

Green Hill Solar Farm

EN010170

Environmental Statement

Appendix 12.4: Archaeological Geophysical Survey Reports

Revision A (Tracked)

(Part 5 of 10)

Prepared by: Lanpro

Date: ~~May~~ November 2025

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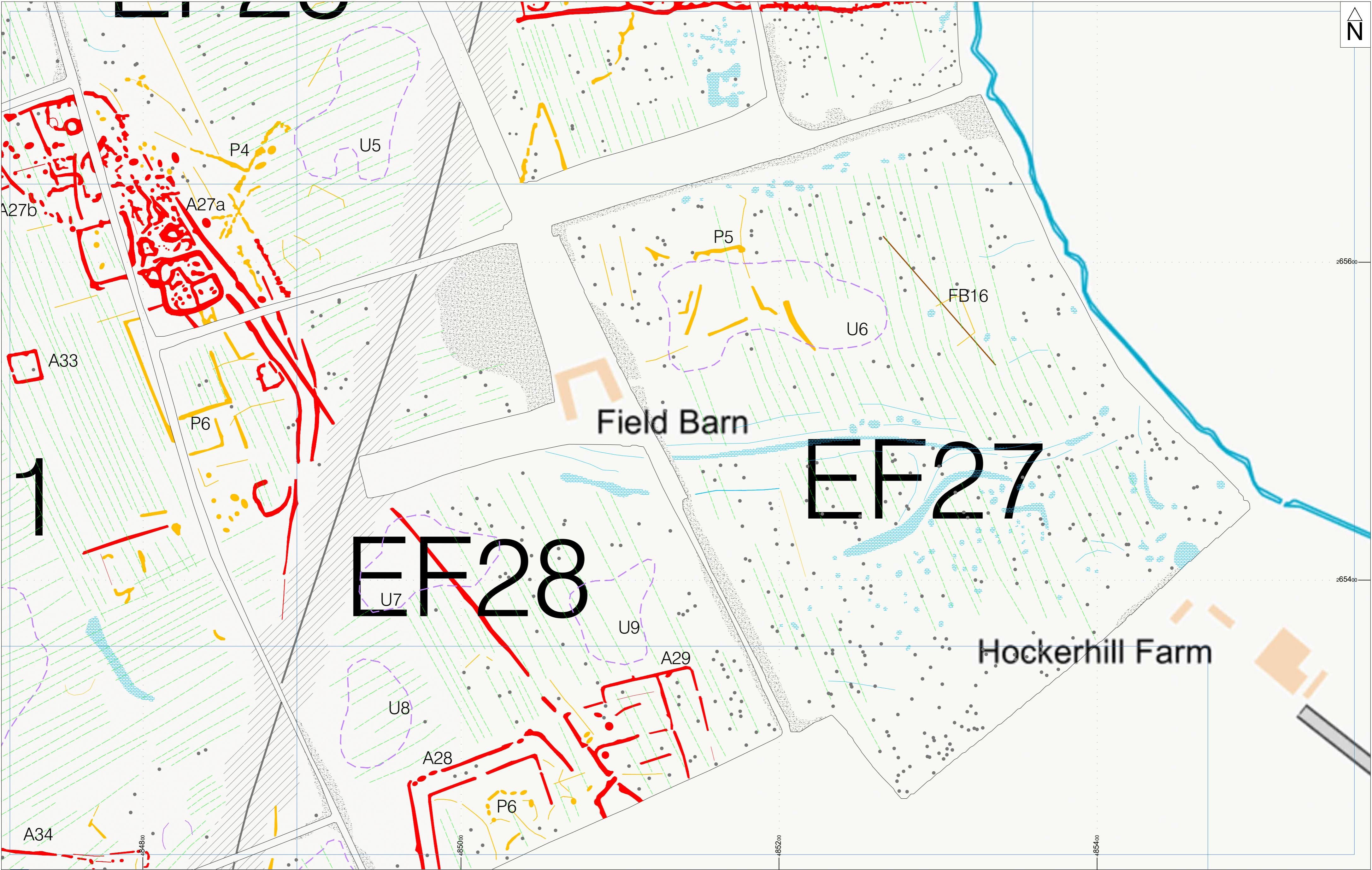
APFP Regulation 5(2)(a)



Schedule of Changes

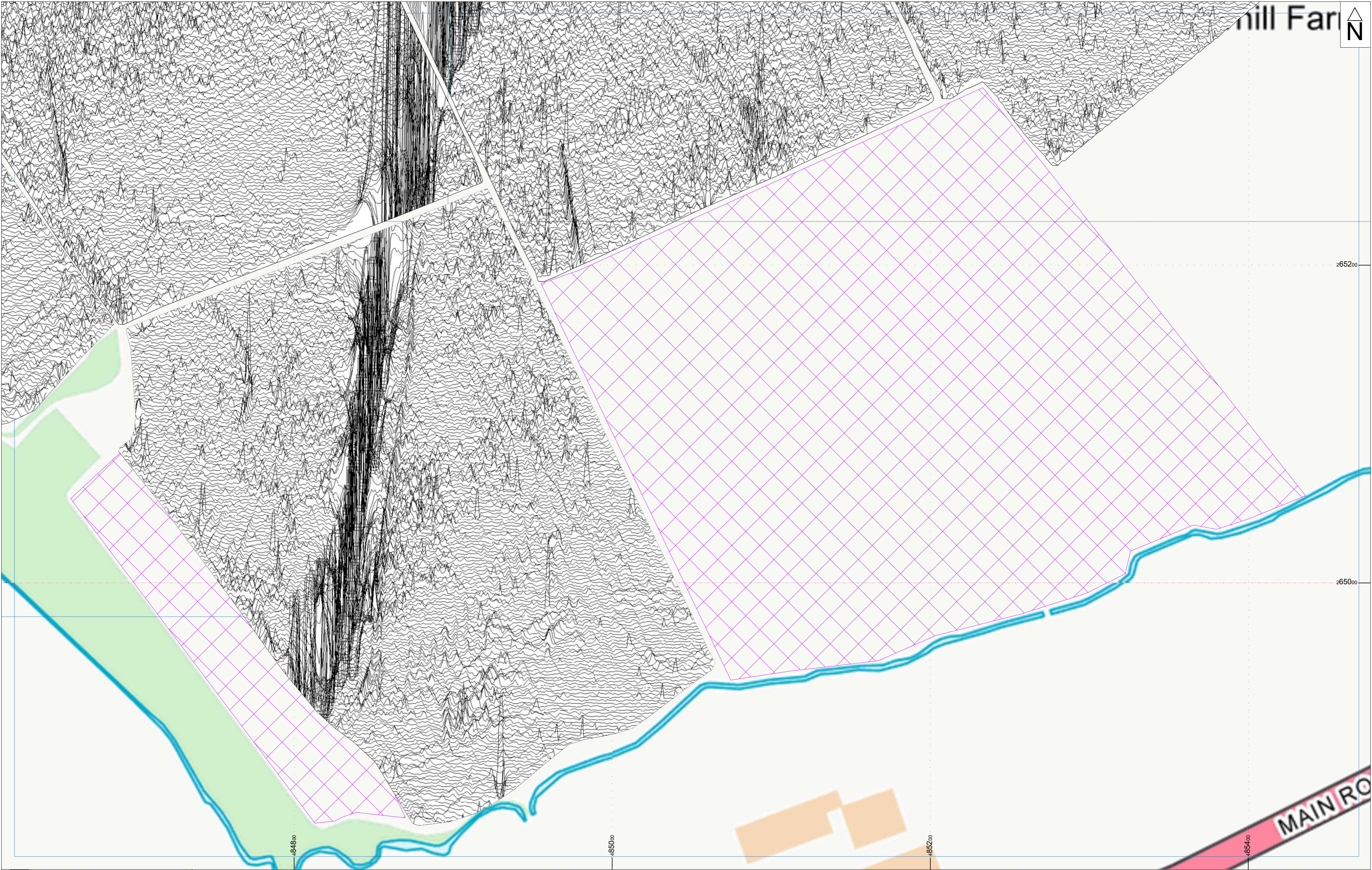
<u>Revision</u>	<u>Section Reference</u>	<u>Description of Changes</u>	<u>Reason for Revision</u>
<u>A</u>	<u>[cover]</u>	<u>Updated document reference to Revision A</u>	<u>Updated survey results (see Parts 8-10 of 10).</u>

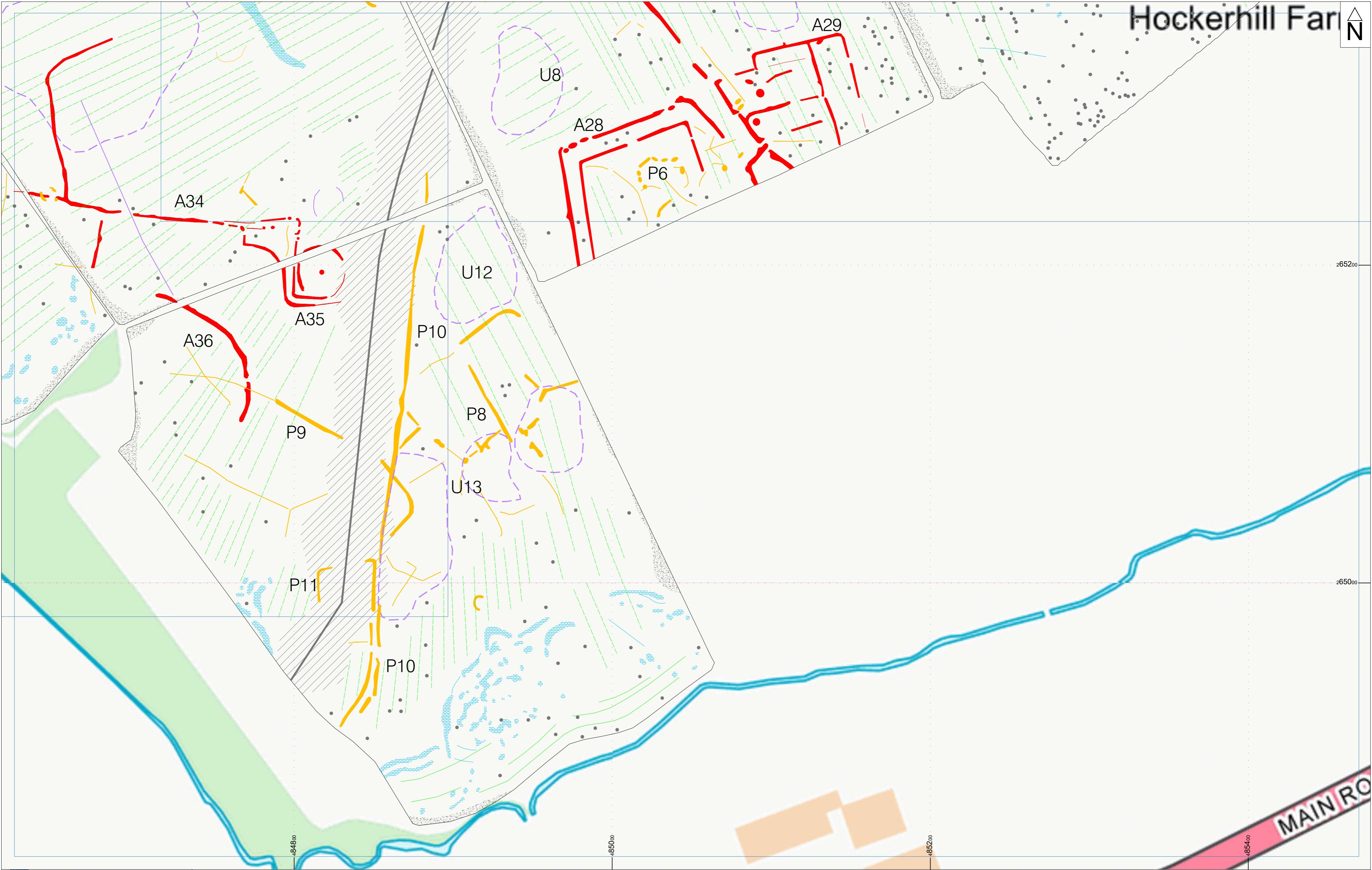














Title		Interpretation					
	SECTOR BOUNDARY		FERROUS		RIDGE & FURROW		GEOLOGY
			SERVICE PIPE		AGRICULTURAL		UNCERTAIN
			MAGNETIC DISTURBANCE		FORMER FIELD BOUNDARY		ARCHAEOLOGY?
			ARCHAEOLOGY				







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

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 archaeol11-531703

OASIS ID (UID)	archaeol11-531703
Project Name	Geophysical Survey at Green Hill Solar Project - Sites C, D and E
Sitename	Green Hill Solar Project - Sites C, D and E
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	18-Sep-2023 - 12-Sep-2024
Location	Green Hill Solar Project - Sites C, D and E NGR : SP 84940 66150 LL : 52.286933325371926, -0.756175325784564 12 Fig : 484940,266150
Administrative Areas	Country : England County/Local Authority : North Northamptonshire Local Authority District : North Northamptonshire Parish : Mears Ashby
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 406 hectares of land associated with Areas C, D and E of the Green Hill Solar Project, Northamptonshire. Numerous archaeological anomalies have been recorded which include large settlements, double ditched large enclosures, ring ditches, trackways and field systems along with ditches and pits indicative of activity over a probable prehistoric to medieval timeframe. Agricultural anomalies include former field boundaries, medieval/post-medieval ridge and furrow cultivation, modern ploughing and land drains. Magnetic disturbance within the dataset can be attributed to adjacent tracks and metal fencing within field boundaries. Service pipes originating from a modern substation in Green Hill E have also been recorded. Uncertain anomalies recorded within the data are generally considered to be geological or caused by agricultural activity. Geological responses seen within the dataset reflect either the topography of the site, possible quarrying, sub-surface fluid dynamics, desiccation cracking 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 archaeological activity and low elsewhere.

Keywords	Linear Settlement - UNCERTAIN - FISH Thesaurus of Monument Types Double Ditched Enclosure - LATER PREHISTORIC - FISH Thesaurus of Monument Types Rectilinear Enclosure - LATER PREHISTORIC - FISH Thesaurus of Monument Types Field System - UNCERTAIN - FISH Thesaurus of Monument Types Barrow - BRONZE AGE - FISH Thesaurus of Monument Types
Funder	Private or public corporation Green Hill Solar Project
HER	Northamptonshire SMR - unRev - STANDARD
Person Responsible for work	Emma Brunning
HER Identifiers	
Archives	

Report generated on: 16 Mar 2025, 18:54

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Appendix D

Green Hill F Geophysical Survey Report



WYAS
**Archaeological
Services**

Green Hill Solar Project

Site F

Northamptonshire

Geophysical Survey

Report no. 4257
March 2025

Client: Green Hill Solar Project



Green Hill Solar Project

Site F

Northamptonshire

Geophysical Survey

Summary

A geophysical (gradiometer) survey was undertaken on approximately 292 hectares of land within Site F of the Green Hill Solar Project, Grendon, Northamptonshire. Archaeological and possible archaeological responses have been recorded. These comprise ring ditches, linear ditches, pits and rectilinear enclosures, indicative of settlement activity over a probable prehistoric to medieval timeframe. A possible henge monument has also been recorded along with the location of a windmill. A previously excavated Roman villa is also apparent surrounded by field divisions. Uncertain anomalies recorded within the data generally appear to be agricultural or geological in origin. Former field boundaries have been recorded along with medieval/post-medieval ridge and furrow cultivation, modern ploughing and land drains. Magnetic disturbance within the dataset can be attributed to adjacent tracks, metal fencing within field boundaries, electricity pylons, overhead cables, and demolition of a former brick works. Geological responses seen within the dataset reflect either the topography of the site, discrete pockets of natural variations, possible quarrying, or former watercourses. 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.

