



Land North of Norwich Road, Chippenham Archaeological Evaluation Report

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Land north of Norwich Road, Chippenham

Archaeological Evaluation Report

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Summary

Between the 24th and the 25th of January 2017 Oxford Archaeology East carried out an evaluation on land north of Norwich Road, Chippenham. A total of eight 30m x 2m trenches were excavated. The evaluation produced no results of archaeological significance, with only two tree throws, a modern ditch and geological hollows being present in the target area.

Acknowledgements

Oxford Archaeology would like to thank Lawtonash Training Services Ltd for commissioning this project. Thanks is also extended to Andy Thomas who monitored the work on behalf of Cambridgeshire County Council Historic Environment Team (CCC HET) for his advice and guidance.

The project was managed for Oxford Archaeology by Aileen Connor. The fieldwork was directed by Kathryn Blackbourn, with the assistance of Paddy Lambert and Jessica Dyson. Survey and digitizing was carried out by Dave Brown. The archive was prepared by Katherine Hamilton. The machine excavation was undertaken by Lattenbury Plant Hire.

1 INTRODUCTION

1.1 Scope of work

1.1.1 Oxford Archaeology East (OAE) was commissioned by Lawtonash Training Services Ltd to undertake a trial trench evaluation at the site of land north of Norwich Road, Chippenham.

1.1.2 The work was undertaken as a condition of Planning Permission (planning ref. 16/01401/FUL) to inform the Planning Authority in advance of a submission of a Planning Application. A brief/specification was set by Andy Thomas (Design Brief: Thomas, 2017) and a Written Scheme of Investigation was produced by OA (WSI: Connor, 2017) detailing the Local Authority's requirements for work necessary to inform the planning process/discharge the planning condition. This document outlines how OA implemented the specified requirements.

1.2 Location, topography and geology

1.2.1 The site is located adjacent to the B1085 and A11, on the south side of the river Kennett. It is c.3.2 km to the south-east of the village of Chippenham and just south of Red Lodge. There are no structures in the proposed development area.

1.2.2 The geology of the area is mapped as Holywell Nodular Chalk Formation and New Pit Chalk Formation (undifferentiated). The site is relatively level at c. 19m OD with a slight northwards slope towards the River Kennett which flows to the north of the application area.

1.3 Archaeological and historical background

1.3.1 The site lies on the south side of the River Kennett in an area rich in archaeological remains (WSI: Connor, 2017). Prehistoric funerary monuments are known above the floodplain of the river including the possible ploughed out remains of a Bronze Age barrow on the northern edge of the application area (HER 07525/MCB9090) and several more further afield eg. MCB9226, MCB13499, MCB08107, WGN003). Other prehistoric activity is attested to by finds of flint scatters to the north-west (MCB19101), the south-east (MCB18220) and south-west (MCB9046) of the application area.

1.3.2 Archaeological work in the vicinity has shown the presence of prehistoric and multi period remains, particularly to the south-east (eg ECB2054, ECB3012). In contrast, an evaluation to the north-east (ECB3300), whilst finding a scatter of prehistoric flint, found no evidence for settlement.

2 EVALUATION AIMS AND METHODOLOGY

2.1 Aims

2.1.1 This evaluation sought to establish the character, date, state of preservation of archaeological remains within the application area. The scheme of works detailed below aimed to:

- i. Provide evidence for the presence /absence of potential archaeological features by means of a geophysical survey
- ii. Ground truth geophysical results, by testing a range of anomalies of likely archaeological origin, and areas where no anomalies registered
- iii. Establish the presence or absence of archaeological remains on those areas of the site where the proposed change of use will impact, characterise where they are found (location, depth and extent), and establish the quality of preservation of any archaeology and environmental remains
- iv. Provide sufficient coverage to establish the form, date and purpose of any archaeological deposits
- v. Provide sufficient coverage to evaluate the likely impact of past land uses, and the possible presence of masking deposits
- vi. Set results in the local, regional, and national archaeological context – and, in particular, its wider cultural landscape and past environmental conditions
- vii. Provide – in the event that archaeological remains were found – sufficient information to construct an archaeological mitigation strategy, dealing with preservation, the recording of archaeological deposits, working practices, timetables, and orders of cost.

2.2 Methodology

2.2.1 The Brief required that a total of eight trenches, each measuring 30m in length, be excavated. These were targeted on anomalies identified by the geophysical survey along with potential blank areas.

2.2.2 The site was surveyed by Magnitude using a magnetometer. The area accessible to survey was 1.6 ha.

2.2.3 Machine excavation was carried out under constant archaeological supervision with a tracked 360° excavator using a toothless ditching bucket.

2.2.4 Service plans were checked before any work commenced.

2.2.5 Top soil and sub soil were separated during the excavation.

2.2.6 All natural and subsoil surfaces uncovered during the excavation were cleaned by hand to ascertain any archaeological potential.

2.2.7 Site conditions were favourable, with dry ground conditions and good weather.

3 RESULTS

3.1 Introduction and presentation of results

3.1.1 The results of the evaluation are presented below. The full details of all trenches, with dimensions and depths of all deposits, form the content of Appendix A.

3.2 General soils and ground conditions

3.2.1 The soil sequence between all trenches was uniform. The natural chalk geology was overlain by subsoil, which in turn was overlain by topsoil.

3.2.2 Ground conditions throughout the evaluation were generally good, and the trenches remained dry throughout. Had archaeological features been present, they would have been easy to identify against the underlying natural geology.

3.2.3 Trenches were located to ground truth geophysical anomalies.

3.3 General distribution of archaeological deposits

3.3.1 Geophysical survey was considered to be successful but did not identify any features of certain or possible archaeological origin. The geophysical survey results reflect agricultural and modern activity together with minor natural soil and geological variations.

3.3.2 The natural deposits in all of the trenches comprised chalk, interspersed with patches of glacial sand. Trenches 2 and 4-7 were devoid of archaeology. A number of possible features in Trenches 1 and 3 were investigated, in order to ground truth and test the archaeological potential of the results of the geophysical survey.

3.3.3 The possible features identified within these trenches were all found to be of natural origin. A ditch investigated in Trench 3 is likely to be relatively modern in date.

3.4 Trench 1

3.4.1 Trench 1 overlies chalk geology with patches of silty-sand, probably resulting from glacial activity. Above this was 0.30m of dark, sandy topsoil. A possible feature was identified as a geophysical anomaly and soil mark within the trench but upon investigation this was found to be a natural hollow (4). No archaeological features were present.

3.5 Trench 3

3.5.1 Two small tree throws (6 & 8) were excavated in Trench 3, yielding no finds. A small ditch was investigated that had been identified by the geophysical survey. This too contained no finds. It is likely that this linear feature (identified by geophysical survey) was associated with modern agricultural activity.

3.6 Finds and Environmental summary

3.6.1 There were no finds recovered during the evaluation. Environmental sampling was not carried out due to the paucity of suitable archaeological deposits.

4 DISCUSSION

4.1 Reliability of Field Investigation

4.1.1 The geophysical survey was successful and the magnetic survey responded well to the survey area's environment.

4.1.2 The investigation was unhindered by adverse weather or unfavourable conditions. The coverage afforded by the trenching was suitable to accurately highlight any archaeological deposits recorded by the geophysical survey. The impact of past land usage was minimal, this was visible in the depth of the top and sub soils.

