Appendix 6.7: Results of Additional Geophysical Survey

MEJS/02

M11 JUNCTION 7A, HARLOW, ESSEX

ADDITIONAL GEOPHYSICAL SURVEY

commissioned by Ringway Jacobs
on behalf of Essex County Council (ECC)

November 2016

HEADLAND ARCHAEOLOGY

REGISTERED ORGANISATION CIfA

M11 JUNCTION 7A, HARLOW, ESSEX

ADDITIONAL GEOPHYSICAL SURVEY

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November 2016

project info

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PARISH	Sheering, Matching
LOCAL AUTHORITY	Essex County Council
OASIS REF.	headland5-267219

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Data Protection Act

[redacted]

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PROJECT SUMMARY

Headland Archaeology (UK) Ltd undertook a second geophysical (magnetometer) survey, covering approximately 6 hectares, to provide supplementary information on the archaeological potential of land that will be impacted by the proposed scheme to construct a new junction north of Junction 7 on the M11, north-east of Harlow, Essex. The survey has identified a circular anomaly interpreted as a round barrow and other linear and discrete anomalies that may also be of archaeological origin, possibly indicative of ditches which may form part of an early field system.

The results and interpretation of the initial survey have been re-assessed in light of the current results and this has allowed for a slight revision of the overall interpretation; both data sets and interpretations are presented in this report. Overall the surveys have identified two areas of archaeological potential. The first is to the centre of the new link road which will connect the M11 with Sheering Road (Areas 5, 11 and 14). Two round barrows are clearly identified together with several discontinuous ditch type anomalies which appear to respect the barrows. This area is assessed to be of moderate to high potential. The second is to the east of the M11, in Area 15 and Area 16, where several discontinuous linear anomalies and pit type responses may locate another area of archaeological activity. However, no clear archaeological pattern is evident and these linear anomalies might equally plausibly be interpreted as the result of recent cultivation or drainage. This area is assessed as of moderate potential. Elsewhere across the majority of the scheme footprint the archaeological potential is assessed as low.

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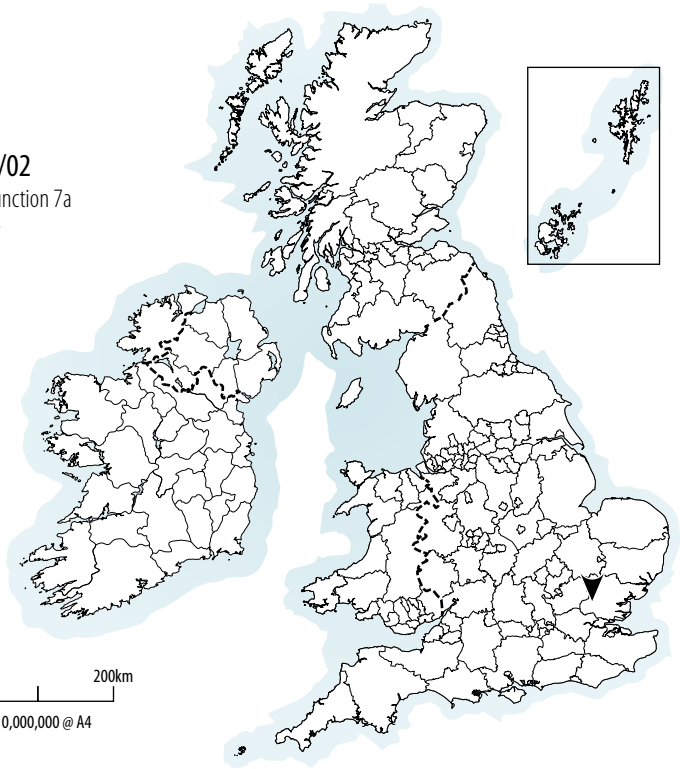

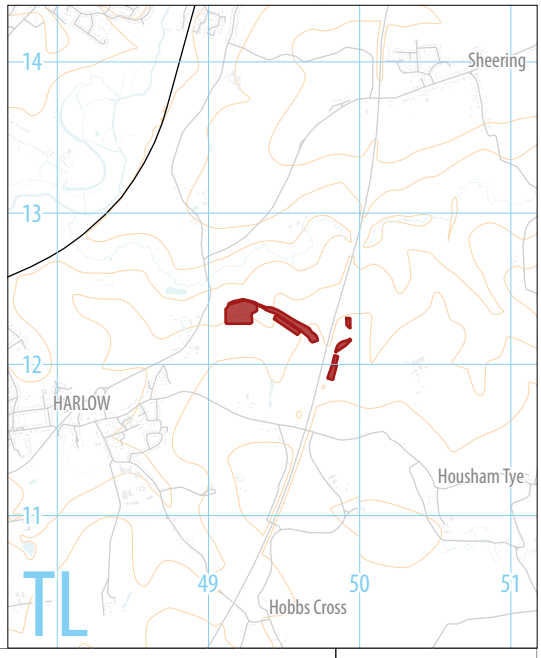

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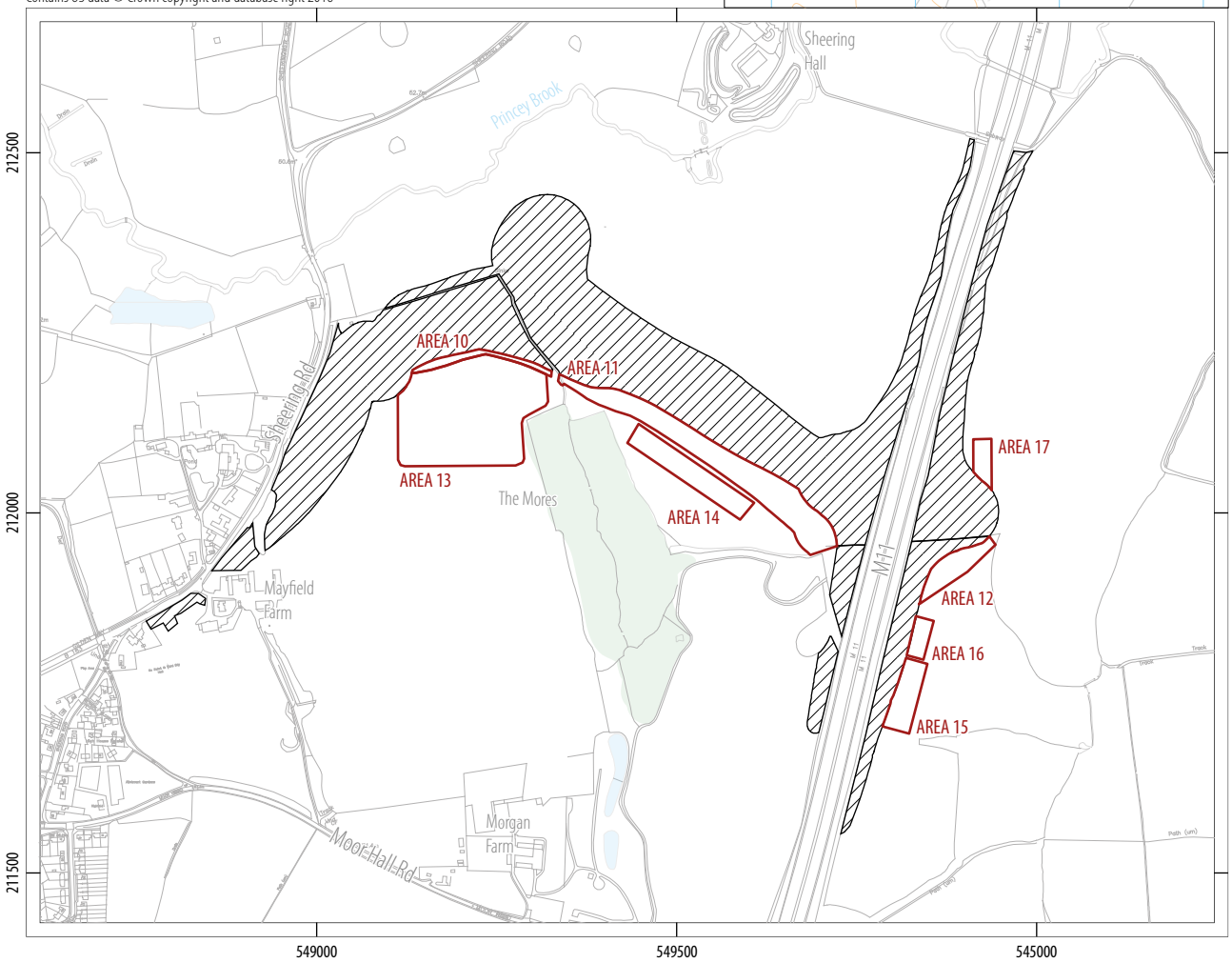

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KEY
geophysical survey area
previous geophysical survey area

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ILLUS 1 Site location

M11 JUNCTION 7A, HARLOW, ESSEX

ADDITIONAL GEOPHYSICAL SURVEY

1 INTRODUCTION

Headland Archaeology (UK) Ltd was commissioned by Ringway Jacobs (The Client) on behalf of Essex County Council (ECC) to undertake a geophysical (magnetometer) survey at the site of a proposed new motorway junction (Junction 7A) on the M11 motorway and associated link road connecting Sheering Road (B183) to Gilden Way (see Illus 1). The geophysical survey was requested by Maria Medlycott, Archaeological Planning Archaeologist at ECC.

The work was undertaken in accordance with a Written Scheme of Investigation (WSI) (Ringway Jacobs 2016), with guidance within the National Planning Policy Framework (DCLG 2012) and in line with current best practice (Chartered Institute for Archaeologists 2014; English Heritage 2008).

