GSEX/01

GILLINGHAM SOUTHERN EXTENSION, DORSET

GEOPHYSICAL SURVEY

commissioned by WYG Group Ltd

May 2017

HEADLAND ARCHAEOLOGY

REGISTERED ORGANISATION CIfA

GILLINGHAM SOUTHERN EXTENSION, DORSET

GEOPHYSICAL SURVEY

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May 2017

project info

HA JOB NO.	GSEX/01
NGR	ST 81622 25543
PARISH	Gillingham
LOCAL AUTHORITY	Dorset
OASIS REF.	headland5- 284199

project team

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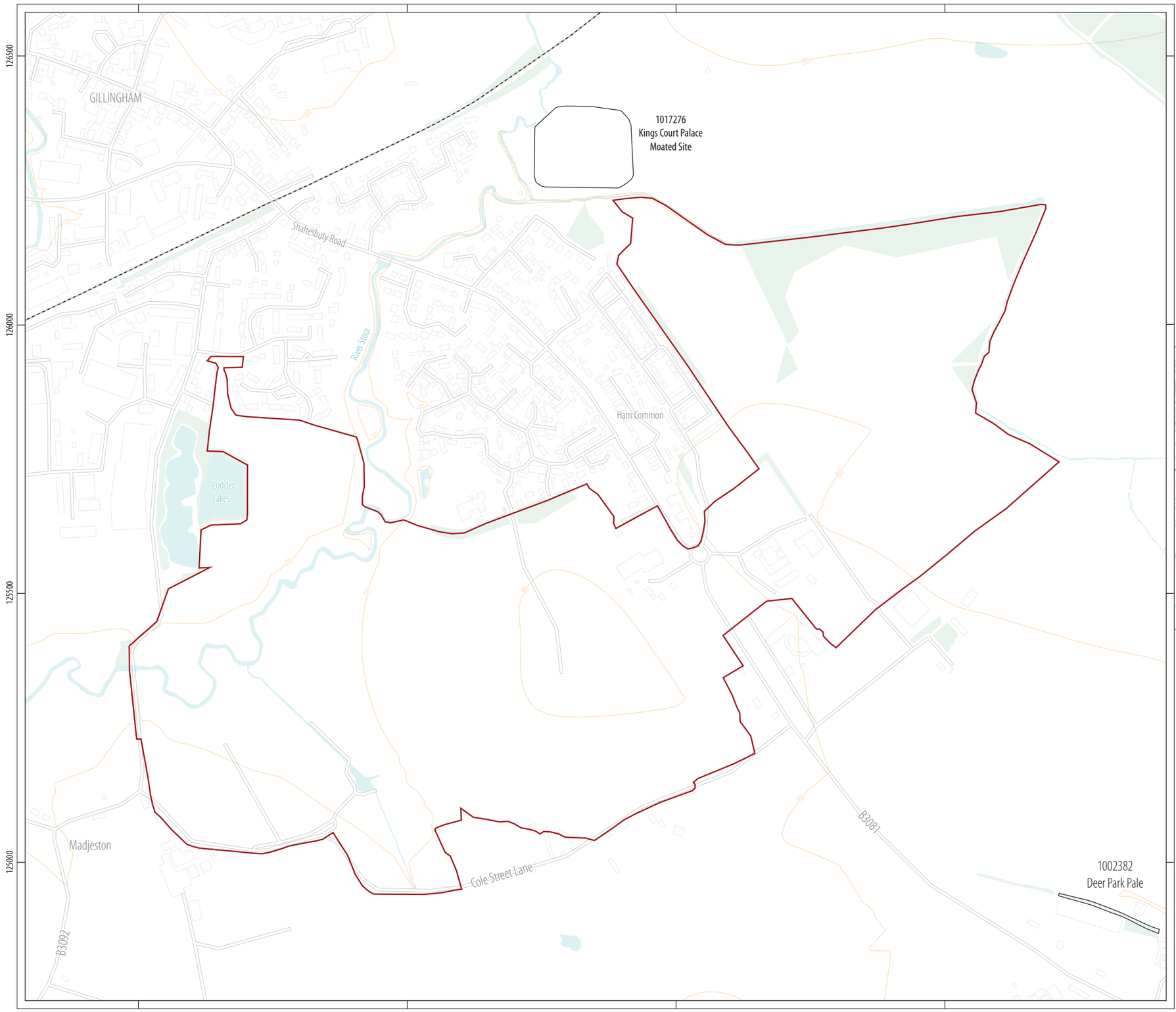
PROJECT SUMMARY

Headland Archaeology (UK) Ltd undertook a geophysical (magnetometer) survey of a 115 hectare site, south of Gillingham, Dorset, as part of a baseline assessment of the heritage potential of the site. This information will help guide archaeological strategy in advance of the proposed development of the site. The majority of anomalies are indicative of post-medieval agricultural and modern activity with some natural variation within the soils due to the localised presence of alluvial deposits and the widespread distribution of other superficial deposits. One area of clear archaeological potential has, however, been located in the south-western corner of the site. Here linear anomalies forming one small square enclosure and one larger rectangular enclosure, together with other ditch type anomalies, have been identified. This area is assessed as of moderate to high archaeological potential. A curvilinear anomaly which may locate the continuation of a medieval deer park pale boundary (which is recorded beyond the site limits) has also been identified. However, this interpretation is extremely tentative and the anomaly could be indicative of much more recent agricultural activity. Consequently its potential is assessed as low to moderate. The archaeological potential of the remainder of the site is assessed as very low.

CONTENTS

LIST OF ILLUSTRATIONS



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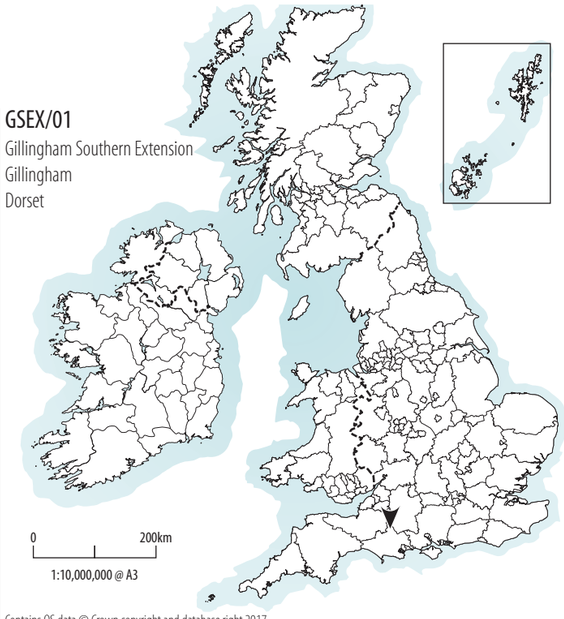
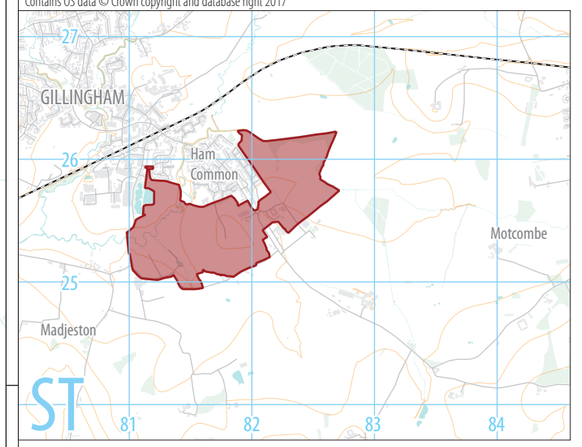
Gillingham Southern Extension
Gillingham
Dorset





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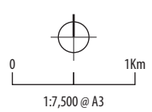

KEY

- proposed development area
- scheduled monument

ILLUS 1 Site location

GILLINGHAM SOUTHERN EXTENSION, DORSET

GEOPHYSICAL SURVEY

1 INTRODUCTION

Headland Archaeology (UK) Ltd was commissioned by WYG Group Ltd (The Client), to undertake a geophysical (magnetometer) survey of land to the immediate south-east of Gillingham where a large mixed use development is being proposed. The survey was carried out as part of a baseline study whose aim was to assess the heritage potential of the proposed development area, which covers approximately 115 hectares, and therefore the impact of the proposed development on the historic environment. The survey was carried out in advance of the submission of detailed planning applications.

The work was undertaken in accordance with a Written Scheme of Investigation (Headland Archaeology 2017), produced on behalf of the client and approved by Dorset County Council, and was undertaken in accordance with guidance contained within the National Planning Policy Framework (DCLG 2012). All work was also undertaken in line with current best practice (Chartered Institute for Archaeologists 2014, English Heritage 2008).

The survey was carried out between February 22nd and March 10th 2017 in order to provide information on the archaeological potential of the PDA.

1.1 SITE LOCATION, TOPOGRAPHY AND LAND-USE

The PDA comprises 36 fields (F1–F36) within a contiguous but irregularly shaped block of land, centred at ST 8200 2550 (see Illus 1), on the southern edge of Gillingham. The fields are predominantly under improved pasture (see Illus 2). Several small parcels of land around a new industrial estate were unsuitable for survey (see Illus 3 and Illus 4), as was Field 36 to the north-west apex of the PDA (see Illus 5), thus reducing the maximum surveyable area to approximately 105 hectares.

New Road (B3092) forms part of the western boundary and Cole Street Lane marks the southern boundary to the west of Shaftesbury Road (B3081) which also bisects the PDA from north/south with some light industrial units either side of the road. Fern Brook defines the eastern boundary. The river Lodden meanders across the north-western corner of the PDA.

Topographically the PDA is gently undulating ranging from approximately 77m above Ordnance Datum (AOD) to the north and south but falling to approximately 72m AOD in the centre and to 66m AOD along the course of the River Lodden.

1.2 GEOLOGY AND SOILS

The underlying bedrock geology comprises mudstone of the Kimmeridge Clay Formation. Much of the PDA is overlain by clay, silt, sand and gravel superficial deposits of alluvium or head although there are parts of the site where there are no recorded superficial deposits (see Illus 6; NERC 2017).

The soils are classified in the Soilscape 18 association, characterised as slowly permeable seasonally wet loams and clays (Cranfield University 2017).

2 ARCHAEOLOGICAL BACKGROUND

Research for the baseline assessment (WYG 2017) has demonstrated that the PDA lies within a landscape of considerable archaeological interest with evidence for activity dating from all periods, from the prehistoric to the present day, having been revealed through archaeological fieldwork carried out over the last 20 years as Gillingham has expanded. However, few known heritage assets are recorded in the PDA itself.

ILLUS 2 General view of the south of Field 29, looking north-east

3 AIMS, METHODOLOGY AND PRESENTATION

The general aim of the geophysical survey was to provide sufficient information to establish the presence/absence, character and extent of any archaeological remains within the PDA. This will therefore enable an assessment to be made of the impact of the proposed development on any sub-surface archaeological remains, if present.

The specific archaeological objectives of the geophysical survey were:

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

3.1 MAGNETOMETER SURVEY

Magnetic survey methods rely on the ability of a variety of instruments to measure very small magnetic fields associated with buried archaeological remains. A feature such as a ditch, pit or kiln can act like a small magnet, or series of magnets, that produce distortions (anomalies) in the earth's magnetic field. In mapping these slight variations, detailed plans of sites can be obtained as buried features often produce reasonably characteristic anomaly shapes and strengths (Gaffney and Gater 2003). Further information on soil magnetism and the interpretation of magnetic anomalies is provided in Appendix 1.

The survey was undertaken using four Bartington Grad601 sensors mounted at 1m intervals (1m traverse interval) onto a rigid carrying frame. The system was programmed to take readings at a frequency of 10Hz (allowing for a 10–15cm sample interval) on roaming traverses 4m apart. These readings were stored on an external weatherproof laptop and later downloaded for processing and interpretation. The system was linked to a Trimble R8s Real Time Kinetic (RTK) differential Global Positioning System (dGPS) outputting in NMEA mode to ensure a high positional accuracy for each data point.

MLGrad601 and MultiGrad601 (Geomar Software Inc.) software was used to collect and export the data. Terrasurveyor V3.0.31.0 (DWConsulting) software was used to process and present the data.