4.2 Interpretation

4.2.1 The evaluation (geophysical survey and trenching) uncovered no evidence of archaeological significance. The natural features recorded in Trench 3 are most likely small tree throws, with sterile fills that contained no finds.

4.2.2 The agricultural linear feature investigated in Trench 3 was found to be relatively recent in date, based on its dark and relatively friable fill composition and irregular profile. The large feature (4) investigated in Trench 1 was proven to be a natural hollow, caused by glacial activity.

4.3 Significance

4.3.1 The investigation has shown that no archaeology is present in the target area. The geophysical survey and subsequent targeted trenching has proven sufficient to demonstrate that the area is devoid of archaeological remains.

APPENDIX A TRENCH DESCRIPTIONS AND CONTEXT INVENTORY

Trench 1						
General description					Orientation	N-S
Trench devoid of archaeology. Consists of topsoil and subsoil overlying natural geology of chalk. Substantial natural hollow investigated 4, measuring 0.80m deep.					Length (m)	30
					Width (m)	2
					Avg. depth (m)	0.45m
Context No.	Type	Width (m)	Depth (m)	Description	Finds	Date
1	Layer	-	0.30	Topsoil	-	-
2	Layer	-	0.15	Subsoil	-	-
3	Layer	-	-	Natural	-	-
4	Cut	-	0.80m	Natural Hollow	-	-
5	Fill	-	0.80m	Natural Hollow	-	-
Trench 2						
General description					Orientation	E-W
Trench devoid of archaeology. Consists of topsoil and subsoil overlying natural geology of chalk.					Length (m)	30
					Width (m)	2
					Avg. depth (m)	0.45
Context No.	Type	Width (m)	Depth (m)	Description	Finds	Date
1	Layer	-	0.30	Topsoil	-	-
2	Layer	-	0.15	Subsoil	-	-
3	Layer	-	-	Natural	-	-
Trench 3						
General description					Orientation	SE-NW
Trench devoid of archaeology, containing two three throws 6 and 8. An agricultural linear of recent date was present in Trench 3. Consists of topsoil and subsoil overlying natural geology of chalk.					Length (m)	30
					Width (m)	2
					Avg. depth (m)	0.45
Context No.	Type	Width (m)	Depth (m)	Description	Finds	Date
1	Layer	-	0.36	Topsoil	-	-
2	Layer	-	0.10	Subsoil	-	-
3	Layer	-	-	Natural	-	-
6	Cut	-	-	Tree throw	-	-
7	Fill			Fill of tree throw	-	-
8	Cut			Tree throw	-	-
9	Fill			Fill of tree throw	-	-
10	Fill			Fill of tree throw	-	-
11	Fill			Fill of tree throw	-	-
Trench 4						
General description					Orientation	E-W
Trench devoid of archaeology. Consists of topsoil and subsoil overlying natural geology of chalk.					Length (m)	30
					Width (m)	2
					Avg. depth (m)	0.43
Context No.	Type	Width (m)	Depth (m)	Description	Finds	Date
1	Layer	-	0.33	Topsoil	-	-

2	Layer	-	0.10	Subsoil	-	-
3	Layer	-	-	Natural	-	-
Trench 5						
General description					Orientation	E-W
Trench devoid of archaeology. Consists of topsoil and subsoil overlying natural geology of chalk.					Length (m)	30
					Width (m)	2
					Avg. depth (m)	0.45
Context No.	Type	Width (m)	Depth (m)	Description	Finds	Date
1	Layer	-	0.35	Topsoil	-	-
2	Layer	-	0.10	Subsoil	-	-
3	Layer	-	-	Natural	-	-
Trench 6						
General description					Orientation	E-W
Trench devoid of archaeology. Consists of topsoil and subsoil overlying natural geology of chalk.					Length (m)	30
					Width (m)	2
					Avg. depth (m)	0.40
Context No.	Type	Width (m)	Depth (m)	Description	Finds	Date
1	Layer	-	0.29	Topsoil	-	-
2	Layer	-	0.11	Subsoil	-	-
3	Layer	-	-	Natural	-	-
Trench 7						
General description					Orientation	E-W
Trench devoid of archaeology. Consists of topsoil and subsoil overlying natural geology of chalk.					Length (m)	30
					Width (m)	2
					Avg. depth (m)	0.45
Context No.	Type	Width (m)	Depth (m)	Description	Finds	Date
1	Layer	-	0.32	Topsoil	-	-
2	Layer	-	0.13	Subsoil	-	-
3	Layer	-	-	Natural	-	-
Trench 8						
General description					Orientation	E-W
Trench devoid of archaeology. Consists of topsoil and subsoil overlying natural geology of chalk.					Length (m)	30
					Width (m)	2
					Avg. depth (m)	0.47
Context No.	Type	Width (m)	Depth (m)	Description	Finds	Date
1	Layer	-	0.34	Topsoil	-	-
2	Layer	-	0.13	Subsoil	-	-
3	Layer	-	-	Natural	-	-

APPENDIX B BIBLIOGRAPHY

Connor, A. 2017, A Written Scheme of Investigation for an Archaeological Evaluation Land North of Norwich Rd and Adjacent A11, Chippenham

Thomas, A 2016 Brief for archaeological evaluation, Land North of Norwich Road and Adjacent A11, in the Parish of Chippenham

APPENDIX C OASIS REPORT FORM

Project Details

OASIS Number	oxfordar3-275130		
Project Name	Land North of Norwich Road, Chippenham		
Start of Fieldwork	24/01/17	End of Fieldwork	25/01/17
Previous Work	No	Future Work	No

Project Reference Codes

Site Code	CHPNOR17	Planning App. No.	16/01401/FUL
HER Number	ECB4888	Related Numbers	

Prompt	Local authority planning condition
Development Type	Change of Use
Place in Planning Process	Not known/Not recorded

Techniques used (tick all that apply)

- | | | |
|--|---|---|
| <input type="checkbox"/> Aerial Photography – interpretation | <input type="checkbox"/> Grab-sampling | <input type="checkbox"/> Remote Operated Vehicle Survey |
| <input type="checkbox"/> Aerial Photography - new | <input type="checkbox"/> Gravity-core | <input type="checkbox"/> Sample Trenches |
| <input type="checkbox"/> Annotated Sketch | <input type="checkbox"/> Laser Scanning | <input type="checkbox"/> Survey/Recording of Fabric/Structure |
| <input type="checkbox"/> Augering | <input type="checkbox"/> Measured Survey | <input checked="" type="checkbox"/> Targeted Trenches |
| <input type="checkbox"/> Dendrochronological Survey | <input type="checkbox"/> Metal Detectors | <input type="checkbox"/> Test Pits |
| <input type="checkbox"/> Documentary Search | <input type="checkbox"/> Phosphate Survey | <input type="checkbox"/> Topographic Survey |
| <input type="checkbox"/> Environmental Sampling | <input type="checkbox"/> Photogrammetric Survey | <input type="checkbox"/> Vibro-core |
| <input type="checkbox"/> Fieldwalking | <input type="checkbox"/> Photographic Survey | <input type="checkbox"/> Visual Inspection (Initial Site Visit) |
| <input checked="" type="checkbox"/> Geophysical Survey | <input type="checkbox"/> Rectified Photography | |

Monument	Period	Object	Period
None	None	None	None
	Choose an item.		Choose an item.
	Choose an item.		Choose an item.