Report Information

Client: Green Hill Solar Project
Report Type: Geophysical Survey
Location: Bozeat, Northampton, Northamptonshire
County: Northamptonshire
Grid Reference: SP 89589 58341 (Approximate Site Centre)
Period(s) of activity: Prehistoric - post-medieval
Report Number: 4257
Project Number: XK77
Site Code: EXG23
OASIS ID: archaeol11-532092
Date of fieldwork: March – October 2024
Date of report: March 2025
Project Management: Emma Brunning BSc MCIfA
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Claire Stephens BA MA
Illustrations: Emma Brunning & Jake Freeman
Research: Emma Brunning
Report: Emma Brunning & Jake Freeman

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1 Introduction

Archaeological Services ASWYAS has been commissioned by Lanpro on behalf of the Green Hill Solar Farm to undertake a geophysical survey on land for the proposed Green Hill Site F, located predominantly within the administrative boundary of Northampton, Northamptonshire.

This report details Site F of the project only, hereafter referred to as the 'Site'. The survey was undertaken in line with current best practice (CIfA 2020; Schmidt *et al.* 2015). Due to the wet weather and young crops, site visits were made as land became available. Survey initially occurred during March - May 2024 and then was completed in October 2024.

Site location, topography and land-use

The Site comprises approximately 292 ha of arable and pasture land across 33 fields (FF1-FF33), located to the immediate west of the village of Bozeat, Northampton, with an approximate site centre at SP 89591 58255 (Fig. 1). The Site is bounded by the A509 and the village of Bozeat to the east, and by further arable land to the north, west, and south.

Ground coverage across the Site generally comprised a mixture of young crop, rolled field, and open pasture. Elevation at the Site varies between approximately 53m above Ordnance Datum (aOD) within the east of Field FF4, to approximately 104m aOD within FF33 at the southern limit of the Site.

Soils and geology

The underlying solid geology of the Site comprises several formations that generally decrease in age from north to south. The oldest formation within Green Hill Site F is the Whitby Mudstone Formation – Mudstone of the Upper Lias Group (present in FF3 – FF9, FF11, FF18 and FF19), which underlies a series of formations of the Great Oolite Group, including the Stamford Member - Sandstone and Siltstone, Interbedded (present in FF4, FF5, FF9 – FF11, FF14, FF15 and FF17) and the Wellingborough Limestone Member - Limestone and Mudstone, Interbedded (present in FF8, FF10 – FF15, FF17 – FF22 and FF25) which form the basal layers of the overarching Rutland Formation – Mudstone (present in FF10 – FF25).

Overlying this (in Fields FF1, FF2, FF10, FF11, FF13 – FF19 and FF21 – FF31) is the Blisworth Limestone Formation – Limestone and above this the Blisworth Clay Formation – Mudstone (present in FF25 – FF29, FF31 and FF32). The youngest solid geology beneath the Site comprises the Kellaway Formation of the Ancholme Group, which is present beneath small parts of FF28 and FF32 (BGS 2025). Within the southern extent of Site F, Cornbrash Formation – Limestone is present within FF31– FF33 and partially within FF28.

Superficial deposits have been recorded as Alluvium - clay and silt.; Bozeat Till – diamicton; Milton Sand - sand and gravel and the Oadby Member - diamicton. All of these are sedimentary superficial deposits that formed during the Quaternary period (BGS 2025).

Soils at the site comprise Lime-rich loamy and clayey soils with impeded drainage (Soilscape 9), freely draining lime-rich loamy soils (Soilscape 5) and slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (Soilscape 18) CSAI 2025).

2 Archaeological Background

The following information is a summary of an archaeological background provided by Lanpro Services based on a 1km search area. The reference number relates to the Monument Number as recorded on Northamptonshire's Historic Environment Record (HER) and the National Heritage List for England (NHLE).

Prehistoric

The earliest evidence for known human activity within the search area comprises a findspot of a Mesolithic flint core discovered within the vicinity of Grendon, *c.* 750m to the northwest of Field FF9 (HER 5511/0/0). An unstratified Neolithic flint axe was recovered *c.* 820m to the southwest of Field FF17 (HER 3300/0/0) and a polished flint axe was recovered from the vicinity of the later prehistoric/Roman settlement north of Easton Lodge (HER 95/1: NHLE 1003876). There is a paucity of Early Bronze Age funerary activity within the 1km search area, although possible barrows have been identified as cropmarks *c.* 270m to the northwest of Field FF9 (HER 3292/0/0), and *c.* 995m to the east of Field FF33 (HER 9913/0/1). A stone covered mound interpreted as a possible barrow was also identified within the former earthworks of the later prehistoric/Roman settlement north of Easton Lodge (HER 95/1: NHLE 1003876).

Fieldwalking at Bozeat Quarry in the field to the immediate east of Field FF3 identified a scatter of prehistoric flints, including 38 waste flakes, five flakes, three cores, six blades and five scrapers (HER 3518/0/0). The subsequent excavations at Bozeat Quarry also recovered 32 worked flints of Neolithic/Early Bronze Age date, comprising an axe fragment, a scraper and four blades, but mostly flakes, indicating a sparse level of activity at this location during these periods (HER 342/0/0). Another prehistoric flint scatter has been identified within the search area *c.* 160m to the southeast of Field FF5 (HER 453/0/0).

The only other evidence of possible Bronze Age activity identified within the search area comprises a cremation burial that could only be broadly dated to a Bronze Age to Early Iron Age date, which was excavated in Bozeat Quarry, *c.* 95m to the east of Field FF3 (HER 3518/0/3), and a pit alignment of possible Late Bronze Age or Early Iron Age date was also recorded at Bozeat Quarry, *c.* 40m to the east of Field FF3 (HER 3518/0/2). A fragment of a

Mid to Late Bronze Age copper alloy blade (a dirk or rapier) was also recovered from the topsoil to the east of the pit alignment

Iron Age and Romano-British

Within the Site, there is evidence of the presence of archaeological remains dating to the Iron Age/Romano-British periods, including evidence of earlier ditches dating to the Iron Age within Field FF5. It is likely that these features represent the western extent of the Iron Age/Romano-British settlement activity recorded immediately to the east at Bozeat Quarry and poorly defined cropmarks were identified during the air photography and LiDAR survey. A ditched trackway of possible prehistoric or Romano-British date identified from cropmarks and corresponding to anomalies recorded by the geophysical survey in Field FF7 might also be associated with this settlement (HER 3520/0/1), and another trackway previously identified by the RCHME appears to be heading towards the same crossing point over the Grendon Brook (RCHME Easton Maudit 1; NRHE 345605).

Iron Age settlement sites have been identified within the search area in the parish of Bozeat through fieldwalking *c.* 710m to the east of Field FF3 (HER 3267), and *c.* 425m to the east of Field FF3 (HER 3266/0/0), and an Iron Age settlement comprising enclosures and a trackway was identified by cropmarks and subsequent excavation at Bozeat Grange, *c.* 320m to the south of Field FF33 (HER 95/2).

A pit alignment (HER 3519/0/2) and cremation burial (HER 3518/0/3) recorded at Bozeat Quarry have been assigned a general 'Late Bronze-Early Iron Age' date, and further open settlement dating to the 'Middle to Late Iron Age' was also identified within the southern part of the quarry, surviving as fragmentary remains including pits, ditches, a routeway, two interconnecting enclosures and two possible roundhouses (HER 3998/0/1).

In Easton Maudit parish, to the northwest of Easton Lodge (and covering much of the field immediately to the south of Field FF32) Iron Age/Romano-British settlement remains survived as earthworks in the 1960s prior to ploughing, and still survive as cropmarks (HER 95/1). The settlement remains comprise a large rectilinear enclosure with three conjoined enclosures to the north and associated ditched trackways, and much of the pottery recovered during fieldwalking within the settlement area has been identified as being of Iron Age date. A trackway leads southward from these enclosures (HER 95/0/8) toward further cropmark enclosures thought likely to be of Iron Age date (HER 95/0/11; HER 95/0/14) and pits thought to be of possible Iron Age date, possibly associated with ironstone working (HER 95/0/9; HER 95/0/10; HER 95/0/12). A possible Iron Age enclosure has also been identified during a number of surveys within Horn Wood, immediately to the east of Field FF32 (HER 5567/0/2).

In the next two fields to the east of the Scheduled Monument (both immediately to the south of Field FF31) further cropmarks of linear boundaries and irregular enclosures identified on aerial photographs are also thought to be of Iron Age date (HER 95/4), and Iron Age pottery has been recovered during fieldwalking in the field to the south, *c.* 200m to the south of Field FF31 (HER 95/0/2), and to the south of Easton Lodge Farm, *c.* 615m to the southeast of Field FF31 (HER 95/0/0). Significant concentrations of Iron Age and Romano-British finds indicating likely settlement activity have been identified at Cold Oak Copse, *c.* 780m to the west of Field FF30 (HER 3288/0/1), and further Iron Age finds indicate settlement activity further to the north of Cold Oak Copse, *c.* 800m to the southwest of Field FF17 (HER 3299). An Iron Age pottery scatter has also been identified at Grendon, *c.* 700m to the northwest of Field FF10 (HER 3293/0/1).

Many of the Iron Age settlements identified above have also produced Romano-British material indicating a continuity of occupation into the Roman period, for example stone features associated with Romano-British pottery and roofing tile have been identified at the Scheduled Monument to the northeast of Easton Lodge (NHLE 1003876), and the two sites in the vicinity site of Cold Oak Copse (HER 3288/0/1 and HER 3299) also have produced significant Romano-British material. The site at Grendon (HER 3293/0/1) also produced evidence of a 4th century Roman building.

At Bozeat Quarry, the southern Iron Age settlement apparently fell out of use *c.* 30 AD, but two new settlement areas *c.* 0.5km apart were subsequently established in the Late pre-Roman Iron Age. The 'northern settlement' was in the same area as the Late Bronze Age/Early Iron Age pit alignment and was relatively short-lived, lasting from *c.* AD 30 to middle/late 2nd century, and comprised a series of enclosures, up to twelve pottery kilns, a corn drier, pits and wells and four inhumations (HER 3518/0/1). The 'southern settlement' was a more substantial farmstead (HER 3519/0/2) that was established around the same time as its northern counterpart, but then re-planned and shifted slightly to the south in the 2nd century. Large quantities of Late Iron Age/early Roman coins and brooches suggest the presence of a temple or shrine, and stone footed buildings a corn drier and paddocks suggest a primarily pastoral economy at this location. However, evidence for Romano-British industrial activity similar to that identified at the northern settlement has also been identified at Bozeat, where excavations uncovered pottery kilns dating to the late 1st century AD as well as 2nd/3rd-century buildings (HER 3268/1).

In the early 1960s, D N Hall and N Nickerson also undertook field-walking across several parishes on the North Bedfordshire and South Northamptonshire border and identified the site of a possible Roman villa at Easton Maudit within Field FF27. The initial phase of work was carried out under the direction of D N Hall when three trenches were excavated in 1987 ahead of deep ploughing, this identifying an area of in situ tessellation. Subsequent stripping in 1988-90 revealed the full footprint of the building (Event ENN10311), and subsequent

excavation between 1990-93 involved the complete excavation of several rooms within the building, alongside metal detecting surveys which identified a concentration of 4th century coins, predominantly to the east of the excavated area, as well as several Iron Age coins to the southwest of the villa where a possible earlier roundhouse had also been identified. Several Colchester one-piece brooches and 1st-century Roman coins were also found at a hollow in the landscape some distance to the north-west of the main area of excavation, in the north-western area of field FF27.

There are numerous cropmarks within the wider search area that have been assigned a general Iron Age/Romano-British date on morphological grounds, such as the double-ditched 'banjo-type' enclosure in the field to the east of Field FF1 (RCHME Bozeat 11; HER 3248) and the 'clothes line' enclosure, hut circle and double-ditched enclosure c. 630m to the east of Field FF1 (RCHME Bozeat 1; HER 3220), located in an area where Romano-British pottery and building material had been recovered during field walking (RCHME Bozeat 8). Two further areas of cropmark enclosures have been identified to the south in the vicinity of Glebe Farm (HER 2879/1; HER 2879/2). Likely Romano-British settlement activity has also been identified from cropmarks south of Yardley Road, c. 300m northwest of Field FF17 (HER3296), and possible prehistoric ditches and enclosures have been identified immediately to the northwest of Field FF7 (HER 3522).

Medieval

The earliest evidence for early medieval activity within the search area comprises several Early Saxon burial sites, including three inhumations that were found at Wyman Close in Bozeat, c. 620m to the east of Field FF25 (HER 6528). These burials may have been part of a larger Saxon cemetery, and one of the burials was associated with a necklace and long brooch of 6th-century type attesting to the early medieval origins of the village settlement. The place name Bozeat is thought to derive from the Old English personal name Bosa and geat, or 'Bosa's gate', possibly referencing the low pass over the high ground between what was to become Northamptonshire and Buckinghamshire.

Five Early-Middle Saxon burials, including a decapitated inhumation, were discovered at Bozeat Quarry, c. 40m to the north of the proposed access route between Fields FF2 and FF5 (HER 3519/0/3), one associated with a buckle dated to the late 6th-7th century. These burials were associated with nearby pits and a possible well or watering hole (HER 3519/0/2), which were thought to relate to intermittent or seasonal visits rather than sustained settlement activity. Artefacts recovered from these features include 35 sherds of Early-Middle Saxon pottery, a Saxon brooch, a possible Anglo-Saxon mortarium and a decorated 6th century sherd (Atkins 2018, 64-65). Early Middle Saxon settlement activity has also been identified within the northern area of Bozeat Quarry in the form of a possible sunken-featured building, c. 115m to the east of Field FF3 (HER 3518/0/25).

The placename ‘Grendon’ derives from the Old English grēne and dūn, meaning ‘Green Hill’ (Watts 2004, 262), and this attests to the probable Anglo-Saxon origin of the settlement (HER 3523). Possible early medieval settlement evidence has been identified at one location within the village, c. 100m to the east of the Church of St. Mary at Hill Farm. A trial trench excavation here in 2020 (HER Event ENN109940) identified a single post hole containing a sherd of St. Neot’s ware dating to the Late Saxon period and the remains of a stone building with a clay floor (HER 3523/0/25).

