archaeological background provided by Lanpro Services.

Prehistoric

There are 42 records held by the Northamptonshire HER, relating to general ‘prehistoric’ activity recorded within the 1km search area. Additionally, three records have been assigned a ‘Prehistoric to Roman’ date and comprise settlement activity (HER 5812/1, HER 5812/2, HER 5514). Two of the records lie adjacent to the southwest corner of the Site and comprise possible Bronze Age round barrows, uncovered during trial trenching (HER 5812/1, HER

5812/2). These features were cut by later Roman ditches, with pottery dating to the 2nd century AD.

There are two other records that lie in close proximity to the Site, of possible prehistoric date. An enclosure (HER 5615/0/1) lies 15m to the south of Field BF2 and was seen as cropmarks on aerial photography and may relate to prehistoric settlement activity. An undated enclosure and ditch (HER 4526), which may date to the prehistoric period, is recorded to the east of the Site and potentially extends into the Site.

The Jurassic Way (HER 195; NRHE 1035203), an important prehistoric routeway connecting the northeast and the southwest of Britain, runs across the search area following the band of Jurassic Limestone that runs along the northern boundary of Northamptonshire. Dating from at least the early Bronze Age period, but potentially the earlier Neolithic period, the ridgeway wasn't a single defined track but a broad set of routes following the line of the hills across the county. It appears that it was during the Iron Age period that the track became clearly defined as a line of movement. There is some conflict as to its route across the search area with the HER depicting the route running northeast to southwest, c.560m south of the Site, whilst the NRHE data depicts the route running northeast to southwest, c.400m northwest of the Site.

Iron Age and Romano-British

There are 13 records relating to general Iron Age activity recorded on the Northamptonshire HER within the 1km search area, and six further records dating to the Roman period and four records attributed more broadly to the 'Iron Age to Roman' periods.

There is a concentrated area of activity dating from the Iron Age to Roman period to the south of the Site. An area of cropmarks (HER 4541), 430m to the south of the south-western Field BF2, was previously subject to geophysical survey and trial trenching which revealed enclosures and linking trackways/boundary ditches dated to the Iron Age. Another record, 420m to the south of the Site, relates to a probable Iron Age settlement (HER 5515/2) where trial trenching uncovered a large D-shaped enclosure with internal divisions and possible structural features. A curvilinear gully in the southern part of the enclosure may be the remains of a roundhouse and initial dating of artefacts suggests an Iron Age date.

Roman pottery associated with large areas of stone and pebbles (HER 4529) was discovered during fieldwalking, c.240m to the south of Field BF2. Geophysical survey suggested that the features are possibly part of an extensive linear, ladder settlement extending over a large area but, trial trenching of the anomalies was inconclusive.

Medieval

There are eight HER 'monument' records assigned to the medieval period within the 1km search area, and five assigned to the 'Medieval to Post Medieval' period. Four HER 'monument' records are assigned to the 'Medieval to Late 20th Century' period and one to the 'Medieval to Modern' period. There are also six HER 'monument' records assigned to

‘Early Saxon to Late Medieval’ period within the 1km search area, and one assigned to the ‘Early Saxon’ period. A very small part of a HER polygon comprising medieval or post-medieval plough headlands (HER 5966/0/6) extends into the northeast of Field BF5.

The Site sat within the manor of Holcot, which means ‘cottages in the hollows’ and a reference in AD 969 to the boundary of Holcot is evidence of the existence of the village during the earlier medieval period. Holcot was mentioned in the 1086 Domesday Survey, within the hundred of Mawsley.

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 aims 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 the survey areas at a scale of 1:5000 whilst Figure 3 shows an overview of the processed magnetometer data and Figure 4 shows an overview of the interpretation both at a scale of 1:5000. Processed and minimally processed data, together

with interpretation of the survey results are presented in Figures 6 to 22 inclusive at a scale of 1:1500.

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 2020). All figures reproduced from Ordnance Survey mapping are with the permission of the controller of His 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 6 to 22)

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.

An area of magnetic disturbance (**F1**) detected in the southeast of BF1 corresponds with the location of an infilled pond shown on historic mapping dating from 1884 (NLS 2024). Another pond (**F2**) can be seen in Field BF5.

Circular ferrous responses (**F3**) in Field BF4 may be associated with a former temporary boundary in which these responses may represent *in-situ* fence posts.

Magnetic disturbance along the limits of the survey areas is due to interference from metal fencing and adjacent tracks.

Geological anomalies

The survey has detected 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.

Within Field BF1 a change in the ridge and furrow also corresponds with a change in the topography which can be seen within the LiDAR data (NLS 2024; DEFRA 2024) and has been marked on the interpretation diagram with a geological trend. This ridge continues south into Field BF2.

Sinuuous responses along and adjacent to a former field boundary (**FB2**) in Field BF2 are associated with a former water course which appears on historic mapping published 1955 (NLS 2024).

Agricultural anomalies

Former field boundaries (**FB1** – **FB6**) have been recorded within Fields BF1, BF2, BF3 and BF4. The majority of these boundaries correspond to historic mapping dating from 1884 (NLS 2024).

Field boundary **FB3** in the northwest of Field BF3 does not appear on any available mapping but is likely to be a continuation of **FB2**.

Boundary **FB5** in Field BF4 corresponds with a change in the crop seen on aerial images dating from 2004 to 2010. Boundary **FB6** also within this field corresponds to crop changes in 2017 and 2018 (Google Earth 2024).

Medieval or post-medieval ridge and furrow cultivation has been recorded within all five areas on differing alignments.

Field drains have been recorded in Fields BF3 and BF4 and have quite a low magnetic strength, it is likely that their construction is of a non-fired clay construction.

Other 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

A handful of anomalies within the dataset have been interpreted as having an uncertain origin.

A cluster of pit-like responses (**U1**) lie to the east of archaeological responses **A1**, but they have quite a strong magnetic signature, similar to that of ferrous anomalies. An *uncertain*

interpretation has been reached as they may be archaeological, such as areas of high intensity burning but equally may also be dumped modern material.

Curving linear response **U2** in the northwest of Field BF3 is likely to be an old boundary but does not show on the available historic mapping.

Anomalies **U3** and **U4** in the south of Field BF4 may be of some anthropogenic interest, although a geological origin is also likely.

Possible and definite archaeological anomalies

Anomalies of both an archaeological and possible archaeological origin have been recorded within the Site. A small complex of features (**A1**) can be seen in the southeast of Field BF2 (covering an area of approximately 133m by 65m) and appear to be confined in this former triangular field, bounded by **FB2** to the west. The features include linear and curvilinear trends along with ditch and pit-like responses forming small enclosures. To the northeast of **A1**, right-angled ditch **A2**, along with **P1** may indicate the corner of a field as it lies on the same alignment as the ridge and furrow.

A group of anomalies (**P2**) in the southwest corner of Field BF2 may have an archaeological origin such as a small enclosure and measure approximately 23m by at least 32m, although due to the alignment being the same as the ridge and furrow, this interpretation is tentative.

Weak, linear responses **P3** in the south of Field BF3 appear to form three partial enclosures which are likely to continue in the field to the south.

5 Conclusions

The geophysical survey has detected a number of magnetic anomalies associated mainly with an agricultural landscape including former field boundaries, medieval/post-medieval ridge and furrow cultivation, modern ploughing and land drains. Archaeological and possible archaeological responses have been recorded within the south of the area in the form of discrete linear and curvilinear features which may form enclosures. Uncertain anomalies recorded within the data may also have an anthropogenic origin.

Geological responses seen within the dataset reflect either the topography of the site, a former water course or discrete pockets of natural variations. Magnetic disturbance can be attributed to adjacent tracks and metal fencing with smaller areas corresponding to infilled ponds or former fencing.

Based on the geophysical survey, the archaeological potential of this area is deemed to be moderate in the south where there are areas of activity and low elsewhere.