Insert more lines as appropriate.

Project Location

County	Cambridgeshire	Address (including Postcode) Land North of Norwich Road, Chippenham CB8 7QJ
District	East Cambridgeshire	
Parish	Chippenham	
HER office	Cambridge	
Size of Study Area	1.6 ha	
National Grid Ref	TL 6908 6950	

Project Originators

Organisation	OA East
Project Brief Originator	Andy Thomas
Project Design Originator	Aileen Connor

Project Manager	Aileen Connor
Project Supervisor	Kathryn Blackburn

Project Archives

	Location	ID
Physical Archive (Finds)	n/a	n/a
Digital Archive	OA East	CHPNOR17
Paper Archive	CCC HET stores	ECB4888

Physical Contents	Present?	Digital files associated with Finds	Paperwork associated with Finds
Animal Bones	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ceramics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Glass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Human Remains	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Industrial	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leather	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Metal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stratigraphic		<input type="checkbox"/>	<input type="checkbox"/>
Survey		<input type="checkbox"/>	<input type="checkbox"/>
Textiles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Worked Bone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Worked Stone/Lithic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Digital Media

Database	<input type="checkbox"/>
GIS	<input type="checkbox"/>
Geophysics	<input checked="" type="checkbox"/>
Images (Digital photos)	<input checked="" type="checkbox"/>
Illustrations (Figures/Plates)	<input checked="" type="checkbox"/>
Moving Image	<input type="checkbox"/>
Spreadsheets	<input type="checkbox"/>
Survey	<input type="checkbox"/>
Text	<input checked="" type="checkbox"/>
Virtual Reality	<input type="checkbox"/>

Paper Media

Aerial Photos	<input type="checkbox"/>
Context Sheets	<input checked="" type="checkbox"/>
Correspondence	<input type="checkbox"/>
Diary	<input type="checkbox"/>
Drawing	<input type="checkbox"/>
Manuscript	<input type="checkbox"/>
Map	<input type="checkbox"/>
Matrices	<input type="checkbox"/>
Microfiche	<input type="checkbox"/>
Miscellaneous	<input type="checkbox"/>
Research/Notes	<input type="checkbox"/>
Photos (negatives/prints/slides)	<input type="checkbox"/>
Plans	<input type="checkbox"/>
Report	<input checked="" type="checkbox"/>
Sections	<input type="checkbox"/>
Survey	<input type="checkbox"/>

APPENDIX D GEOPHYSICAL SURVEY



**magnitude
surveys**

**Geophysical Survey Report MSTL83
of
Land South of Red Lodge,
Cambridgeshire**

**For
Oxford Archaeology East
On Behalf Of**

Magnitude Surveys Ref: MSTL83

CHET Event Number: ECB 4888

January 2017



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Abstract

Magnitude Surveys was commissioned to assess the subsurface archaeological potential of a c. 4ha area of land south of Red Lodge, Cambridgeshire. A hand-pulled, cart-mounted fluxgate gradiometer survey was successfully completed and no anomalies of probable or possible archaeological origin were identified. The geophysical results primarily reflect modern agricultural activity and minor variations in the soil's magnetic properties.

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1. Introduction

- 1.1. Magnitude Surveys Ltd (MS) was commissioned by Oxford Archaeology East (OAE) on behalf of [CLIENT] to undertake a geophysical survey on a c. 4ha area of land south of Red Lodge, Cambridgeshire (TL 6908 6950).
- 1.2. The geophysical survey comprised hand pulled, cart-mounted fluxgate gradiometer survey.
- 1.3. The survey was conducted in line with the current best practice guidelines produced by Historic England (David et al., 2008), the Chartered Institute of Field Archaeologists (CIfA, 2014) and the European Archaeological Council (Schmidt et al., 2015).
- 1.4. The survey commenced on 19 January and took 1 day to complete.

2. Quality Assurance

- 2.1. Project management, survey work, data processing and report production have been carried out by qualified and professional geophysicists to standards exceeding the current best practice (CIfA, 2014; David et al., 2008, Schmidt et al., 2015).
- 2.2. Magnitude Surveys is a corporate member of ISAP (International Society of Archaeological Prospection).
- 2.3. Director Graeme Attwood is a Member of the Chartered Institute for Archaeologists (CIfA), the chartered UK body for archaeologists, as well as the Secretary of GeoSIG, the CIfA Geophysics Special Interest Group. Director Finnegan Pope-Carter is a Fellow of the London Geological Society, the chartered UK body for geophysicists and geologists, as well as a member of GeoSIG, the CIfA Geophysics Special Interest Group. Director Chrys Harris is a doctoral candidate in archaeological geophysics at the University of Bradford.
- 2.4. All MS managers have postgraduate qualifications in archaeological geophysics. All MS field staff have relevant archaeology or geophysics degrees and supervisors have at least three years' field experience.

3. Objectives

- 3.1. The geophysical survey aimed to assess the subsurface archaeological potential of the survey area.

4. Geographic Background

- 4.1. The site is located approximately 1km south-west from the centre of Red Lodge and 7.5km northeast from Newmarket. Survey was undertaken over the southern end of a flat, arable field; whose northern boundary forms the border between Cambridgeshire and Suffolk. The site is bounded by the A11 Red Lodge Bypass to the west and the B1085 to the east.
- 4.2. The underlying geology comprises sedimentary bedrock of Holywell Nodular Chalk and New Pit Chalk Formations. No superficial deposits have been recorded (British Geological Survey, 2017).
- 4.3. The soils are recorded as freely draining slightly acid but base-rich soils (Soilscapes, 2017).

5. Archaeological Background

- 5.1. The following forms a brief summary of the significant heritage assets within the site's wider landscape, derived from Cambridgeshire Historic Environment Team's brief for archaeological evaluation (2016) and from query of Heritage Gateway (2017) with a 1km search radius from the centre of site.
- 5.2. No previous archaeological works or designated heritage assets are recorded within the site itself. To the immediate north of the survey area, a mound of unknown date has been recorded (HER 07525), which has possibly been ploughed out.
- 5.3. Evidence for Prehistoric activity in the site's wider landscape is limited to Bronze Age burial mounds 1.2 – 2km to the west and south of site (Cambridgeshire Historic Environment Team, 2016), and scattered find spots 500-600m to the north and east of site (HER ECB3300, 07490, ECB2054, ECB3021).
- 5.4. Three-quarters of a possible sub-rectangular enclosure of an unknown date has been recorded 650m north-east of the site (MSF16529).