The current survey was carried out between October 17th and October 19th 2016 in order to assess the archaeological potential of eight additional parcels of land which have been added to the scheme to accommodate design changes, topsoil storage areas and contractors compounds.

1.1 SITE LOCATION, TOPOGRAPHY AND LAND-USE

The survey covered eight irregularly-shaped parcels of land (Area 10 to Area 17) covering approximately 6 hectares. Areas 10, 11, 13 and 14 are on the south side of the proposed new link road corridor which will connect the M11 with Sheering Road (B183). Areas 12, 15, 16 and 17 are to the east of the M11. The road scheme footprint is located within a rolling landscape. The highest point is at 73m above Ordnance Datum (AOD) to the north of Area 2 with the land generally sloping down to the north-west towards Princey Brook. The lowest point is at 44m AOD to the north-west of Area 5. At the time of the survey Area 10 and Area 13 contained a recently germinated arable crop (see Illus 2) as did Area 11 and Area 14 (see Illus 3). Area 17 had been ploughed (see Illus 4) and Areas 12, 15 and 16 had been recently drilled and seeded (see Illus 5).

1.2 GEOLOGY AND SOILS

The underlying geology comprises London Clay Formation sedimentary bedrock comprised of clay, silt and sand, which is overlain by superficial deposits of Lowestoft Formation diamicton. A narrow band of head (clay, silt, sand and gravel) is recorded in the centre of the survey area running north/south alongside a drainage ditch through Area 5, Area 11 and Area 14 (NERC 2016).

The soils within the lower-lying northern part of the scheme are classified in the Soilscape 7 association which are characterised as freely draining, slightly acid base-rich soils. Elsewhere, the soils are classified in the Soilscape 9 association, which are characterised as lime-rich loams and clays with impeded drainage (Cranfield University 2016).

2 ARCHAEOLOGICAL BACKGROUND

A Heritage Statement (Jacobs 2014) compiled baseline heritage data for a study area extending 300m in all directions from the proposed scheme. Within the study area no heritage assets of High value were identified although nine assets of Medium value were identified including prehistoric and Roman archaeological remains, cropmarks and find spots. Four heritage assets were identified within the geophysical survey area including Potter's Croft Field Name (Negligible value), the site of a Neolithic polished axe (Low value), the site of Moor Hall (Medium value) and the site of an Iron Age arrowhead and core (Low value). The Heritage Statement concluded that there is potential for unknown archaeological remains within the scheme footprint.

The first stage of geophysical survey (Headland 2016a) identified a circular anomaly, interpreted as a round barrow, in Area 5 together with three ditch type anomalies.

2.1 AIMS, METHODOLOGY AND PRESENTATION

The main aim of the geophysical survey was to provide sufficient information to enable an assessment to be made of the impact of the proposed road scheme on any potential sub-surface archaeological remains.

The general archaeological objectives of the geophysical survey were:

- to determine (so far as possible) the presence or absence of buried archaeological remains in the survey areas;

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ILLUS 2 Area 13 and Area 10, looking north-west **ILLUS 3** Area 11 and Area 14, looking south **ILLUS 4** Area 17, looking east **ILLUS 5** Area 12, Area 16 and Area 15, looking south-east

- to clarify the extent and layout of known sites of archaeological interest within or adjacent to the study area;
- to clarify the extent and layout of previously unknown buried remains within the survey areas; and
- to interpret any geophysical anomalies identified by the survey.

2.2 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. Features 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 has been used to process and present the data.

2.3 REPORTING

A general site location plan is shown in Illus 1 at a scale of 1:10,000. Illus 2 to Illus 5 are site condition photographs. A large scale (1:5,000) survey location plan showing the processed greyscale magnetometer data is presented in Illus 6. An overall interpretative plot is shown at the same scale in Illus 7.

Detailed data plots (greyscale and XY trace) and interpretative illustrations are presented at a scale of 1:1000 in Illus 8 to Illus 19.

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 (Ringway Jacobs 2016)

and guidelines outlined by Historic England (English Heritage 2008) and by the Chartered Institute for Archaeologists (CIfA 2014). All illustrations reproduced from Ordnance Survey (OS) mapping are 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.

3 RESULTS AND DISCUSSION

Generally, the survey has detected a variable magnetic background throughout partly due to the presence of superficial deposits of head and diamicton throughout the scheme but also due to the survey areas having been recently ploughed and re-seeded. The recent agricultural activity accounts for the noticeable difference in magnetic background between the data from this survey when compared to the background in adjoining areas surveyed seven months previously. Against this background, numerous discrete and linear anomalies have been identified. These are discussed below and cross-referenced to specific examples on the interpretive figures, where appropriate.

3.1 FERROUS 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 or material is common on most sites, often being present as a consequence of manuring or tipping/infilling. There is no clustering to the ferrous anomalies to suggest that the responses are caused by anything other than random ferrous debris in the plough-soil.

3.2 AGRICULTURAL ANOMALIES

Analysis of historical mapping indicates that the division of land within the PDA has undergone minor alterations since unchanged since the publication of the first edition OS map in 1875. These alterations include the removal of field boundaries from within Area 13, Area 11 and Area 15. The former boundaries manifest in the data as linear anomalies, (see Illus 7 – FB1–FB3). FB2 and FB3 were identified in the previous survey as anomalies B and C (Headland 2016a).

Within the lower-lying parts of the survey area in Area 11, Area 13 and Area 14 linear trend anomalies of varying magnitude are interpreted as field drains.

Elsewhere, several faint linear anomalies are identified on a number of different alignments. These are generally aligned parallel with, or at right angles to, existing or historical field boundaries and are likely to be reflect the direction of recent cultivation.

3.3 GEOLOGICAL ANOMALIES

Discrete areas of magnetic enhancement are identified across the proposed scheme. These are generally sparsely distributed and are thought to be due to localised variations in the soils and the superficial deposits from which they derive.

A narrow band of enhanced responses, G1, extending across the western end of Area 11 is the continuation of anomaly H recorded in the previous survey which corresponds to a slight break of slope and also to a band of superficial head deposits. The anomaly is caused by the accumulation of deposits at this location.

3.4 ARCHAEOLOGICAL AND POSSIBLE ARCHAEOLOGICAL ANOMALIES

A clear circular anomaly, RB1, has been identified in Area 14, centred on NGR TL 4957 1222. The anomaly, caused by a soil-filled ditch, measures 24m in diameter and is interpreted as a round barrow. It is located 220m south-east of another barrow of identical dimensions identified by the previous survey in Area 5. A linear ditch type anomaly, D1, is also recorded immediately to the south of the barrow, aligned east/west and this is also interpreted as of probable archaeological origin. A very weak linear trend, D2, further to the west in Area 14 marks the continuation of another possible ditch type anomaly identified in the previous survey which skirts the eastern side of another barrow.

To the east of the M11, in Area 12, a short linear anomaly, D3, and two possible pit anomalies, P1 and P2, have been interpreted as of possible archaeological origin.

Immediately to the south of Area 12, in Area 15 and Area 16, a cluster of low magnitude linear trend anomalies and discrete anomalies has been identified (Illus 19 – D4, D5, and P4–P8) are also interpreted as possible ditches and pits. In all three of these areas it is difficult to be confident of an archaeological interpretation given the relatively small survey area and the absence of an obvious pattern. Nevertheless an archaeological interpretation is considered possible although recent agricultural activity and geological variation could equally account for the recorded responses.

4 CONCLUSION

Assessed together the two geophysical surveys have demonstrated the potential for the presence of sub-surface archaeological remains within the areas that will be directly impacted by the proposed road scheme improvements and indirectly through the temporary creation of soil storage areas and site compounds. Of most clear potential are the two round barrows located to the west of the M11. Linear ditch type anomalies appear to respect the barrows and may form part of an early field system. The archaeological potential here is assessed as moderate to high. To the east of the motorway a cluster of ditch and pit type anomalies may locate a small area of archaeological activity although the limited survey area and absence of a clear pattern makes an archaeological interpretation less certain. The archaeological potential here is assessed as moderate. Across the remainder of the survey areas the potential is considered to be low.