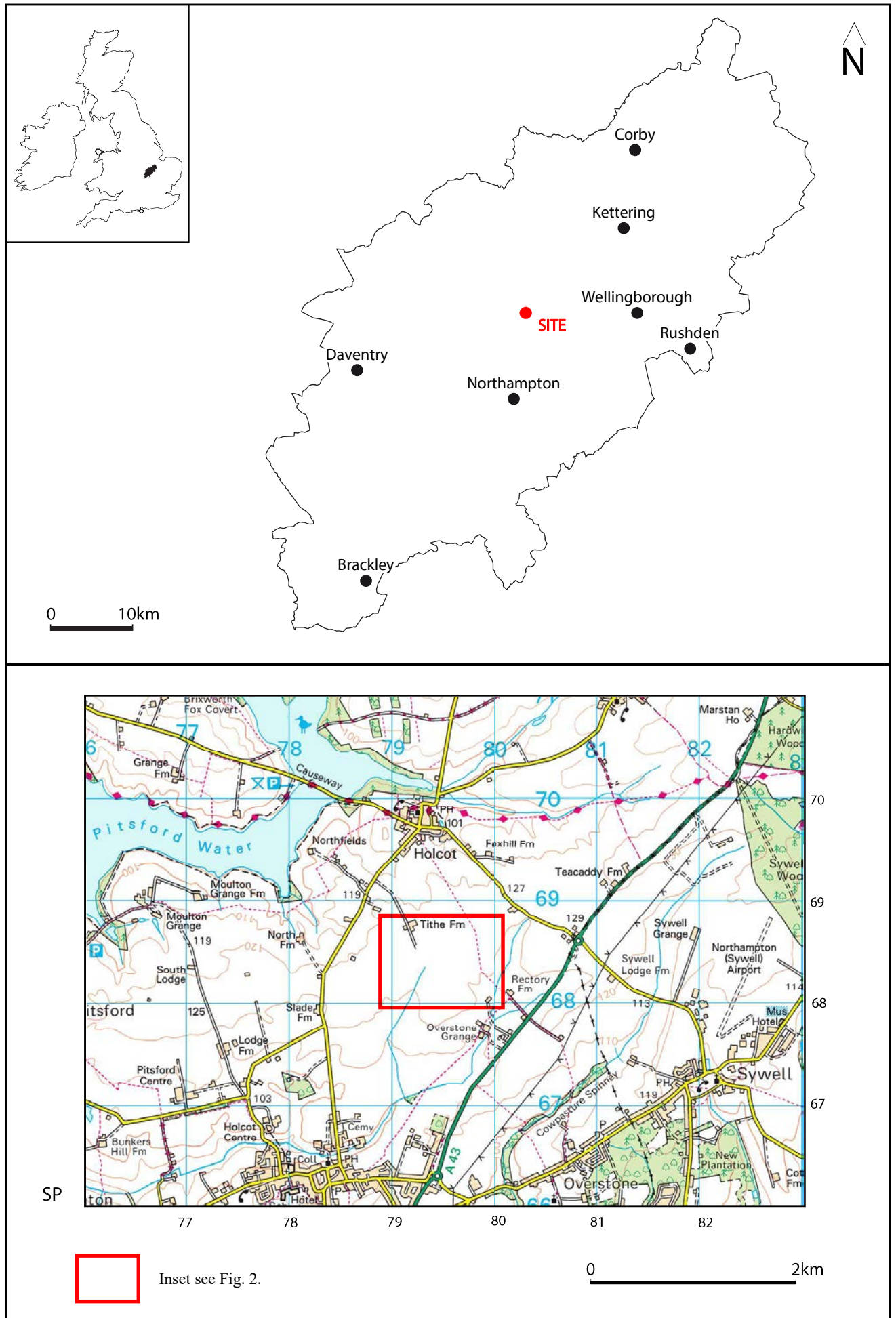
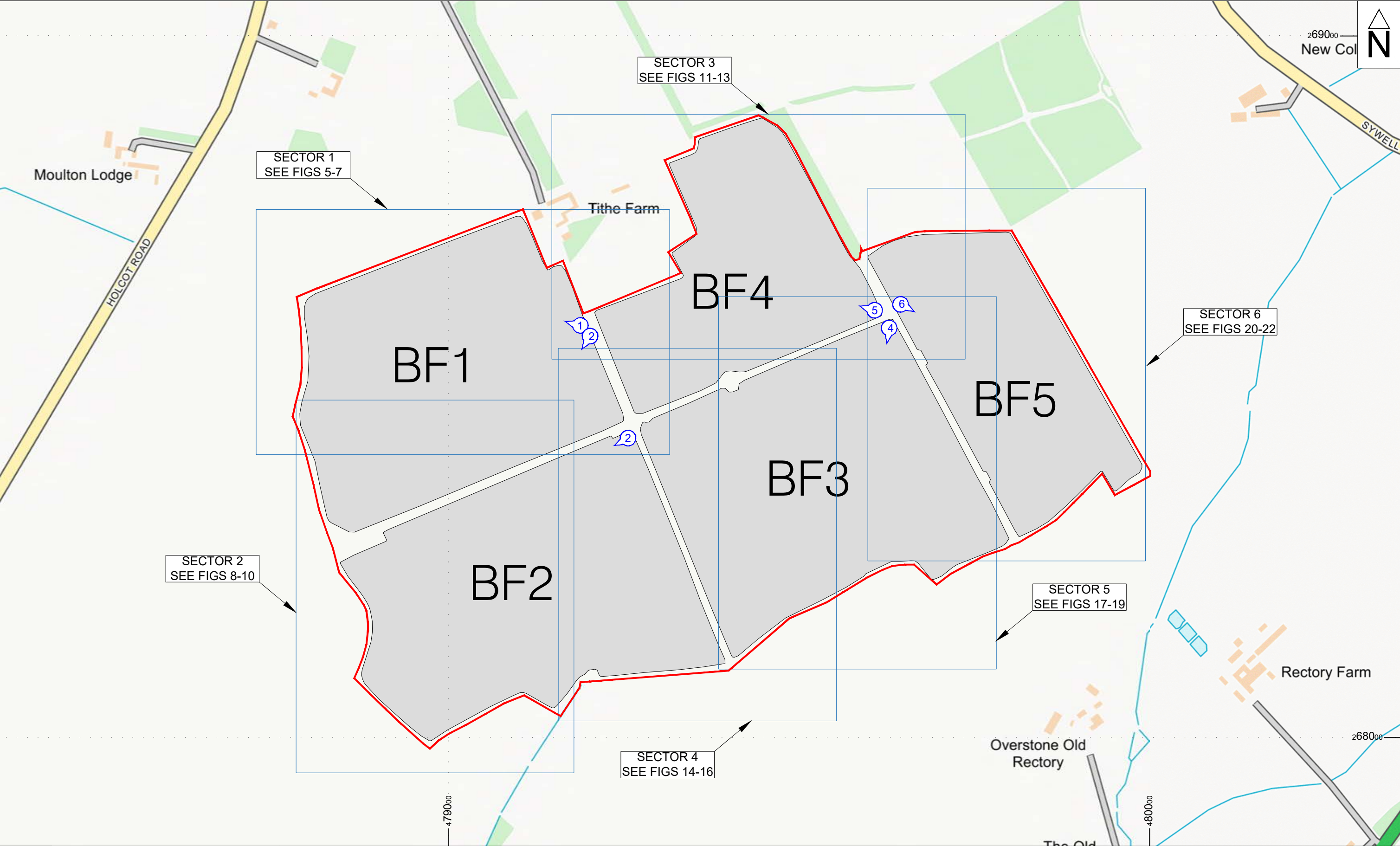


Fig. 1. Site location

Reproduced with the permission of the controller of His Majesty's Stationery Office © Crown Copyright. Archaeological Services WYAS: licence LA076406, 2023.





© ASWYAS 2024.
Archaeological Services W Y A S,
Nepshaw Lane South, Morley, LS27 7JQ
Tel: 0113 535 3007 Email: archaeology@wyjs.org.uk www.aswyas.com

Project ID: XK77_EXG23 Site B

Location of survey areas

Reproduced from the Ordnance Survey mapping with the permission of the Controller of His Majesty's Stationery Office.
© Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings.
Wakefield Metropolitan District Council licence 100019574, 2024.