3.2 REPORTING

A general site location plan is shown in Illus 1 at a scale of 1:7,500. Illus 2–5 inclusive are site condition photographs. Illus 6 is a 1:7,500 scale survey location plan showing the GPS swath data. The superficial geology data (after NERC 2017) is presented at the same scale in Illus 7.

The processed greyscale data and an overall interpretation plot are also presented at 1:7,500 on Illus 8 and Illus 9. Detailed data plots of the fully processed data (greyscale), the minimally processed data (XY traceplot) and an accompanying interpretative plot, are presented at a scale of 1:2,500 in Illus 10–24 inclusive, with more detailed (1:1,000) plots of the area of archaeological potential in Illus 25, 26 and 27.

ILLUS 3 Area unsuitable for survey in Field 8

Technical information on the equipment used, data processing and magnetic survey methodology is given in Appendix 1. Appendix 2 details the survey location information and Appendix 3 describes the composition and location of the site archive. Data processing details are presented in Appendix 4. A copy of the OASIS entry (Online Access to the Index of Archaeological Investigations) is reproduced in Appendix 5.

The survey methodology, report and any recommendations comply with the Written Scheme of Investigation (Headland Archaeology 2017) and guidelines outlined by Historic England (English Heritage 2008) and by the Chartered Institute for Archaeologists (CIfA 2014). All illustrations from Ordnance Survey mapping are reproduced with the permission of the controller of Her Majesty's Stationery Office (© Crown copyright).

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

4 RESULTS AND DISCUSSION

The ground conditions across the PDA were good (with the exception of the omitted areas – see above) and the overall quality of the data collected was good throughout.

The magnetic background only varies slightly across the PDA with no obvious discernible differences between the data recorded over the superficial head deposits and where there are no recorded superficial deposits.

Against this background numerous anomalies have been identified. Those anomalies with modern, agricultural or geological origins are discussed first followed by those anomalies with a possible or probable archaeological cause. All anomalies are discussed below and cross-referenced to specific anomalies on the interpretative drawings, where appropriate.

4.1 FERROUS AND MODERN ANOMALIES

Ferrous anomalies, characterised as individual 'spikes', 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 is common on most sites, often being present as a consequence of manuring or tipping/infilling.

There is a cluster of these ferrous anomalies to the east of the PDA in F3 (Illus 13–15). These responses are not considered to be archaeological and are probably due to the spreading or tipping of modern debris probably resulting from the groundworks/ landscaping which has obviously been carried out in the adjoining land block (F8 – see Illus 3 and Illus 16–18). A larger, L-shaped, area of disturbance is also located in F5 (Illus 13–15), including several high magnitude discrete anomalies. These responses are also considered highly likely to be due to recent ground disturbance/activity.

ILLUS 4 Area unsuitable for survey in Field 12

Four high magnitude linear dipolar anomalies (Illus10–12; **SP1**–**4**) are identified in the fields (F2, F3, F4 and F7) east of Shaftesbury Road. These anomalies are caused by sub-surface pipes. A fifth pipe anomaly (**SP5**) is recorded aligned north-west/south-east crossing F18 to the western side of the PDA (Illus16–18).

Several individual high magnitude dipolar anomalies (Illus 10–12; **MH1**, **MH2** and **MH3**), in F1 east of Shaftesbury Road, locate man-holes and a modern sewer/drain system. **MH4**–**7**, in F2 (Illus 10–12), are also due to man-holes and a sewer which probably link to the pipes identified as **SP1** and **SP2**. **MH8**–**11** in F3–F5, are also caused by man-holes (Illus 10–15).

In F5 several high magnitude 'spike' anomalies are identified for which there are no obvious surface features. However there is a lot of magnetic contamination in this field and it is assumed that there has also been a lot of modern disturbance and/or tipping/infilling in this field.

A small cluster of magnetic disturbance in F21 (Illus 22–24; **FP1**) and a larger cluster in F4 (Illus 10–12; **FP2**) locate the sites of two former ponds/clay pits, shown on the (1886) first edition mapping, and which are now infilled.

Magnetic disturbance around the field edges is due to ferrous material within or close to the adjacent field boundaries and is of no archaeological interest.

4.2 AGRICULTURAL ANOMALIES

Numerous linear anomalies are identified across the PDA for which no definite interpretation can be given. However, analysis of historical mapping suggests that the division and layout of land within the PDA has remained virtually unchanged since the publication of the first edition Ordnance Survey map in 1886. Consequently only one of these linear anomalies, **FB1**, in F31 (Illus 19–21) is interpreted as a former field boundary. However, it is noted that some of these boundaries 'may potentially originate in the later medieval period' (WYG 2017).

However, with the exception of the anomalies described in Section 4.4 below, the remainder of the linear trend anomalies are all considered likely to have an agricultural origin with the majority interpreted as field drains, most obviously in F18 (Illus 16–18).

4.3 GEOLOGICAL ANOMALIES

Numerous low magnitude discrete anomalies are identified across the PDA. These anomalies are due to minor variations in composition of the soils. Much broader low magnitude anomalies in F23 and F31 (Illus 19–21), either side of the river Lodden, reflect the likely deposition and accumulation of alluvium from the flooding of the river.

4.4 ANOMALIES OF ARCHAEOLOGICAL POTENTIAL (ILLUS 22–27)

One area of definite archaeological potential has been identified in F30, to the south-west corner of the PDA. Here a single small square

ILLUS 5 Area unsuitable for survey in Field 36

enclosure, **E1**, and three sides of a much larger rectangular enclosure, **E2**, are clearly located on slightly higher ground just off the flood plain of the River Lodden. Several linear ditch type anomalies, **D1**–**5**, are also identified between, and immediately south of, these two enclosures. Another short linear anomaly, **D6**, is also identified, immediately to the east in F29 which may also be indicative of a ditch forming part of the enclosure system located immediately to the west. Parallel linear anomalies, **D7** and **D8**, further east in F28 are also tentatively ascribed a possible archaeological origin.

In F18 arcing anomaly, **FB2**, may also be of archaeological potential. Whilst this anomaly may be caused by a drain it could possibly locate the continuation of the deer park pale (HER 1002382) recorded approximately 0.5km from the southern boundary of the PDA.

5 CONCLUSION

The geophysical survey has successfully evaluated the site and has identified one clear area of archaeological potential, which comprises two enclosures and associated ditches, in the south-western corner of the PDA just off the flood plain of the river Lodden. This area is assessed as of moderate to high archaeological potential.

Further to the east a curvilinear ditch type anomaly may locate the line of a medieval deer park pale boundary. However, this interpretation is considered tentative and the potential is assessed as low to moderate.

Elsewhere across the PDA the anomalies identified are consistent with post-medieval and recent agricultural and modern activity. The majority of the PDA is therefore assessed as having a very low archaeological potential.

6 REFERENCES

Chartered Institute for Archaeologists (ClfA) 2014 ***Standard and guidance for archaeological geophysical survey*** [online document] available from http://www.archaeologists.net/sites/default/files/ClfAS&GGeophysics_1.pdf

Cranfield University 2017 ***Cranfield Soil and Agrifood Institute Soilscapes*** [online] accessed 22 March 2017 from www.landis.org.uk/soilscapes/

Department of Communities and Local Government (DCLG) 2012 ***National Planning Policy Framework*** [online document] available from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

English Heritage 2008 ***Geophysical Survey in Archaeological Field Evaluation: Research and Professional Services Guidelines*** (2nd edition) [online document] available from http://content.historicengland.org.uk/images-books/publications/geophysical-survey-in-archaeological-field-evaluation/geophysics-guidelines.pdf

Gaffney, C & Gater, J 2003 ***Revealing the Buried Past: Geophysics for Archaeologists*** The History Press: Stroud

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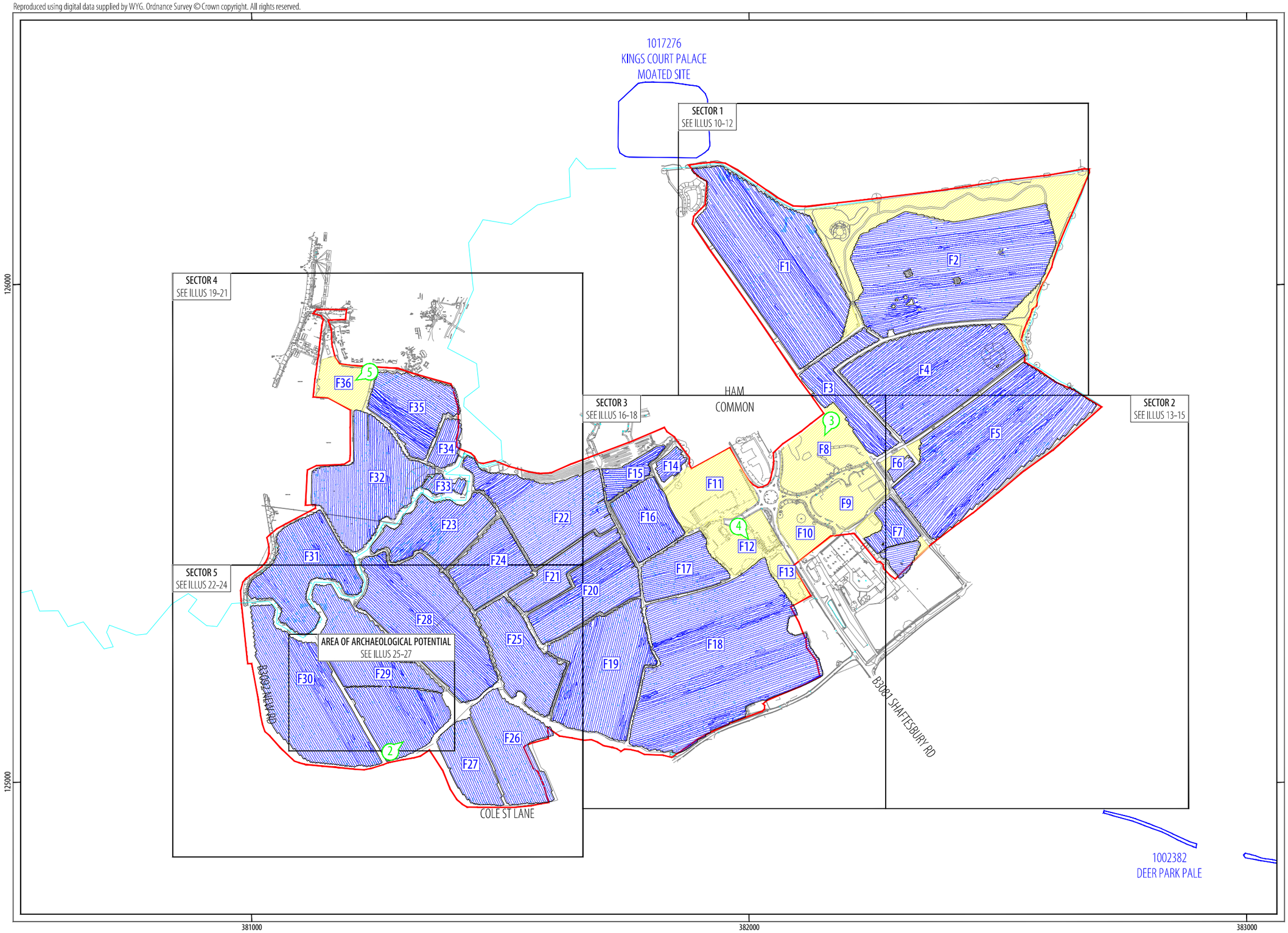
WYG Group Ltd 2017 (in prep) ***Gillingham Southern Extension, Dorset: Archaeological DBA, Setting Assessment and Geophysical Survey*** [unpublished document] WYG



- proposed development area
- scheduled monument area
- area unsuitable for survey
- GPS swaths
- location and direction of ILLUS 2–5

