



GEOPHYSICAL SURVEY REPORT

**Land at Pound Farm, Ickleford
Hertfordshire, SG5 3RS**

Client

Tetra Tech

For

Bugler Homes Ltd

Survey Report

SUMO-25078

OASIS Ref. No.

Sumogeop1-538926

Date

20 January 2026



Survey Report SUMO-25078: Land at Pound Farm, Ickleford, Hertfordshire, SG5 3RS

Survey dates	5-8 January 2026
Field co-ordinator	Simon Lobel BSc
Field team	Simon Lobel BSc, Gabriel Mazeski BA
Report date	20 January 2026
Report author	Mark Whittingham BSc MA MCIfA Jelmer Wubs BA MA
CAD drawings	Mark Whittingham BSc MA MCIfA
Project manager	Rebecca Fradgley BSc (Hons) ACIfA
Office	Darlington
Report approved	Nicola Fairs BSc MSC DIC CGeol FGS

SUMO GeoSurveys

Aycliffe Business Park, Newton Aycliffe, DL5 6AU
01325 311 751

www.sumoservices.com
geophysics@sumoservices.com

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TABLE OF CONTENTS

1	EXECUTIVE SUMMARY	1
2	PROJECT BACKGROUND.....	2
2.1	Site details	2
2.2	Archaeological and historical context	2
2.3	Aims and objectives	2
3	SURVEY METHODOLOGY AND DATA PROCESSING	3
3.1	Instrumentation	3
3.2	Survey methodology	3
3.3	Data processing and display.....	3
4	RESULTS.....	4
4.1	Probable and possible archaeology	4
4.2	Ridge and furrow	4
4.3	Uncertain.....	4
4.4	Agricultural – ploughing	5
4.5	Ferrous / fired / magnetic disturbance	5
5	DATA APPRAISAL AND CONFIDENCE ASSESSMENT	6
6	CONCLUSIONS	7
7	BIBLIOGRAPHY AND REFERENCES	8
8	ARCHIVE	9
9	COPYRIGHT	10

Appendix A Magnetometer survey methods, processing and presentation

Appendix B Magnetic theory

Appendix C OASIS Data collection sheet

Appendix D Data management plan & archive selection strategy

LIST OF FIGURES

Figure 01	Various	Site location
Figure 02	1:2000	Magnetic gradient data - greyscale plots: Area 1 and part of Area 2
Figure 03	1:2000	Magnetic gradient data – interpretation: Area 1 and part of Area 2
Figure 04	1:2000	Magnetic gradient data – greyscale plots: Area 2 and part of Area 1
Figure 05	1:2000	Magnetic gradient data - interpretation: Area 2 and part of Area 1
Figure 06	Not to scale	Illustrative plots of magnetic gradient data, interpretation and selected historic map and LiDAR images
Figure 07	1:2500	Magnetic gradient data – interpretation: Full site
Figure 08	1:2500	Magnetic gradient data – X-Y trace plots (clipped at +/- 15nT)

The geophysical interpretation drawings must be used in conjunction with the relevant results section and appendices of this report.

1 EXECUTIVE SUMMARY

SUMO GeoSurveys was commissioned to undertake a geophysical survey of an area outlined for development. This survey forms part of an archaeological investigation being undertaken by **Tetra Tech** on behalf of **Bugler Homes Ltd**. The site was approximately 21.5 ha in area and approximately 20.7 ha was accessible / suitable for survey.

The magnetometer survey has identified anomalies related to archaeological and possible archaeological features. These form parts of several enclosures and possibly boundary ditches. Anomalies related to the remnants of ridge and furrow, recent ploughing and modern material / features have also been identified. Numerous responses of uncertain origin are present. Archaeological origins for some of these cannot be discounted but the majority are probably due to modern activity / material, agricultural activity or natural variations.

The soil conditions appear to vary across the site and it is possible that, in parts of the site, some types of feature(s) may not produce measurable / identifiable magnetic anomalies. This could mean that the full extent of archaeological features / activity within the site may not have been identified by the survey.

2 PROJECT BACKGROUND

2.1 Site details

Approximate centre NGR	TL 17494 31610
Location	The site is situated 13 km to the north-east of Luton, 2.5 km to the north-west of Benslow, immediately to the west of Ickleford, at Pound Farm.
HER	Hertfordshire HER
OASIS Ref. No.	sumogeop1-538926
District	North Hertfordshire
Parish	Ickleford
Topography	Gradual incline to the west / south-west
Land use	Arable
Geology (BGS 2025)	Bedrock: Gault Formation - Mudstone Superficial: Predominantly glaciofluvial deposits (clay, silt, sand with gravel) with Lowestoft Formation-Diamicton in the north and Head (clay, silt, sand and gravel) in the far north
Survey method(s)	Magnetometer survey (fluxgate gradiometer)
Site / survey area	The site was approximately 21.5 ha. An area of approximately 20.7 ha was covered by the magnetic survey. The remainder could not be surveyed due to field boundaries / dense vegetation adjacent to field boundaries.