6. Methodology

6.1. Data Collection

6.1.1. Geophysical prospection comprised the magnetic method as described in the following table.

6.1.2. Table of survey strategies:

Method	Instrument	Traverse Interval	Sample Interval
Magnetic	Bartington Instruments Grad-13 Digital Three-Axis Gradiometer	1 m	200 Hz reprojected to 0.125 m

6.1.3. The magnetic data were collected using MS' bespoke hand-pulled cart system.

- 6.1.3.1. MS' cart system was comprised of Bartington Instruments Grad 13 Digital Three-Axis Gradiometers. Positional referencing was through a Hemisphere S321 GNSS Smart Antenna RTK GPS outputting in NMEA mode to ensure high positional accuracy of collected measurements. The Hemisphere S321 GNSS Smart Antenna is accurate to 0.008 m + 1 ppm in the horizontal and 0.015 m + 1 ppm in the vertical.
- 6.1.3.2. Magnetic and GPS data were logged on a USB flash drive housed in MS' bespoke data-logger and transferred to a laptop computer for processing.
- 6.1.3.3. A series of temporary sight markers were established in each survey area to guide the surveyor and ensure full coverage with the cart. Data were collected by traversing the survey area along the longest possible lines, to ensure that the data was efficiently collected and processed.

6.2. Data Processing

6.2.1. Magnetic data were processed in bespoke in-house software produced by MS. Processing steps conform to Historic England's standards for "raw or minimally processed data" (see sect 4.2 in David et al., 2008: 11).

Sensor Calibration – The sensors were calibrated using a bespoke in-house algorithm, which conforms to Olsen et al. (2003).

Zero Median Traverse – The median of each sensor traverse is calculated within a specified range and subtracted from the collected data. This removes striping effects caused by small variations in sensor electronics.

Projection to a Regular Grid – Data collected using RTK GPS positioning requires a uniform grid projection to visualise data. Data are rotated to best fit an orthogonal grid projection and are resampled onto the grid using an inverse distance-weighting algorithm.

Interpolation to Square Pixels – Data are interpolated using a bicubic algorithm to increase the pixel density between sensor traverses. This produces images with square pixels for ease of visualisation.

6.3. Data Visualisation and Interpretation

- 6.3.1. This report presents the gradient of the sensors' total field data as greyscale images. Multiple greyscales images at different plotting ranges have been used for data interpretation. Greyscale images should be viewed alongside the XY trace plots (Figure A1). XY trace plots visualise the magnitude and form of the geophysical response, aiding in anomaly interpretation.
- 6.3.2. Geophysical results have been interpreted using greyscale images and XY traces in a layered environment, overlaid against open street mapping, satellite imagery and historic mapping.

7. Results

7.1. Qualification

7.1.1. Geophysical techniques are not a map of the ground and are instead a direct measurement of subsurface properties. Detecting and mapping features requires that said features have properties that can be measured by the chosen technique(s) and that these properties have sufficient contrast with the background to be identifiable. The interpretation of any identified anomalies is inherently subjective. While the scrutiny of the results is undertaken by qualified, experienced individuals and rigorously checked for quality and consistency, it is often not possible to classify all anomaly sources. Where possible an anomaly source will be identified along with the certainty of the interpretation. The only way to improve the interpretation of results is through a process of comparing excavated results with the geophysical reports. MS actively seek feedback on their reports as well as reports of further work in order to constantly improve our knowledge and service.

7.2. Survey Considerations

Survey Area	No. Survey Blocks	Surveyed Y/N	Ground Conditions	Further notes:
1	1	Y	Flat, under stubble.	The ground surface was muddy and sticky, but did not hamper data collection. However, on one occasion a piece of metallic debris adhered to one of the cart's wheels, which has introduced a minor ferrous effect within a limited extent of a single line.

Refer to Figure 2 for survey area locations.

7.3. Discussion

- 7.3.1. The geophysical results, both greyscale images and XY traces, are presented in consideration with satellite imagery (Bing, 2017; Figure 5) and historic mapping (Ordnance Survey, 6" 2nd edition c.1882-1913; Figure 6).
- 7.3.2. The magnetic survey has responded well to the survey area's environment. No anomalies of possible or probable archaeological origin have been identified. Minor

natural soil and geological variation across the site have produced broad, amorphous bands and a mottled background effect. Agricultural and modern activity has been detected as well.

7.4. Interpretation

7.4.1. General Statements

7.4.1.1. Geophysical anomalies will be discussed broadly as classification types across the survey area. Only anomalies that are distinctive or unusual will be discussed individually.

7.4.1.2. **Undetermined** – Anomalies are classified as Undetermined when the anomaly origin is ambiguous through the geophysical results and there is no supporting or correlative evidence to warrant a more certain classification. These anomalies are likely to be the result of geological, pedological or agricultural processes--although an archaeological origin cannot be entirely ruled out. Undetermined anomalies are generally not ferrous in nature.

7.4.1.1. **Ferrous (Discrete/Spread)** – Discrete ferrous-like, dipolar anomalies are likely to be the result of modern metallic disturbance on or near the ground surface. A ferrous spread refers to a concentrated scattering of these discrete, dipolar anomalies. Broad dipolar ferrous responses from modern metallic features, such as fences, gates, neighbouring buildings and services, may mask any weaker underlying archaeological anomalies should they be present.

7.4.2. Magnetic Results - Specific Anomalies

7.4.2.1. **Natural** – Weak, amorphous bands and mottled background responses have been detected across the site. The magnitude and form of these responses is characteristic of minor natural variations in the soil and geology of the site.

7.4.2.2. **Agricultural** – A number of weak, positive magnetic linear anomalies have been recorded running across the site and are orientated parallel to the eastern and western edges of the field. These anomalies correlate with modern ploughing and tractor movement visible in satellite imagery (see Figure 5).

7.4.2.3. **Undetermined** – Several weak, linear anomalies have been recorded on separate alignments to the agricultural features and cannot be correlated with activity visible in the satellite imagery (Figure 5) or features denoted on the historic mapping (Figure 6). The magnitude and orientation of these responses suggests a likely agricultural or modern origin; particularly for the anomalies on a NW-SE alignment, which occur parallel to tractor marks visible in satellite imagery (Figure 5).

7.4.2.4. **Ferrous** – The discrete linear Ferrous band near the western end of site has been introduced by a piece of metallic debris on the wheels (see 7.2).

8. Conclusions

- 8.1. A cart-based fluxgate gradiometer has been successfully undertaken across the site. The magnetic survey has responded well to the survey area's environment. No anomalies of probable or possible archaeological origin have been identified. The geophysical results reflect agricultural and modern activity, as well as minor natural soil and geological variations. The detection of signals both weak and strong in magnitude, both natural and anthropogenic in origin, demonstrate the method has been effective over the survey area.
- 8.2. Agricultural activity has been identified across the site, comprising ploughing activity and tractor movement around the field. These responses correlate with features visible in the satellite imagery (see Figure 5).
- 8.3. Modern activity has been detected in the form of strong ferrous responses and magnetic disturbance, primarily along the perimeter of the site. Discrete ferrous responses are produced by scattered metallic debris, on or near the ground surface

9. Archiving

- 9.1. MS maintains an in-house digital archive, which is based on Schmidt and Ernenwein (2013). This stores the collected measurements, minimally processed data, georeferenced and un-georeferenced images, XY traces and a copy of the final report.
- 9.2. MS contributes all reports to the ADS Grey Literature Library subject to any time embargo dictated by the client.
- 9.3. Whenever possible, MS has a policy of making data available to view in easy to use forms on its website. This can benefit the client by making all of their reports available in a single repository, while also being a useful resource for research. Should a client wish to impose a time embargo on the availability of data, this can be achieved in discussion with MS.