N

0 200m

scale 1:7,500 @ A3

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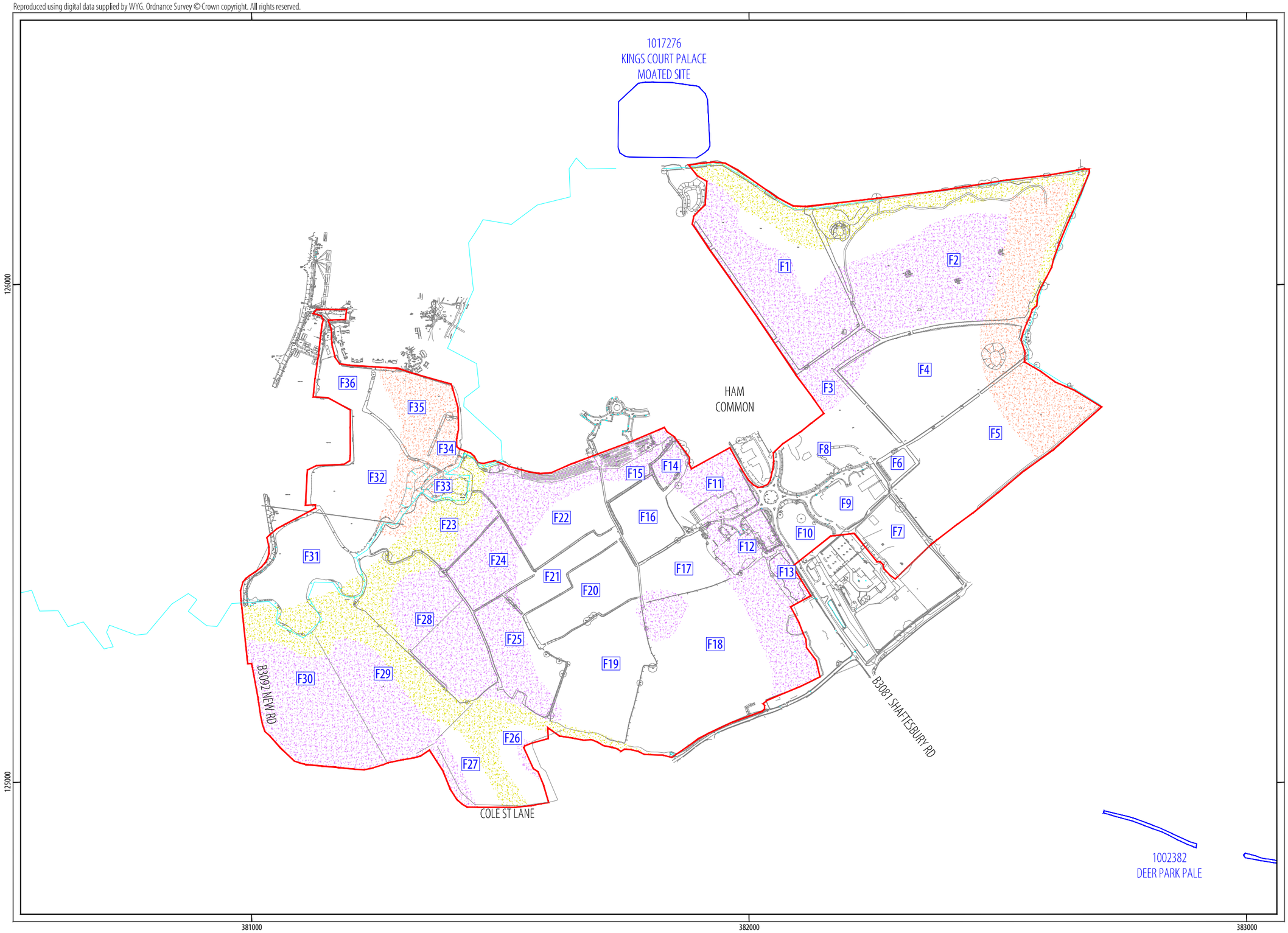
ILLUS 6 Survey location showing GPS swaths



proposed development area
scheduled monument area

SUPERFICIAL GEOLOGY
Alluvium - Clay, silt, sand and gravel
Head - Clay, silt, sand and gravel
Head, 1 - Clay, silt, sand and gravel

N
0 200m
scale 1:7,500 @ A3

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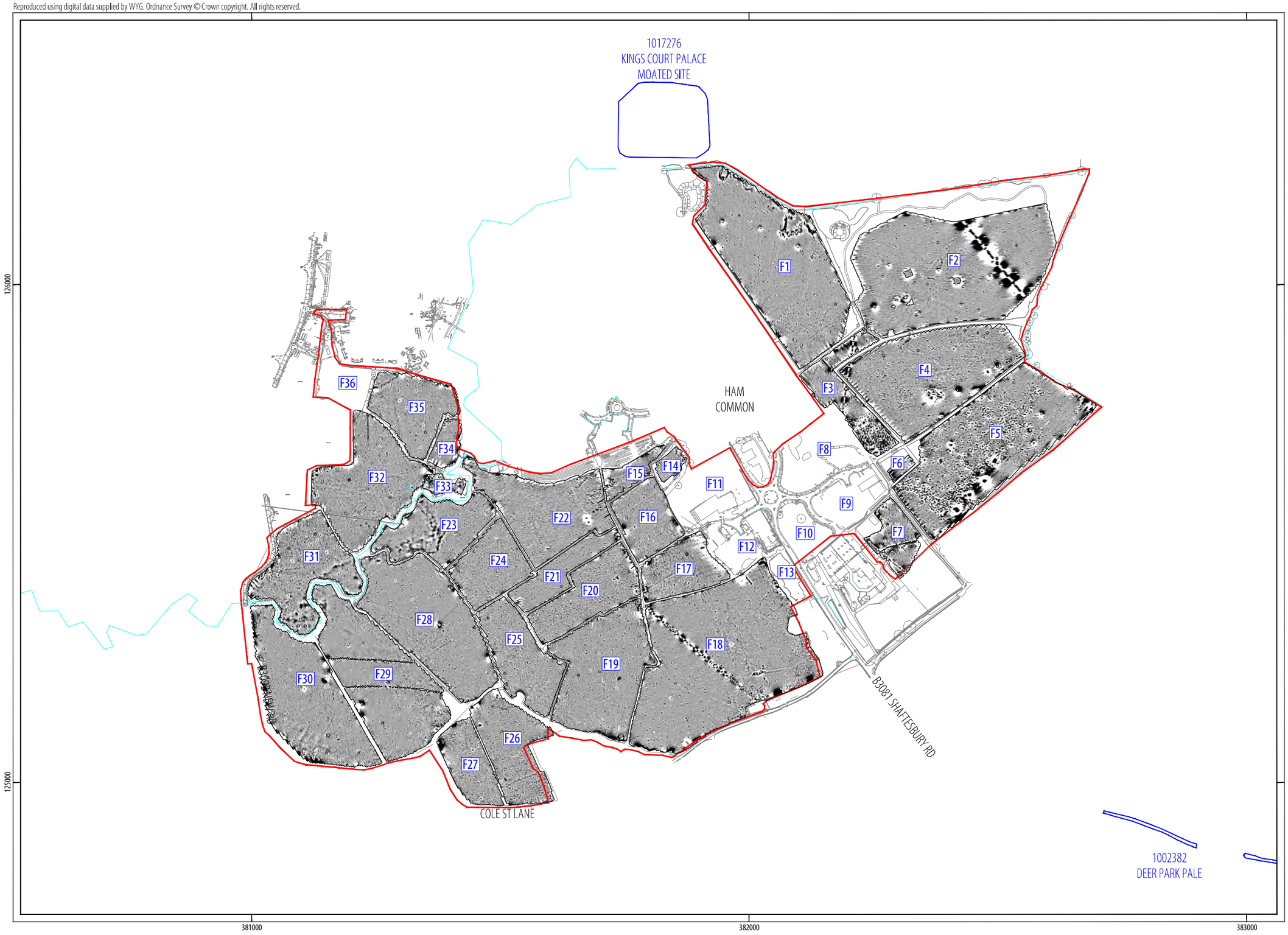
ILLUS 7 Survey location showing superficial geology data



proposed development area
scheduled monument area

nT
-1.0 2.0

N
0 200m
scale 1:7,500 @ A3

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ILLUS 8 Overall processed greyscale magnetometer data

1017276
KINGS COURT PALACE
MOATED SITE

HAM
COMMON

COLE ST LANE

B3081 SHAFTESBURY RD

1002382
DEER PARK PALE

126000
125000
381000
382000
383000

proposed development area
scheduled monument area

TYPE OF ANOMALY	INTERPRETATION
dipolar isolated	ferrous material
magnetic disturbance	ferrous material
dipolar linear	service pipe
dipolar isolated	manhole cover
linear	modern
magnetic enhancement	modern
linear trend	agricultural
linear trend	field drain
linear	former field boundary?
linear	former field boundary
magnetic enhancement	geology?
linear trend	archaeology?
magnetic enhancement	archaeology?
magnetic enhancement	archaeology

ABBREVIATIONS

D	ditch
E	enclosure
FB	former boundary
FP	former pond
MH	manhole cover
SP	service pipe

N
0 200m
scale 1:7,500 @ A3

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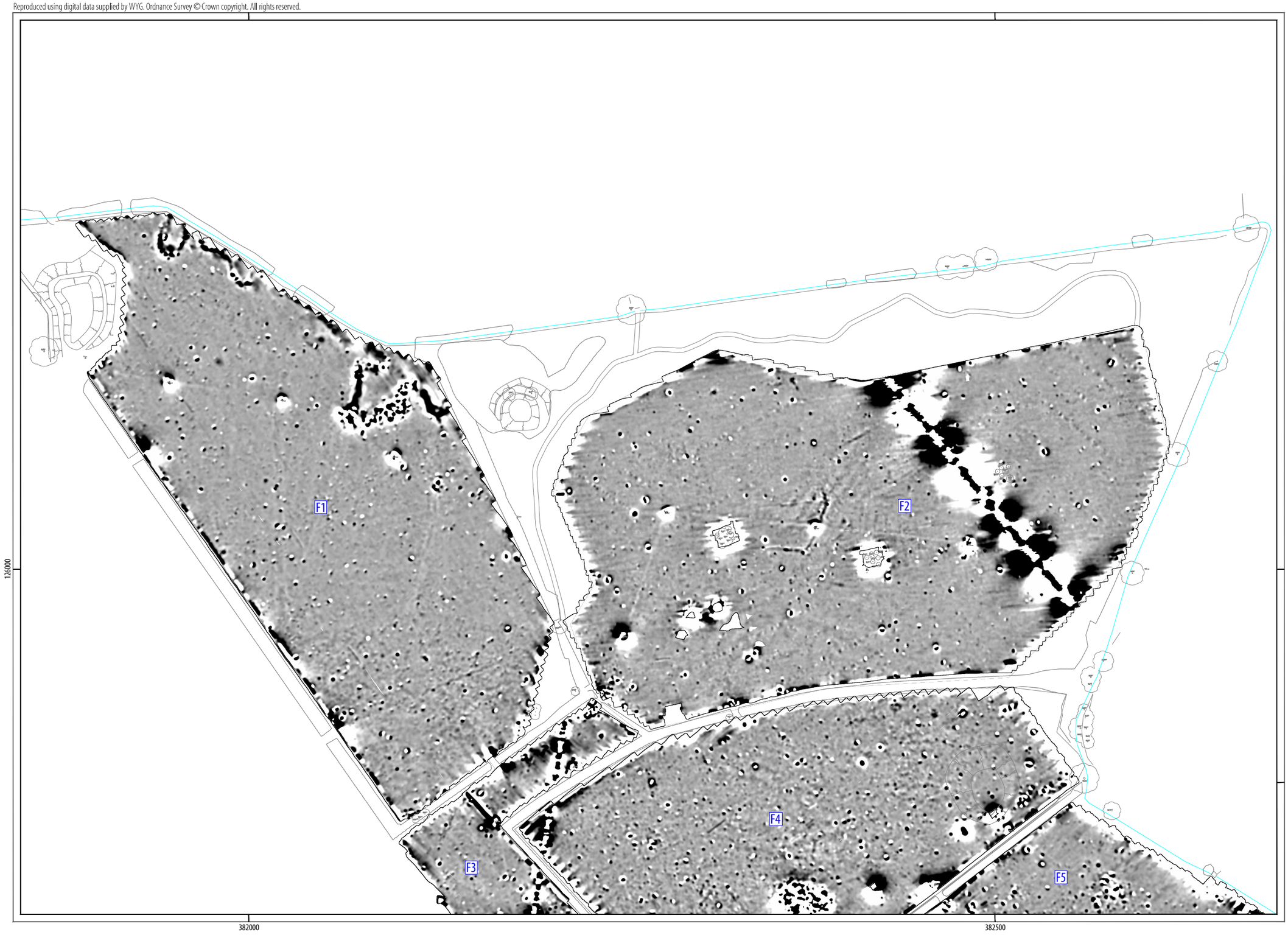
ILLUS 9 Overall interpretation of magnetometer data