Early Saxon settlement activity has also been identified within the study site within field FF27, where a sunken-featured building in association with over a hundred sherds of Anglo-Saxon pottery was partially excavated, within the yard associated with Easton Maudite Roman villa, and five early medieval inhumations were also recorded within the demolished Roman building (HER 8091/0/1). A possible later medieval occupation site has also been identified c. 40m to the west of Field FF27, comprising a large rectangular ditched enclosure respected by the surrounding ridge and furrow and containing further ditches and furrows. Excavations within this enclosure identified a stone walled building of 13th century date (HER 1406/0/5), and excavations in 1965 in Horn Wood c. 80m to the northwest of Field FF33 also identified a rectangular stone building associated with 13th-century pottery, interpreted as a possible lodge keeper’s bothy (HER 5567/0/1).

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.

Fields FF1, FF2 and the paddocks of FF27 was surveyed using a hand-held approach. The Site grid was laid out using a Trimble VRS differential Global Positioning System (Trimble R8 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 the survey areas at a scale of 1:25000 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 1:25000. Processed and minimally processed data, together with interpretation of the survey results are presented in Figures 5 to 79 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 5 to 79)

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.

Overhead electricity pylons running through the south of the Site have been recorded within Field FF31 and has produced a ‘shimmer’ effect. Large ferrous responses **F1** in Fields FF2 and FF3 are associated with pylons, however, the overhead cables in these fields are not seen within the data, perhaps due to a difference in voltage or the height of the cables.

Magnetic disturbance in the south of Field FF5 is likely to be associated with the former 19th-century Bozeat Brickworks (HER 6334/1) depicted on historic mapping dating from 1884 (NLS 2024) and abandoned by 1900.

Linear dipolar trends have been recorded in Fields FF5, FF14, FF20, FF22 and FF30 which relate to service pipes.

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.

Broad zones of natural responses in Field FF3 – FF6 with clear edges dominate the dataset. The responses are low level mottling with some stronger curving bands which may suggest a former watercourse.

Sinuuous bands of natural responses have been recorded along the western limits of Fields FF7, FF8, FF9 and FF15 which are likely to be associated with a former route of the adjacent watercourse.

Geological responses which appear to have a low magnetic strength but with clearly defined edges are thought to relate to possible quarrying. These include responses **G1** and **G2** in Field FF13, **G3** in Field FF15 and **G4** in Field FF19. Those at **G1** and **G2** correspond to depressions within LiDAR data (NLS 2025).

Further large-scale bands of geology in Fields FF21, FF22, FF25, FF26 and FF30 correspond with changes to the topography.

Agricultural anomalies

Former field boundaries (**FB1 – FB14**) have been recorded within Fields FF2, FF11, FF14, FF19, FF28, FF31, FF30, FF31, FF32 and FF33. Most of these boundaries correspond to historic mapping dating from 1884 (NLS 2025).

Medieval or post-medieval ridge and furrow cultivation has been recorded within Fields FF1, FF2, FF7, FF11, FF13, FF15, FF16, FF17, FF25, FF27, FF28, FF29 and FF31 on differing alignments.

Field drains have been recorded in Fields FF1, FF3, FF17, FF22, FF29, FF32 and FF33. These have quite a low magnetic strength, and it is likely that their construction is of a non-fired clay construction.

Other parallel linear trends can be seen within most of the 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

Two magnetically strong broad but short linear anomalies (**U1**) in Field FF3 have distinct straight edges which suggest an anthropogenic origin, but no obvious cause is apparent. In the southeast corner of Field FF3 trends and short ditch lengths (**U2**) may be indicative of archaeological activity, but given the mass of natural responses nearby, these responses could be agricultural responses enhanced by underlying natural.

A large oval response (**U3**) in Field FF5 measures approximately 56m by 44m and may be of some interest, but due to the widespread geological responses in this area, a natural origin is also likely.

Anomalies (**U4**) in the middle of Field FF9 do not form sufficient patterning to obtain a clear interpretation. They are possibly agricultural or natural although an archaeological origin cannot be ruled out as lie between responses **P2** and **P3**.

In the south of Field FF16 a group of anomalies (**U5**) have been recorded adjacent to a possible windmill. Some of these appear to form an eastern boundary ditch to the windmill.

A series of linear trends and pit-like anomalies (**U6** and **U7**) have been recorded in Fields FF18 and FF19 and have proved difficult to interpret. They may be geological, but due to the clear defined southern edge, an anthropogenic origin is also likely.

A distinct change in background levels of response within Field FF25 with a clear linear edge (**U8**) is visible in the data. The straight linear nature of this change would suggest a former boundary, with differential land use accounting for the different magnetic background. However, the edge is offset from a mapped former boundary by some 50m and on a slightly different orientation, which are errors greater than one might expect for old map transcriptions. It is possible, therefore, that the change is due to natural factors.

A linear anomaly (**U9**) runs through Fields FF28 and FF27 and has a curious magnetic signature consisting of a line of closely spaced small pits. The part of the anomaly in Field FF8 roughly corresponds to a footpath seen on historic mapping but continuing north it veers off in the wrong direction. A similar response (**U10**) which runs through Fields FF31 and FF32 is likely to be a water pipe as runs to a water trough. It is also possible that **U9** is a water pipe.

Curvilinear bands of anomalies and trends **U11** and **U12** in Field FF33 both appear on aerial imagery and visible as a topographic feature on LiDAR data (NLS 2025). Looking at the larger scale LiDAR data, it is likely these are palaeochannels.

Possible and definite archaeological anomalies

Anomalies of both an archaeological and possible archaeological origin have been recorded within the Site with areas devoid of (archaeological) anomalies between and/or around them. Presumably, these 'blank' areas represent pastureland or other similarly open spaces that were utilised in the past but in ways that have left little or no geophysical signature. There is the possibility of multiple phases of activity within some of the areas.

A small complex of features (**A1**) has been recorded in the east of Field FF1 covering an area of approximately 130m by 75m. Some weaker trends on the periphery of the complex have been downgraded to possible archaeology due to incomplete patterns and very weak response.

A small rectilinear enclosure and parts of a larger rectilinear feature (**A2**) have been recorded in Field FF5. The small enclosure measures approximately 14m by 13m. Other linear anomalies and trends (**P1**) in the vicinity of **A2** have been identified as possible archaeology due to either their weak magnetic nature, incomplete patterns or alignment with various modern cultivation trends.

A group of rectilinear responses (**A3**) in the south of Field FF7 along with **A13** in the north of Field FF11 cover an area of approximately 85m by 74m with magnetically weak ditch responses heading northwards. Internal divisions are clearly visible.

A small rectilinear enclosure (**A4**) measuring approximately 11m by 9m has been recorded in the northeast of Field FF8. It is possible that the sides of this enclosure are a series of pits.

Straddling Fields FF8 and FF10, enclosures **A5**, **A6** and **A8** are possibly connected with the enclosures at **A3** and **A13**. They are on the same alignment, but their appearance is different, being larger. A magnetically strong response has been recorded within **A5** towards the east, which has been interpreted as possible archaeology due to the location, being on the edge of the field boundary.

A group of responses (**P3**) in the south of Field FF9 are possibly a continuation of the anomalies **A16** to the south and **A11** to the east. As the field is narrow, a cautious approach has been taken.

A rectilinear enclosure (**A7**) has been recorded, the majority within Field FF10, although it continues into Fields FF8 and FF9 (**P2**) and measures approximately 63m by 34m. This enclosure may be part of the linear settlement (**A9** - **A11**) visible throughout the western half of Field FF10 and continuing south (**A16**) into Field FF14. Magnetically weak parallel responses (**P4**) are thought to be trackways linking the linear settlement to further archaeological features in Field FF13. There is a clear, distinct change in the magnetic background levels between the track ditches which may relate to the surface material.

An isolated ring ditch (**A14**) can be seen along the eastern boundary of Field FF11, measuring approximately 25m in diameter.

Linear responses **P5** in Field FF12 and **P6** in Field FF13 have been interpreted as possible archaeology. However, a number of geological features have been recorded in the vicinity and as such they may also represent natural features.

Definite archaeological responses (**A15**) within Field FF13 consist of ditches, enclosures, and a possible trackway. Within and surrounding these features geological responses (**G1** and **G2**) which are thought to be quarrying may have destroyed further archaeology.

A small semi-circle (**A17**) has been located in the south of Field FF15 measuring approximately 12m in diameter. This feature is isolated but may represent a ring ditch.

Situated in the south of Field FF16, a rectangular arrangement of anomalies and trends (**A18**) have been recorded. Within the centre, lies a negative 'cross' shaped response which is typical of a medieval/post-medieval post mill.

A large double ringed feature (**A19**) has been recorded in Field FF19. The outer ring measures approximately 73m in diameter with the inner ring measuring 22m in diameter. It is possible that these anomalies relate to a henge monument. There is a clear entrance in the south of the outer ring. It is unfortunate that a former boundary truncates the northernmost part of the monument and that geological responses in this vicinity may have masked any other archaeological features.

To the immediate southeast of **A19**, a 'D' shaped enclosure (**A20**) can be seen measuring approximately 25m by 19m. The western arm appears to lie on a weaker trend (**P7**) which has been interpreted as possible archaeology.

An area of archaeological activity has been recorded in Field FF21 and consists of part a large rectilinear enclosure (**A21**), a double ditched curving feature (**A22**), two ring ditches (**A23**), linear ditches and pits. Possible ring ditches have also been identified (**P8**). The majority of these features lie in an area of natural responses.

Part of a small rectilinear enclosure (**A24**) can be seen in the southwest corner of Field F22 with a possible entrance along its south-eastern length.

A large complex of features has been recorded within Field FF27 with anomalies extending in both Fields FF26 and FF28. Anomalies (**A25**) in the very southeast of the field are almost certainly the site of the Easton Maudit Roman villa. The possible footings of the villa site measure at least 87m by 40m but is obscured by high magnetic readings which may relate to excavations and subsequent backfilling within this area. Surrounding the villa are multiple enclosures or field divisions, which are likely to be contemporary. Surrounding these immediate field divisions, other linear ditches and curvilinear features are on differing alignments and therefore, most likely of a different period.

To the immediate north of the villa complex, a cluster of linear responses (**A26**) form a series of enclosures and part enclosures possibly associated with a field system. To the north in Field FF26, anomalies (**A27**) form a 'triangular'-shaped enclosure with internal divisions.

A large sub-circular enclosure (**A28**) in Field FF28 measures approximately 110m by at least 80m and shows a ring ditch (**A29**) measuring 12m in diameter with a further three possible ring ditches (**P9**) of differing sizes.

Curving ditch (**P10**) lies on the northern boundary of Field FF32 and continues a short distance into Field FF29. An interpretation is difficult due to the limited magnetic response.

Discrete linear and trend (**P11**) in Field FF33 curves at its southern end and thus appears to be heading towards the field boundary. This may be historic field division although limited extent precludes a firm interpretation.

5 Conclusions

The geophysical survey has detected numerous magnetic anomalies associated with an archaeological and possible archaeological origin, comprising ring ditches, linear ditches and rectilinear enclosures, indicative of settlement activity over a probable prehistoric to medieval timeframe. A possible henge monument has also been recorded, along with a

medieval/post-medieval windmill. The location of a previously excavated Roman villa is also apparent surrounded by field divisions. Uncertain anomalies recorded are generally considered to be of an agricultural or geological origin.

Former field boundaries have been recorded along with medieval/post-medieval ridge and furrow cultivation, modern ploughing and land drains. Magnetic disturbance within the dataset can be attributed to adjacent tracks, metal fencing within field boundaries, electricity pylons, overhead cables and demolition of a former brick works.

Geological responses seen within the dataset reflect either the topography of the site, discrete pockets of natural variations, possible quarrying or former watercourses.

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.