10. Copyright

- 10.1. Copyright and the intellectual property pertaining to all reports, figures, and datasets produced by Magnitude Services Ltd. is retained by MS. The client is given full licence to use such material for their own purposes. Permission must be sought by any third party wishing to use or reproduce any IP owned by MS.

11. References

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MSTL83 - Land South of Red Lodge, Cambridgeshire


Figure 1 - Site Location

1 : 25,000 @ A4

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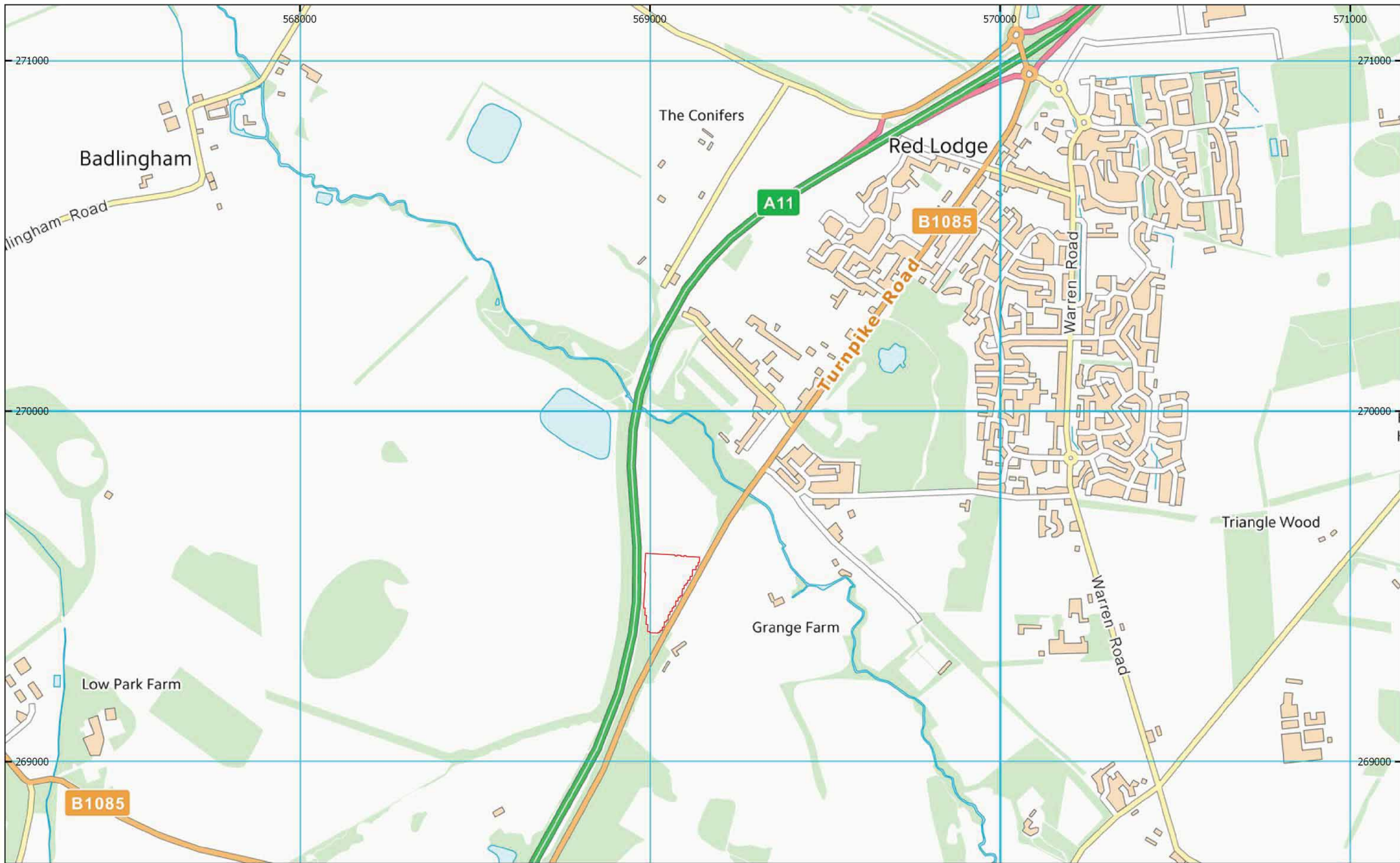
 Site Boundary