nT
-1.0 2.0

N
0 50m
scale 1:2,500 @ A3

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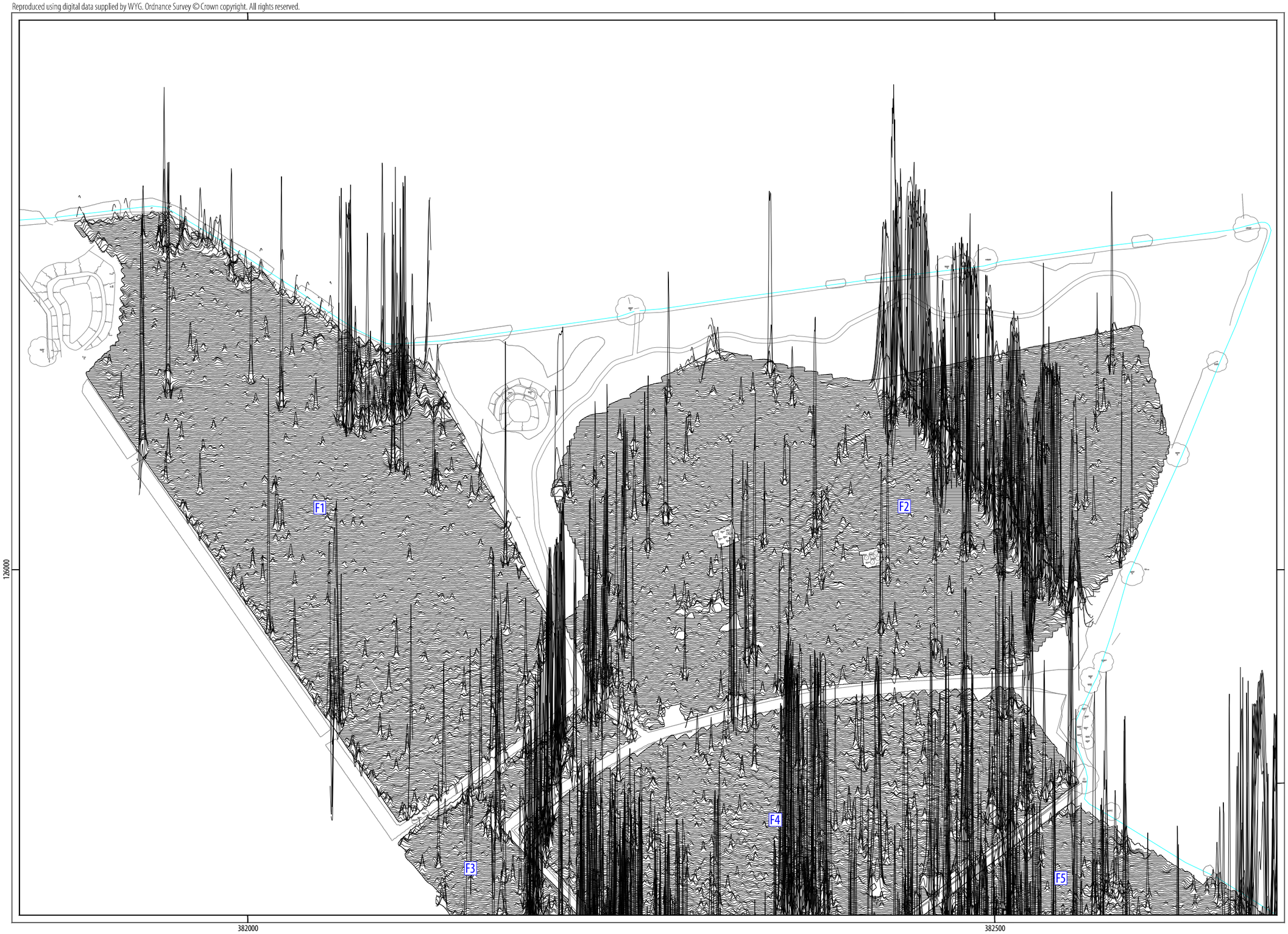
ILLUS 10 Processed greyscale magnetometer data; Sector 1



15.0nT/cm

N

0 50m

scale 1:2,500 @ A3

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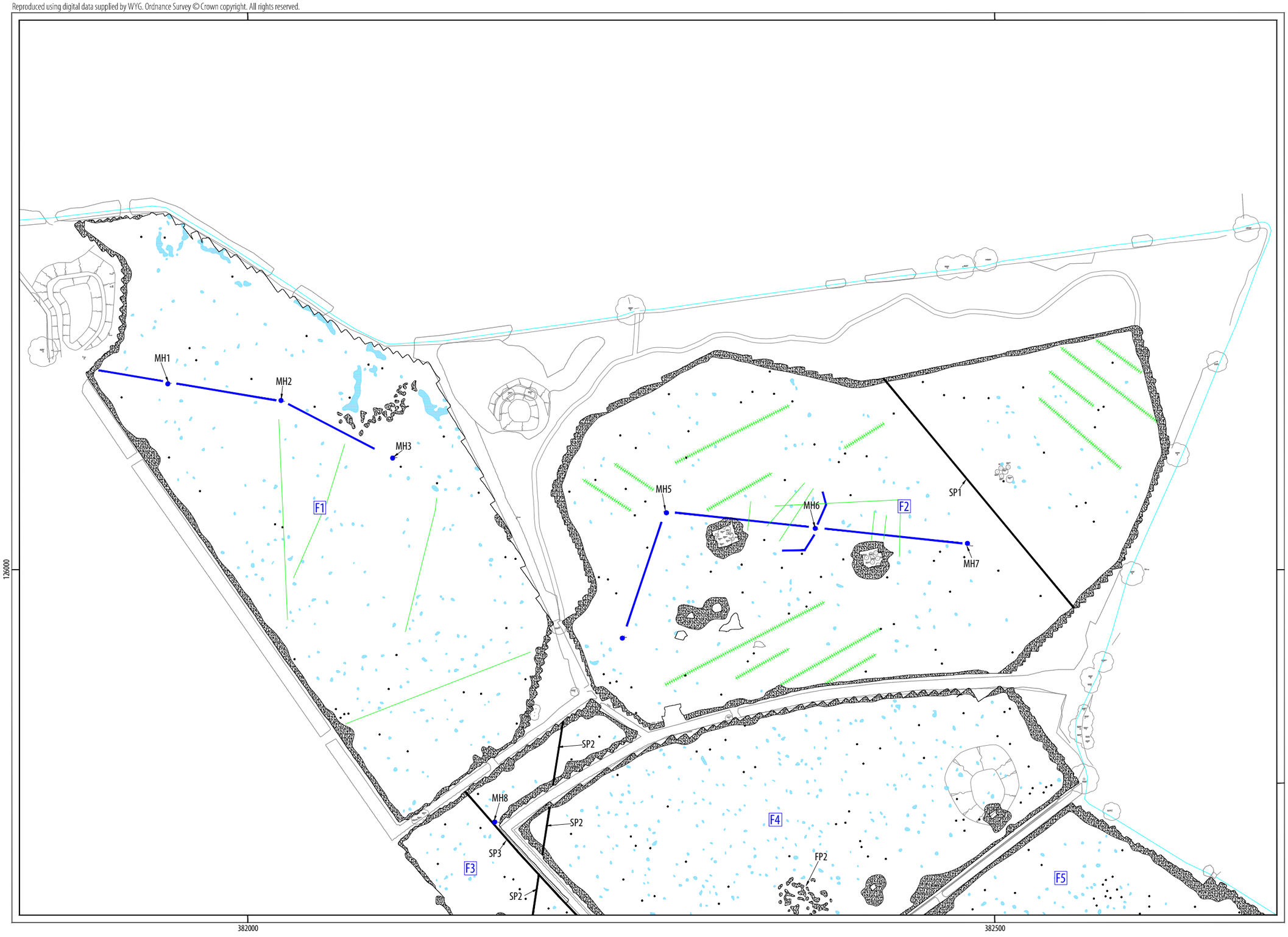
ILLUS 11 XY trace plot of minimally processed magnetometer data; Sector 1



TYPE OF ANOMALY	INTERPRETATION
dipolar isolated	ferrous material
magnetic disturbance	ferrous material
dipolar linear	service pipe
dipolar isolated	manhole cover
linear	modern
magnetic enhancement	modern
linear trend	agricultural
linear trend	field drain
magnetic enhancement	geology?

ABBREVIATIONS

FP	former pond
MH	manhole cover
SP	service pipe

N

0 50m

scale 1:2,500 @ A3

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ILLUS 12 Interpretation of magnetometer data; Sector 1

nT
-1.0 2.0

N
0 50m
scale 1:2,500 @ A3

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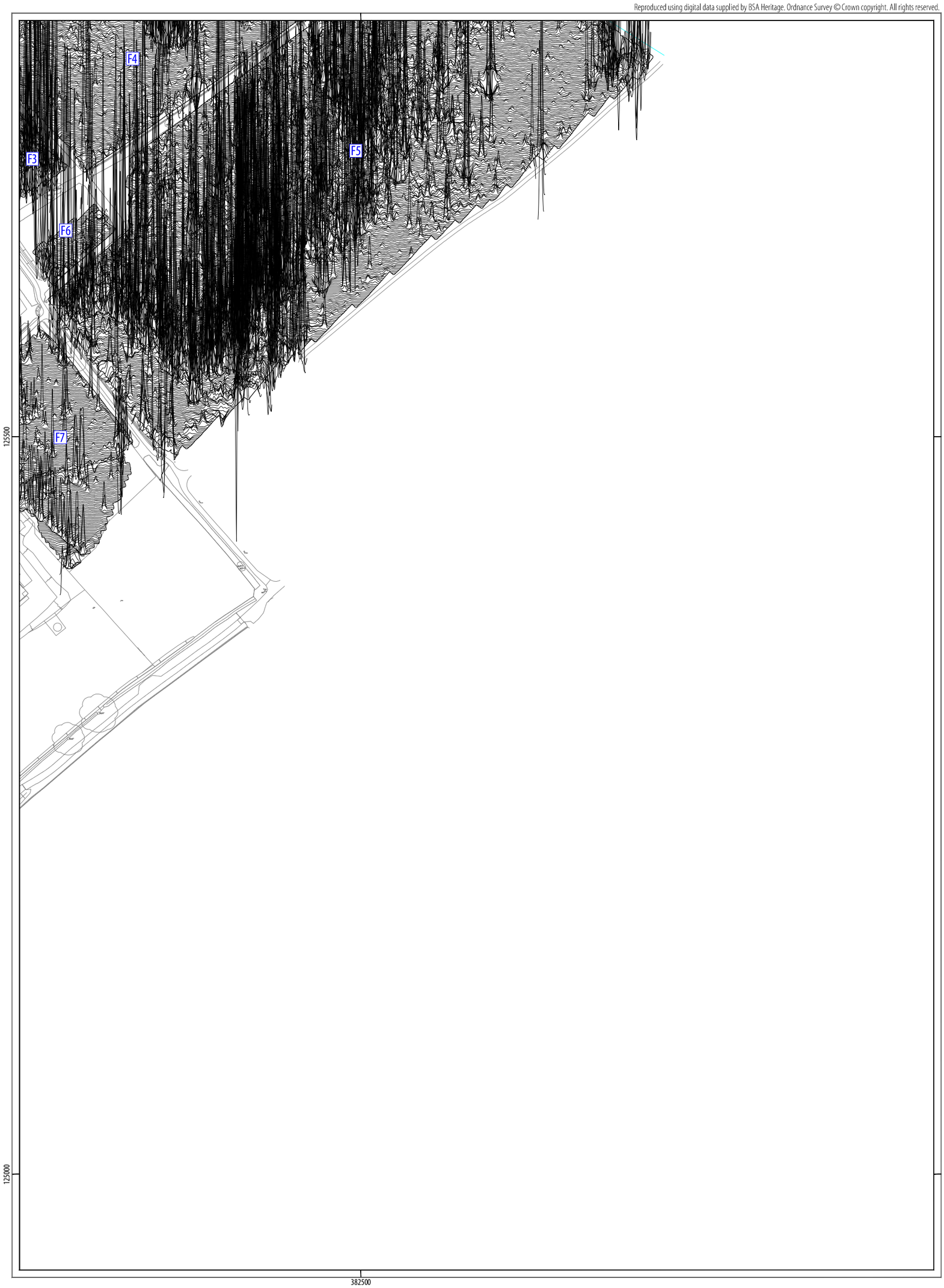
ILLUS 13 Processed greyscale magnetometer data; Sector 2