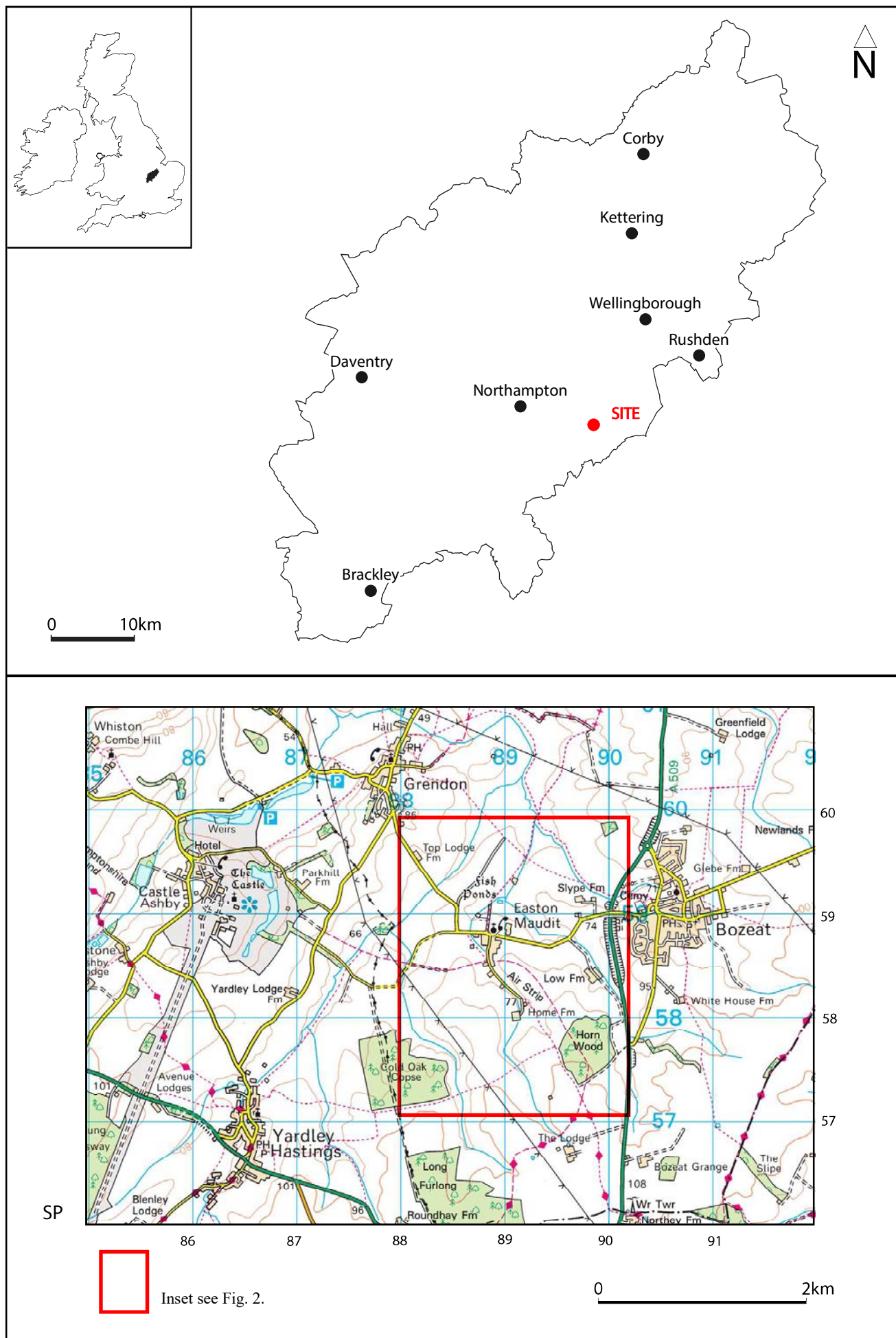
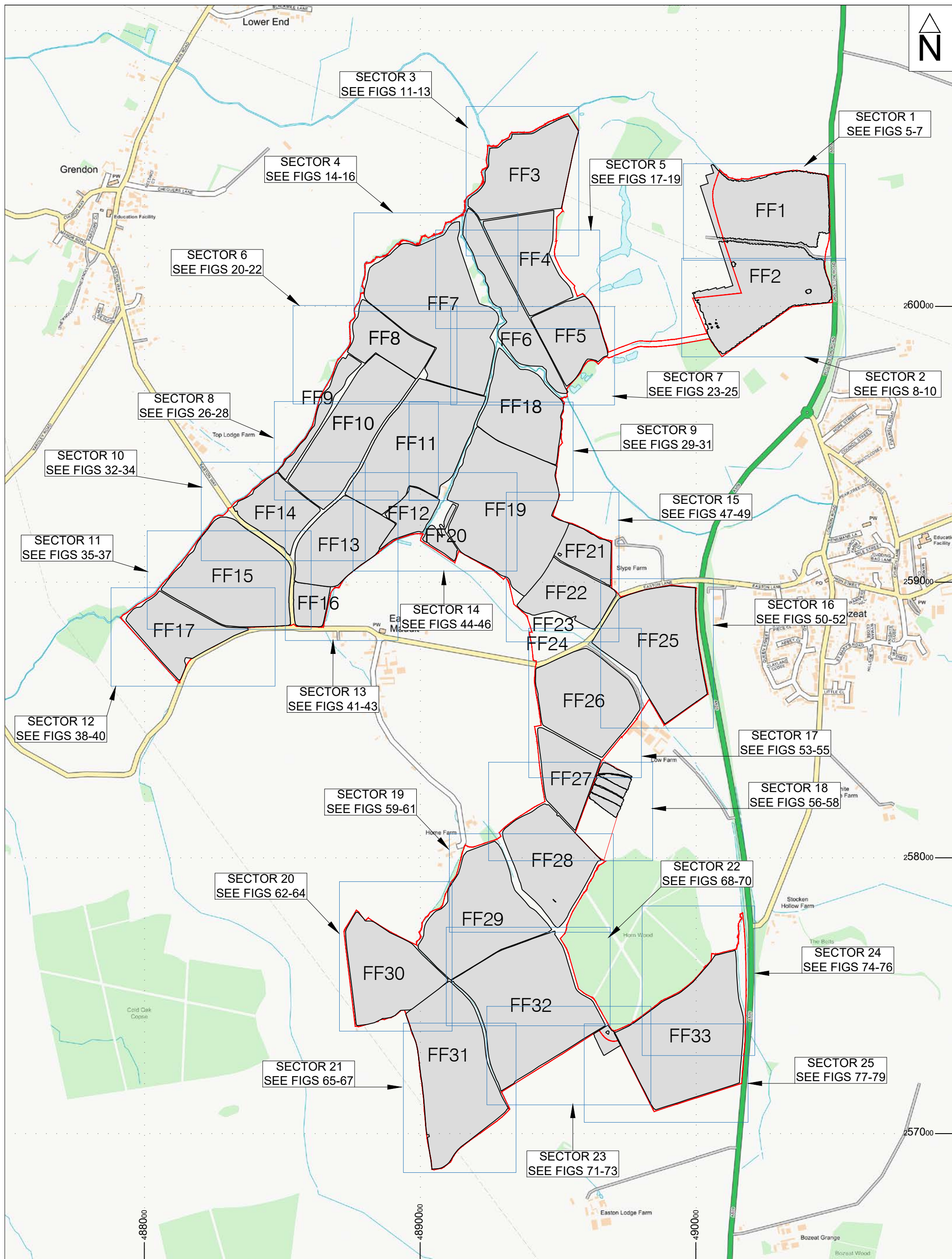



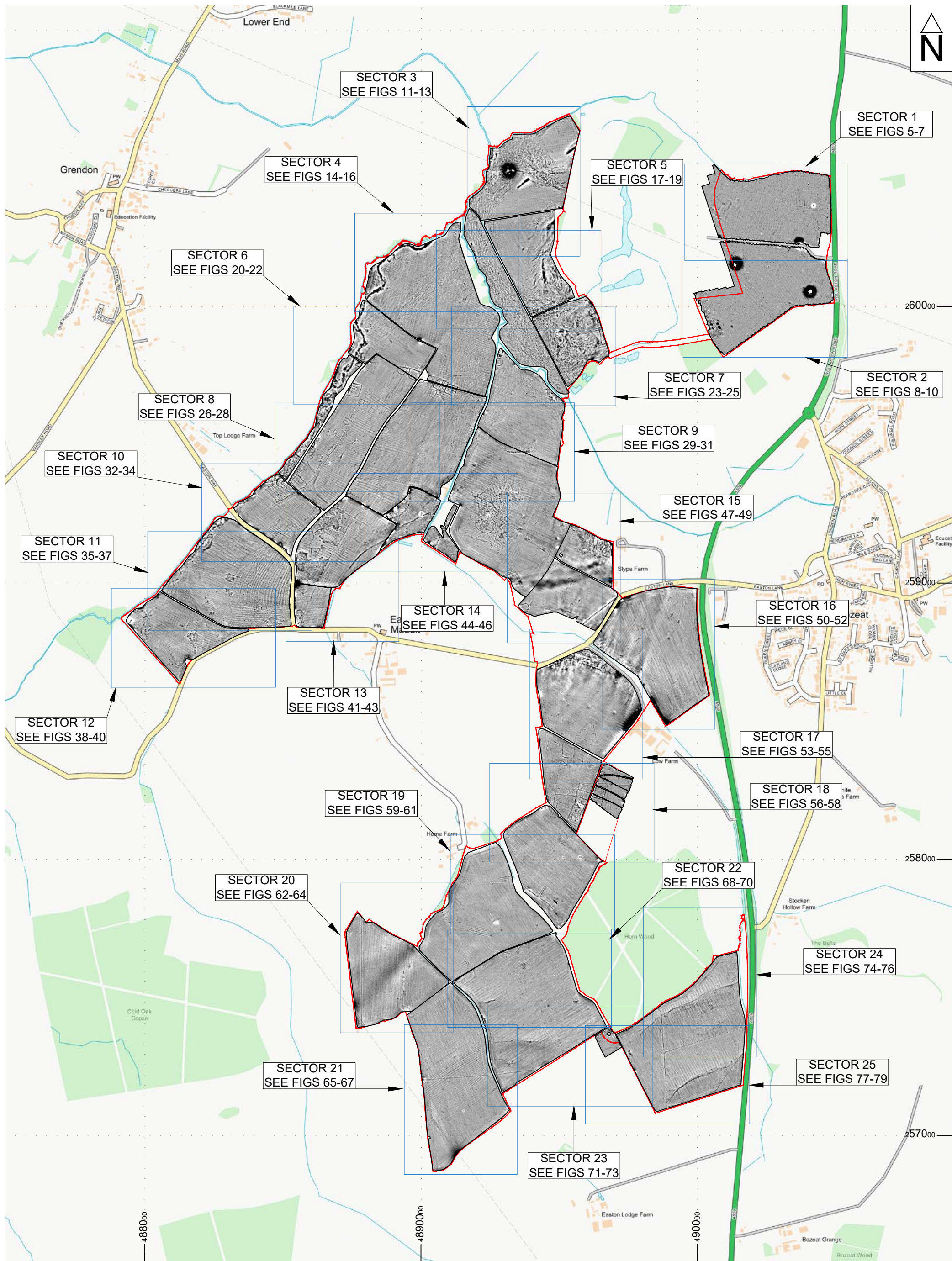




Fig. 1. Site location

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	FIELD NUMBERS
	SECTOR BOUNDARY

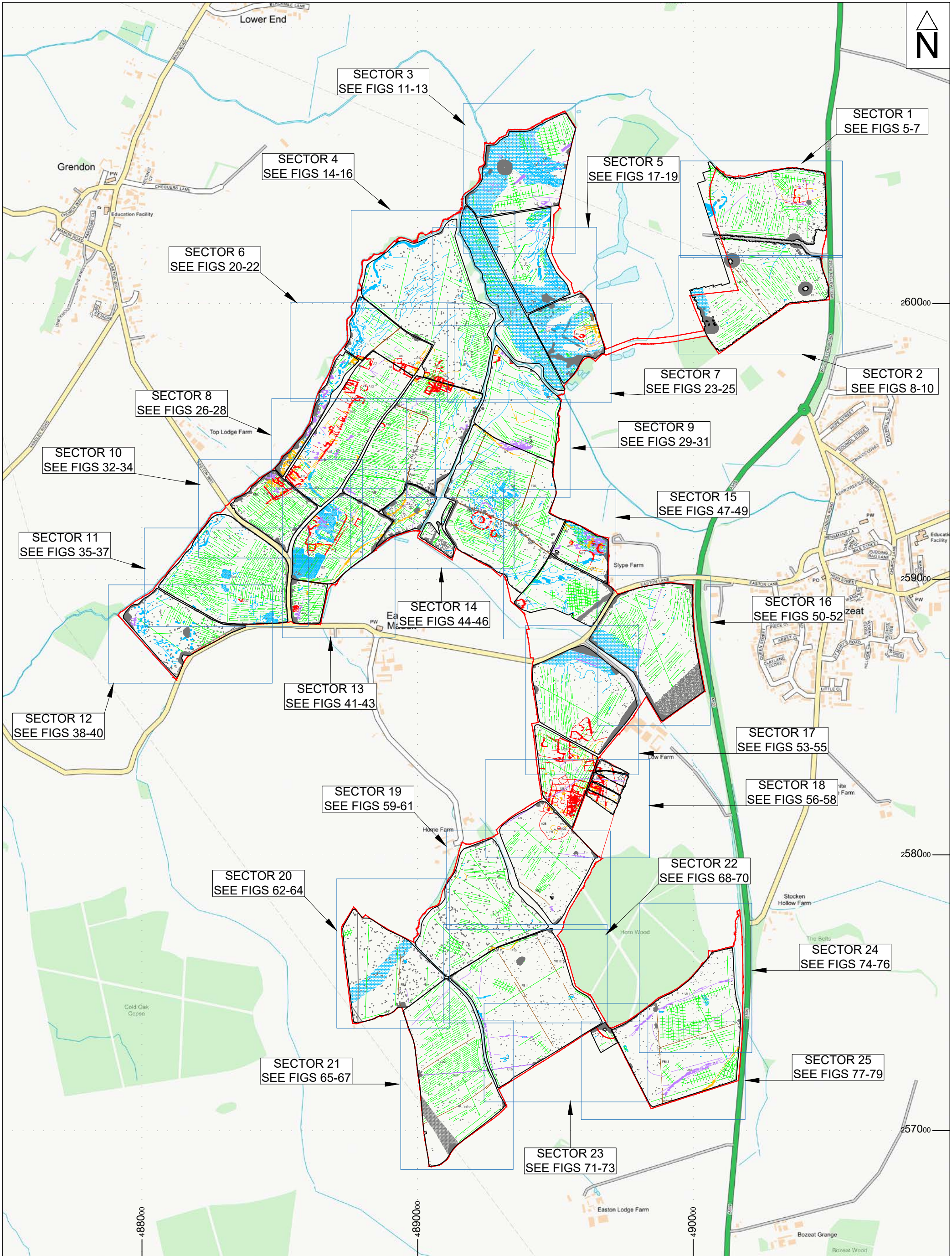



Title	
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	SECTOR BOUNDARY



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1:12500 @ A3





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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 G

Overall Interpretation of magnetometer data

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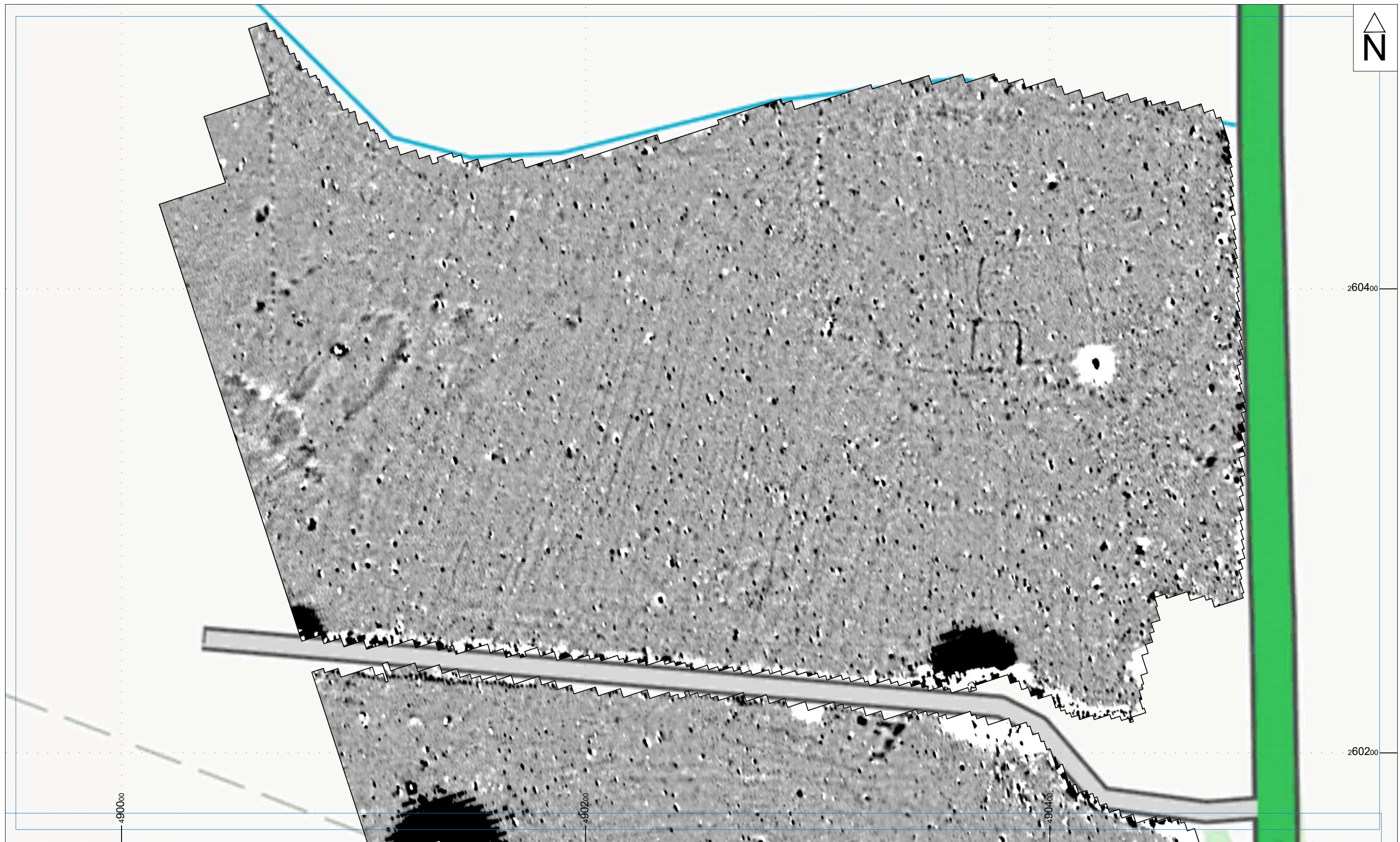
Fig. 4