2.2 Archaeological and historical context

2.2.1 An archaeological desk-based assessment (RPS Group Ltd, now Tetra Tech, 2025) indicates,

'the presence of Areas of Archaeological Significance, which lie to the east, northwest and southwest of the study site. These designations are understood to hold no particular planning policy status, and are understood to have been designated by the Hertfordshire Historic Environment Record (HER) due to recorded archaeological findings.

'The study site is considered likely to have a generally low to moderate archaeological potential for the later prehistoric periods, together with the Roman, and the Medieval periods, for remains deemed most likely to be of low (i.e. local) significance. The identified archaeological potential for the later prehistoric periods, together with the Roman, and Medieval periods, for remains deemed most likely to be of low (i.e. local) significance. The identified archaeological potential for all other periods of human activity is anticipated to be generally low.

The study site has remained undeveloped farmland throughout its documented history. Impacts as a result of agricultural and/or horticultural activities may be considered likely to have had a moderate, widespread negative archaeological impact.'

2.3 Aims and objectives

2.3.1 To locate and characterise any anomalies of possible archaeological interest within the survey area.

3 SURVEY METHODOLOGY AND DATA PROCESSING

A magnetic survey was proposed as the most effective method of locating the type of archaeological anomalies which might be expected at this site.

The survey fieldwork and this report follow the general guidance set out by ClfA (2020) and the European Archaeology Council (EAC) (2016).

3.1 **Instrumentation**

3.1.1 The magnetic survey was undertaken using the following equipment configuration:

Sensors	Equipment configuration	Traverse interval (m)	Sample interval (m)
4 No. Foerster Ferex MG-10-550	Cart-based system Hand pushed Data is georeferenced by RTK GNSS	1.0	0.1 - 0.2

3.2 **Survey methodology**

3.2.1 The cart-based system can be towed by an all-terrain vehicle (ATV) or pushed by hand, depending on the ground conditions, accessibility and size of fields. The hand pushed option was used for this survey

3.2.2 Marker canes were set-out along field boundaries (and at points within the field as required) at set intervals and these were used to align the profiles when pushed by hand.

3.2.3 The survey profiles are usually offset from field boundaries, buildings and other metallic features by several metres to reduce the detrimental effect that these surface magnetic features have on the data. Gaps were also left adjacent to boundaries and surface obstructions to allow cart-based system sufficient space to safely pass and turn.

3.2.4 The location of the cart-based survey data is converted direct to Ordnance Survey National Grid co-ordinates, using the UK OSTN15 transformation.

3.3 **Data processing and display**

3.3.1 The data was processed and gridded using Anomaly v2.

3.3.2 The only processes performed on data are the following unless specifically stated otherwise:

Zero Mean Traverse: This process sets the background mean of each traverse within each grid to zero. The operation removes instrument striping effects and edge discontinuities over the whole of the data set.

3.3.3 Greyscale raster images (PNG files) are created at a range of -1 nT to 2 nT, which is 'standard' for archaeological surveys.

3.3.4 X-Y trace plots were created at a clip of +/- 15 nT. These have been overlain onto the greyscale plots to assist in the interpretation, primarily to help identify dipolar / bipolar responses (that will probably be associated with surface / near-surface ferrous or fired objects) and thermoremanent material. When not displayed in the report, a digital drawing showing the X-Y trace plot is provided in the Archive.

3.3.5 A detailed discussion of data processing, display and the general categories of anomaly which have been identified by the survey is provided in the Appendices.

4 RESULTS

The survey has been divided into two survey areas (Areas 1 and 2) and specific anomalies have been given numerical labels [1] [2] which appear in the text below, as well as on the interpretation figure(s).

4.1 Probable and possible archaeology

4.1.1 A number of magnetic anomalies are present that have been interpreted as having archaeological interest. Some responses are clearly related to archaeological features and others are suggestive of archaeology but the interpretation of these is less certain; either because they are relatively weak and fragmented or because they are aligned with agricultural activity.

4.1.2 Anomalies [1] are parts of curving / sub-rectangular enclosures present in Areas 1 and 2. The enclosures in Area 2 appear to be connected to each other but the responses 'fade out' between these and the enclosure in Area 1 so it is not certain if these are also related. It is possible that the feature causing Anomalies [2] and [3] in Area 1 terminate but it is more likely that the features have either been truncated (by later agricultural activity) or the magnetic properties of the soils infilling them changes and does not produce a measurable magnetic response in some areas. In the latter case the features may continue but have not been detected by the survey.

4.1.3 Anomaly [4] may be related to an infilled archaeological ditch, running between two enclosures but the anomaly is aligned with ridge and furrow anomalies and it is possible that Anomaly [4] is related to ridge and furrow, rather than an archaeological feature. Anomalies [5] are also aligned / partly aligned with agricultural activity and so it is not certain if these are related to archaeological features or are a product of the agricultural activity. Some of these are suggestive of archaeological features but the cause of others is less certain.

