

Substrata

Archaeological Geophysical Surveyors

An archaeological magnetometer survey

**Land at Chapel Farm, Marwood
Barnstaple, Devon**

Centred on NGR: 253726,137398

Report: 1802CHA-R-2

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1 Introduction

This report presents the results of an archaeological geophysical survey at the site listed in Section 4 and shown in Figure 1, hereafter referred to as the 'Survey Area'. The survey was commissioned by Devon County Council and was designed to further understand the archaeological potential of a small iron age enclosure. The survey and report were completed in compliance with a Survey Method Statement (Substrata Ltd, 2018).

2 Client details

Devon County Council.

3 Copyright

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4 Survey type and location

4.1 Survey

Method:	shallow depth magnetometer survey
Instrument:	twin-sensor fluxgate gradiometer
Date:	21 & 25 March 2018
Area:	2.4ha
Survey resolution:	1m by 0.125m

4.2 Location

Name:	Chapel Farm
Location:	Chapel Farm, Marwood, Barnstaple, Devon
Civil Parish:	Marwood
District:	North Devon
County:	Devon
Nearest Postcode:	EX31 4EQ
Survey centre NGR:	SS 53726 37398 (point)
Survey centre NGR (E/N):	253726,137398 (point)
Historic environment designation:	Devon County Council Historic Environment Record MDV941
Approximate survey area:	2.4ha
OASIS ID:	substrat1-328063

5 Summary

A magnetometer survey was selected to provide a relatively fast and cost-effective evaluation of any buried archaeology across the Survey Area (see Section 14). The magnetic anomaly groups pertaining to potential buried archaeology were georeferenced to the Ordnance Survey National Grid, mapped, characterised and assigned with an appropriate degree of certainty in conformance with the survey aims and objectives set out in Section 7.

The differences in magnetic responses across the Survey Area were sufficient to be able to differentiate between anomalies representing possible buried archaeology and background magnetic responses.

Eight magnetic anomaly groups were characterised as representing potential archaeological deposits. Of these, two anomaly groups are likely to represent the ditch of the enclosure that is

the main target of this survey. There is a gap in the anomaly pattern representing the ditch on its south-western side that does not correspond to any gap in the enclosure earthworks recorded on a Royal Commission on the Historical Monuments of England (RCHME) map of the monument (RCHME, 1989). One group may reflect a stony deposit in this gap. It may reflect either the surface of an original gap in the enclosure ditch or a later in-filling of the ditch. A gap shown in the RCHME earthworks map on the enclosure's eastern side is not reflected by the geophysical survey data which shows the anomaly group representing the enclosure ditch as continuous at this point. The questions raised about which, if either, of the gaps is an original entrance can only be resolved through archaeological excavation.

Two anomaly groups may represent disturbed ground with archaeological material and another could possibly represent a sub-circular archaeological feature such as a ring-ditch although all three may represent natural deposits or ground disrupted during the clearance of the woods across the site. Two groups may represent disturbed ground and deposits associated with the ploughed-out enclosure bank.

The anomaly groups representing the enclosure ditch do not coincide exactly with the earthworks of the enclosure as depicted on the RCHME earthworks survey (*ibid*) but it is thought that the earthworks survey and this geophysical survey depict the same feature, rather than two distinct phases of enclosure, and that the geophysical data is likely to be more positionally accurate as it made use of later GPS technology and was not hampered by the presence of woodland. Moreover, the RCHME earthworks map records a relatively low set of earthworks and are bound to reflect slumping of the banks and other depreciation of the monument over time.

6 Standards

The standards that were used to complete this survey are defined by the Chartered Institute for Archaeologists (2014b) and the *Europae Archaeologiae Consilium* (undated). The codes of approved practice to be followed are those of the Chartered Institute for Archaeologists (2014) and Archaeology Data Service (undated).

7 Survey aims and objectives

7.1 Aims

1. Within the framework set out in Chartered Institute for Archaeologists (2014b) and *Europae Archaeologiae Consilium* (undated), complete an archaeological geophysical survey and report which will, as far as possible, establish the presence or absence, extent and character of any buried archaeology within the survey area.
2. Provide sufficient information on the nature of any archaeological remains to facilitate the assessment of their interest prior to the determination of the planning application.

7.2 Objectives

1. Complete a magnetometer survey across the Survey Area.
2. Identify any magnetic anomalies that may be related to buried archaeology.
3. Within the limits of the technique and dataset, archaeologically characterise any such anomalies or patterns of anomalies.
4. Accurately record the location of the identified anomalies.
5. Produce a report based on the survey that is sufficiently detailed to inform any subsequent development on the survey area about the location and possible archaeological character of the recorded anomalies.

8 Methodology

The magnetometer survey was undertaken in accordance a Survey Method Statement (Substrata Ltd, 2018) using the standards specified in Section 6 to achieve the aims and objectives set out in Section 7. The survey method was selected to provide a relatively fast and cost-effective evaluation of any buried archaeology across the Survey Area (see Section 14).

Data processing was undertaken using appropriate software (Table 2), with all anomalies being

digitised and geo-referenced. The final report (this document) includes a graphical and textual account of the techniques undertaken, the data obtained and an archaeological interpretation of that data and conclusions about any likely archaeology. The survey and report conform to the Chartered Institute for Archaeologists standard for geophysical survey (Chartered Institute for Archaeologists, 2014b).