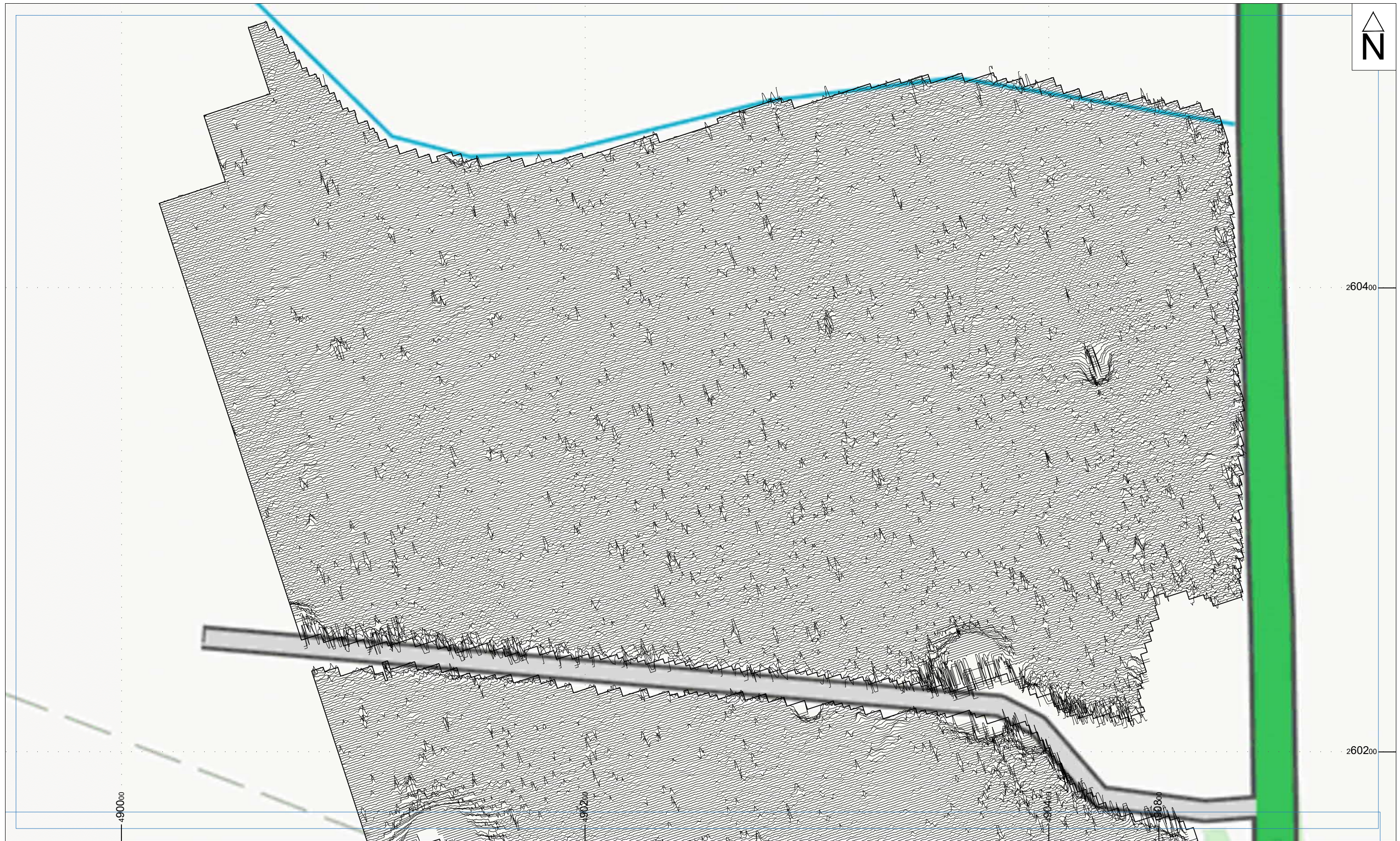
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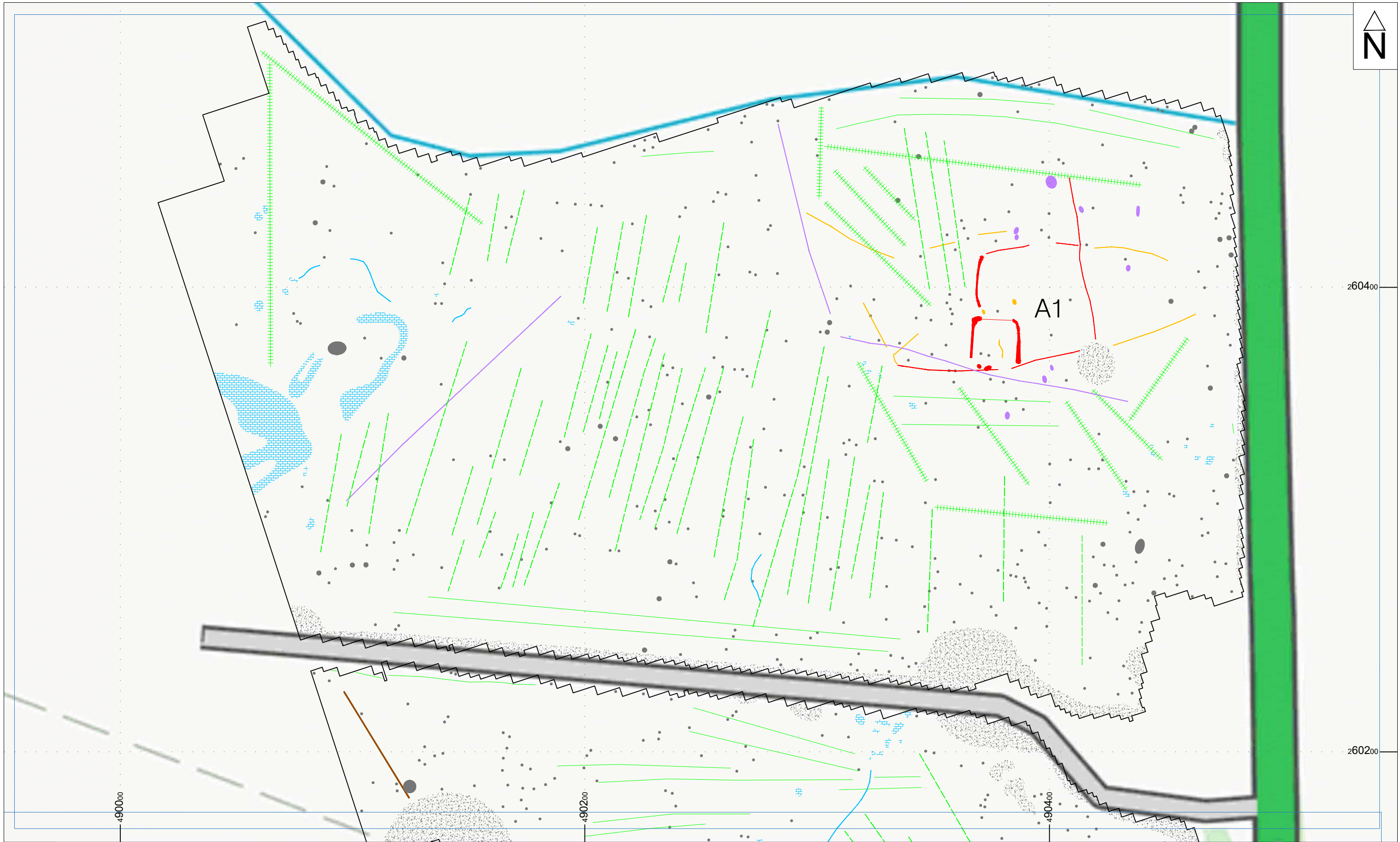
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	SERVICE PIPE		RIDGE & FURROW		UNCERTAIN
	MAGNETIC DISTURBANCE		AGRICULTURAL		ARCHAEOLOGY?
	OVERHEAD POWER CABLE		FORMER FIELD BOUNDARY		ARCHAEOLOGY

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Title

	SECTOR BOUNDARY
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Interpretation











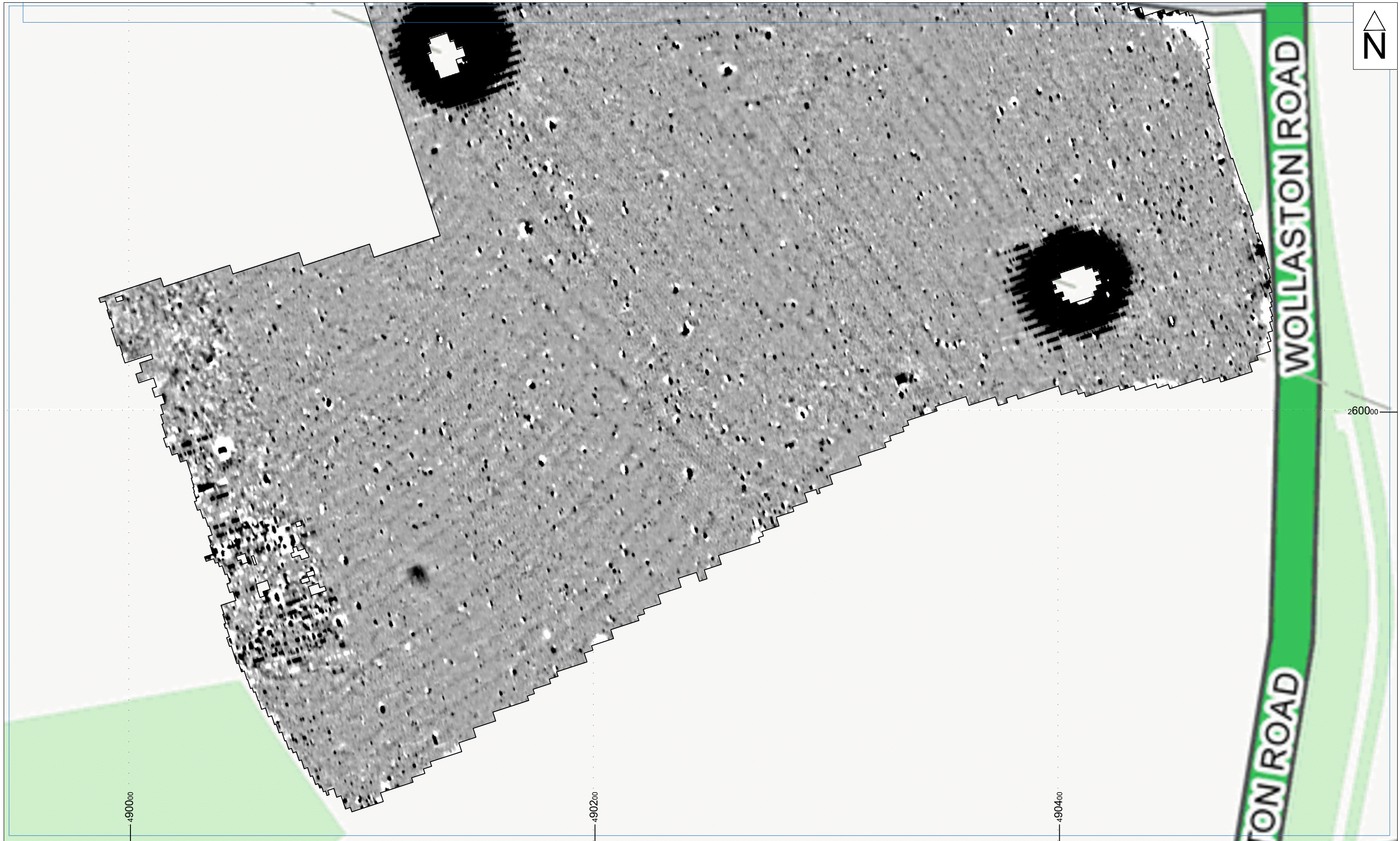
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	MAGNETIC DISTURBANCE		AGRICULTURAL		UNCERTAIN		ARCHAEOLOGY
	RIDGE & FURROW		FORMER FIELD BOUNDARY				