0 0.5 1 km

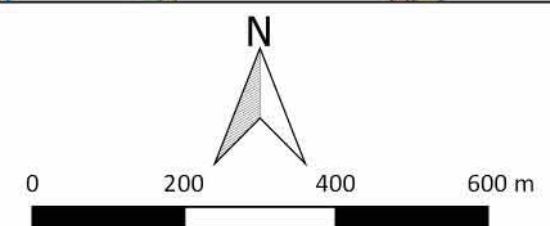


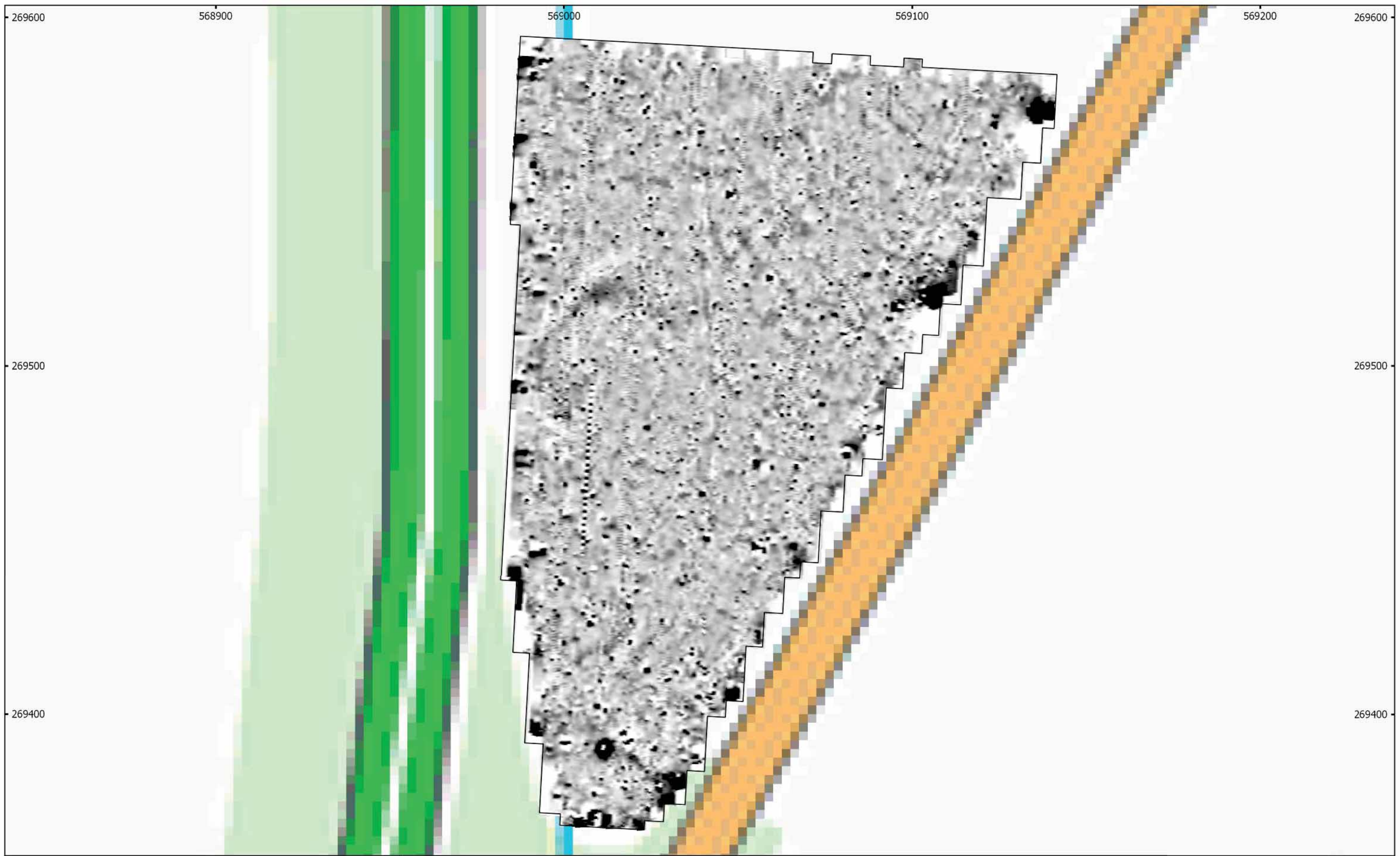

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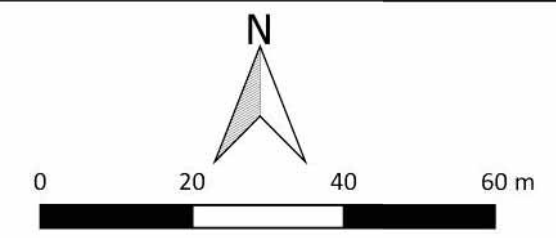
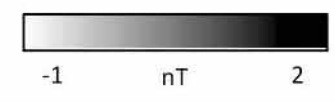
MSTL83 - Land South of Red Lodge, Cambridgeshire
 Figure 2 - Survey Area
 1 : 10,000 @ A3
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 Survey Area





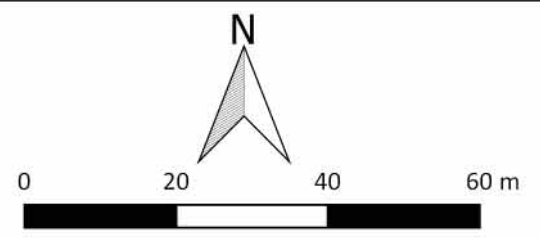
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Figure 3 - Magnetic Greyscale
1 : 1000 @ A3
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 Figure 4 - Magnetic Interpretation
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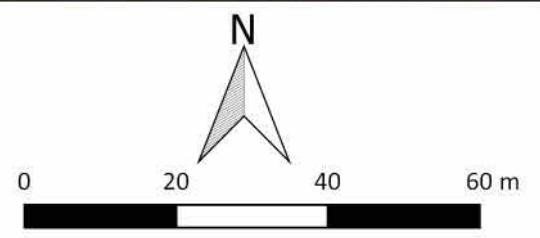
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|-------------------|-----------------------|
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| Ferrous (Spread) | Undetermined (Weak) |
| Natural (Weak) | Agricultural (Weak) |
| Natural (Spread) | |

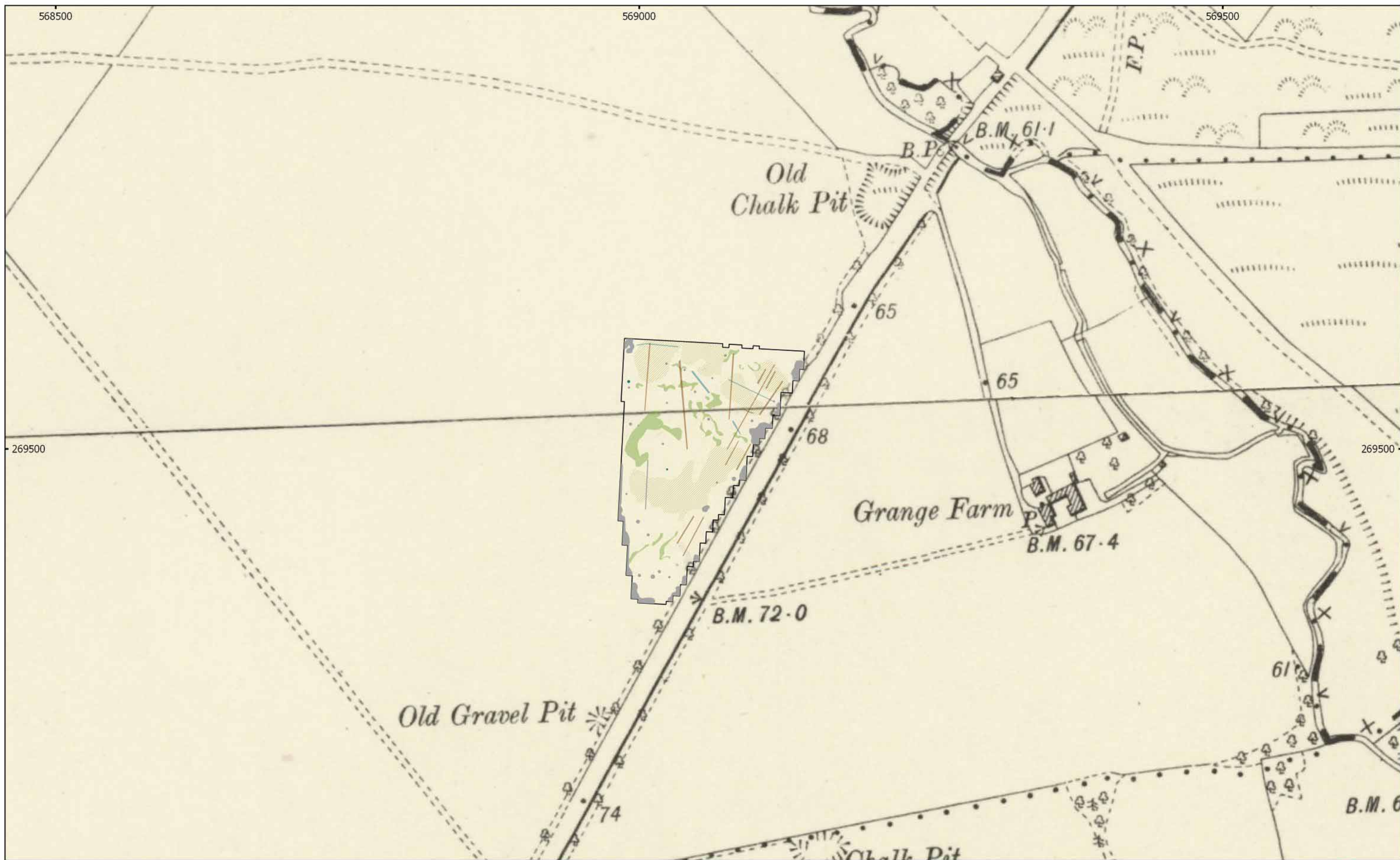






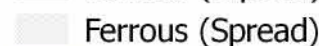
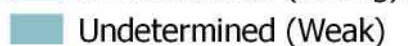