4.1.4 Anomalies [6] are an alignment of responses, some of which are relatively weak and fragmented. These are suggestive of an archaeological boundary ditch.

4.2 Ridge and furrow

4.2.1 Responses indicative of ridge and furrow cultivation are present. These are weak / fragmented or not visible in places which suggests that either the majority of the ridge and furrow has been removed in those areas or it could indicate areas where the soils have a relatively low magnetic susceptibility and features in those areas either produce very weak anomalies or may not have a measurable magnetic response.

4.2.2 In some parts of the site responses could be related to the remnants of ridge and furrow but they also correspond with a modern ploughing regime and so may be related to more recent cultivation.

4.3 Uncertain

4.3.1 A number of relatively weak trends are present. There are also trends that are aligned with ridge and furrow or modern ploughing but which stand out slightly. The cause of the trends is not certain and so they have been categorised as *uncertain*. It is likely that the majority of these are related to agricultural, or other modern activity, or natural features / variations but it is possible that some could be caused by parts of archaeological features.

4.3.2 There are also a large number of positive discrete anomalies across the site. A large majority, if not all, of these will be related to buried ferrous or fired material or natural variations but in some instances this type of response can be caused by archaeological features / activity, such as pits or areas of burning. As these responses can have a variety of causes they have been categorised as *uncertain*. None of the responses stand out as having obvious archaeological potential but this cannot be completely discounted,

particularly for those that are located in proximity to probable / possible archaeological features.

4.4 *Agricultural – ploughing*

- 4.4.1 Responses are present that are probably related to modern ploughing activity, although it is possible that some responses could be associated with the remnants of ridge and furrow.

4.5 *Ferrous / fired / magnetic disturbance*

- 4.5.1 Small scale discrete bipolar / dipolar anomalies ("iron spikes") are present throughout the data and are characteristic of small pieces of ferrous debris in the topsoil. Some fired material (brick / tile) can produce similar responses as can gravels derived from igneous rocks. These types of responses are commonly assigned a modern origin, unless there strong supporting evidence indicating a different cause. Where isolated responses are grouped together they are usually categorised as magnetic disturbance and indicate the presence of a concentration of (usually modern) material. Only the most prominent of these are isolated responses and areas of magnetic disturbance are highlighted on the interpretation diagram
- 4.5.2 Strong responses in this category that are located close to field boundaries are usually due to adjacent features, such as metallic fences and gates, walls and other brick structures and those within the site by other ferrous or brick features / objects.

5 DATA APPRAISAL AND CONFIDENCE ASSESSMENT

- 5.1.1 The results from this survey indicate the presence of responses related to probable and possible archaeological features and the remnants of ridge and furrow. Usually this would indicate that there is no a priori reason why archaeological features would not have been detected, if any such features were present. However, it is noticeable that anomalies become weaker and 'fade out' in some parts of the site, suggesting that the magnetic properties of the soils may vary across the site. There may therefore be parts of the site where some types of sub-surface features may only produce weak, fragmented anomalies or may not produce any measurable response.
- 5.1.2 It should be noted that a geophysical survey does not directly locate sub-surface features - it identifies variations or anomalies in the background response caused by features. The interpretation of geophysical anomalies is often subjective, and it is rarely possible to identify the cause of all such anomalies. Not all features will produce a measurable anomaly, and the effectiveness of a geophysical survey is also dependant on the site-specific conditions. The main factors that may limit whether a feature can be detected are the composition of a feature, its depth and size and the surrounding material. It is not possible to guarantee that a geophysical survey will identify all sub-surface features.

6 CONCLUSIONS

- 6.1.1 The magnetometer survey has identified anomalies related to archaeological and possible archaeological features. These form parts of several enclosures and possibly boundary ditches. Anomalies related to the remnants of ridge and furrow have also been identified. A number of responses of uncertain cause are present. It is thought that the majority of these are probably related to agricultural, drainage, other modern activity, or natural variations but an archaeological cause for some of them is possible.
- 6.1.2 Anomalies relating to recent ploughing and modern material / features are also present.
- 6.1.3 It should be noted that the anomalies associated with archaeological features and ridge and furrow vary in strength, which could suggest that the magnetic properties of the soils change across the site. If that is the case then it is possible that some types of sub-surface features may not produce strong, consistent or measurable magnetic responses.