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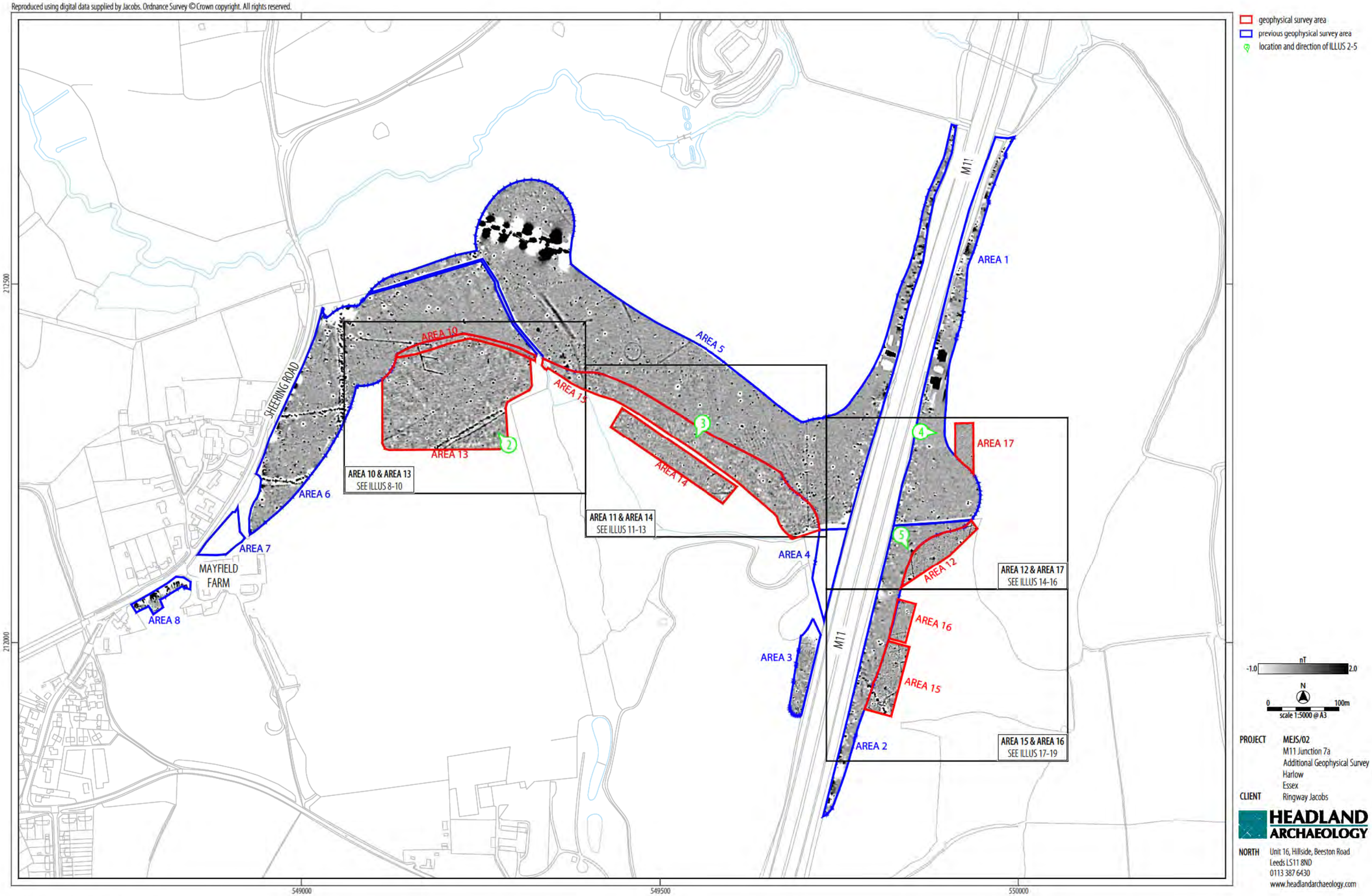

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ILLUS 6 Survey location showing processed greyscale magnetometer data

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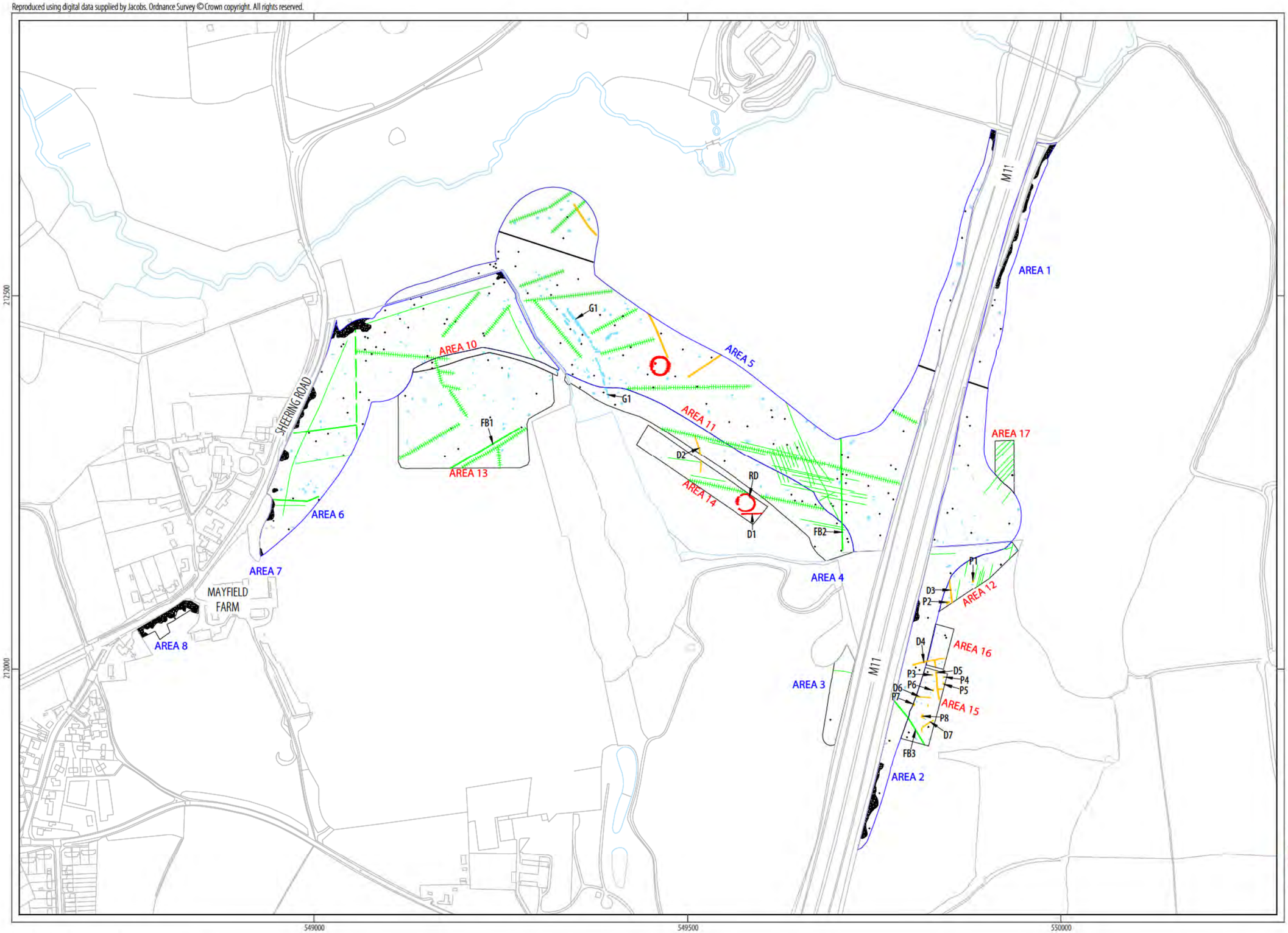

previous geophysical survey area

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
linear	former field boundary?
magnetic enhancement	geology?
magnetic enhancement	archaeology?
magnetic enhancement	archaeology

ABBREVIATIONS

- D ditch
- FB former boundary
- G geology
- P pit
- RD ring-ditch

N

0 100m

scale 1:5000 @ A3

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ILLUS 7 Overall interpretation of geophysical survey

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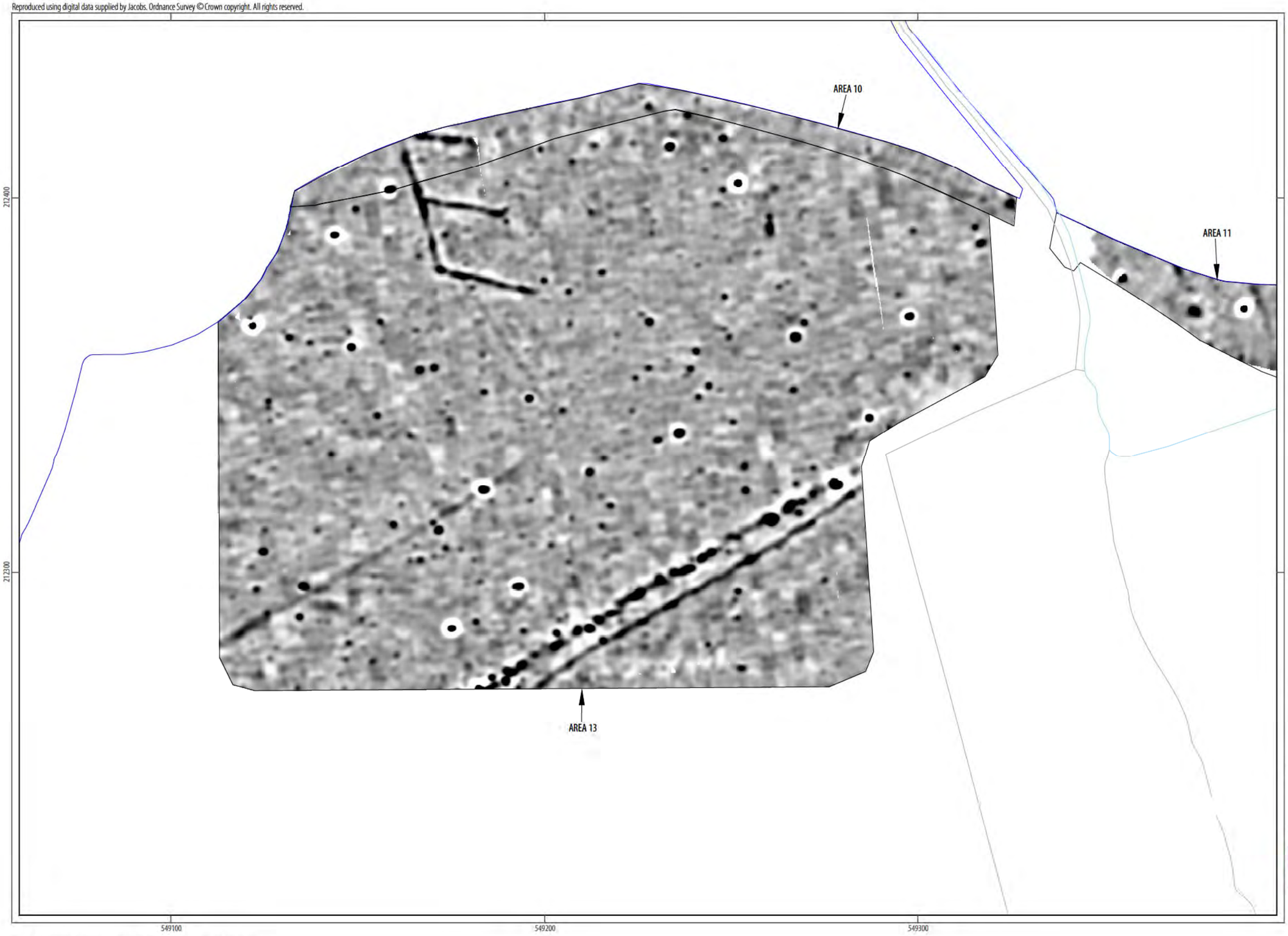