15.0nT/cm

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0 50m

scale 1:2,500 @ A3

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ILLUS 14 XY trace plot of minimally processed magnetometer data; Sector 2

TYPE OF ANOMALY	INTERPRETATION
dipolar isolated	ferrous material
magnetic disturbance	ferrous material
dipolar linear	service pipe
dipolar isolated	manhole cover
linear	modern
magnetic enhancement	geology

ABBREVIATIONS	
FP	former pond
MH	manhole cover
SP	service pipe

N

0 50m

scale 1:2,500 @ A3

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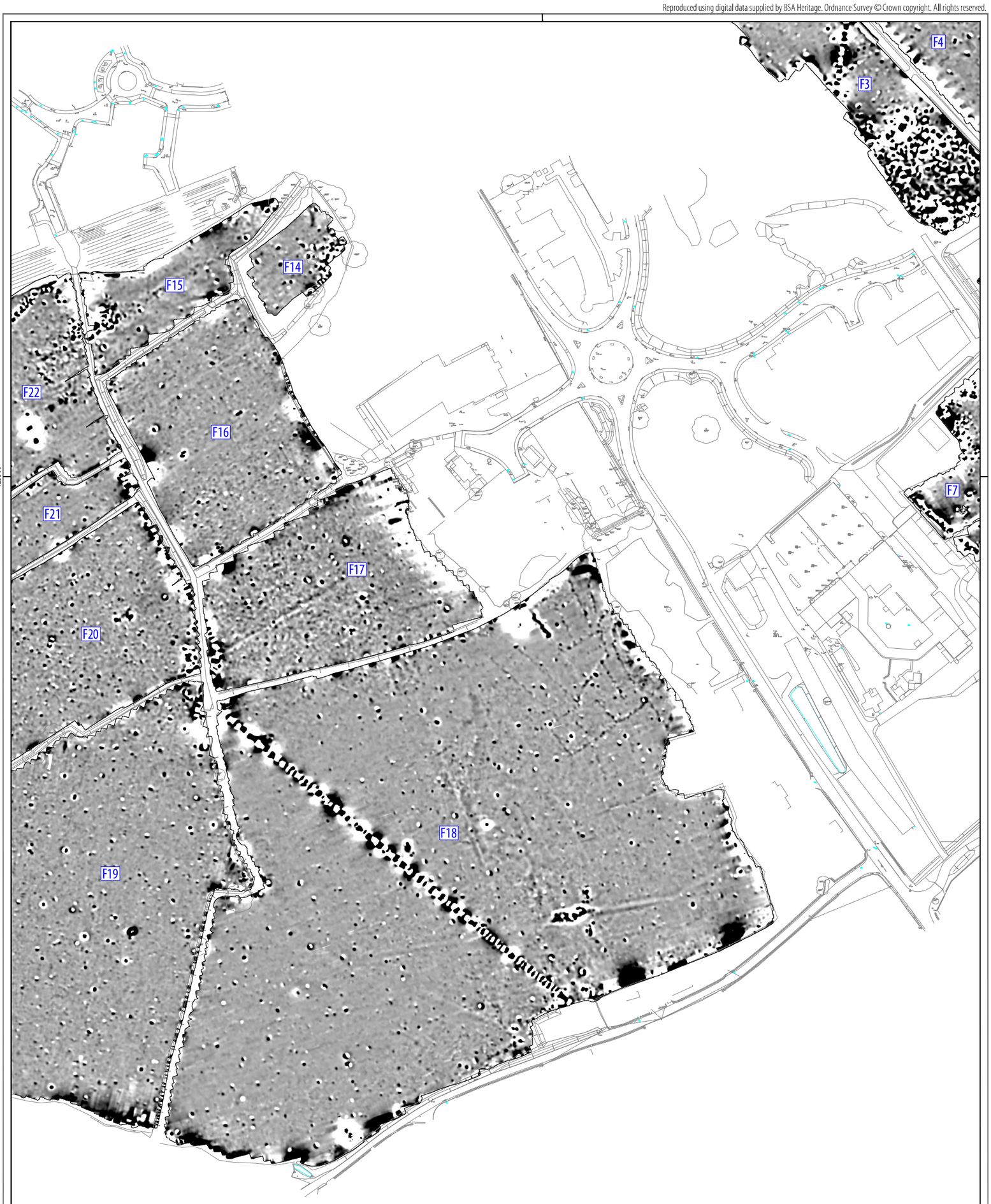
ILLUS 15 Interpretation of magnetometer data; Sector 2



nT
-1.0 2.0

N
0 50m
scale 1:2,500 @ A3

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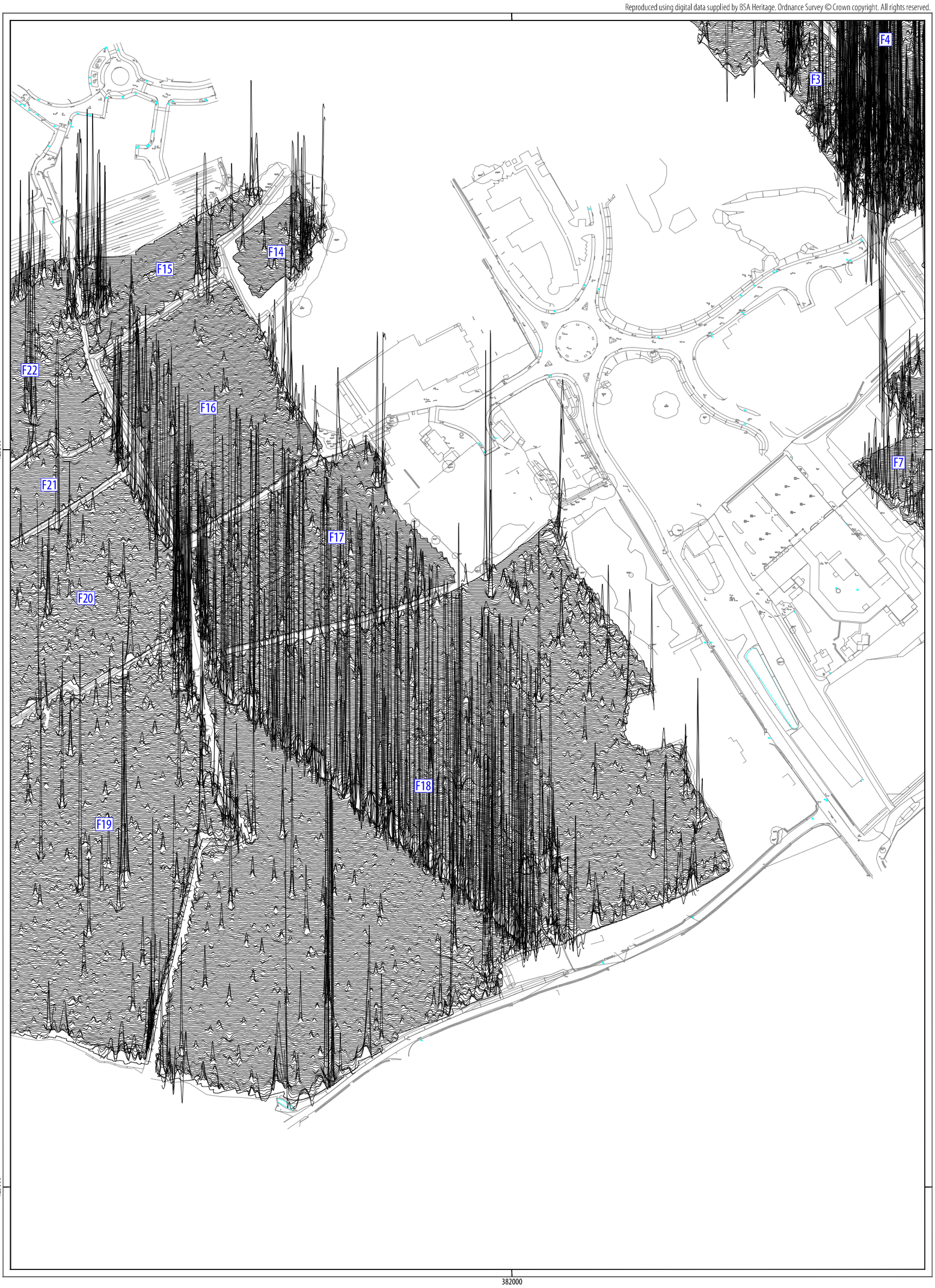
ILLUS 16 Processed greyscale magnetometer data; Sector 3



15.0nT/cm

N

0 50m

scale 1:2,500 @ A3

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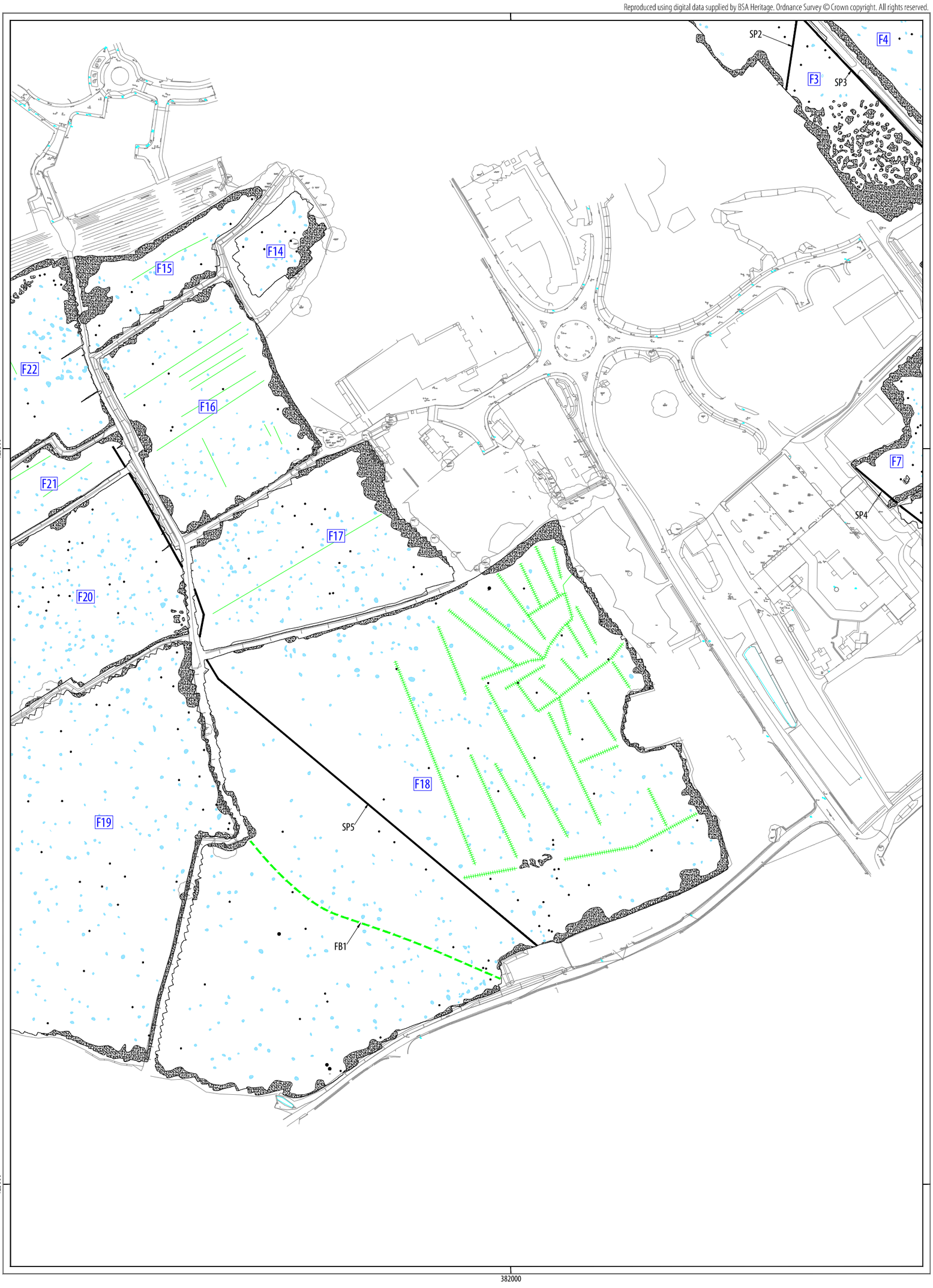
ILLUS 17 XY trace plot of minimally processed magnetometer data; Sector 3



ABBREVIATIONS

FB former boundary

SP service pipe

TYPE OF ANOMALY	INTERPRETATION
dipolar isolated	ferrous material
magnetic disturbance	ferrous material
dipolar linear	service pipe
linear trend	agricultural
linear trend	field drain
linear	former field boundary?