Title

 SURVEY AREA

 FIELD NUMBERS

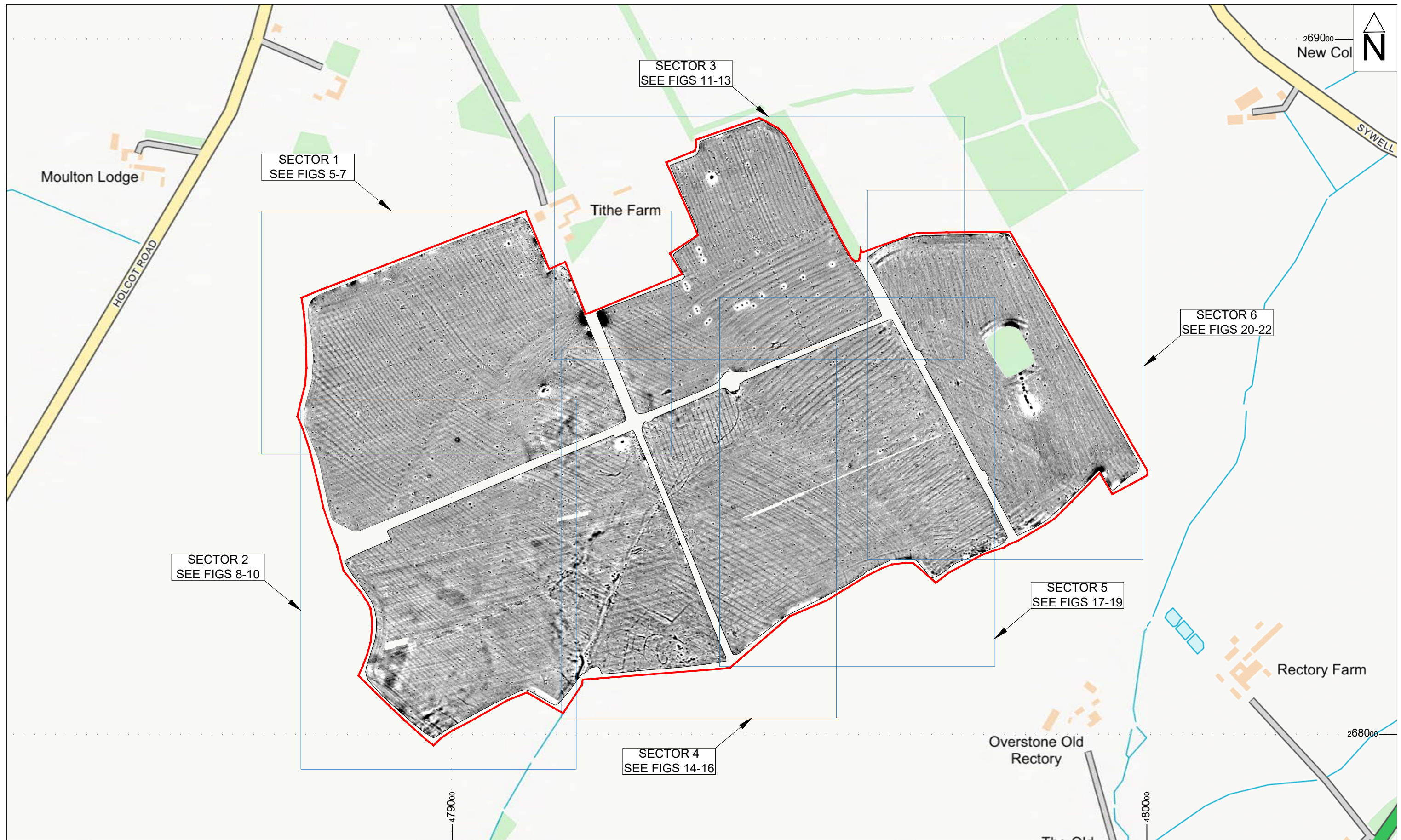
 SECTOR BOUNDARY

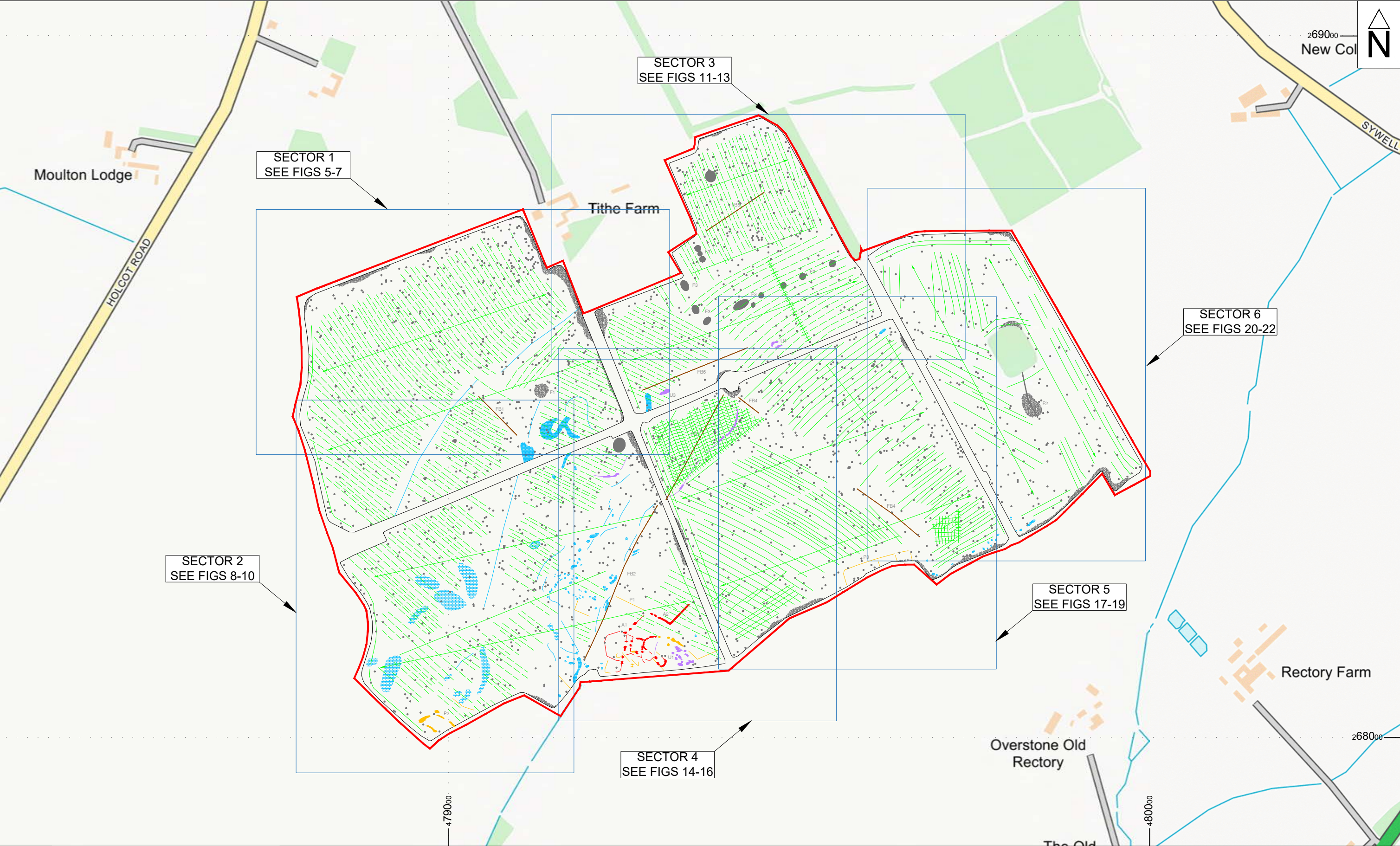
 PHOTO LOCATIONS

0200m

1:5000 @ A3

Fig. 2





Title		Interpretation			
	SURVEY AREA		FERROUS		RIDGE & FURROW
	SECTOR BOUNDARY		SERVICE PIPE		AGRICULTURAL
			MAGNETIC DISTURBANCE		FORMER FIELD BOUNDARY
			FIELD DRAIN		GEOLOGY
					UNCERTAIN
					ARCHAEOLOGY?
					ARCHAEOLOGY