Fig. 7



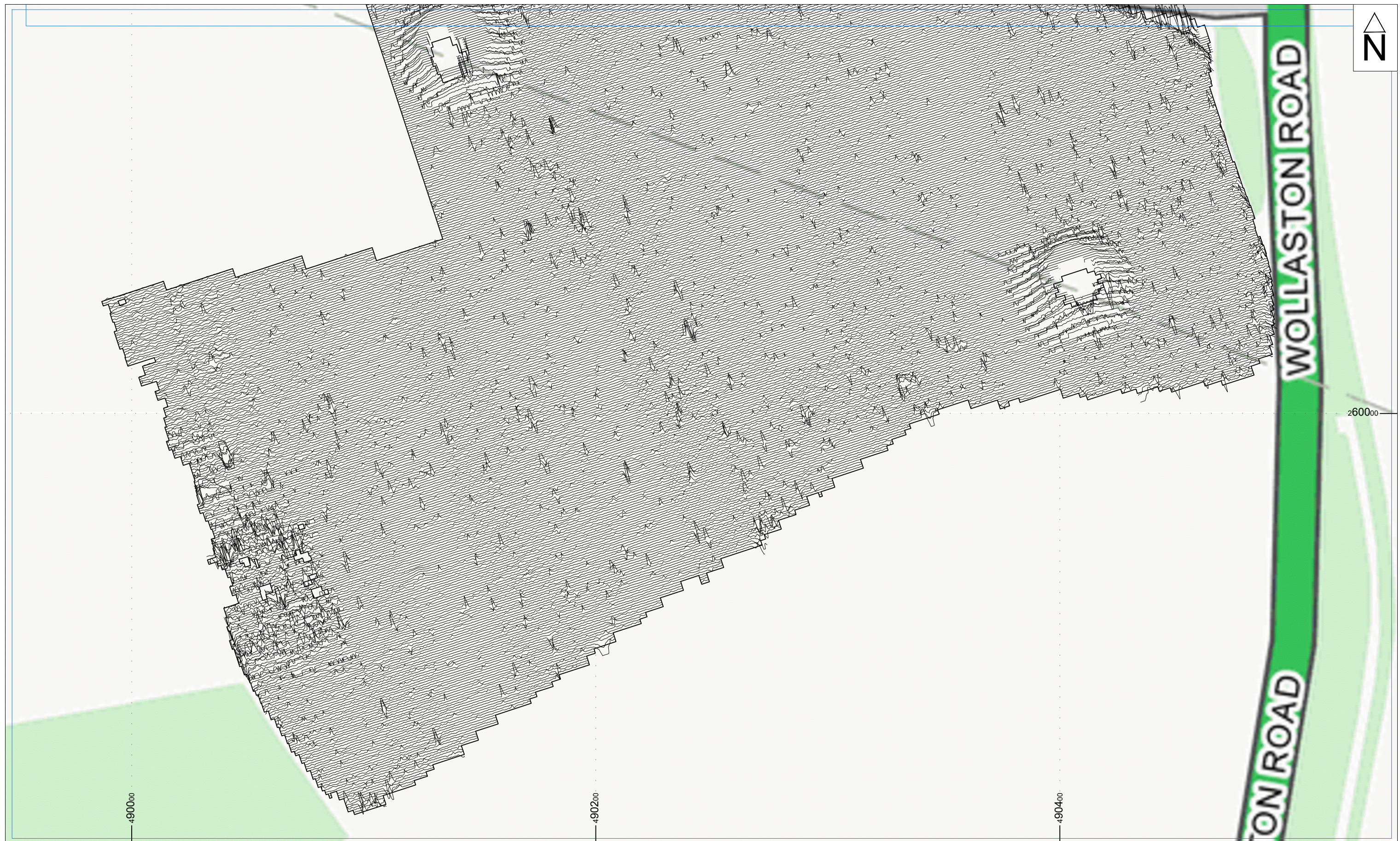
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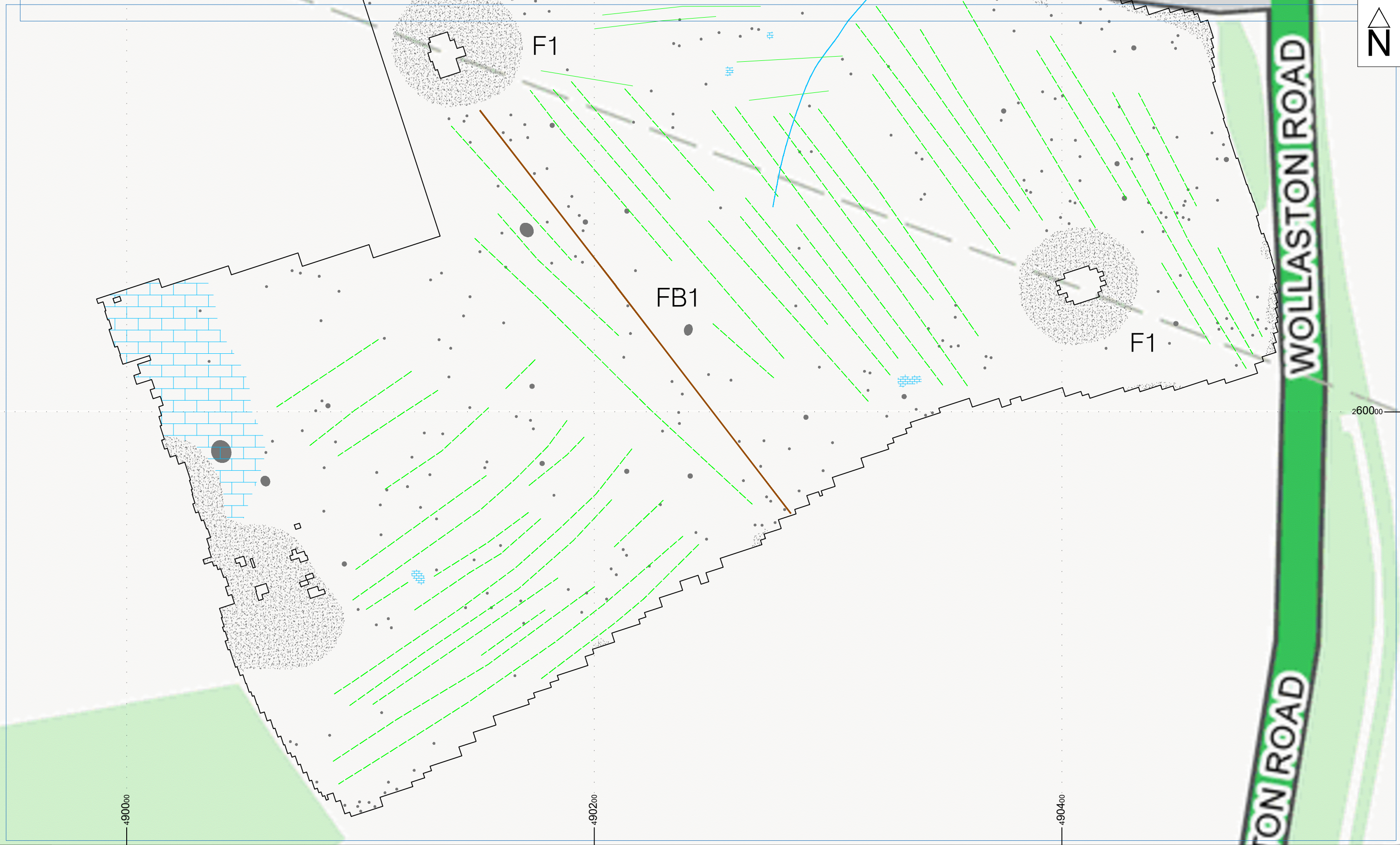
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






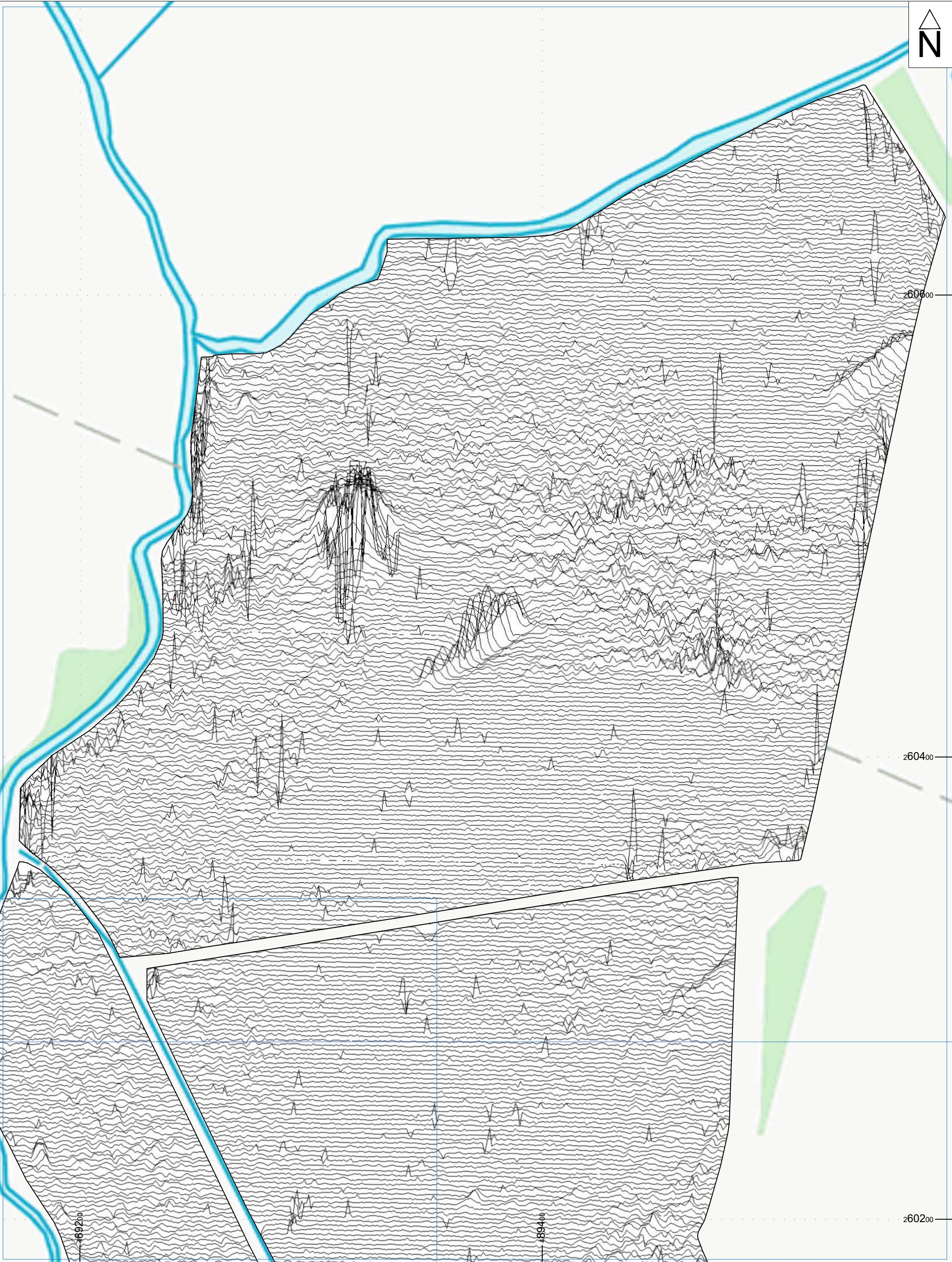

Title		Interpretation			
	SECTOR BOUNDARY		FERROUS		AGRICULTURAL
			MAGNETIC DISTURBANCE		GEOLOGY
			RIDGE & FURROW		GEOLOGY ZONE

Fig. 10







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XY trace plot of minimally processed magnetometer data;
Sector 3

Title

SECTOR BOUNDARY

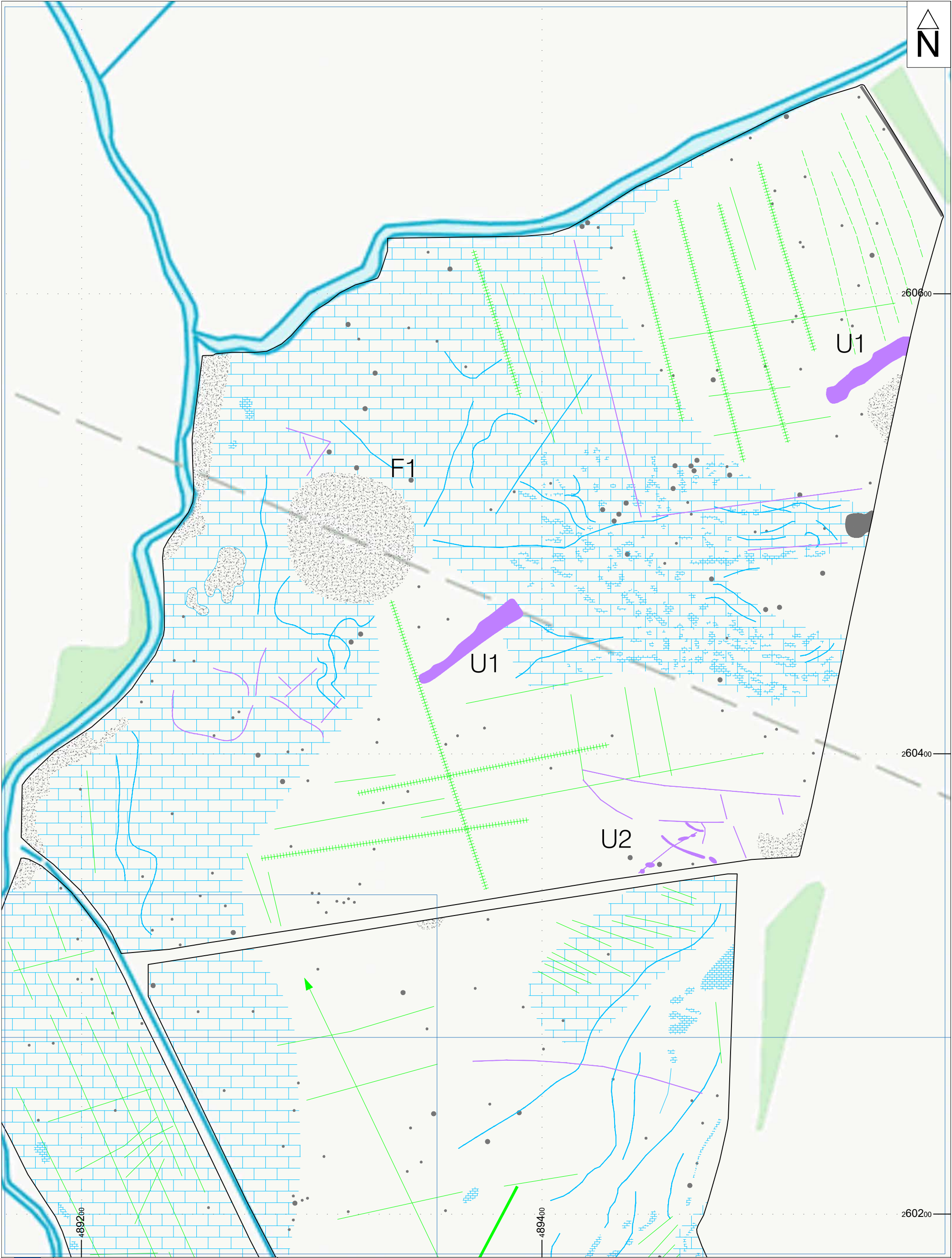
15.0 nT/cm


0 50m

1:1500 @ A3

Fig. 12

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






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Interpretation of magnetometer data; Sector 3

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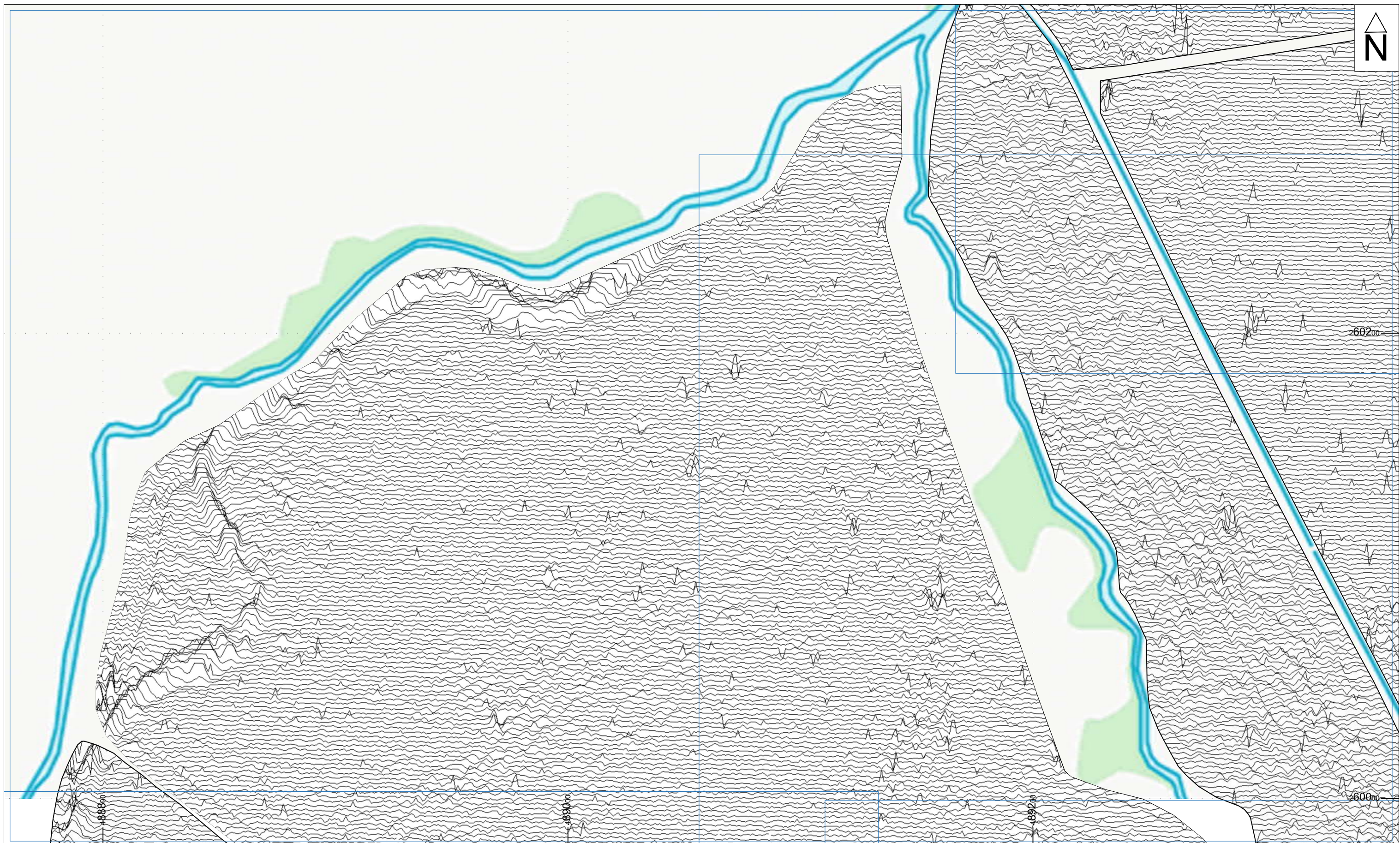
Fig. 13