TYPE OF ANOMALY	INTERPRETATION
magnetic enhancement	geology

N

0 50m

scale 1:2,500 @ A3

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ILLUS 18 Interpretation of magnetometer data; Sector 3

nT
-1.0 2.0

N
0 50m
scale 1:2,500 @ A3

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Gillingham Southern Extension
Gillingam
Dorset
CLIENT WYG

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ILLUS 19 Processed greyscale magnetometer data; Sector 4

126000

125500

381000

381500

F35

F34

F32

F33

F22

F23

F31

F24

F21

F28

15.0nT/cm

N

0 50m

scale 1:2,500 @ A3

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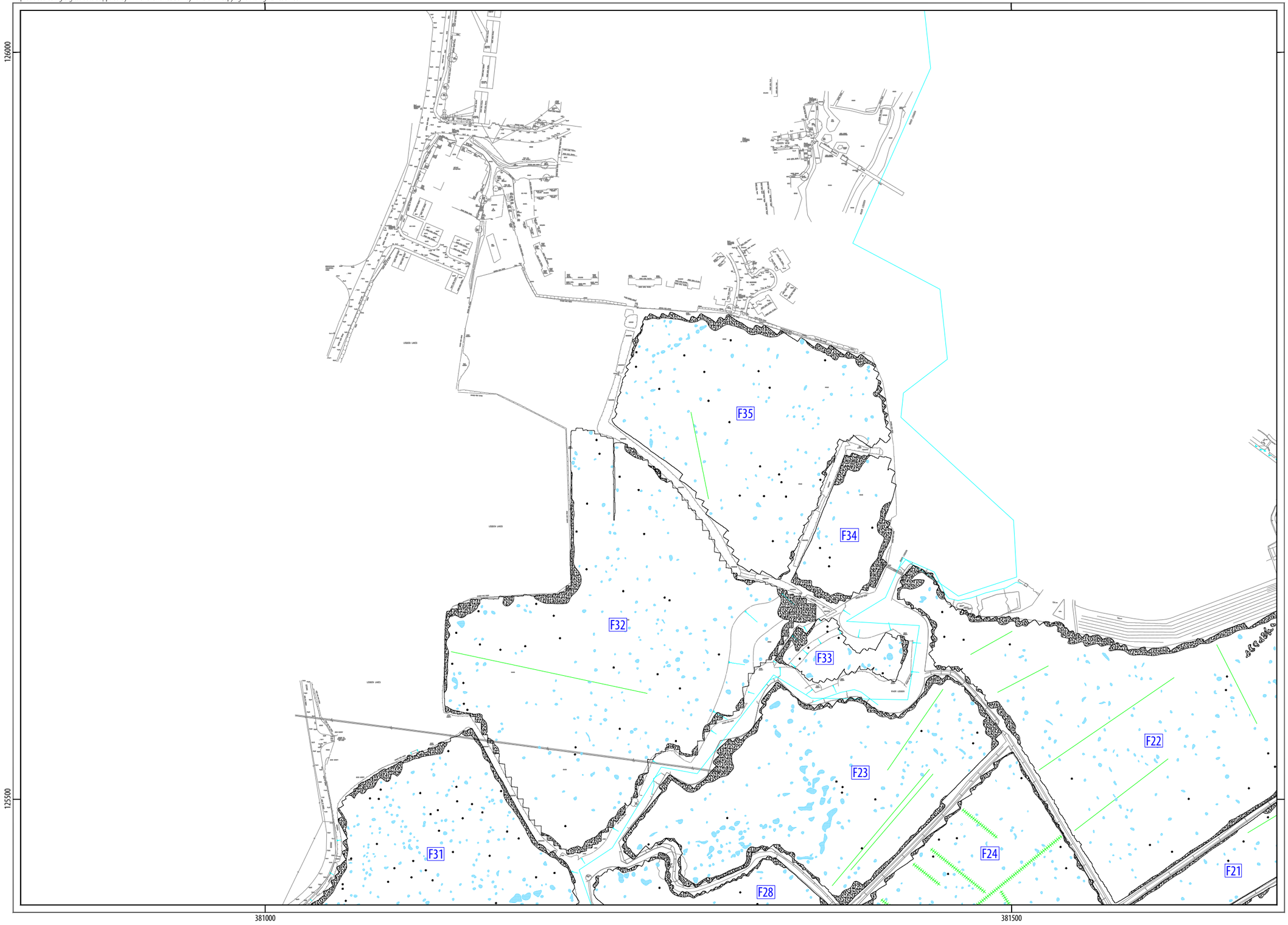
ILLUS 20 XY trace plot of minimally processed magnetometer data; Sector 4



TYPE OF ANOMALY	INTERPRETATION
dipolar isolated	ferrous material
magnetic disturbance	ferrous material
linear trend	agricultural
linear trend	field drain
magnetic enhancement	geology?

N

0 50m

scale 1:2,500 @ A3

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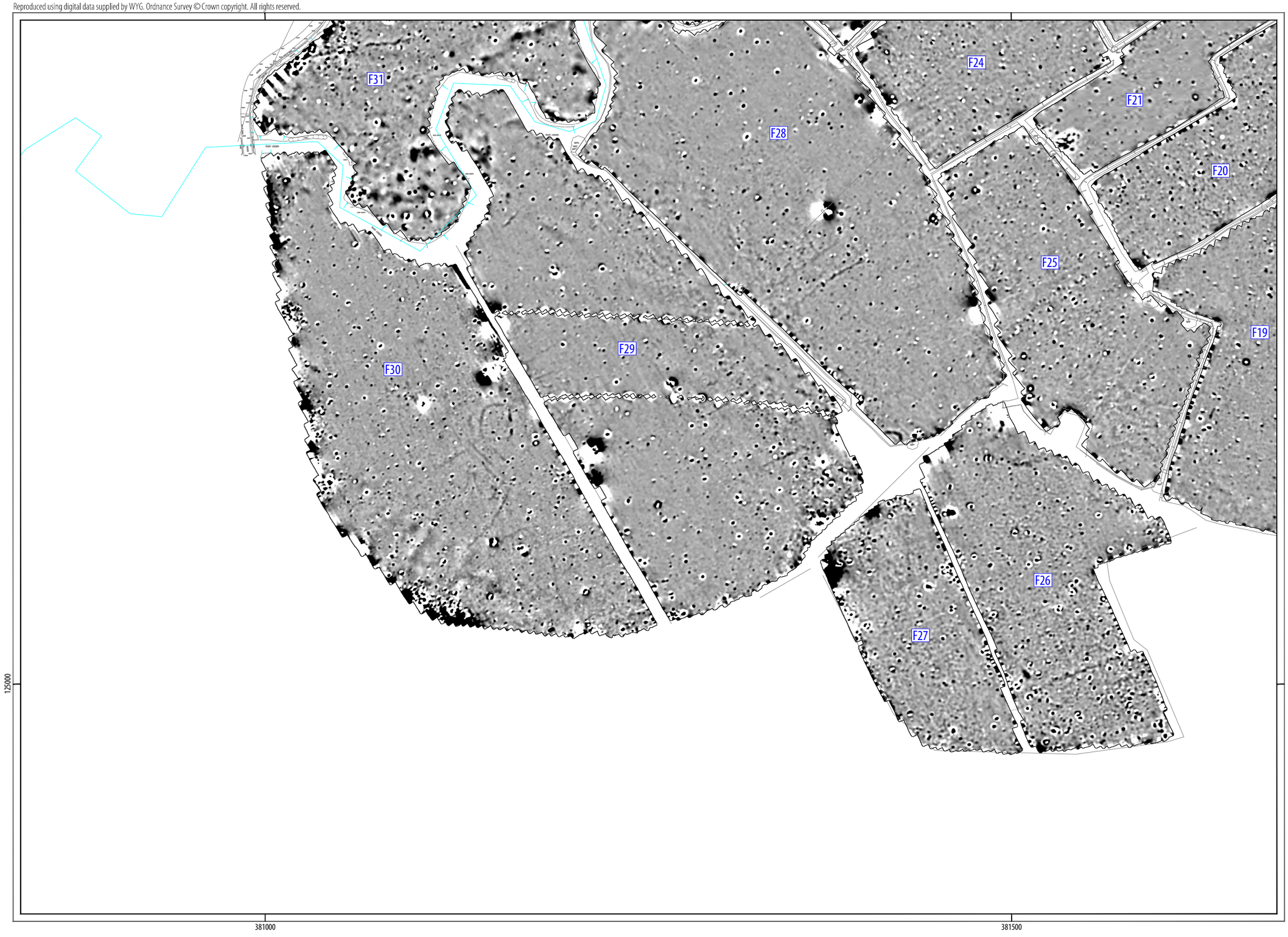
ILLUS 21 Intepretation of magnetometer data; Sector 4