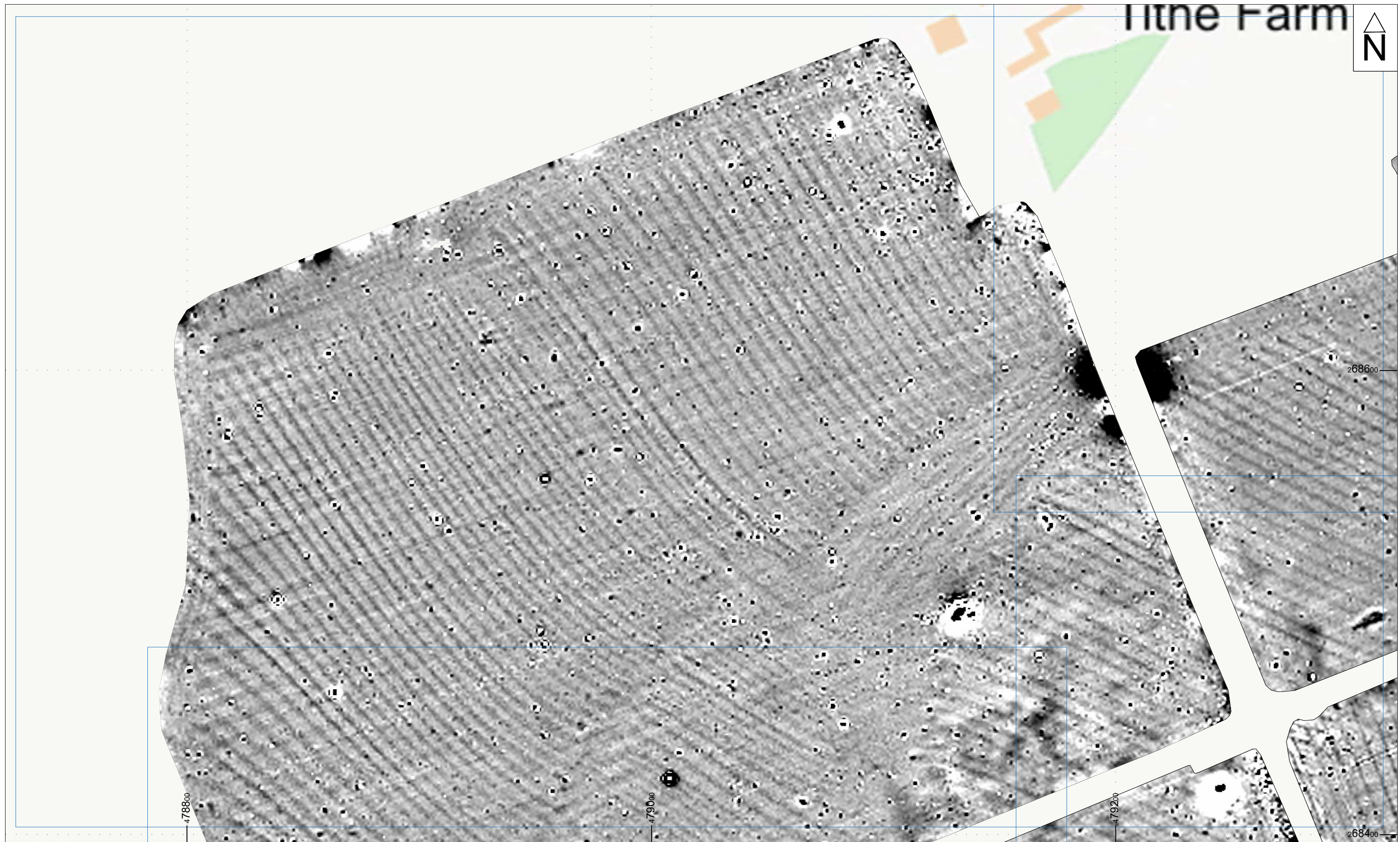


Fig. 5

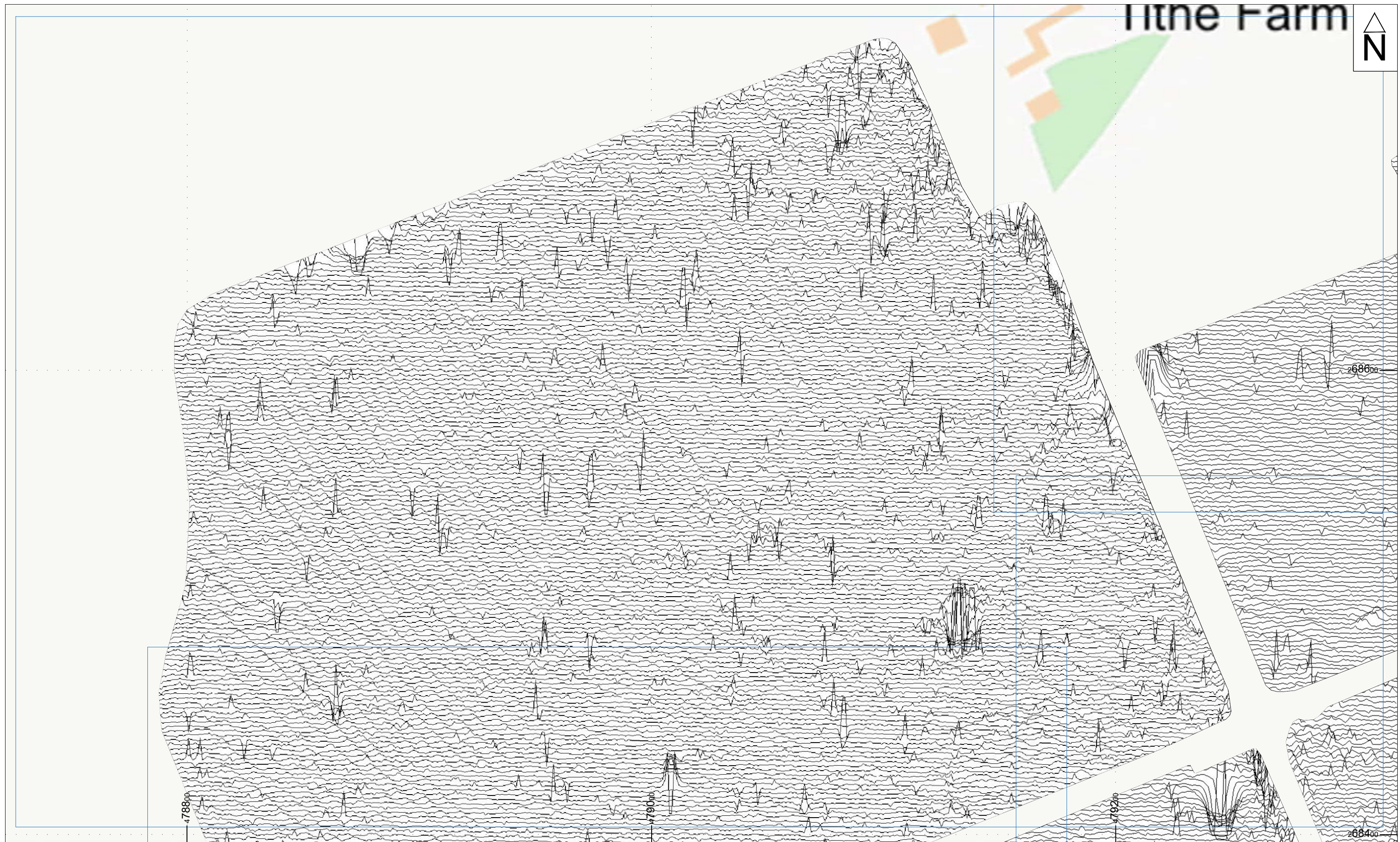


Fig. 6

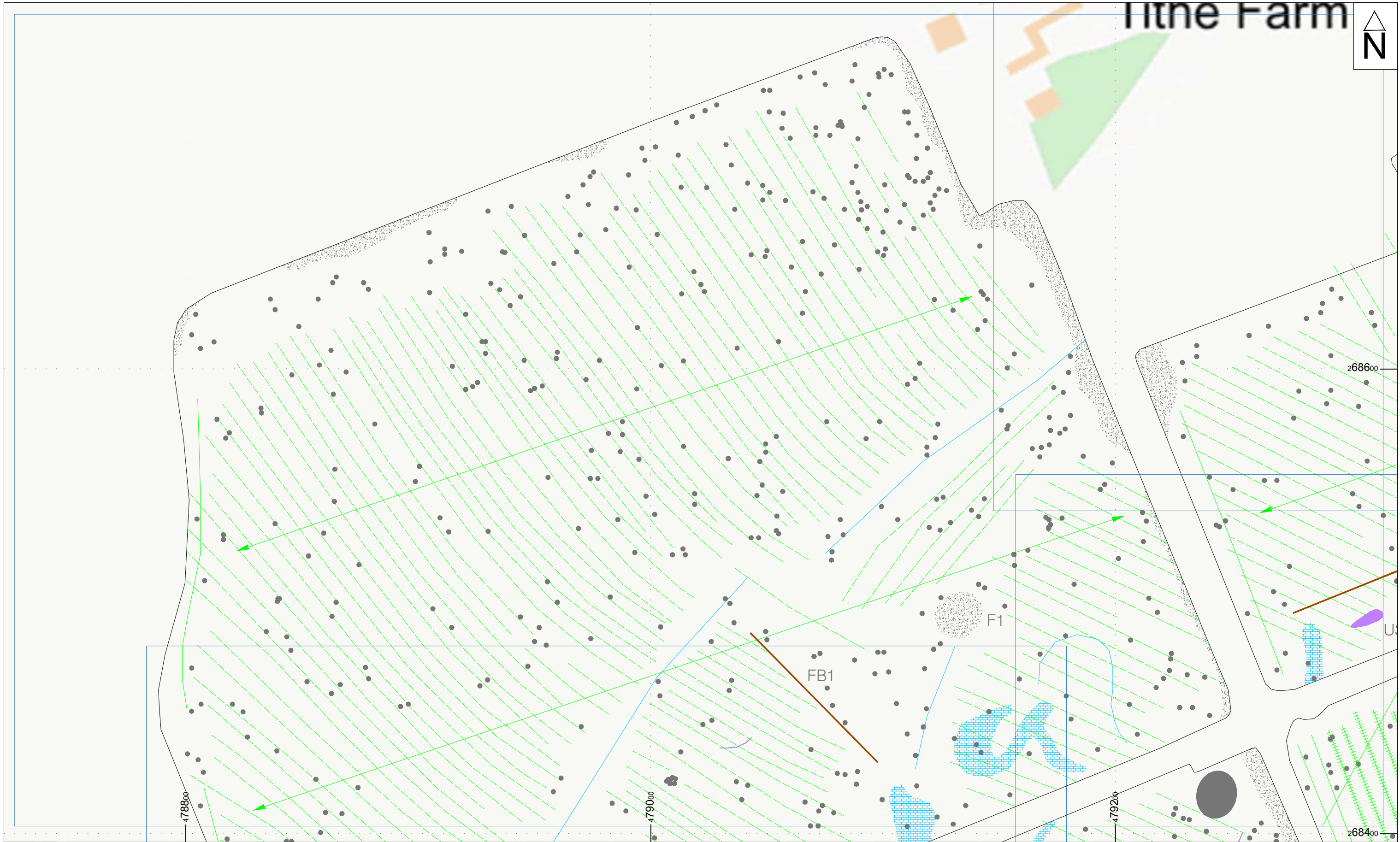
Title

	SECTOR BOUNDARY
---	-----------------

15.0 nT/cm

0 50m

1:1500 @ A3





© ASWYAS 2024.
Archaeological Services W Y A S,
Nepshaw Lane South, Morley, LS27 7JQ
Tel: 0113 535 3007 Email: archaeology@wyjs.org.uk www.aswyas.com

Project ID: XK77_EXG23 Site B

Interpretation of magnetometer data; Sector 1

Reproduced from the Ordnance Survey mapping with the permission of the Controller of His Majesty's Stationery Office.
© Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings.
Wakefield Metropolitan District Council licence 100019574, 2024.