MSTL83 - Land South of Red Lodge, Cambridgeshire
 Figure 5 - Magnetic Interpretation - Satellite
 1 : 1000 @ A3
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 Contains Satellite Imagery © Bing 2017

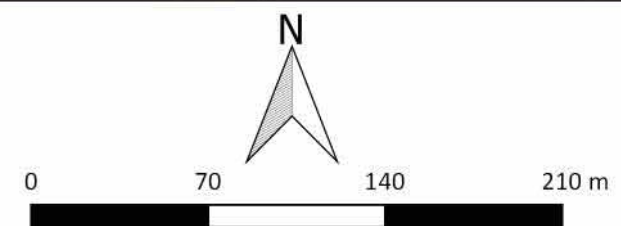
- | | |
|-------------------|-----------------------|
| Ferrous (Dipolar) | Undetermined (Strong) |
| Ferrous (Spread) | Undetermined (Weak) |
| Natural (Weak) | Agricultural (Weak) |
| Natural (Spread) | |

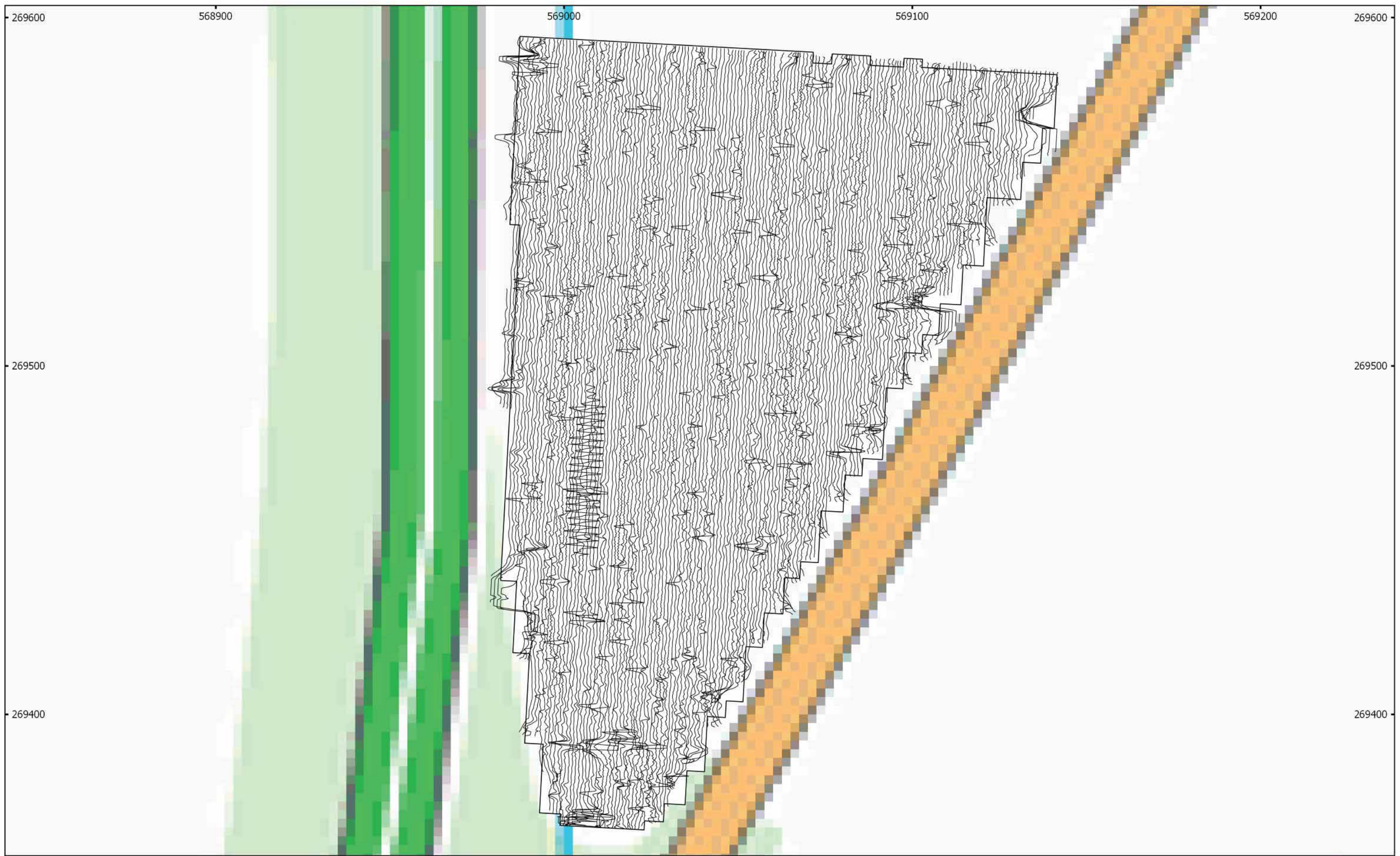




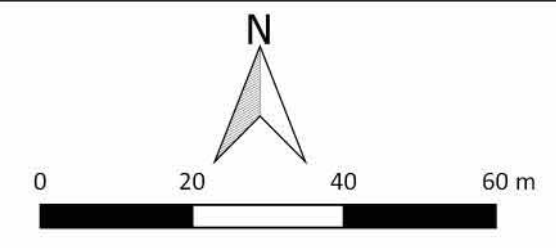
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 Figure 6 - Magnetic Interpretation - Historic
 1 : 3000 @ A3
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 Historic mapping Ordnance Survey, 6" 2nd edition c. 1882-1913 © National Library of Scotland