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ILLUS 8 Processed greyscale magnetometer data; Area 10 & Area 13

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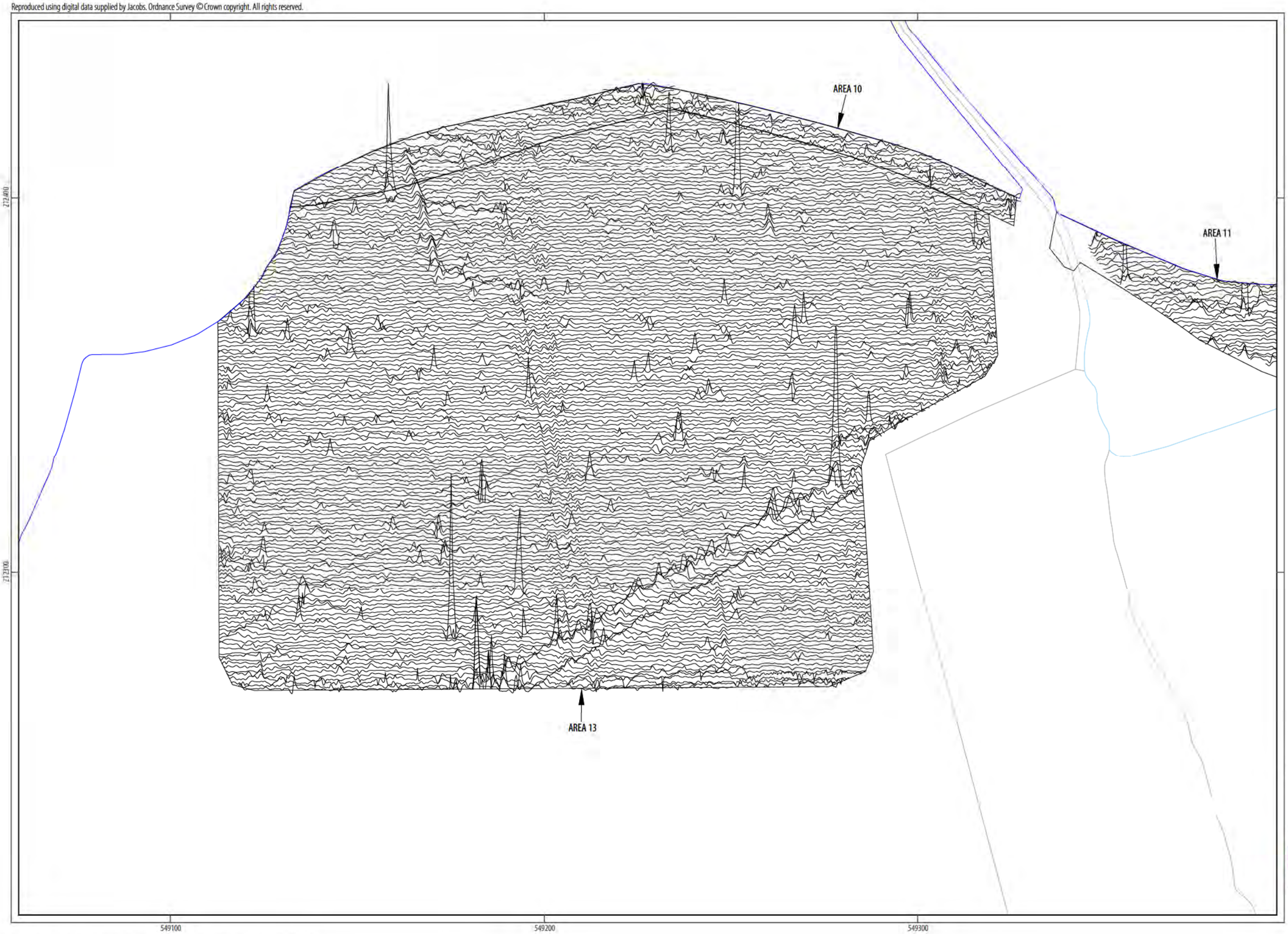

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ILLUS 9 XY trace plot of minimally processed magnetometer data; Area 10 & Area 13

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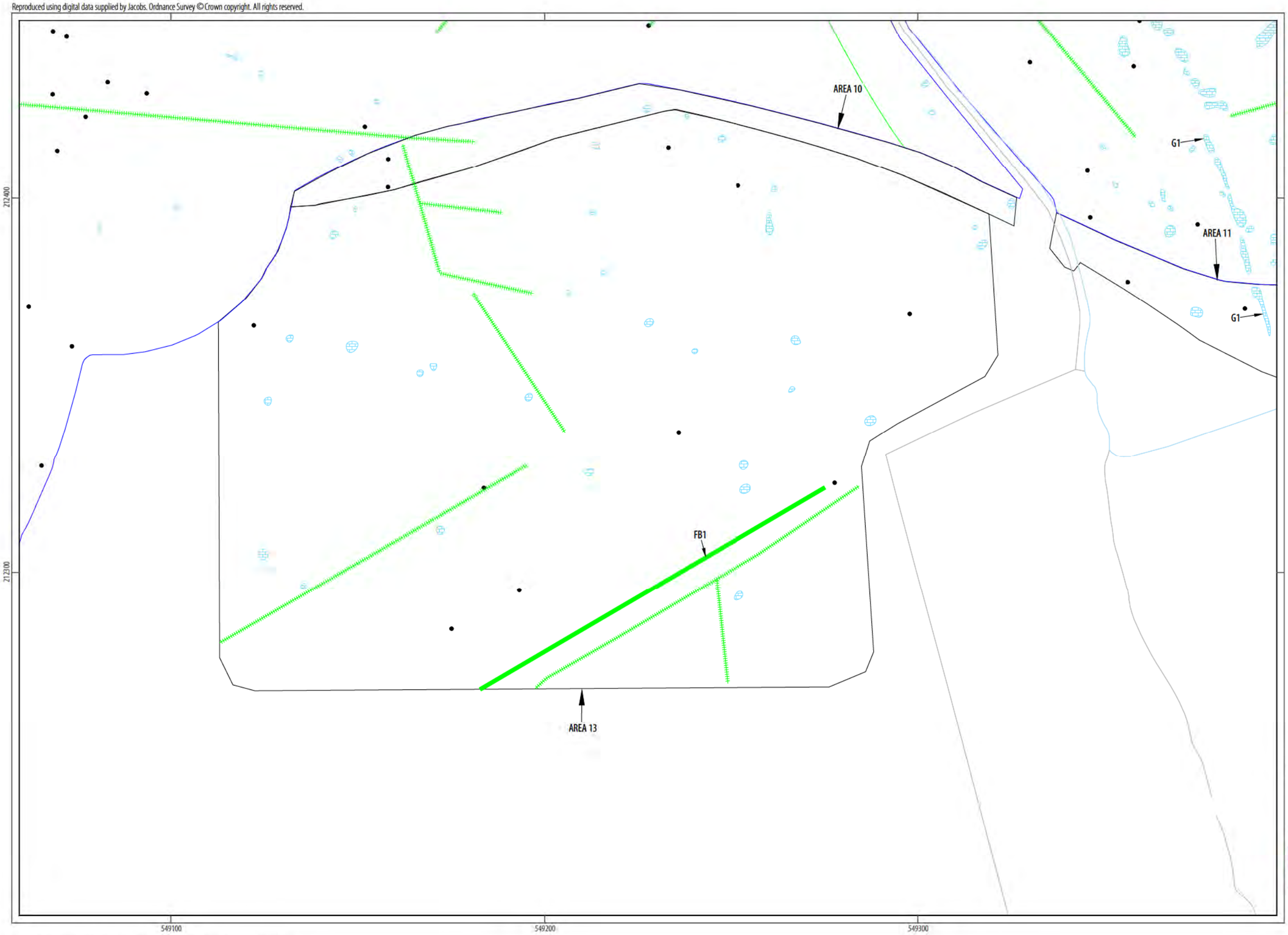

previous geophysical survey area

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

ABBREVIATIONS

FB former boundary

G geology

N

0 25m

scale 1:1,000 @ A3

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ILLUS 10 Interpretation of processed magnetometer data; Area 10 & Area 13