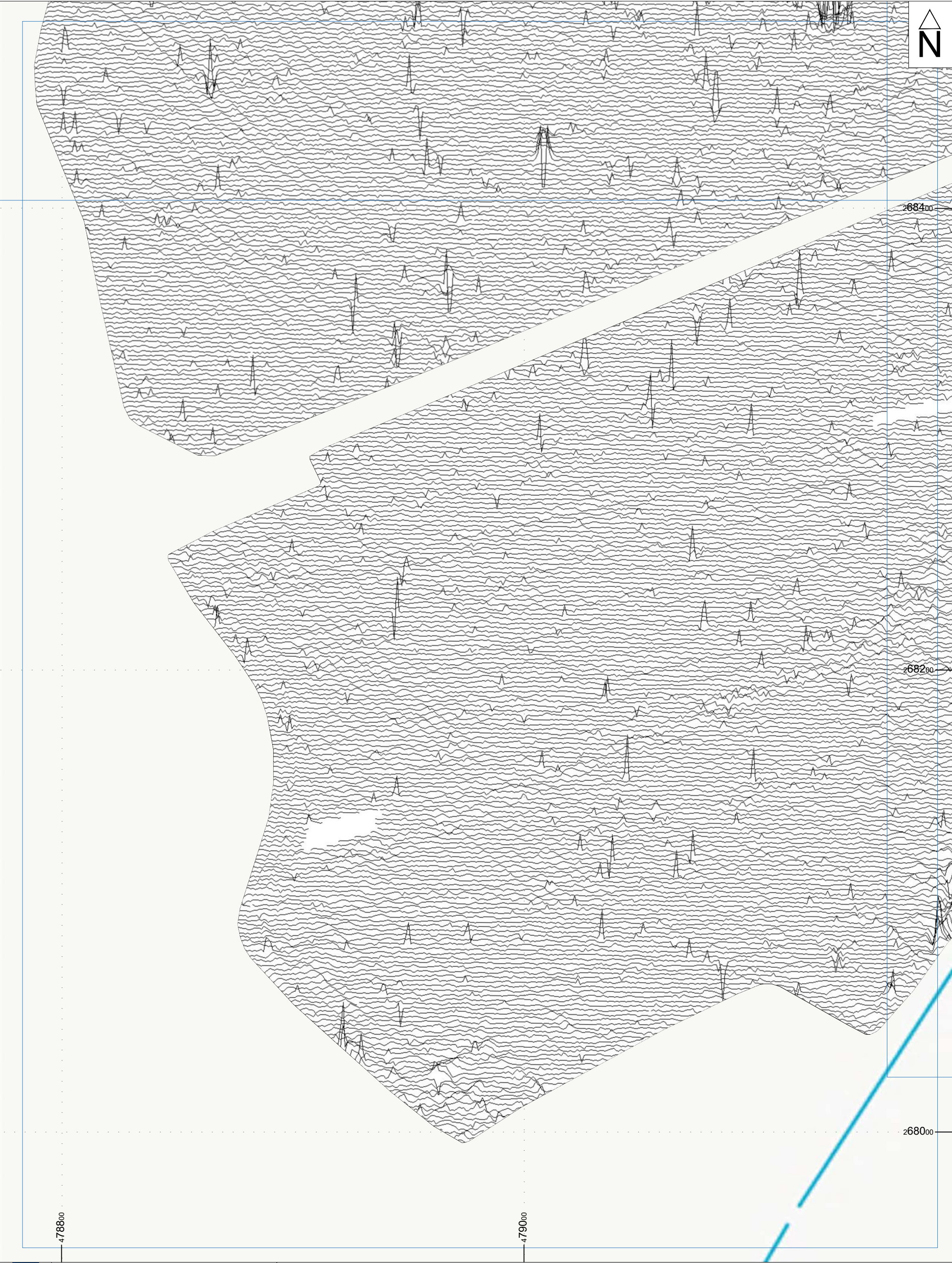
Fig. 7

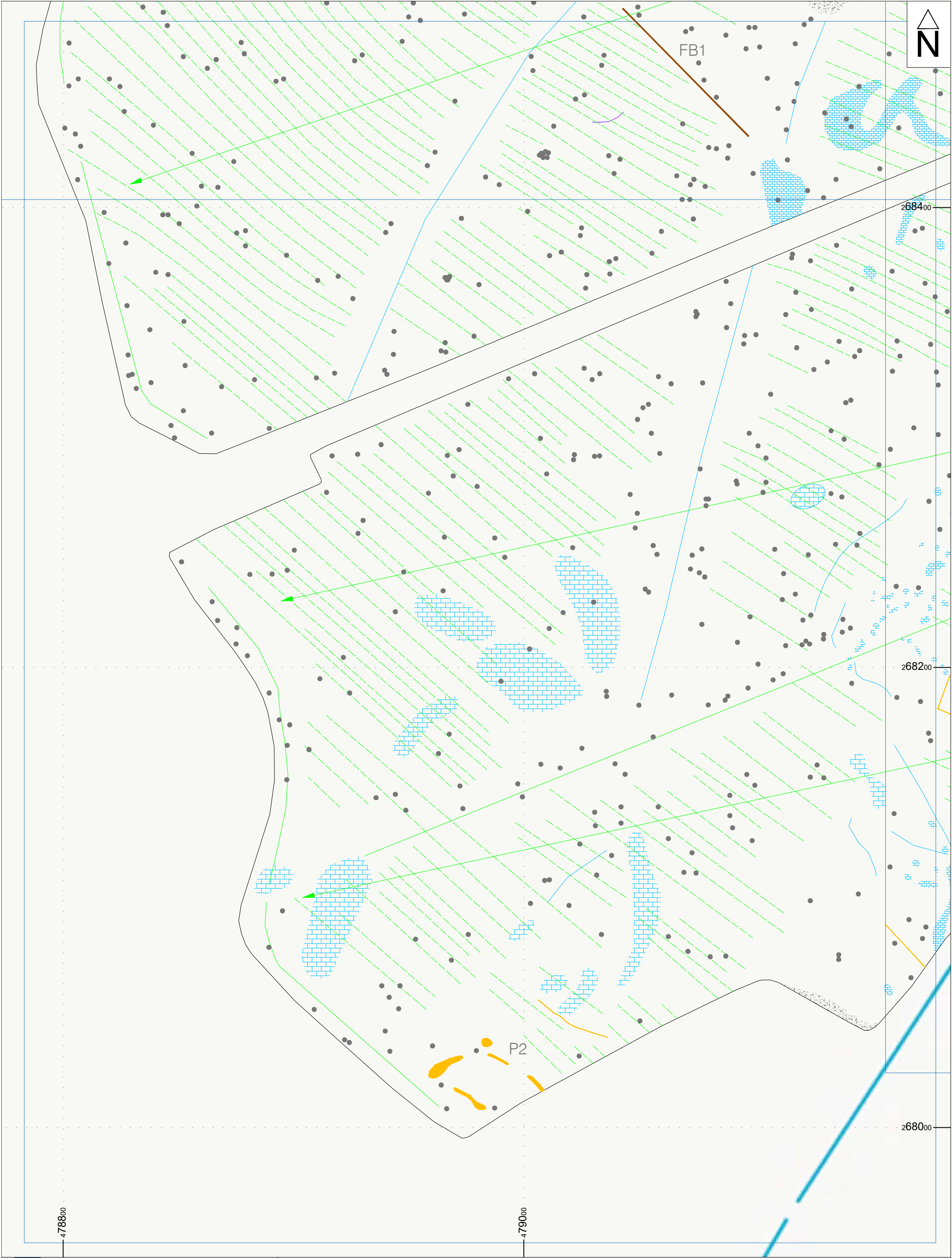
Title		Interpretation			
	SECTOR BOUNDARY		FERROUS		RIDGE & FURROW
			MAGNETIC DISTURBANCE		AGRICULTURAL
			FIELD DRAIN		FORMER FIELD BOUNDARY
					GEOLOGY
					UNCERTAIN

0 50m

1:1500 @ A3







Interpretation

 FERROUS	 AGRICULTURAL	 UNCERTAIN
 MAGNETIC DISTURBANCE	 FORMER FIELD BOUNDARY	 ARCHAEOLOGY?
 RIDGE & FURROW	 GEOLOGY	

0 50m

1:1500 @ A3



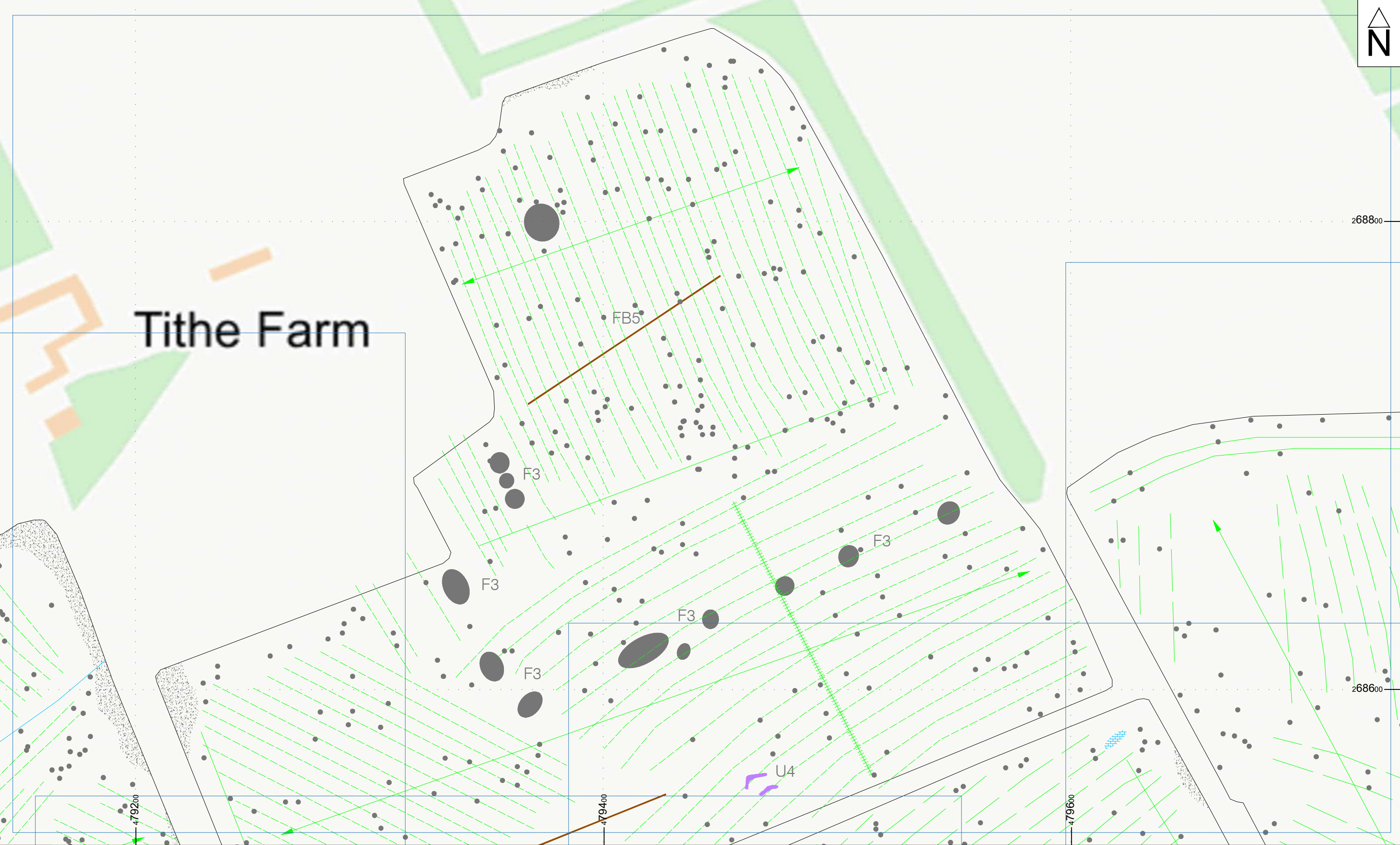
Title

SECTOR BOUNDARY



0 50m

1:1500 @ A3





© ASWYAS 2024.
Archaeological Services W Y A S,
Nepshaw Lane South, Morley, LS27 7JQ
Tel: 0113 535 3007 Email: archaeology@wyjs.org.uk www.aswyas.com

Project ID: XK77_EXG23 Site B

Interpretation of magnetometer data; Sector 3

Reproduced from the Ordnance Survey mapping with the permission of the Controller of His Majesty's Stationery Office.
© Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings.
Wakefield Metropolitan District Council licence 100019574, 2004.