-1.0 nT 2.0

N

0 50m

scale 1:2,500 @ A3

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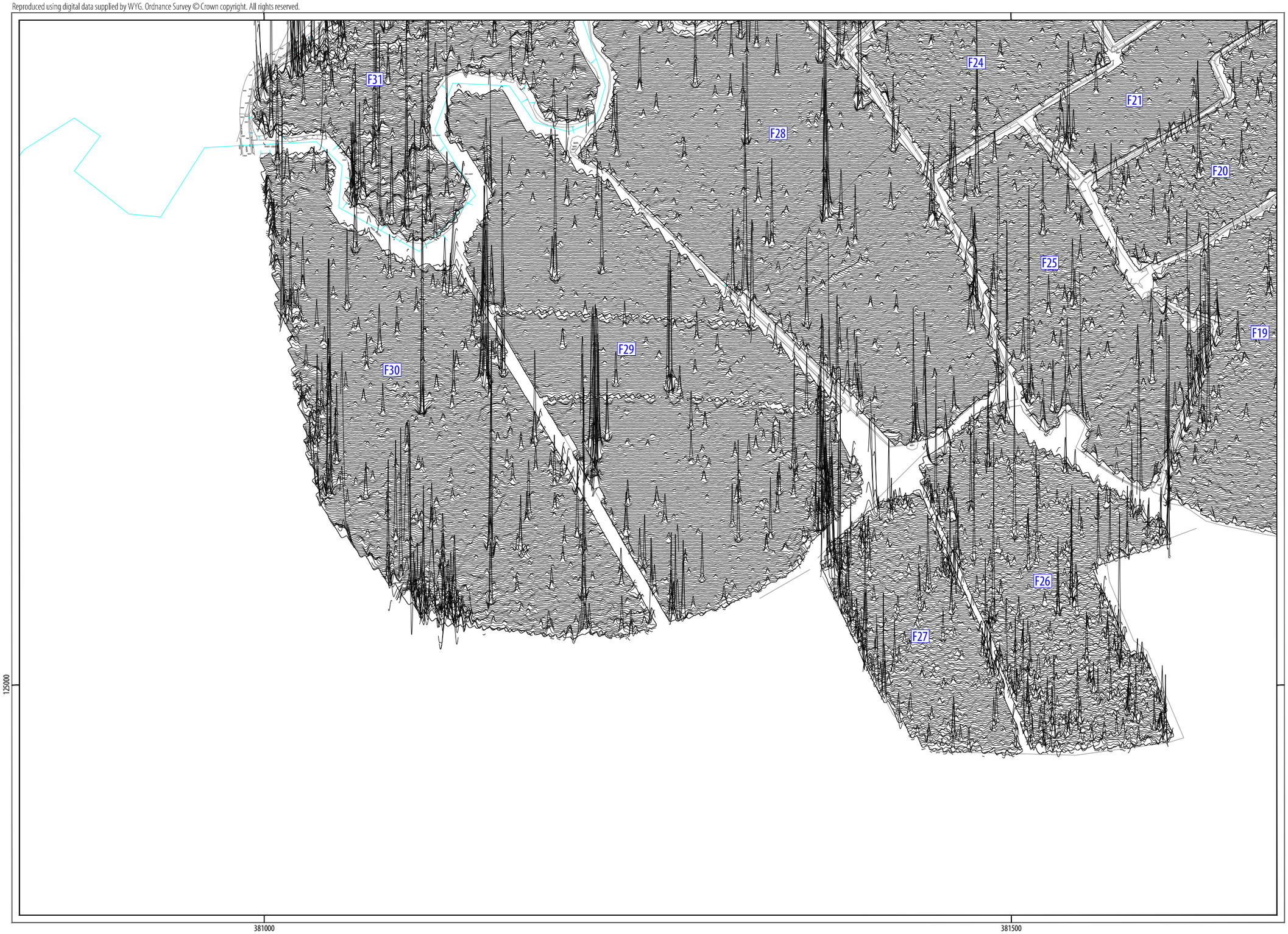
ILLUS 22 Processed greyscale magnetometer data; Sector 5



15.0nT/cm

N

0 50m

scale 1:2,500 @ A3

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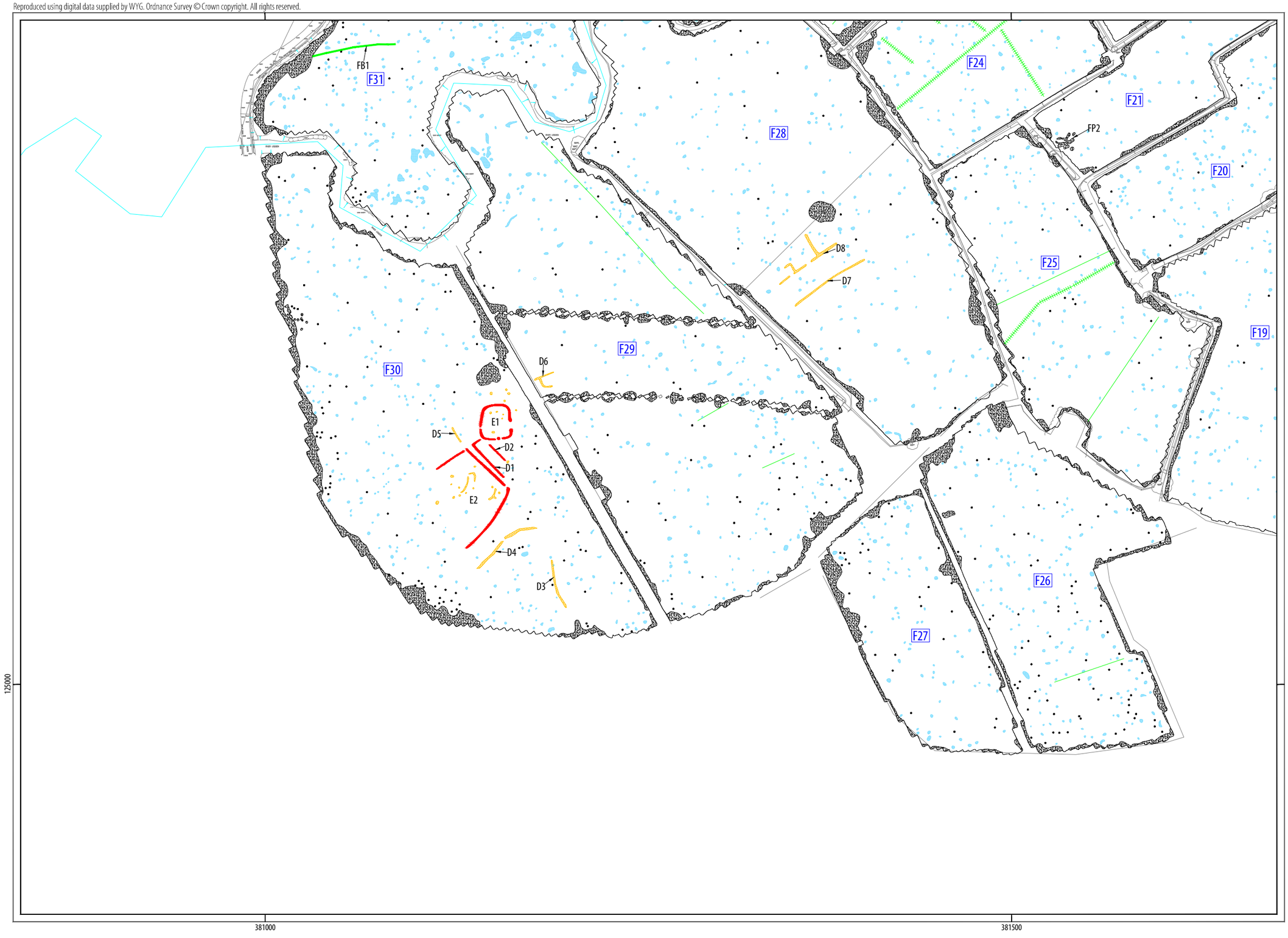
ILLUS 23 XY trace plot of minimally processed magnetometer data; Sector 5



TYPE OF ANOMALY	INTERPRETATION
dipolar isolated	ferrous material
magnetic disturbance	ferrous material
linear trend	agricultural
linear trend	field drain
linear	former field boundary
magnetic enhancement	geology?
magnetic enhancement	archaeology?
magnetic enhancement	archaeology

ABBREVIATIONS

D	ditch
E	enclosure
FB	former boundary
FP	former pond

N

0 50m

scale 1:2,500 @ A3

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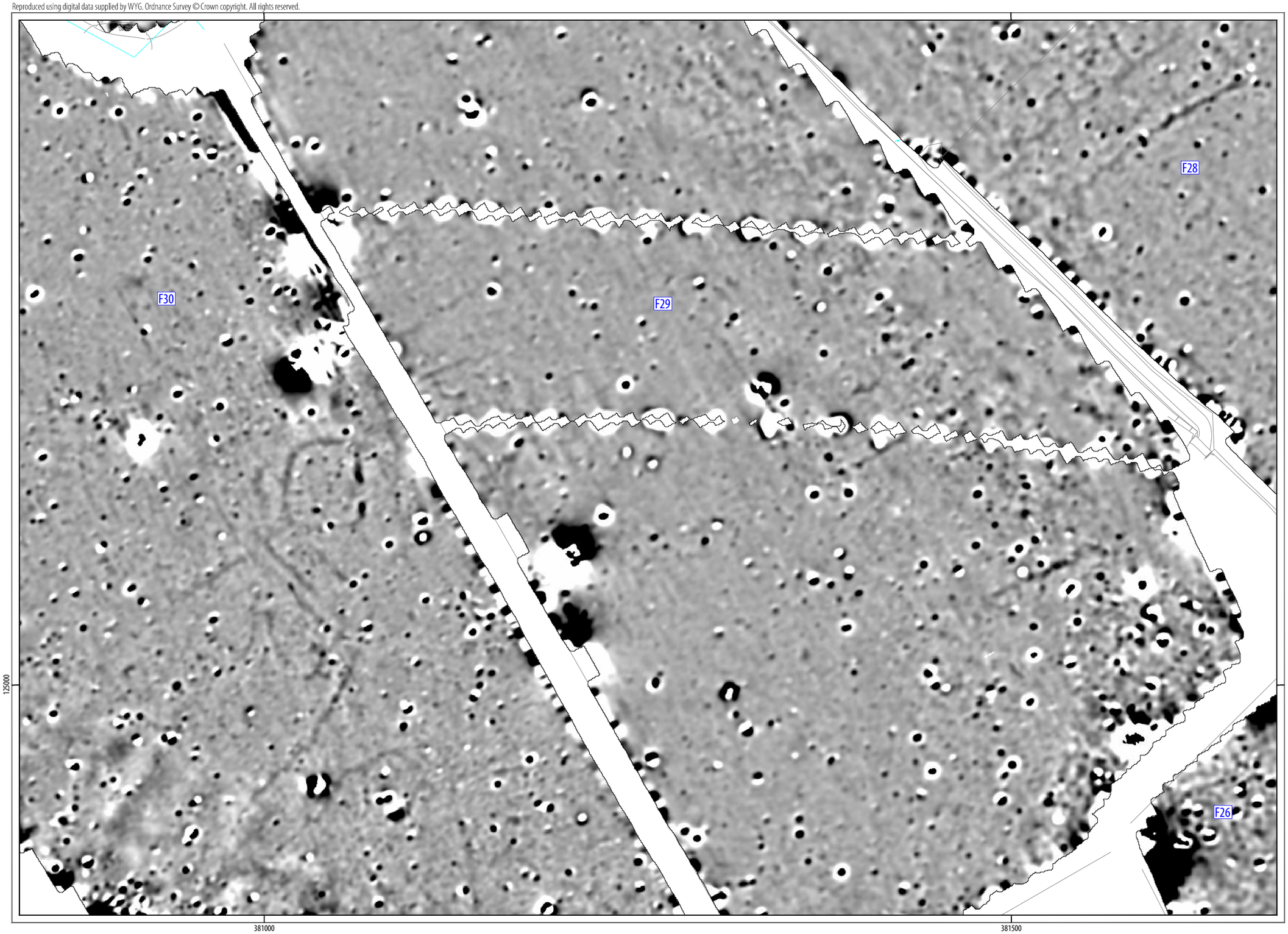
ILLUS 24 Interpretation of magnetometer data; Sector 5