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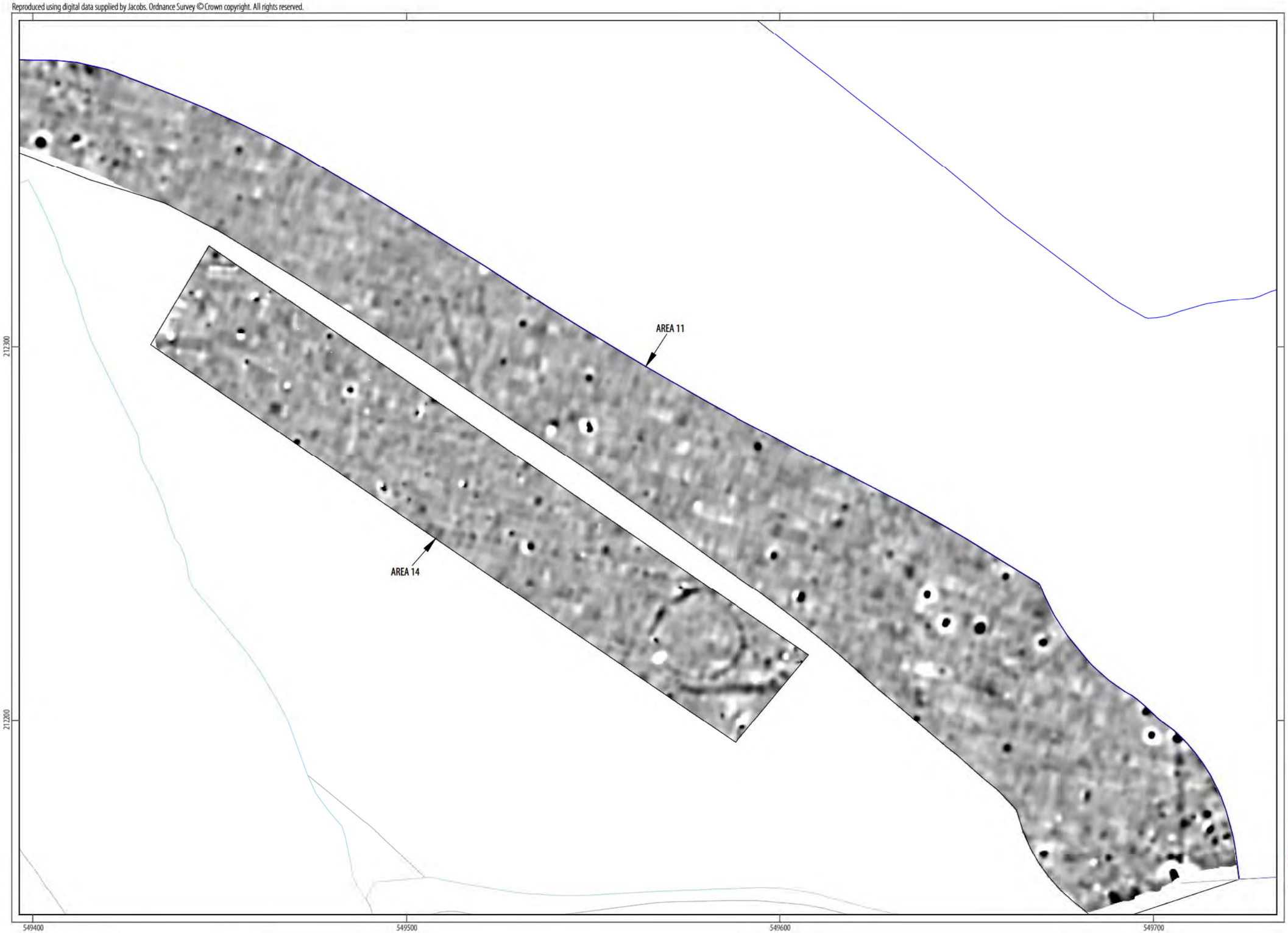

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ILLUS 11 Processed greyscale magnetometer data; Area 11 & Area 14

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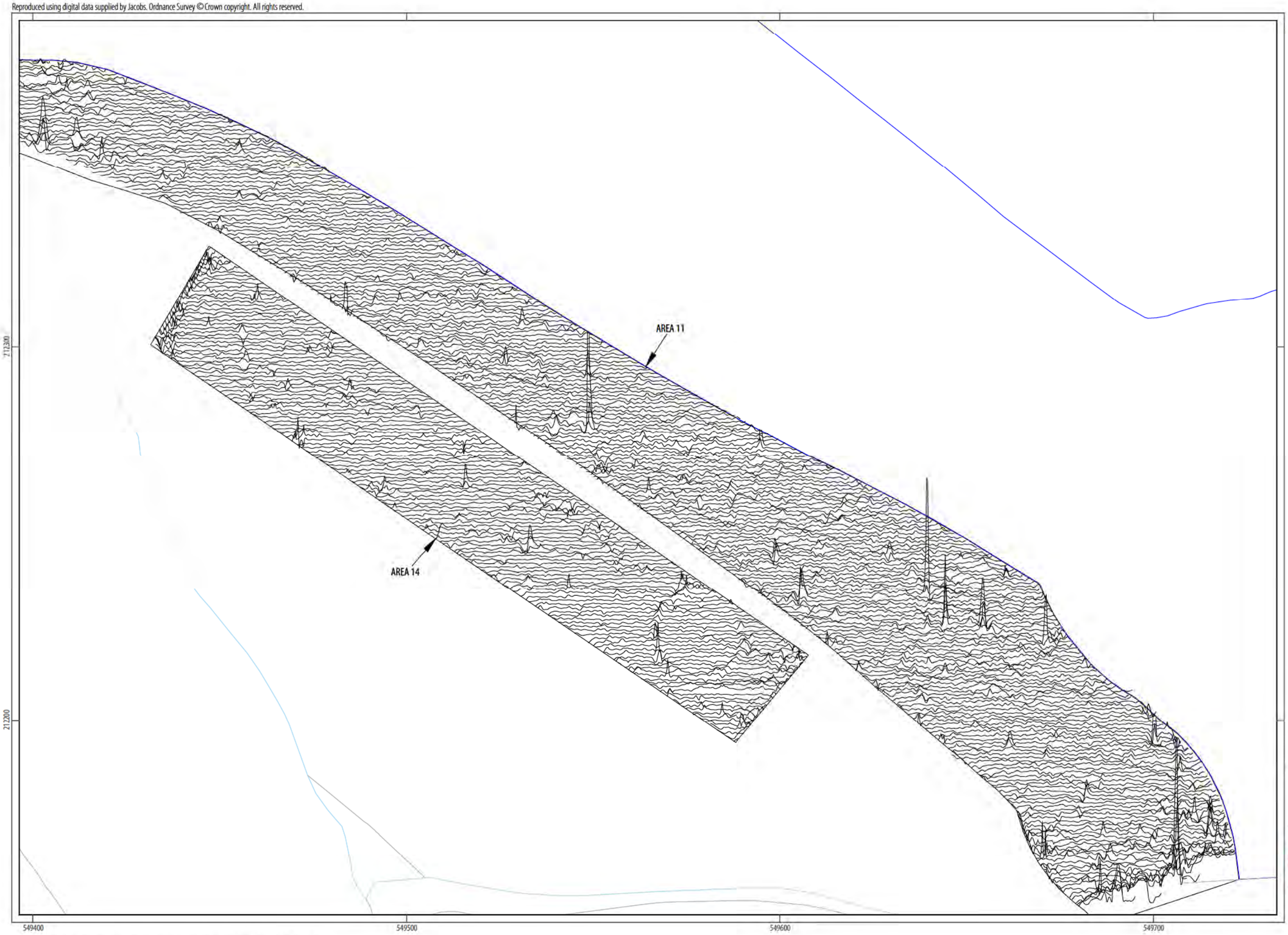

previous geophysical survey area

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ILLUS 12 XY trace plot of minimally processed magnetometer data; Area 11 & Area 14

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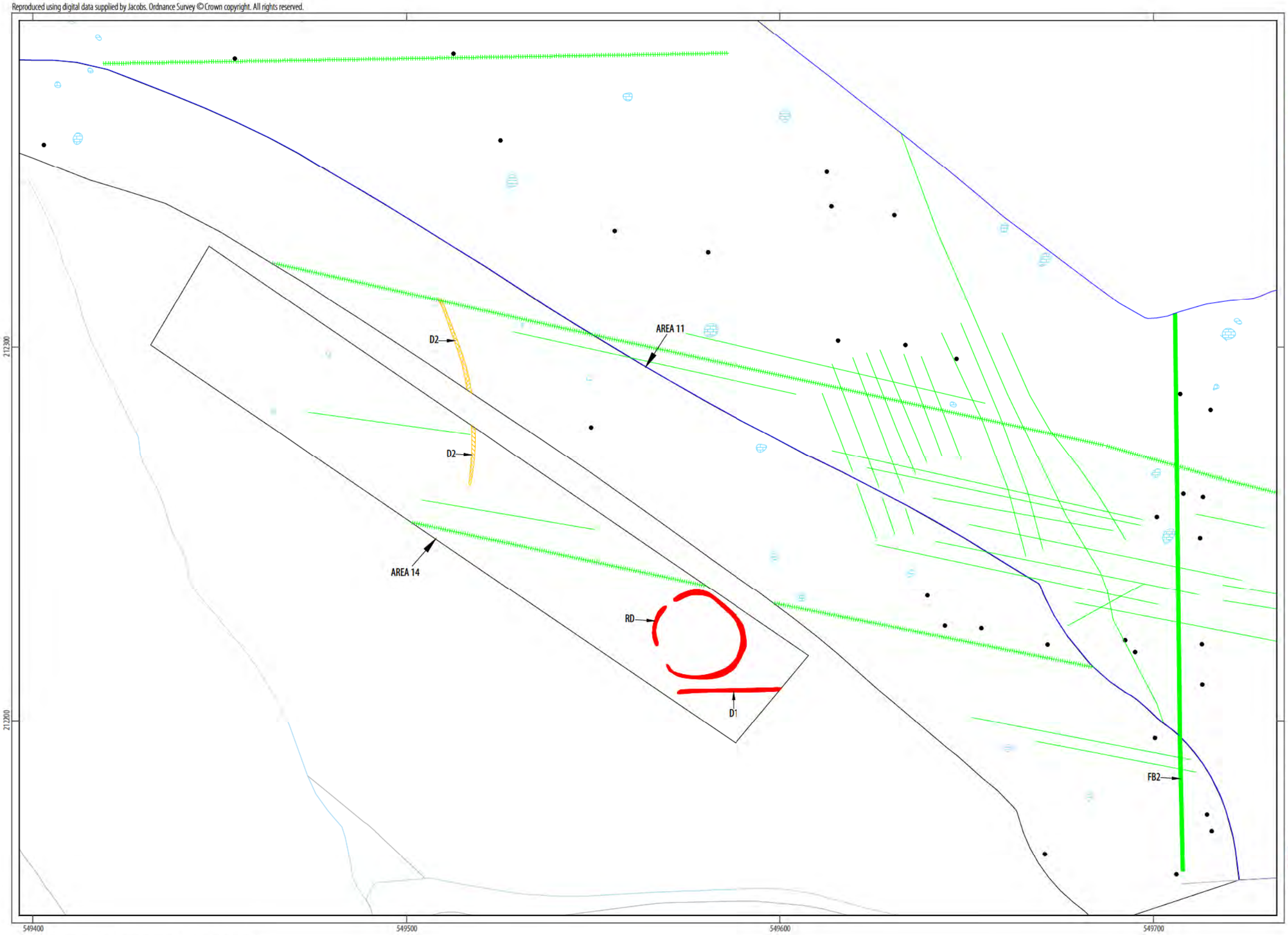

previous geophysical survey area

TYPE OF ANOMALY	INTERPRETATION
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linear trend	field drain
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magnetic enhancement	archaeology?
magnetic enhancement	archaeology