Fig. 13

Title		Interpretation			
	SECTOR BOUNDARY		FERROUS		RIDGE & FURROW
			MAGNETIC DISTURBANCE		AGRICULTURAL
			FIELD DRAIN		FORMER FIELD BOUNDARY
					GEOLOGY
					UNCERTAIN

0 50m
1:1500 @ A3



	© ASWYAS 2024. Archaeological Services W Y A S, Nepshaw Lane South, Morley, LS27 7JQ Tel: 0113 535 3007 Email: archaeology@wyjs.org.uk www.aswyas.com	Title SECTOR BOUNDARY	-1.0 2.0 nT	0 50m 1:1500 @ A3
	Project ID: XK77_EXG23 Site B			
	Processed greyscale magnetometer data; Sector 4			
	Reproduced from the Ordnance Survey mapping with the permission of the Controller of His Majesty's Stationery Office. © Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. Wakefield Metropolitan District Council licence 100019574, 2024.			
	Fig. 14			

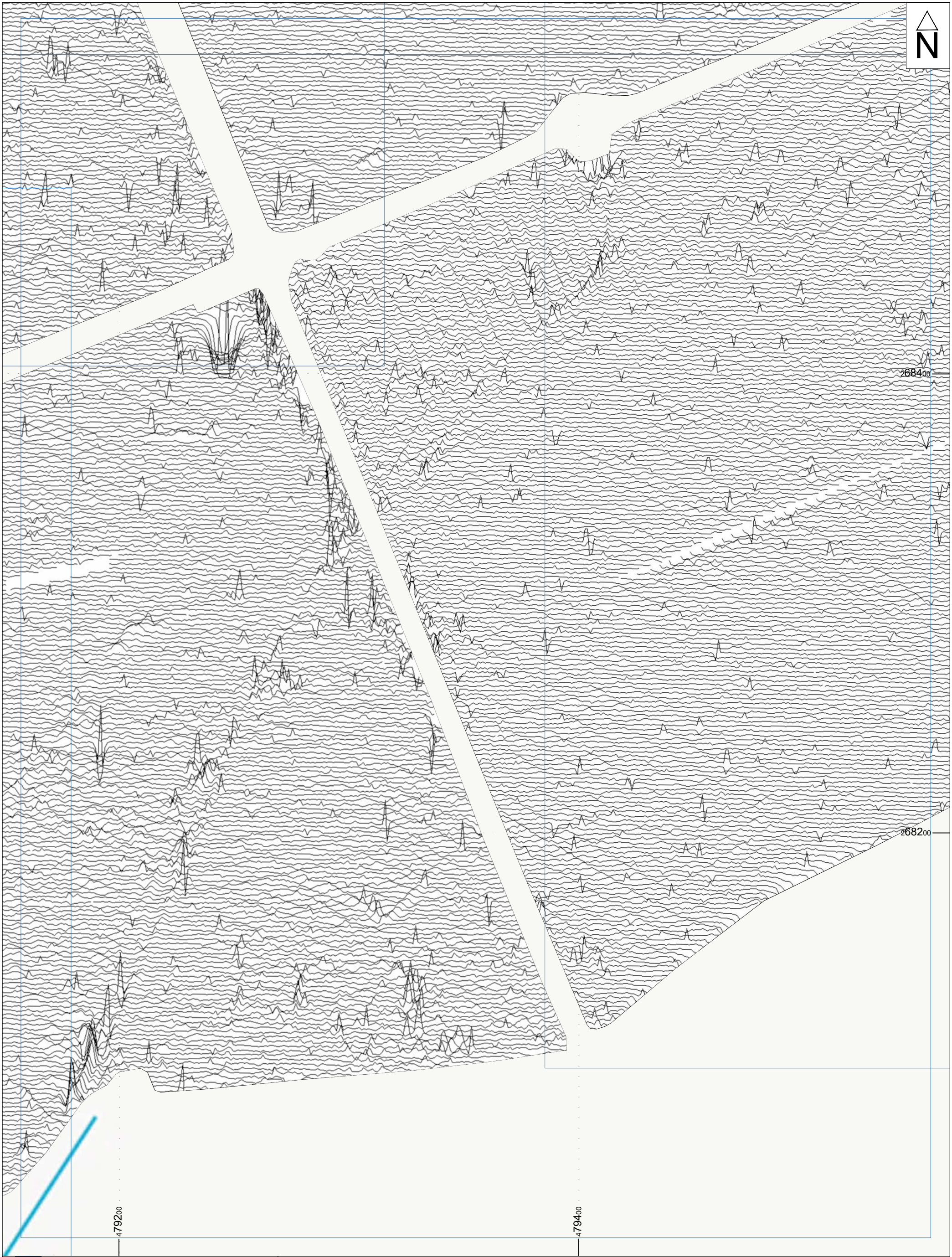


Fig. 15

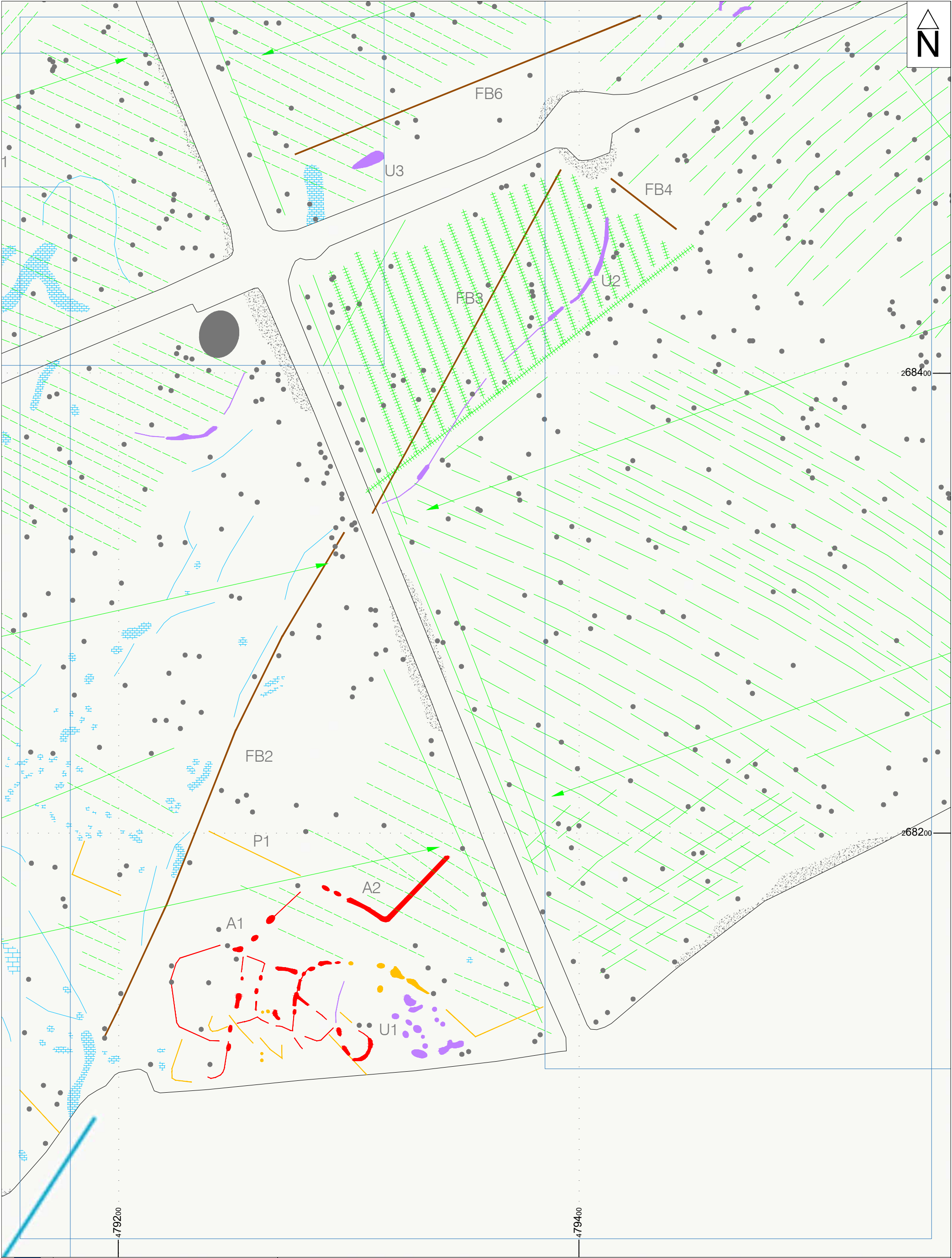
Title

 SECTOR BOUNDARY

15.0 nT/cm

0 50m

1:1500 @ A3





© ASWYAS 2024.
Archaeological Services W Y A S,
Nepshaw Lane South, Morley, LS27 7JQ
Tel: 0113 535 3007 Email: archaeology@wyjs.org.uk www.aswyas.com

Project ID: XK77_EXG23 Site B

Interpretation of magnetometer data; Sector 4

Reproduced from the Ordnance Survey mapping with the permission of the Controller of His Majesty's Stationery Office.
© Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings.
Wakefield Metropolitan District Council licence 100019574, 2024.