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

0 50m

1:1500 @ A3





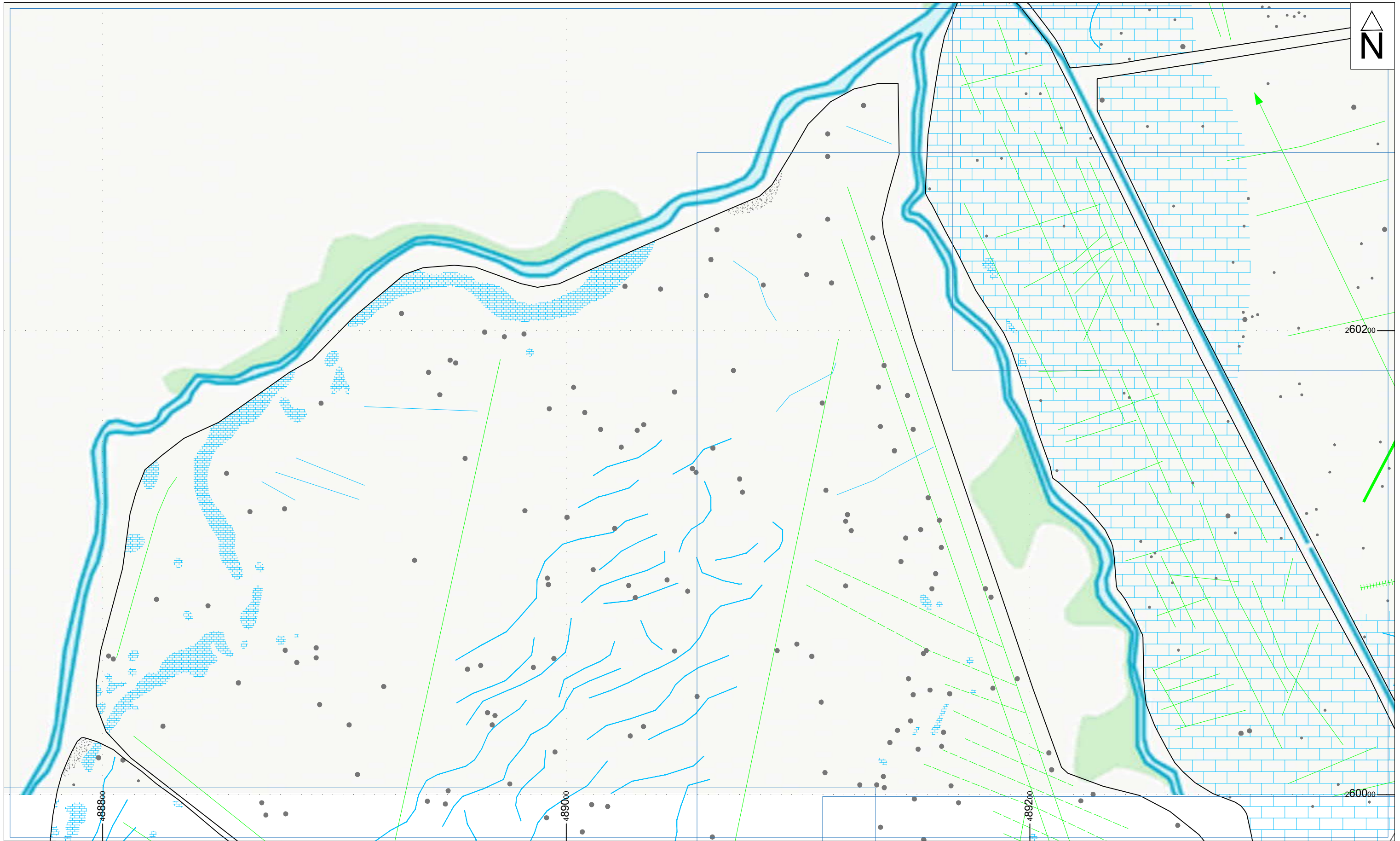
Title


SECTOR BOUNDARY

15.0 nT/cm

0 50m

1:1500 @ A3












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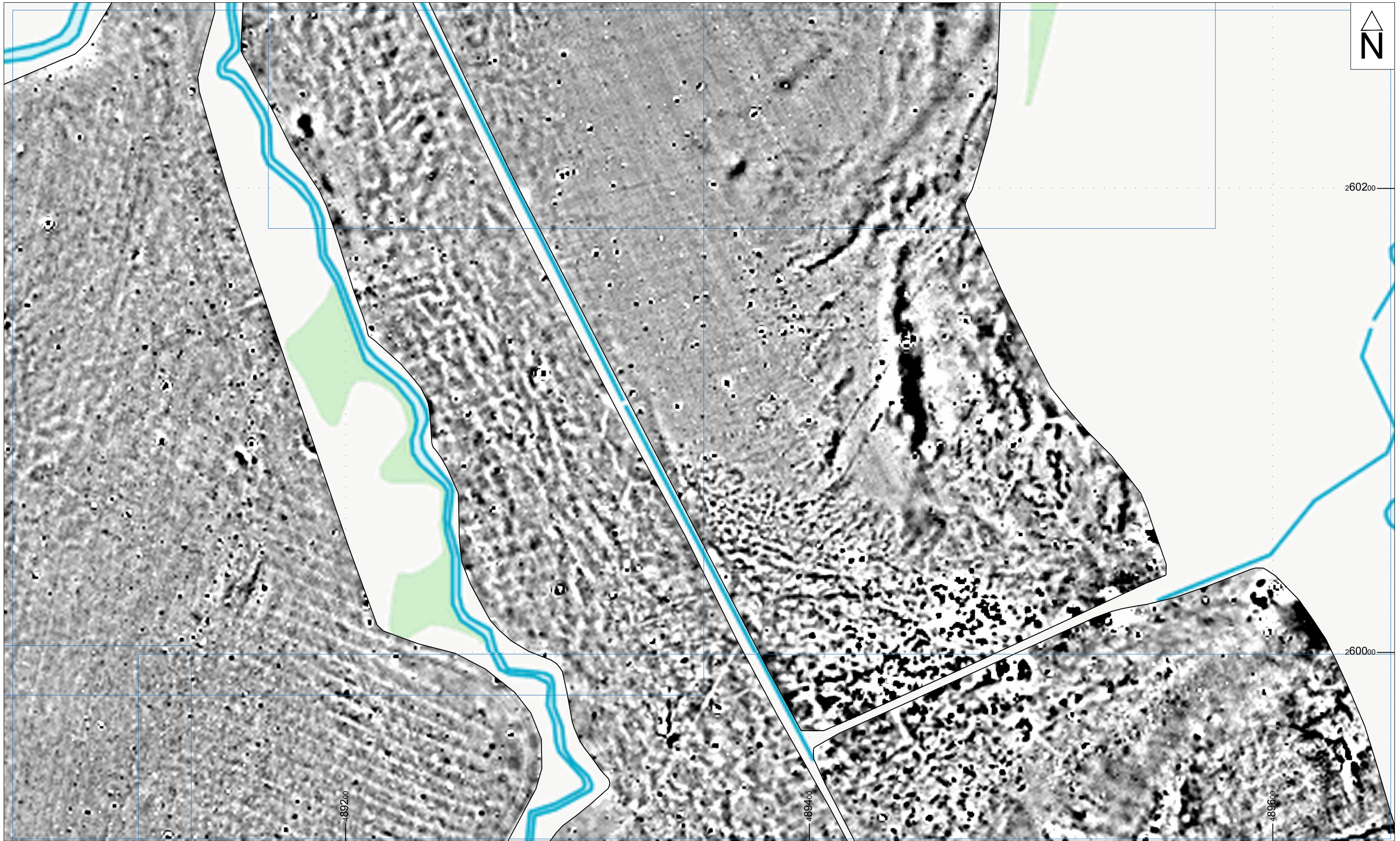
Interpretation of magnetometer data; Sector 4


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Fig. 16

Title		Interpretation					
	SECTOR BOUNDARY		FERROUS		AGRICULTURAL		GEOLOGY
	FIELD DRAIN		FOOTPATH		GEOLOGY ZONE		

0 50m
1:1500 @ A3





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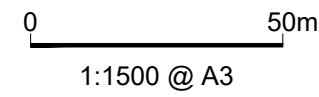
Processed greyscale magnetometer data; Sector 5

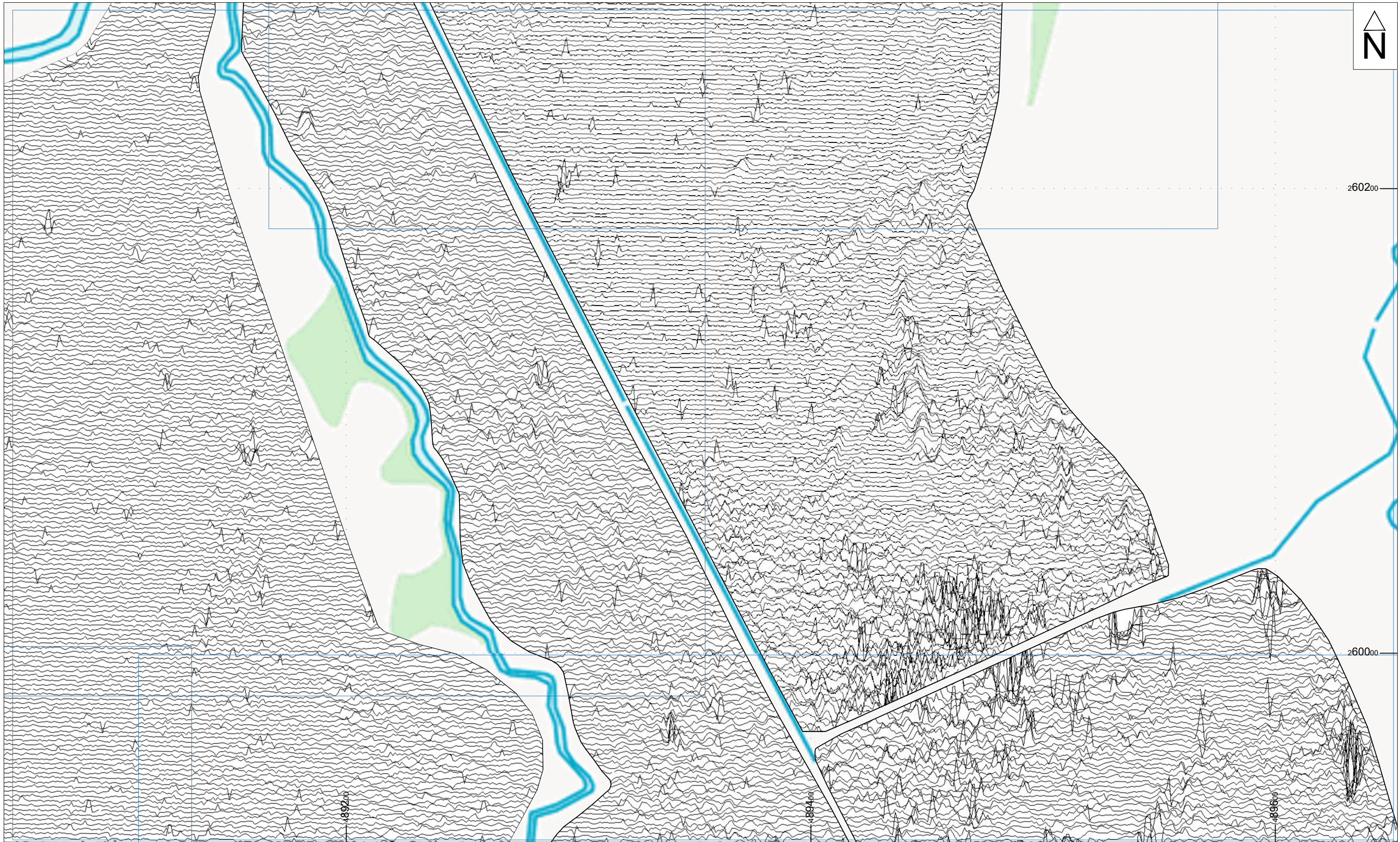
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Fig. 17