ABBREVIATIONS

D ditch
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RD ring-ditch

N

0 25m
scale 1:1,000 @ A3

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ILLUS 13 Interpretation of magnetometer data; Area 11 & Area 14

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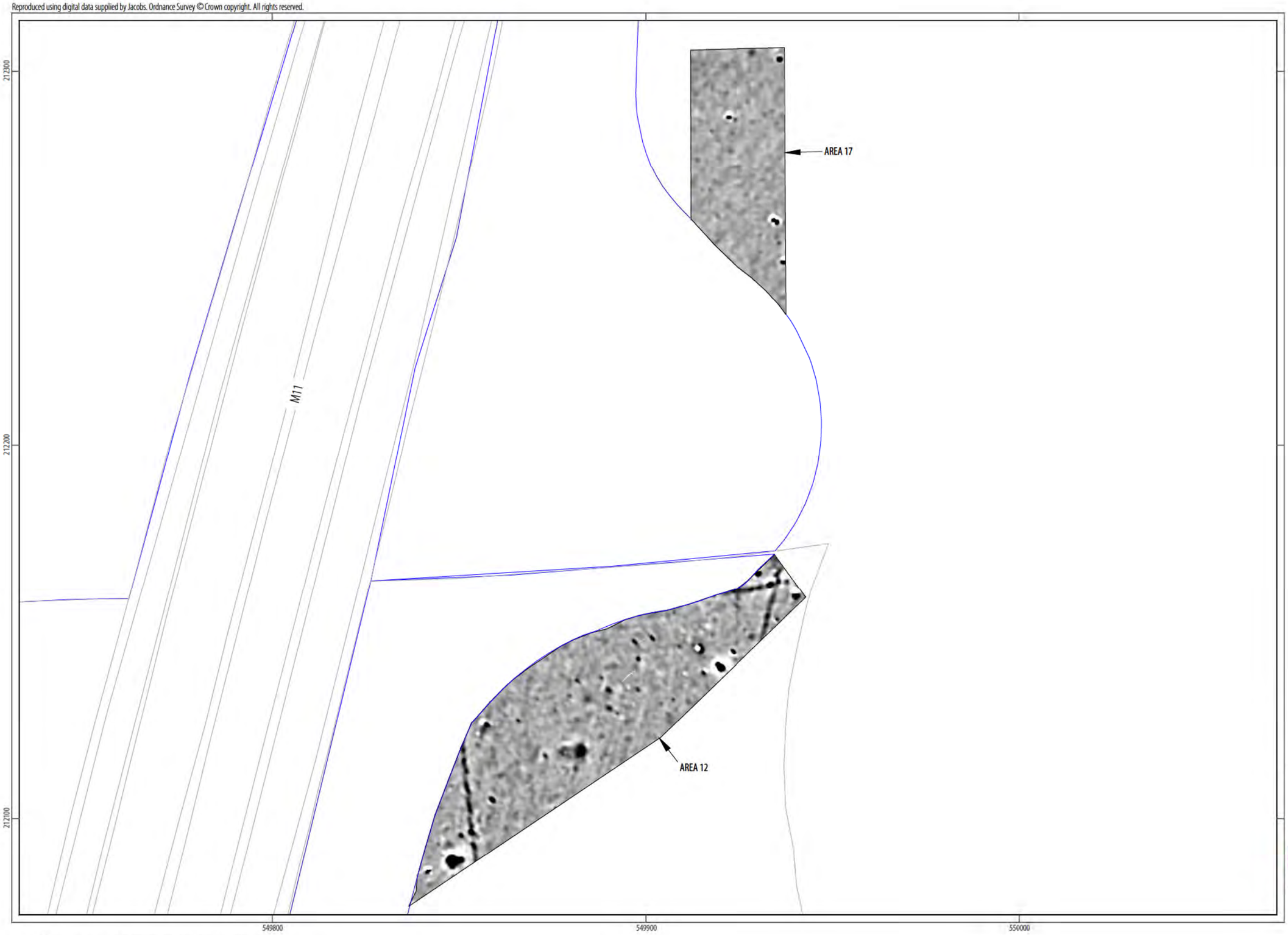

previous geophysical survey area

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scale 1:1,000 @ A3

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ILLUS 14 Processed greyscale magnetometer data; Area 12 & Area 17

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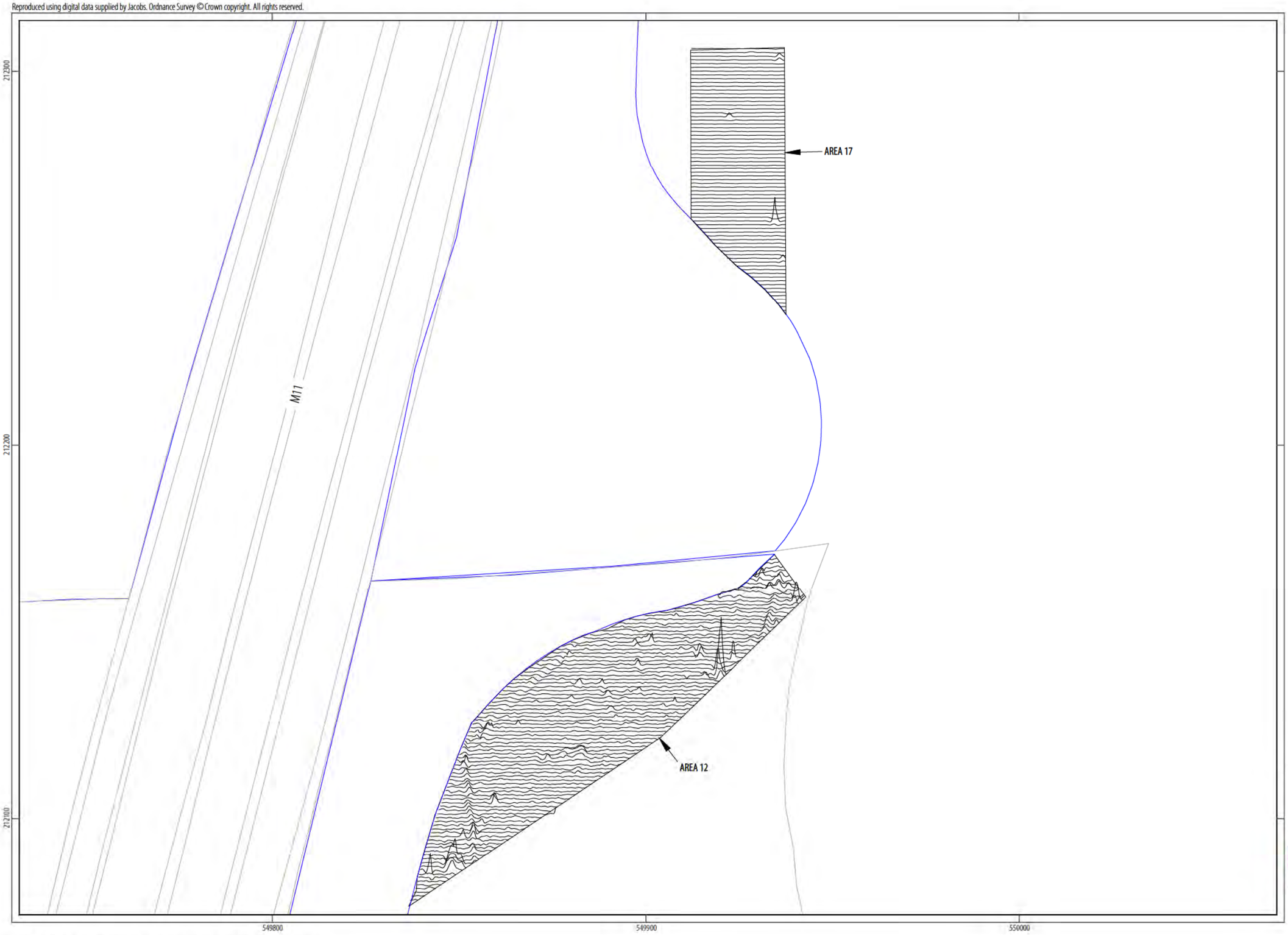

previous geophysical survey area

30.0nT/cm

N

0 25m

scale 1:1,000 @ A3

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M11 Junction 7a
Additional Geophysical Survey
Harlow
Essex