7 BIBLIOGRAPHY AND REFERENCES

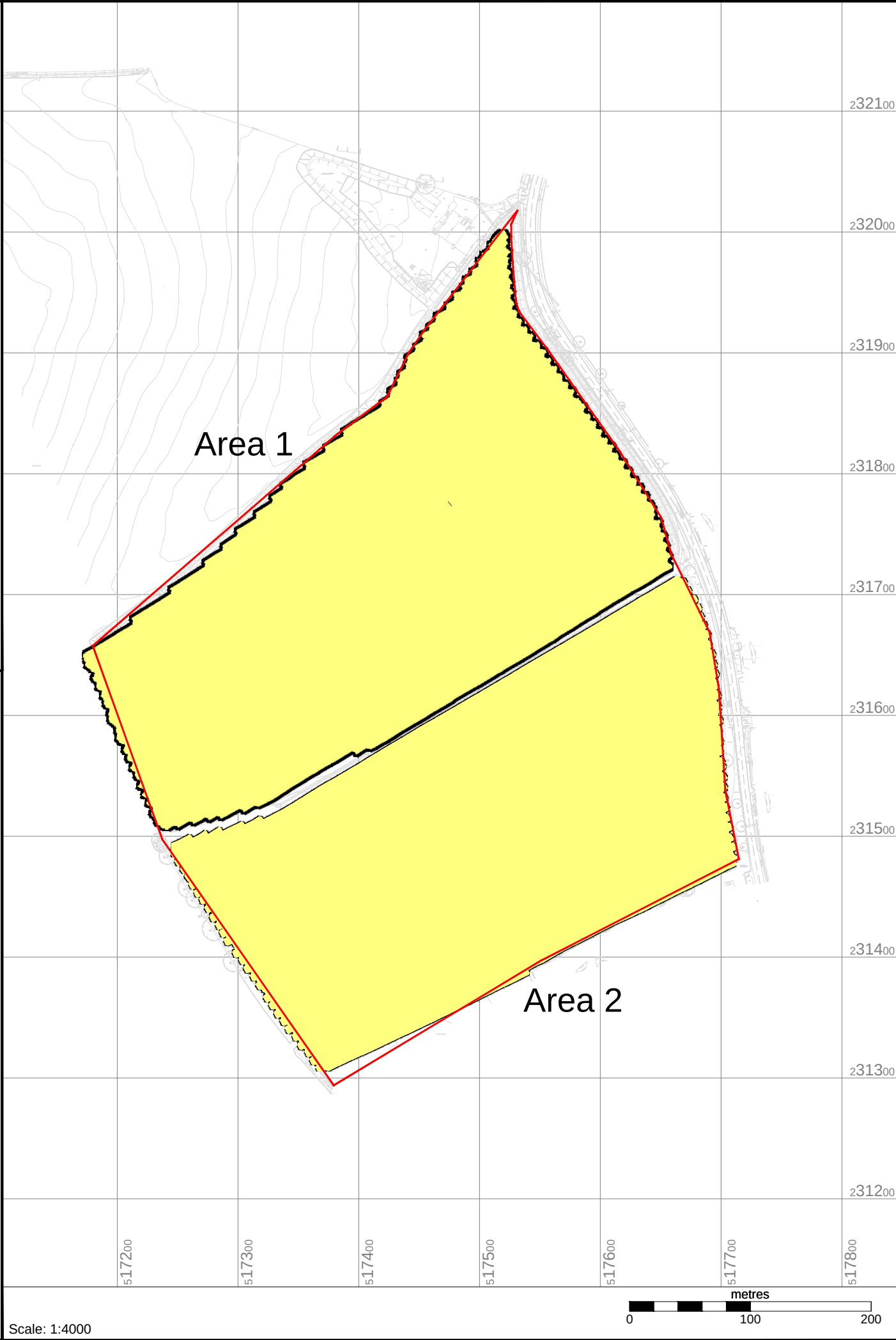
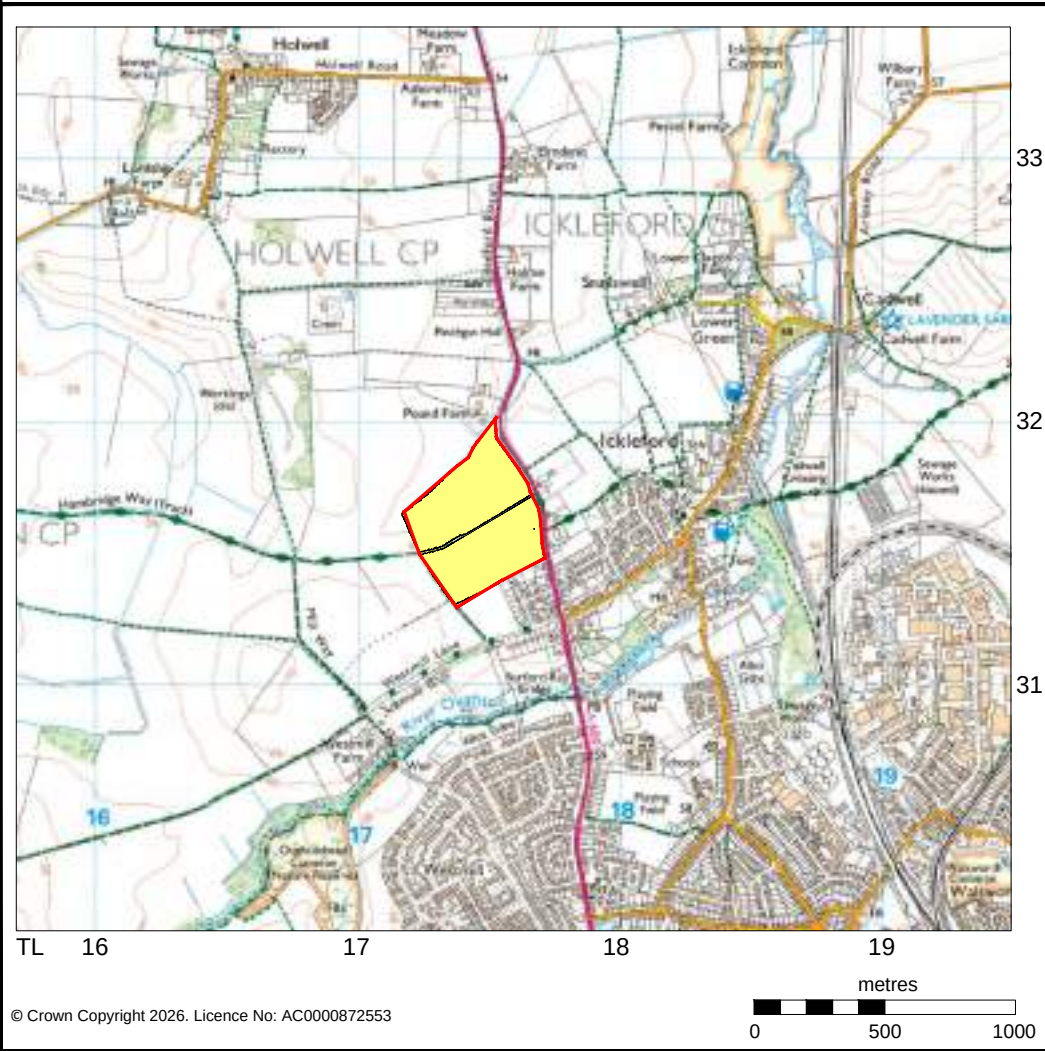
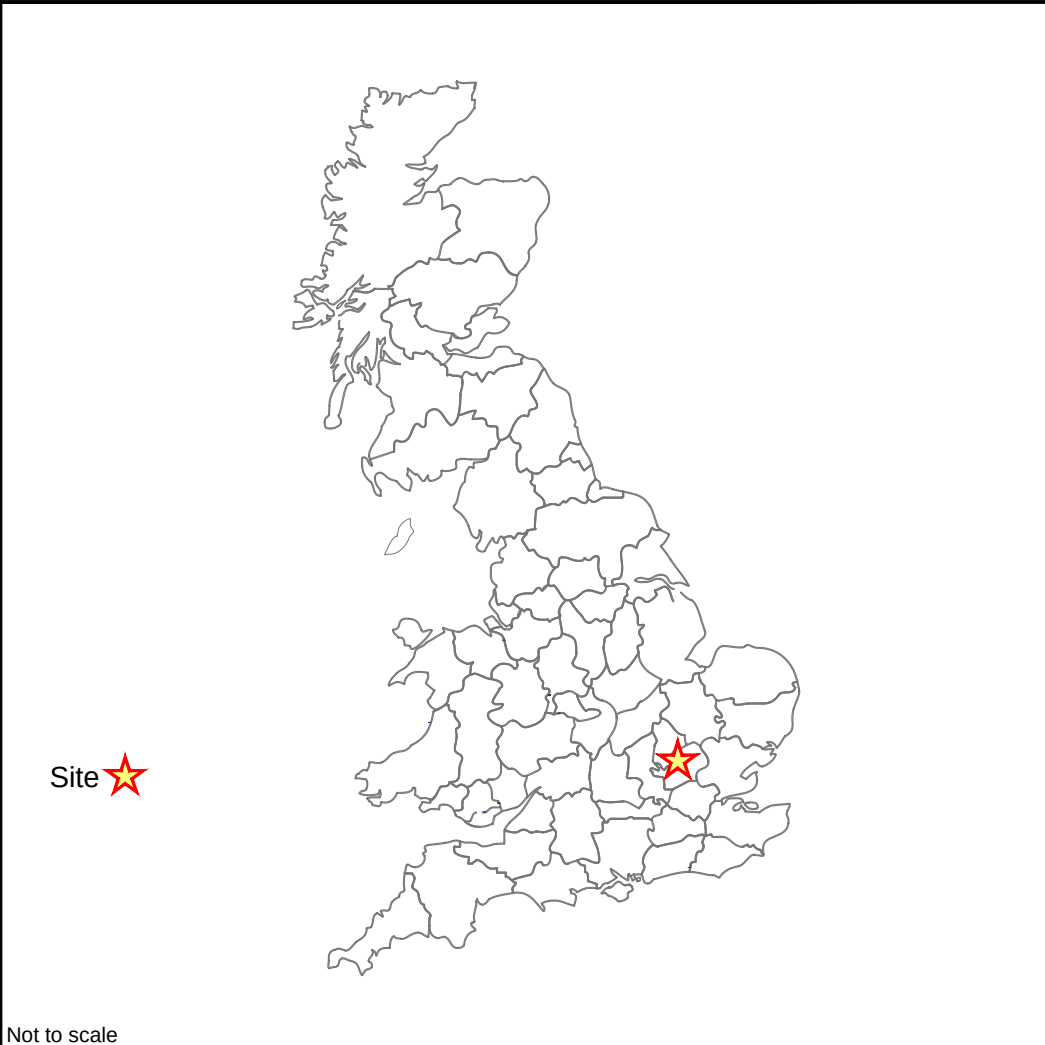
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- DSD 2025 Defra Survey Data Download, Department for Environment, Food and Rural Affairs. Website: <https://environment.data.gov.uk/survey>
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<https://maps.nls.uk/geo/find/marker>
- RPS (now Tetra Tech) Archaeological Desk-Based Assessment. Land South of Pound Farm, Bedford Road, Hitchin, Hertfordshire SG5 3RS
2025