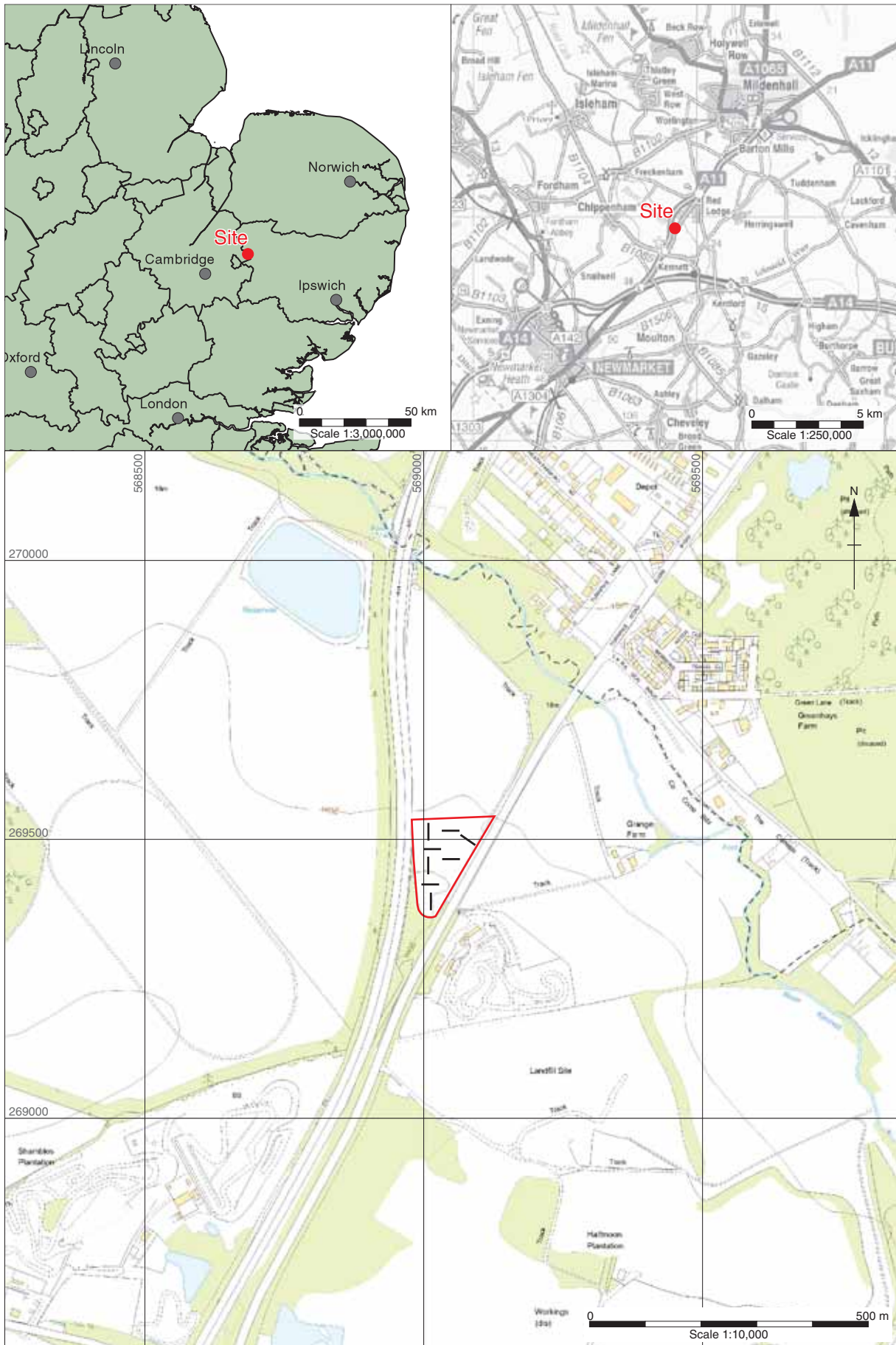
- | | |
|--|---|
|  Ferrous (Dipolar) |  Undetermined (Strong) |
|  Ferrous (Spread) |  Undetermined (Weak) |
|  Natural (Weak) |  Agricultural (Weak) |
|  Natural (Spread) | |





MSTL83 - Land South of Red Lodge, Cambridgeshire
Figure A1 - XY Trace Plot
20nT/cm @ 1:1000
1 : 1000 @ A3
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Figure 1: Site location map

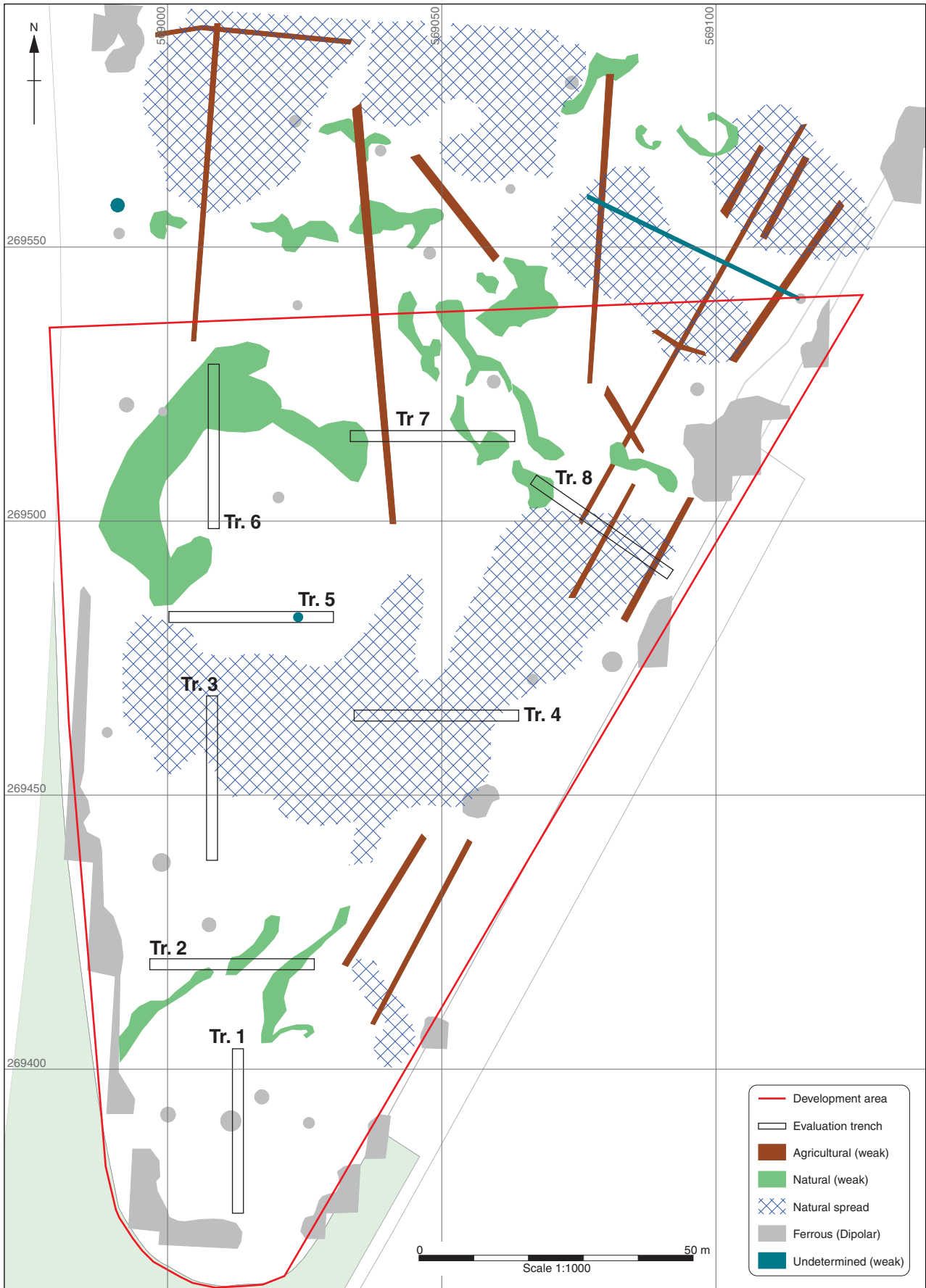


Figure 2: Trench plan overlaying the geophysical results



Plate 1: Trench 1, looking south - showing large natural hollow



Plate 2: Trench 2, looking west



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