CLIENT Ringway Jacobs

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ILLUS 15 XY trace plot of minimally processed magnetometer data; Area 12 & Area 17

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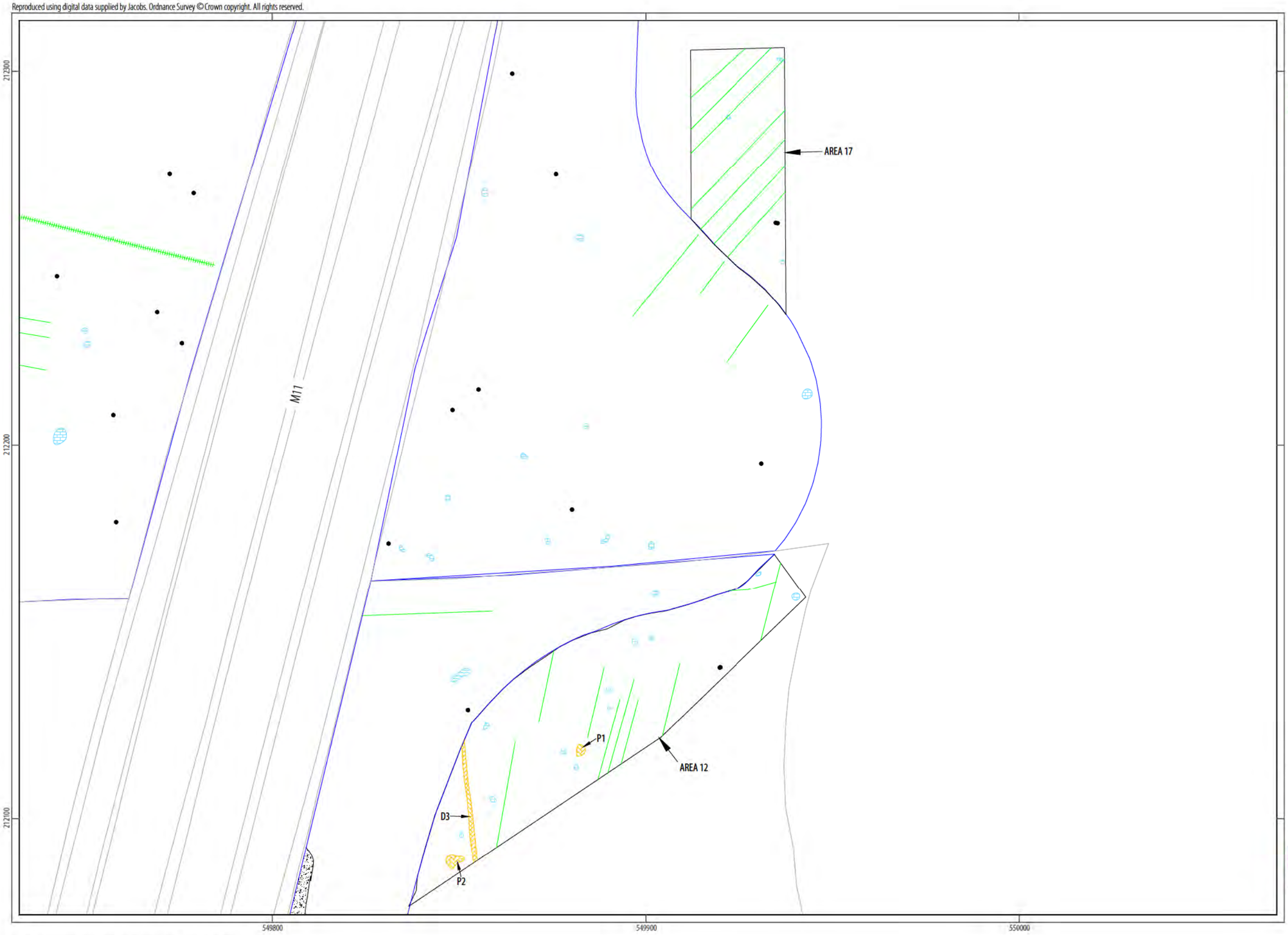

previous geophysical survey area

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

ABBREVIATIONS

D ditch

P pit

N

0 25m

scale 1:1,000 @ A3

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ILLUS 16 Interpretation of magnetometer data; Area 12 & Area 17

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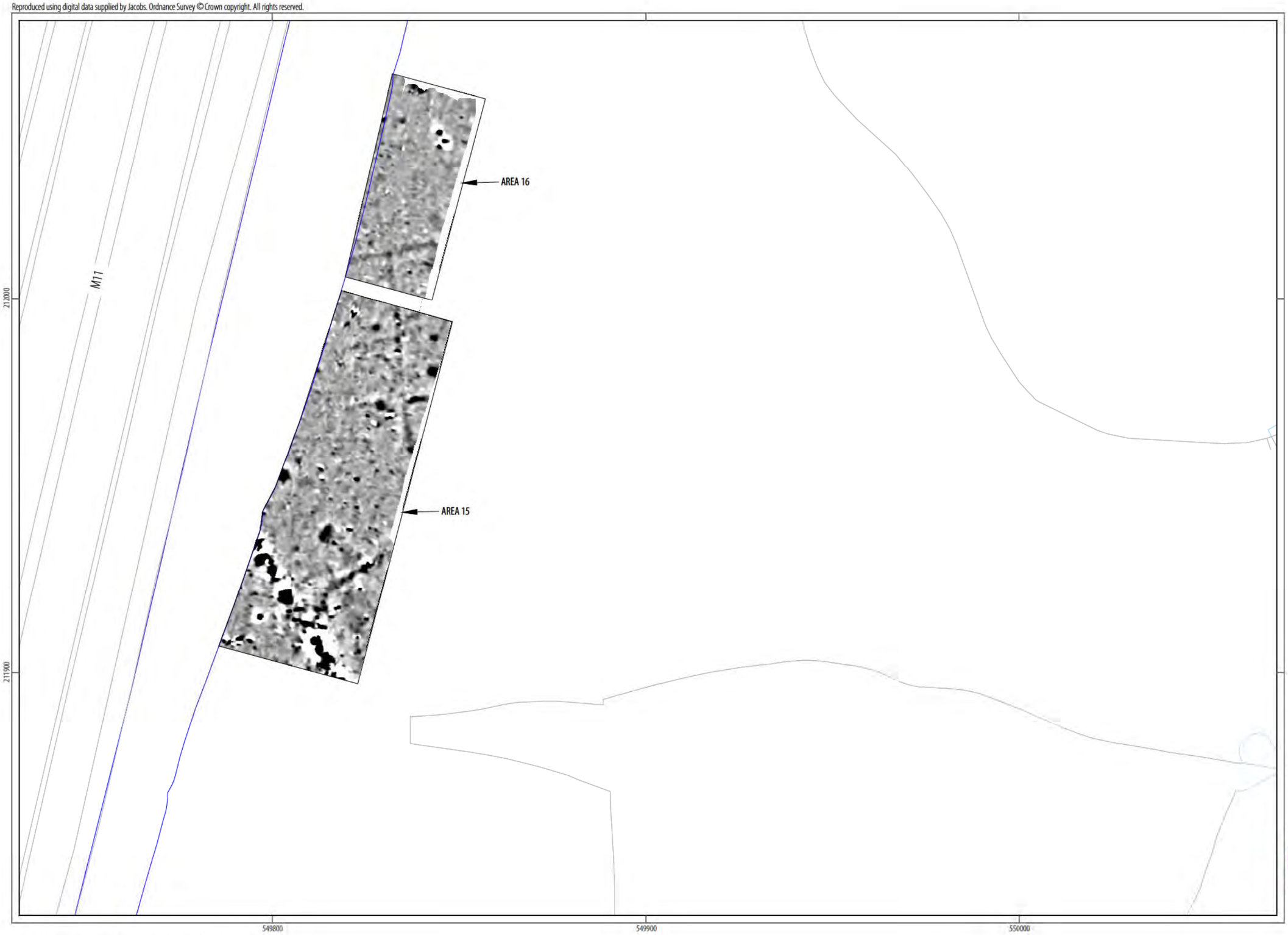

previous geophysical survey area

-1.0 nT 2.0

N

0 25m

scale 1:1,000 @ A3

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ILLUS 17 Processed greyscale magnetometer data; Area 15 & Area 16