nT
-1.0 2.0

N

0 25m
scale 1:1,000 @ A3

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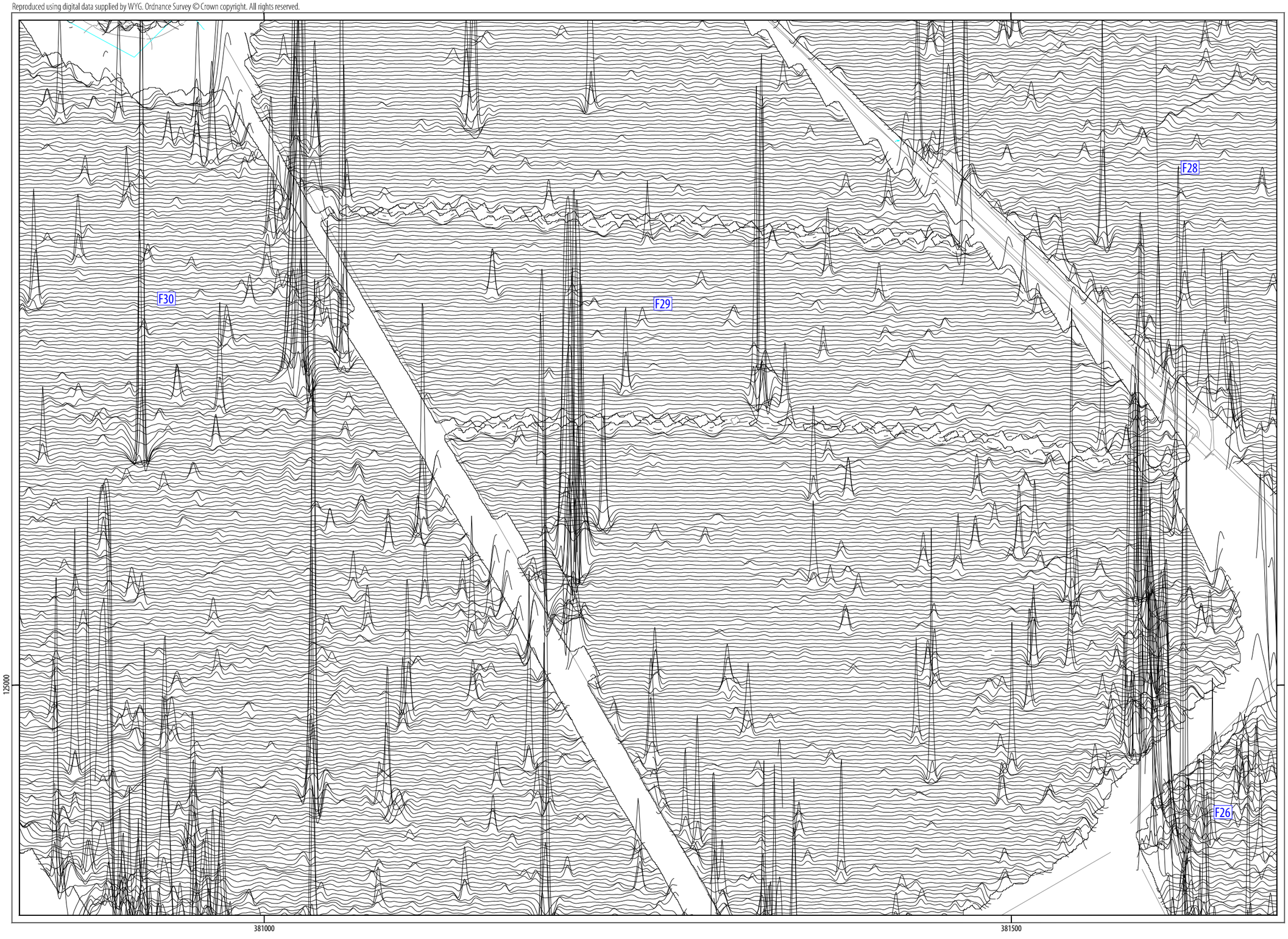
ILLUS 25 Processed greyscale magnetometer data; Area of Archaeological Potential



25.0nT/cm

N

0 25m

scale 1:1,000 @ A3

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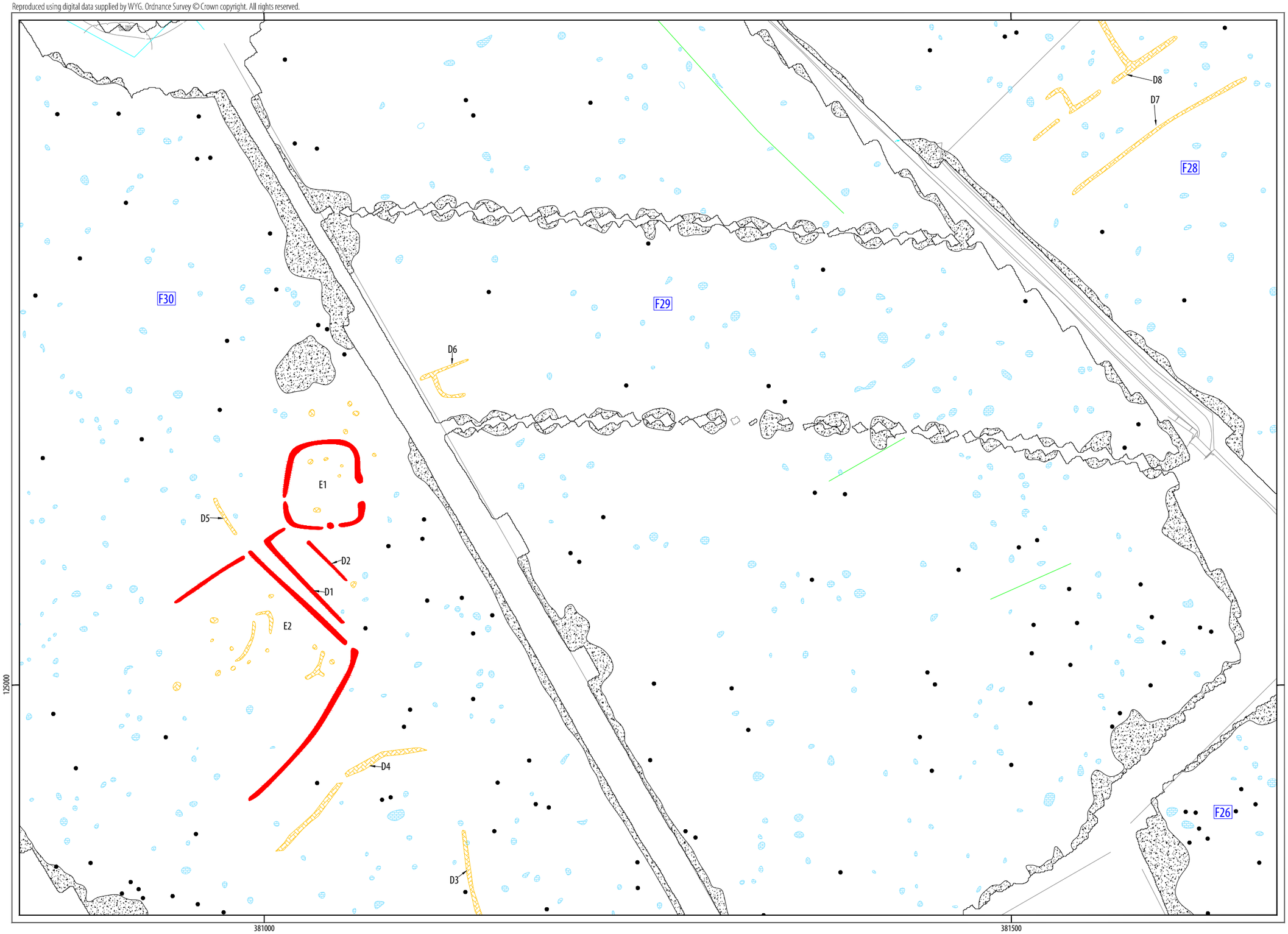
ILLUS 26 XY trace plot of minimally processed magnetometer data; Area of Archaeological Potential



TYPE OF ANOMALY	INTERPRETATION
dipolar isolated	ferrous material
magnetic disturbance	ferrous material
linear trend	agricultural
magnetic enhancement	geology?
magnetic enhancement	archaeology?
magnetic enhancement	archaeology

ABBREVIATIONS

D ditch
E enclosure

N

0 25m

scale 1:1,000 @ A3

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Dorset

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ILLUS 27 Interpretation of magnetometer data; Area of Archaeological Potential

7 APPENDICES

APPENDIX 1 MAGNETOMETER SURVEY

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 haematite. 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 so that by measuring the magnetic susceptibility of the topsoil, areas where human occupation or settlement has occurred can be identified by virtue 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. This effect can lead to the detection of features such as hearths, kilns or areas of burning.

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 (sometimes only visible on an XY trace plot) 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.

APPENDIX 2 SURVEY LOCATION INFORMATION

An initial survey base station was established using a Trimble VRS differential Global Positioning System (dGPS). The magnetometer data was georeferenced using a Trimble RTK differential Global Positioning System (Trimble R8s model).

Temporary sight markers were laid out using a Trimble VRS differential Global Positioning System (Trimble R8s model) to guide the operator and ensure full coverage. The accuracy of this dGPS equipment is better than 0.01m.

The survey data were then super-imposed onto a base map provided by the client to produce the displayed block locations. However, it should be noted that Ordnance Survey positional accuracy for digital map data has an error of 0.5m for urban and floodplain areas, 1.0m for rural areas and 2.5m for mountain and moorland areas. This potential error must be considered if coordinates are measured off hard copies of the mapping rather than using the digital coordinates.

Headland Archaeology cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party.

APPENDIX 3 GEOPHYSICAL SURVEY ARCHIVE

The geophysical archive comprises an archive disk containing the raw data in XYZ format, a raster image of each greyscale plot with associate world file, and a PDF of the report.

The project will be archived in-house in accordance with recent good practice guidelines (http://guides.archaeologydataservice.ac.uk/g2gp/Geophysics_3). The data will be stored in an indexed archive and migrated to new formats when necessary.

APPENDIX 4 DATA PROCESSING

The gradiometer data has been presented in this report in processed greyscale and minimally processed XY trace plot format.

Data collected using RTK GPS-based methods cannot be produced without minimal processing of the data. The minimally processed data has been interpolated to project the data onto a regular grid and de-striped to correct for slight variations in instrument calibration drift and any other artificial data.

A high pass filter has been applied to the greyscale plots to remove low frequency anomalies (relating to survey tracks and modern agricultural features) in order to maximise the clarity and interpretability of the archaeological anomalies.

The data has also been clipped to remove extreme values and to improve data contrast.

APPENDIX 5 OASIS DATA COLLECTION FORM: ENGLAND

OASIS ID: headland5-284199

PROJECT DETAILS	
Project name	Gillingham SOuthern Extension
Short description of the project	Headland Archaeology (UK) Ltd undertook a geophysical (magnetometer) survey of a 115 hectare site, south of Gillingham, Dorset, as part of a baseline assessment of the heritage potential of the site. This information will help guide archaeological strategy in advance of the proposed development of the site. The majority of anomalies are indicative of post-medieval agricultural and modern activity with some natural variation within the soils due to the localised presence of alluvial deposits and the widespread distribution of other superficial deposits. One area of clear archaeological potential has, however, been located in the south-western corner of the site. Here linear anomalies forming one small square enclosure and one larger rectangular enclosure, together with other ditch type anomalies, have been identified. This area is assessed as of moderate to high archaeological potential. A curvilinear anomaly which may locate the continuation of a medieval deer park pale boundary (which is recorded beyond the site limits) has also been identified. However, this interpretation is extremely tentative and the anomaly could be indicative of much more recent agricultural activity. Consequently its potential is assessed as low to moderate. The archaeological potential of the remainder of the site is assessed as very low.
Project dates	Start: 22-02-2017 End: 10-03-2017
Previous/future work	Not known / Not known
Any associated project reference codes	GSEX - Sitecode
Type of project	Field evaluation
Site status	None
Current Land use	Grassland Heathland 4 - Regularly improved
Monument type	N/A None
Monument type	N/A None
Significant Finds	N/A None
Significant Finds	N/A None
Methods & techniques	"Geophysical Survey"
Development type	mixed use development
Prompt	National Planning Policy Framework - NPPF
Position in the planning process	Pre-application
Solid geology (other)	Kimmeridge Clay Formation
Drift geology (other)	Alluvium and Head
Techniques	Magnetometry

PROJECT LOCATION	
Country	England
Site location	DORSET NORTH DORSET GILLINGHAM GILLINGHAM SOUTHERN EXTENSION, DORSET
Study area	115 Hectares
Site coordinates	ST 81622 25543 51.028421162992 -2.262093759055 51 01 42 N 002 15 43 W Polygon

PROJECT CREATORS	
Name of Organisation	Headland Archaeology
Project brief originator	WYG
Project design originator	Headland Archaeology

Project director/manager	Harrison, S
Project supervisor	Bishop, R
Type of sponsor/funding body	Developer

PROJECT ARCHIVES	
Physical Archive Exists?	No
Digital Archive recipient	In house
Digital Contents	"other"
Digital Media available	"Geophysics"
Paper Archive Exists?	No

PROJECT BIBLIOGRAPHY 1	
Publication type	Grey literature (unpublished document/manuscript)
Title	Gillingham Southern Extension, Dorset: Geophysical Survey
Author(s)/Editor(s)	Webb, A.
Other bibliographic details	GSEX-01
Date	2017
Issuer or publisher	Headland Archaeology
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Description	A4 glue bound report and PDF/A
Entered by	Sam Harrison (sam.harrison@headlandarchaeology.com)
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