8 ARCHIVE

- 8.1.1 The minimally processed data, data images, X-Y traces and a copy of this report are stored in **SUMO GeoSurveys'** digital archive, on an internal RAID configured NAS drive in the Eckington Office. These data are also backed up to the Cloud for off-site storage.
- 8.1.2 The Grey Literature will be archived with OASIS and the relevant HER within a period of 12 months.

9 COPYRIGHT

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KEY

	Site boundary
	Survey area(s)

Title:

Site location

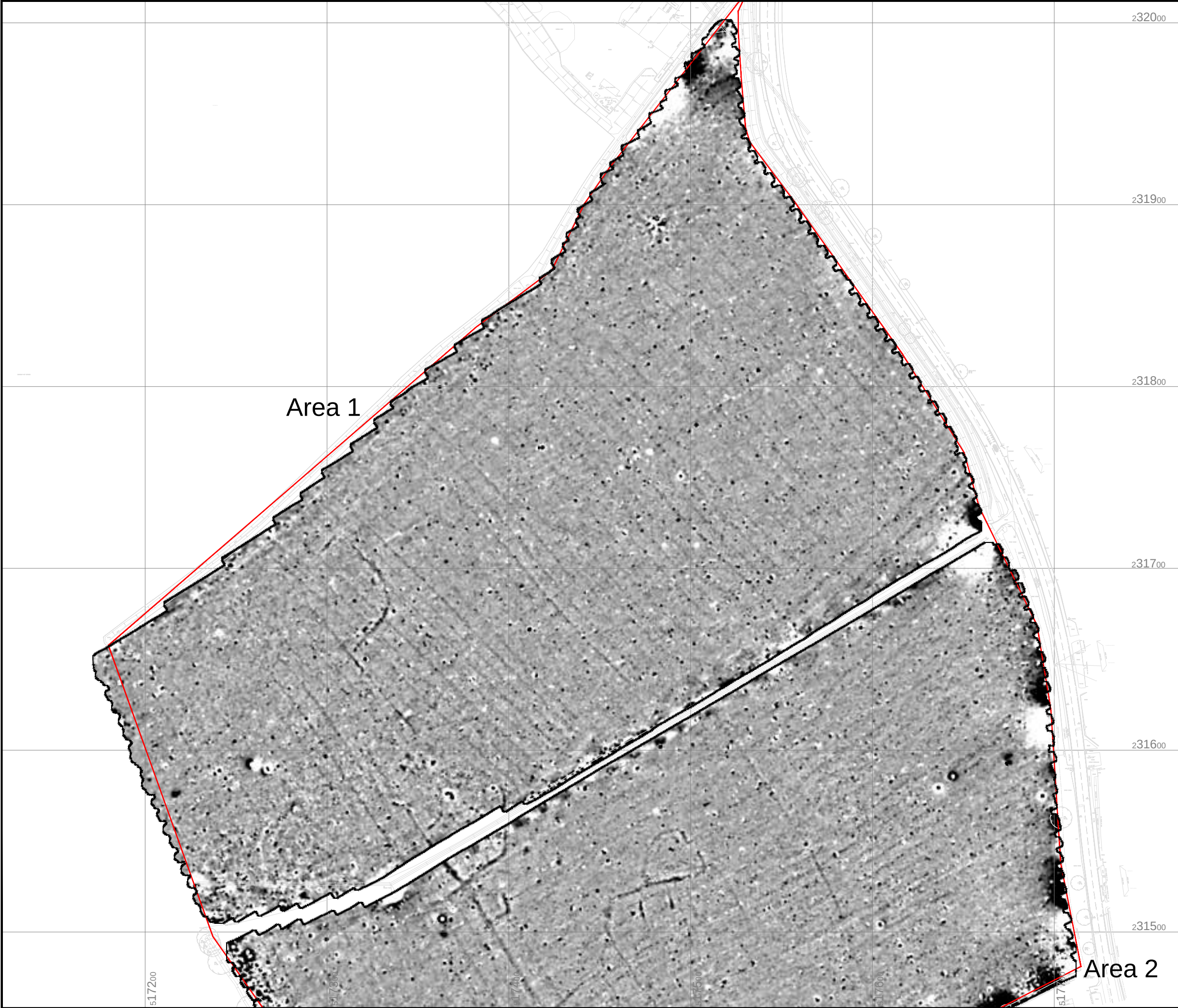
Client:

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Project:

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Hertfordshire SG5 3RS

Scale:	As shown	Figure:	01
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NOTES

1. This drawing is based upon drawing '35089.dwg' provided by the client. The Ordnance Survey co-ordinates obtained for this survey were measured using the UK OSTN15 transformation. This transformation should be taken into account if the survey data is relocated.
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N

KEY

Site boundary

Title:

Magnetic gradient data - greyscale plots
Area 1 and part of Area 2

Client:

Tetra Tech
(for Bugler Homes Ltd)

Project:

Land at Pound Farm, Ickleford
Hertfordshire SG5 3RS

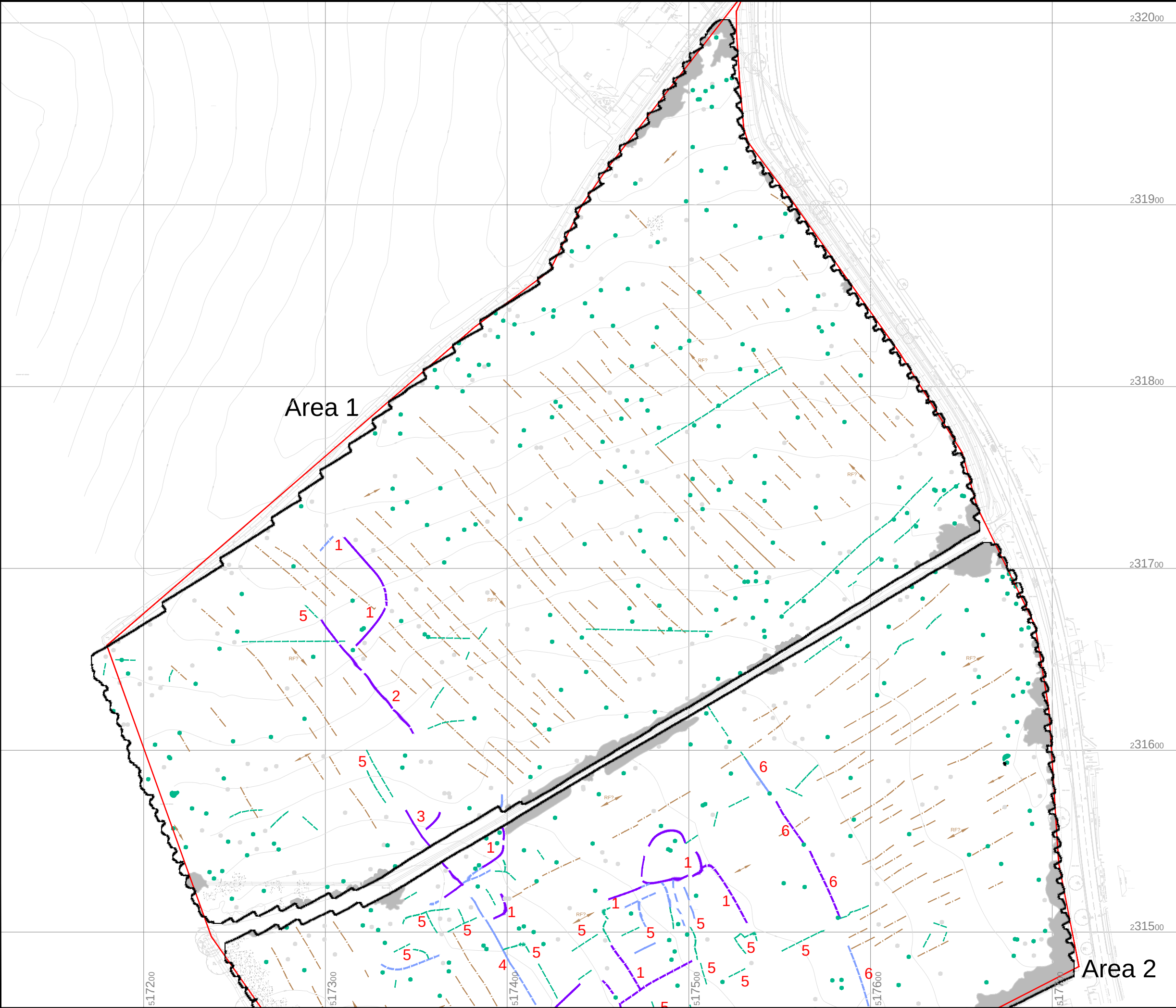
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metres

050100

Figure:

02



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KEY

	Probable archaeology (linear or curvi-linear) / trend
	Possible archaeology (linear or curv-linear / trend)
	Uncertain origin (discrete / linear or curvi-linear / trend)
	Ridge and furrow
	Possible ridge and furrow regime but some responses could be modern ploughing
	Former field boundary (corroborated)
	Agriculture. Orientation of modern ploughing regime. Some responses could be ridge and furrow
	Magnetic disturbance - usually related to a spread / concentration of modern material
	Ferrous and / or fired material (probable modern)
	Site boundary

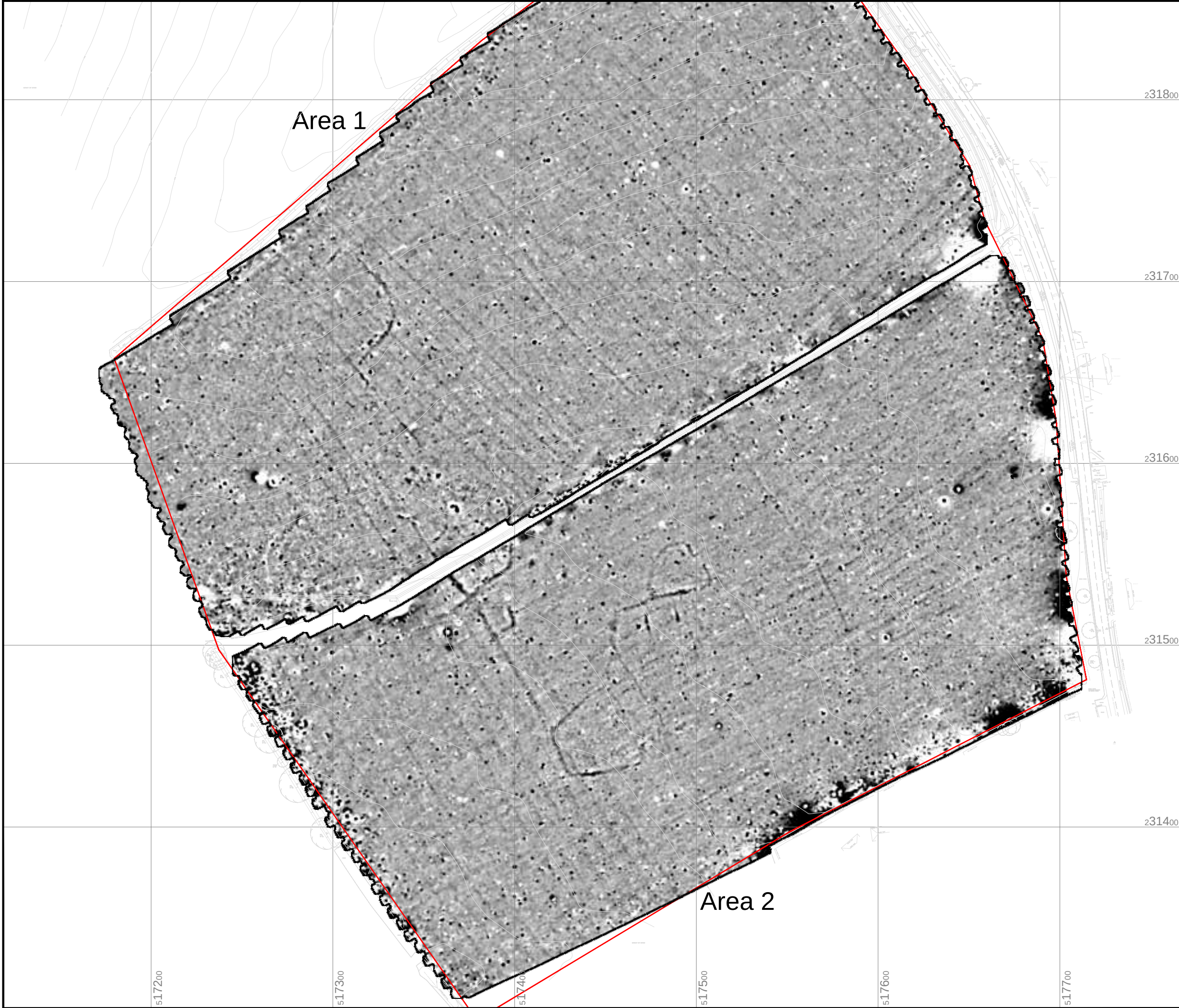
Title: Magnetic gradient data - interpretation
Area 1 and part of Area 2

Client: Tetra Tech
(for Bugler Homes Ltd)

Project: Land at Pound Farm, Ickleford
Hertfordshire SG5 3RS

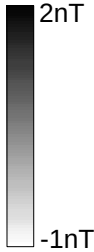
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Figure: 03



NOTES

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KEY

-  Site boundary



Title: Magnetic gradient data - greyscale plots
Area 2 and part of Area 1

Client: Tetra Tech
(for Bugler Homes Ltd)

Project: Land at Pound Farm, Ickleford
Hertfordshire SG5 3RS

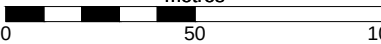
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Figure:
04