Title

 SECTOR BOUNDARY





Title

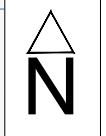
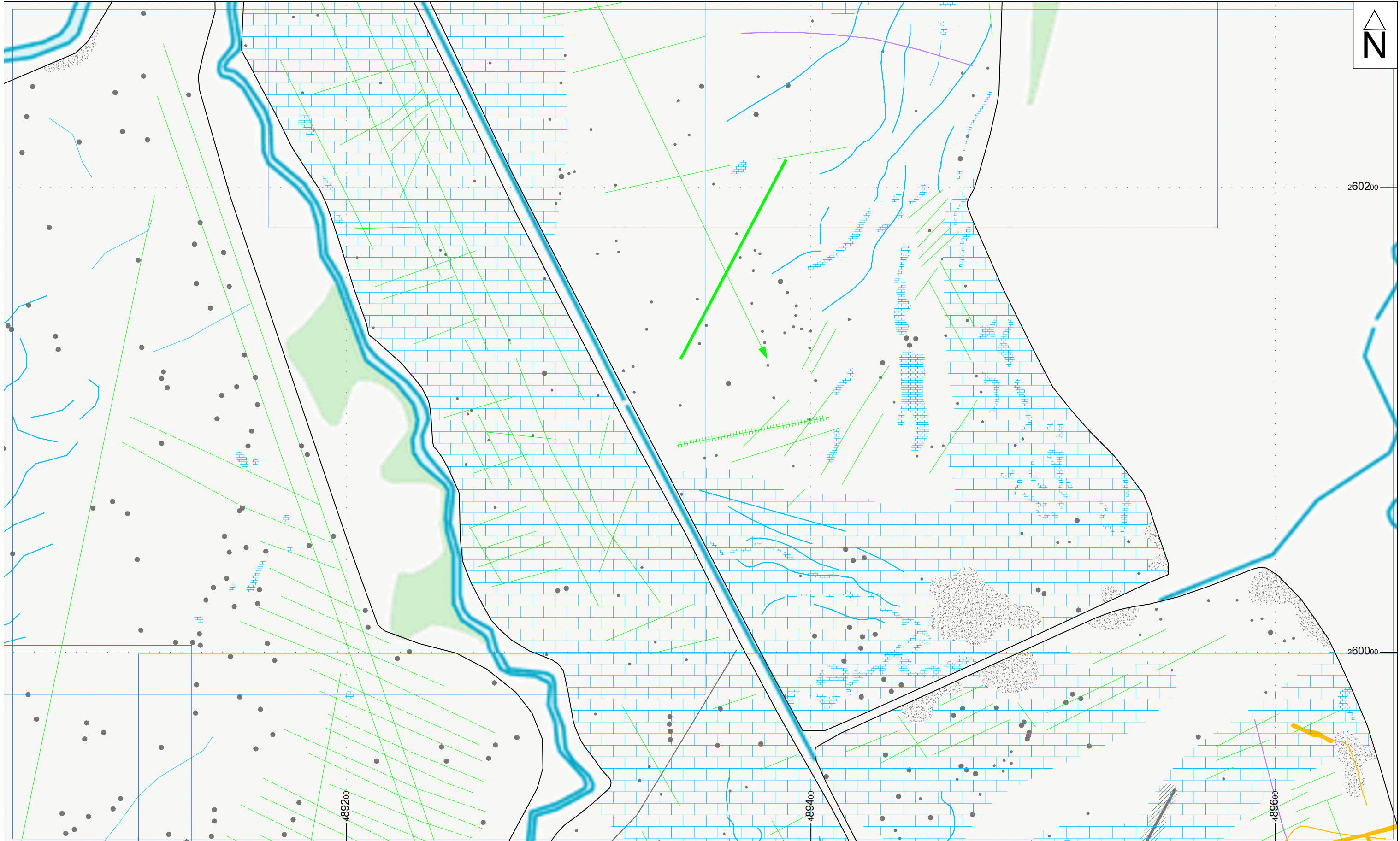
 SECTOR BOUNDARY


15.0 nT/cm

0 50m

1:1500 @ A3

Fig. 18





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Interpretation of magnetometer data; Sector 5

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Fig. 19

Title

SECTOR BOUNDARY


Interpretation

	FERROUS		AGRICULTURAL		UNCERTAIN
	SERVICE PIPE		FOOTPATH		ARCHAEOLOGY?
	MAGNETIC DISTURBANCE		GEOLOGY		
	FIELD DRAIN		GEOLOGY ZONE		

050m

1:1500 @ A3





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Processed greyscale magnetometer data; Sector 6

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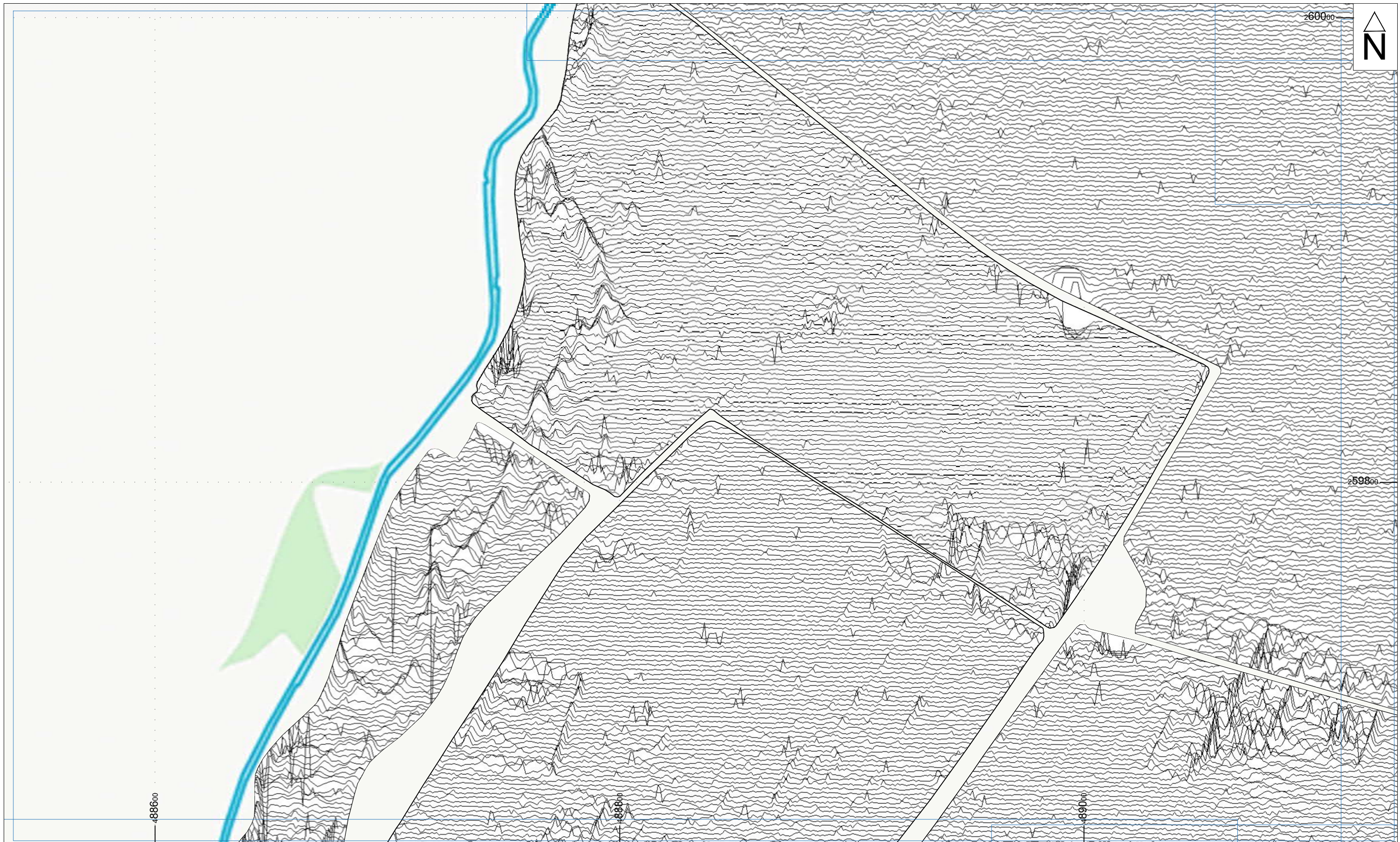
Fig. 20

Title

SECTOR BOUNDARY



0 50m
1:1500 @ A3



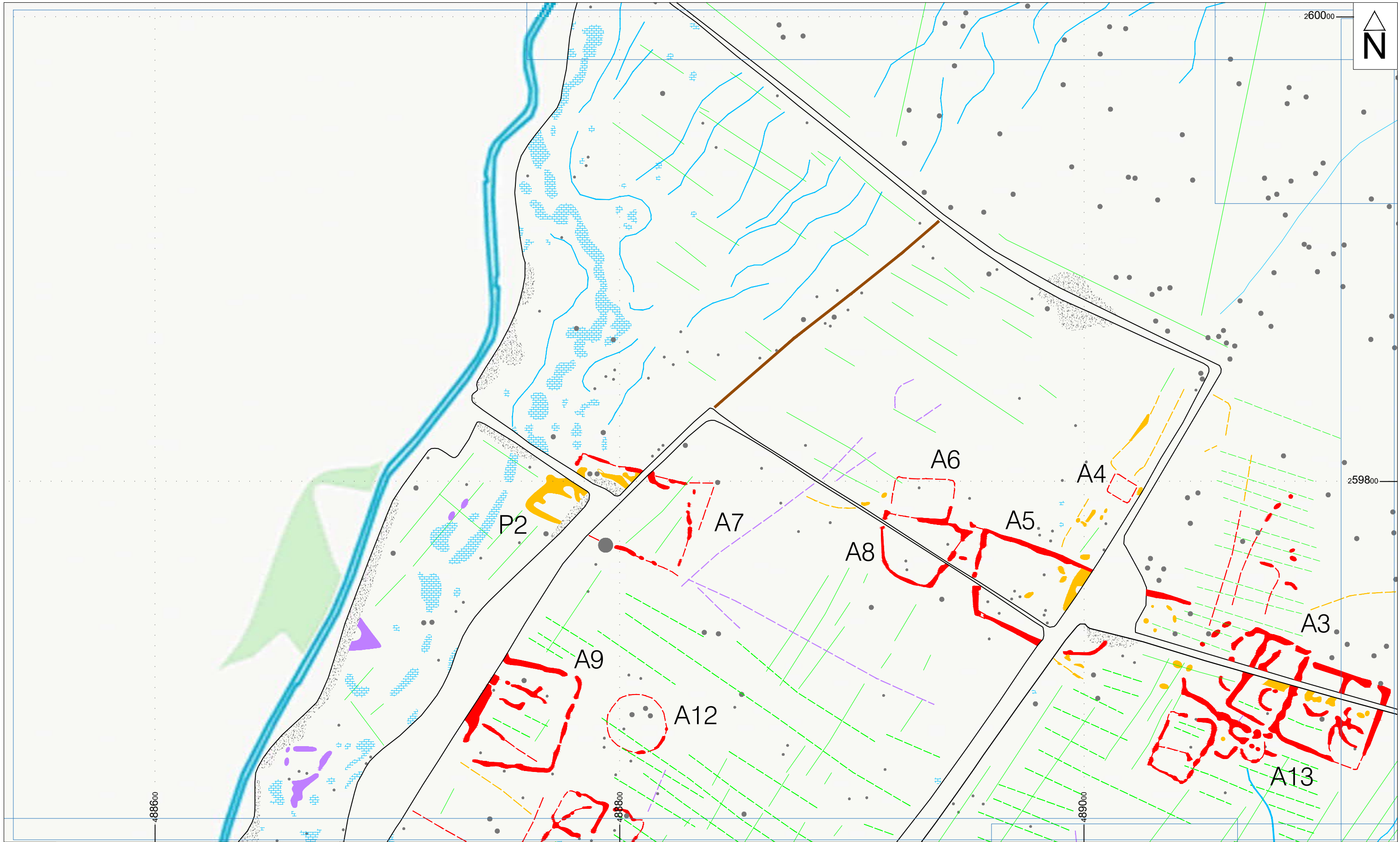
Title

SECTOR BOUNDARY

15.0 nT/cm

0 50m

1:1500 @ A3













Title		Interpretation			
	SECTOR BOUNDARY		FERROUS		RIDGE & FURROW
			MAGNETIC DISTURBANCE		AGRICULTURAL
					GEOLOGY
					UNCERTAIN
					ARCHAEOLOGY?
					ARCHAEOLOGY

Fig. 22



Fig. 23

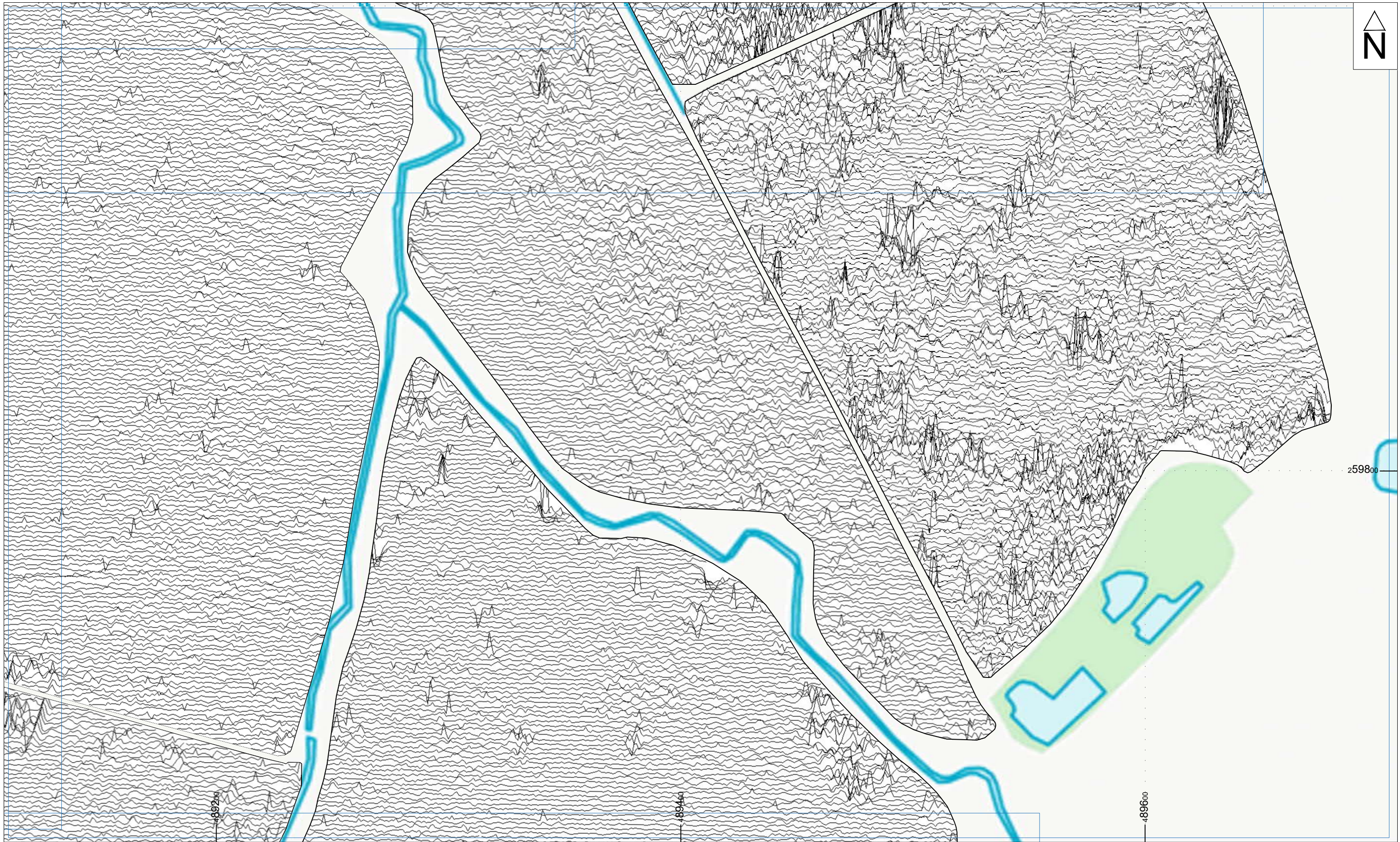
Title

 SECTOR BOUNDARY




0 50m

1:1500 @ A3



Title

 SECTOR BOUNDARY


15.0 nT/cm

0 50m

1:1500 @ A3

Fig. 24






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Processed greyscale magnetometer data; Sector 8

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Title

 SECTOR BOUNDARY

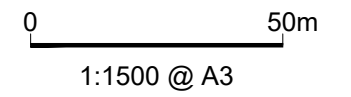


Fig. 26