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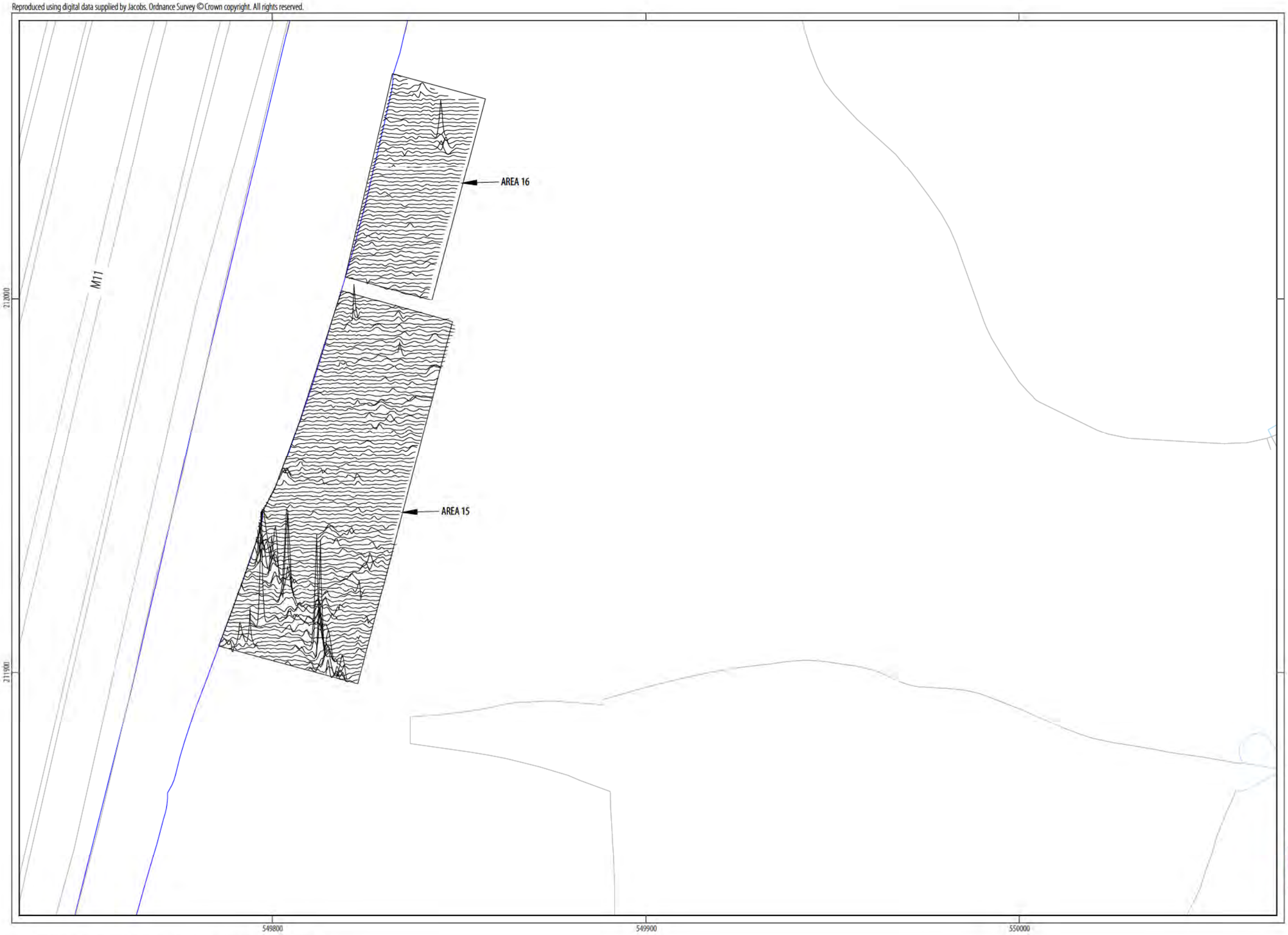

previous geophysical survey area

30.0nT/cm

N

0 25m

scale 1:1,000 @ A3

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ILLUS 18 XY trace plot of minimally processed magnetometer data; Area 15 & Area 16

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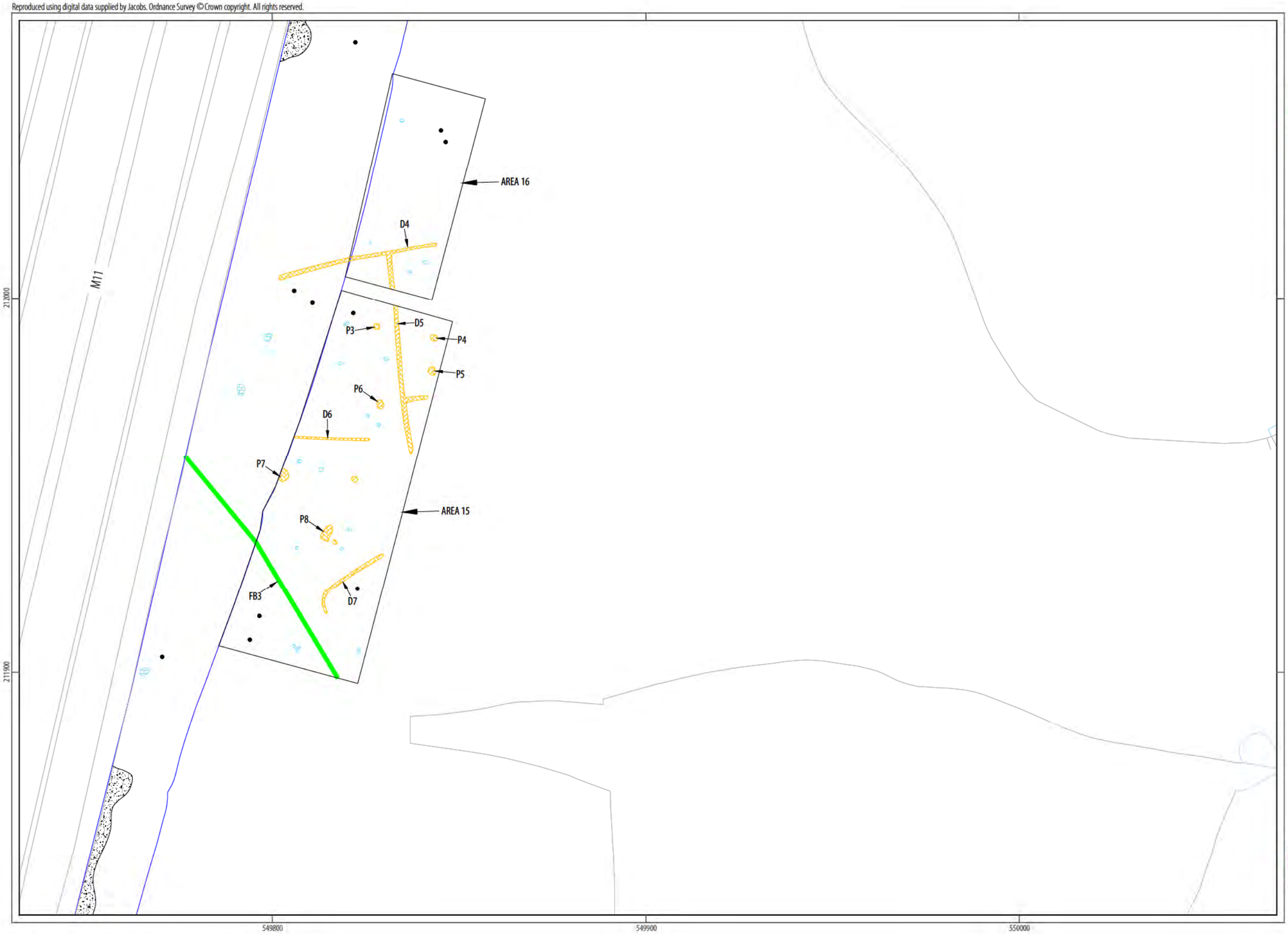

previous geophysical survey area

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?

ABBREVIATIONS

D ditch
FB former boundary
RD ring-ditch

N

0 25m
scale 1:1,000 @ A3

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Additional Geophysical Survey
Harlow
Essex

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ILLUS 19 Interpretation of magnetometer data; Area 15 & Area 16

6 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.

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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.

Data is also clipped to remove extreme values and to improve data contrast.

APPENDIX 5 OASIS DATA COLLECTION FORM: ENGLAND

OASIS ID: headland5-267219

PROJECT DETAILS	
Project name	M11 Junction 7A, Harlow, Essex Additional Geophysical Survey
Short description of the project	Headland Archaeology (UK) Ltd undertook a second geophysical (magnetometer) survey, covering approximately 6 hectares, to provide supplementary information on the archaeological potential of land that will be impacted by the proposed scheme to construct a new junction north of Junction 7 on the M11, north-east of Harlow, Essex. The survey has identified a circular anomaly interpreted as a round barrow and other linear and discrete anomalies that may also be of archaeological origin, possibly indicative of ditches which may form part of an early field system. The results and interpretation of the initial survey have been re-assessed in light of the current results and this has allowed for a slight revision of the overall interpretation; both data sets and interpretations are presented in this report. Overall the surveys have identified two areas of archaeological potential. The first is to the centre of the new link road which will connect the M11 with Sheering Road (Areas 5, 11 and 14). Two round barrows are clearly identified together with several discontinuous ditch type anomalies which appear to respect the barrows. This area is assessed to be of moderate to high potential. The second is to the east of the M11, in Area 15 and Area 16, where several discontinuous linear anomalies and pit type responses may locate another area of archaeological activity. However, no clear archaeological pattern is evident and these linear anomalies might equally plausibly be interpreted as the result of recent cultivation or drainage. This area is assessed as of moderate potential. Elsewhere across the majority of the scheme footprint the archaeological potential is assessed as low.
Project dates	Start: 17-10-2016 End: 19-10-2016
Previous/future work	Yes / Not known
Any associated project reference codes	MEJS/02 - Sitecode
Type of project	Field evaluation
Site status	None
Current Land use	Cultivated Land 4 - Character Undetermined
Monument type	RING DITCH Uncertain
Monument type	N/A None
Significant Finds	N/A None
Significant Finds	N/A None
Methods & techniques	"Geophysical Survey"
Development type	Amenity area (e.g. public open space)
Prompt	National Planning Policy Framework - NPPF
Position in the planning process	Pre-application
Solid geology (other)	London Clay Formation
Drift geology (other)	Lowestoft Formation diamicton
Techniques	Magnetometry

PROJECT LOCATION	
Country	England
Site location	ESSEX HARLOW HARLOW M11 Junction 7A
Study area	5.8 Hectares
Site coordinates	TL 4946 1240 51.789784786967 0.1673087700023 51 47 23 N 000 10 02 E Polygon

PROJECT CREATORS	
Name of Organisation	Headland Archaeology
Project brief originator	Ringway Jacobs

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Project design originator	Headland Archaeology
Project director/manager	Harrison, S
Project supervisor	Turner, J
Type of sponsor/funding body	County Council

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)
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Other bibliographic details	MEJS/02
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