Fig. 16

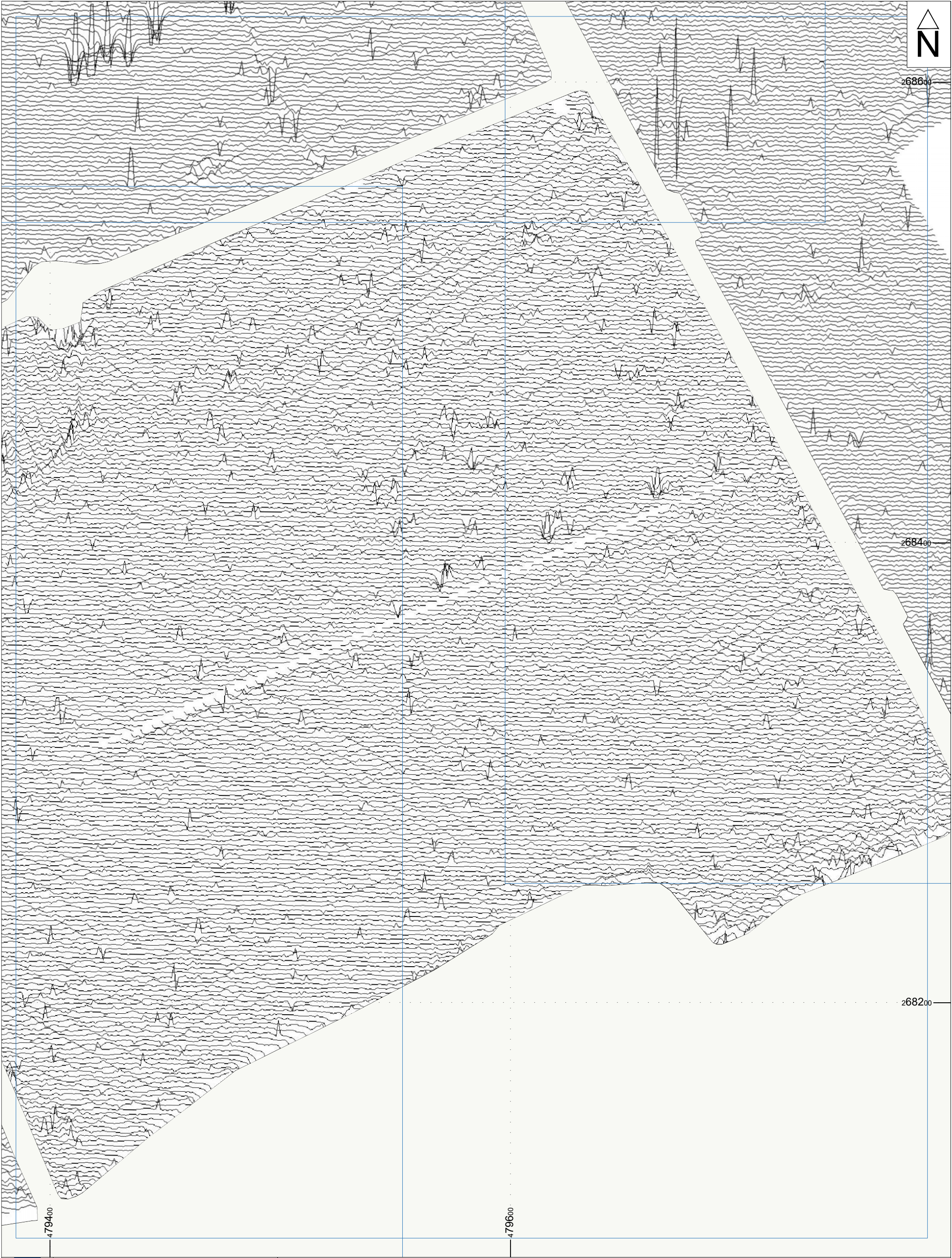
Interpretation

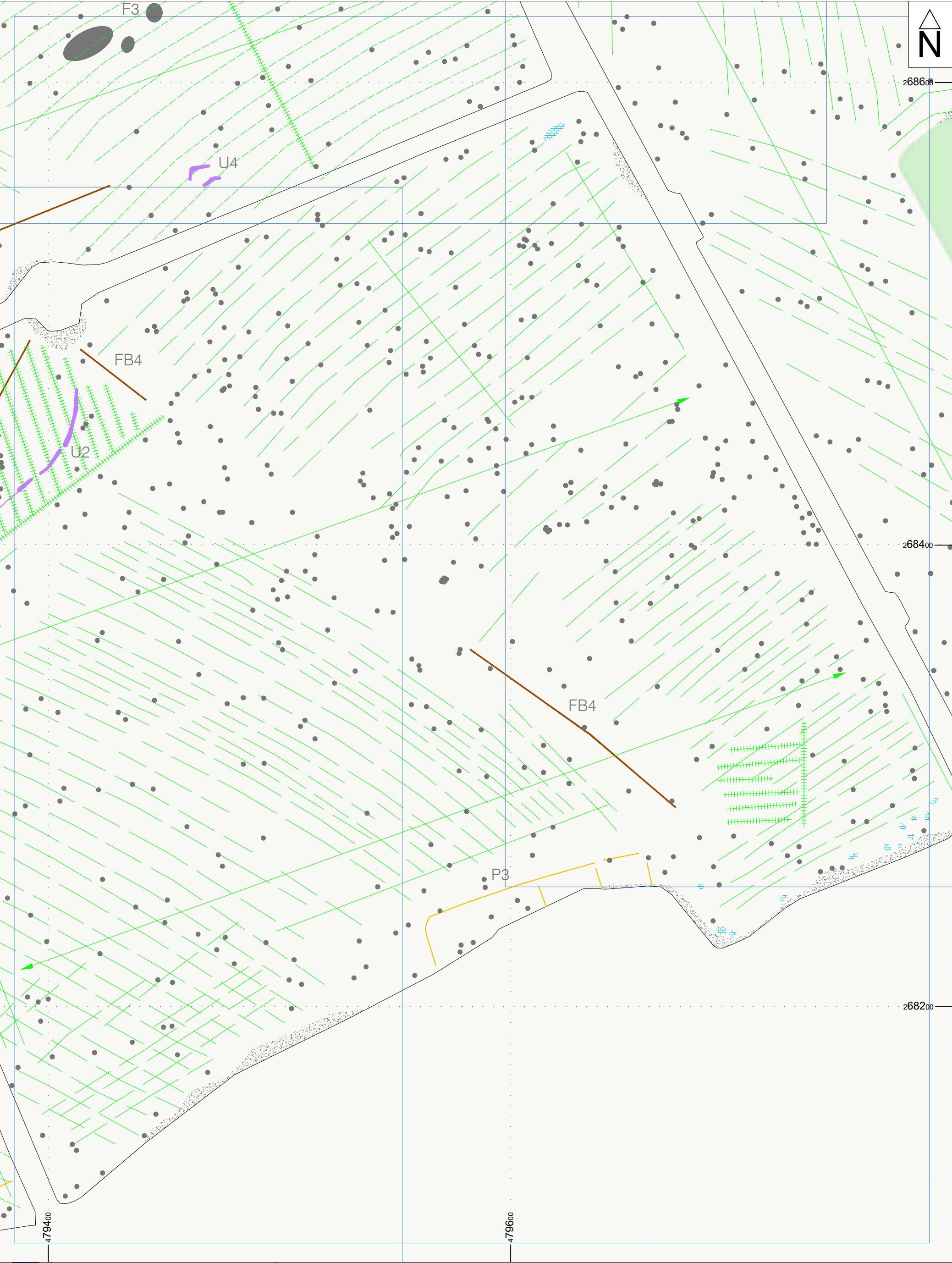
 FERROUS	 RIDGE & FURROW	 UNCERTAIN
 MAGNETIC DISTURBANCE	 AGRICULTURAL	 ARCHAEOLOGY?
 FIELD DRAIN	 FORMER FIELD BOUNDARY	 ARCHAEOLOGY
	 GEOLOGY	

0 50m

1:1500 @ A3









© ASWYAS 2024.
Archaeological Services W Y A S,
Nepshaw Lane South, Morley, LS27 7JQ
Tel: 0113 535 3007 Email: archaeology@wyjs.org.uk www.aswyas.com

Project ID: XK77_EXG23 Site B

Interpretation of magnetometer data; Sector 5

Reproduced from the Ordnance Survey mapping with the permission of the Controller of His Majesty's Stationery Office.
© Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings.
Wakefield Metropolitan District Council licence 100019574, 2024.

Interpretation

 FERROUS	 RIDGE & FURROW	 GEOLOGY
 MAGNETIC DISTURBANCE	 AGRICULTURAL	 UNCERTAIN
 FIELD DRAIN	 FORMER FIELD BOUNDARY	 ARCHAEOLOGY?

0 50m

1:1500 @ A3

Fig. 19