9 Survey Area

9.1 Location and description

The Survey Area is part of one field lying closed to Lee House approximately 700m to the west of the village of Marwood (Figure 1). It is centred on the site of an enclosure, thought to be iron age in date (see Section 10), which lies between approximately 112m and 122m aOD on an east-south-east to west-north-west trending spur of land with the land sloping down from east to west (Figure 2). To the north, east and south of the enclosure the land falls steeply away to stream-fed valleys. The slopes to the north and west are part of Lee Wood and are tree-covered. Historic Ordnance Survey maps published between 1889 and 1989 show the Lee Wood covered much of the spur and had formal paths and rides, two of which passed through the enclosure trending approximately north-south and east-west. The trees along the top of the spur have since been removed and the land ploughed to the extent that the monument is greatly reduced and was not visible in the 15cm high grass encountered during the survey.

9.2 Geology and sub-surface deposits

The solid geology across the Survey Area comprises rocks of the Devonian Baggy Sandstones Formation. Generically, these rocks are interbedded brown and grey fine-grained sandstones, siltstones and greenish-grey shaly mudstones with thicker buff, fine- and medium-grained feldspathic and micaceous sugary sandstones (British Geological Survey, undated). The superficial geology is not recorded in the source used (ibid).

No relevant geotechnical reports or borehole logs of near-surface deposits within 500m of the Survey Area were available at the time of writing.

9.3 Soils

The topsoil is freely draining, slightly acid and loamy (LandIS, undated).

10 Archaeological background

10.1 Historic landscape characterisation

'Modern enclosures'

Modern enclosures have replaced earlier woodland (Devon County Council, undated).

10.2 Summary of archaeological background

This section summarises heritage assets that are thought relevant to the survey data analysis and is not designed to be a comprehensive description of the archaeological background.

A summary of the Devon County Council Historic Environment Record was made available on 16 February 2018 and this was examined along with the Devon County Council Historic Environment Map (Devon County Council, undated) and the Heritage Gateway Historic England, undated). Historic maps were consulted using Devon County Council (undated) and Old-Maps (undated). Whilst providing a useful context for the data analysis, the HER information and maps from the on-line sources are not necessarily comprehensive and detailed publication in commercial reports of the HER information or maps is not permitted.

The survey target is a small iron age ring-work (Historic Environment Record MDV941) discovered in Lee Wood in 1962 at which time it was in woodland. The site lies at approximately 120m aOD which is well below the highest point of the ridge on which it sits (Section 9.1). A recent ride bisected the enclosure from east to west which probably passed through the original entrance on the eastern and upper side (but see Section 12). A second path or ride passed through the monument north to south. It is described as a small enclosure with a ditch surviving best on the eastern (uphill) side. On the southwestern, downhill side the monument survived at the time of discovery as an earthwork within woodland. The woodland

was recorded on historic survey maps until at least 1989 (Table 1) but has since been cleared and the ground ploughed.

Approximately 900m southeast of the target enclosure, at NGR SS 544 368, a medieval curvilinear enclosure was depicted on the 1880 - 1899, First Edition Ordnance Survey 25 inch map (HER MDV80891) which is thought to be one of the few lowland enclosures near the boundary between the Braunton and Shirwell Hundreds.

HER MDV21844 describes a flint arrowhead along with a number of flint scatters, a stone hammer and sling stones at NGR SS 535 373, approximately 250m southwest of the target enclosure.

11 Results

11.1 Scope and definitions

This survey was designed to record magnetic anomalies. A magnetic anomaly is a local variation in the Earth's magnetic field. Such variations can result from differences in the magnetic properties of the underlying solid geology, superficial geology and other near-surface deposits including those altered and created by past human activities. Near-surface artefacts can also create magnetic anomalies.

The dimensions of magnetic anomalies mapped as representing potential buried archaeology do not represent the dimensions of any associated archaeology.

The analysis presented below identifies and characterises anomalies and anomaly groups that may relate to buried archaeology.

11.2 Analysis

Figures 2 and 3 show the interpretation of the survey data and include the anomaly groups identified as possibly relating to archaeological deposits along with their identifying numbers. Table 1 is an extract of the detailed analysis of the survey data sourced from the attribute tables of the GIS project provided in the project archive.

Figures 2 and 3 along with Table 1 comprise the analysis of the survey data.

Figures 4 and 5 are plots of the processed data as specified in Table 3. Figure 6 is a plot of minimally processed data as specified in Table 4. Figure 7 shows the location of the survey grid and grid data files.

12 Discussion

12.1 General points

Scope

Not all anomalies or anomaly groups identified in Table 1 are necessarily discussed below. All identified anomaly groups are recorded in the GIS project held in the survey archive.

Data collection

Data collection along the survey area edges was restricted as shown in the figures due to the presence of dense, rough vegetation and magnetic materials within and adjacent to the field boundaries. Strong magnetic responses mapped close to the boundaries are likely to relate to the magnetic materials except where otherwise indicated in Figures 2 and 3 and Table 1.

Anomaly characterisation

There are a number of anomaly groups that could be interpreted as relating to large postholes or pits although most will have natural origins and, in this case, a number probably reflect tree bowls and tree removal disturbance (Sections 9.1 and 10.2). Anomalies of this sort are mapped as potential archaeology when they are well defined in the data, associated with other significant anomaly groups or otherwise formed recognisable patterns as listed in Table 1.

Anomalies thought to relate to natural features and recent man-made objects such as manholes, water management equipment, drains, cables and other services are only mapped where they comprise significant magnetic responses across the dataset that need clarification.

Numerous dipole magnetic anomalies are present within the dataset. These are likely to represent recent ferrous objects. They are only mapped if they could influence the analysis of anomaly groups thought to have an archaeological origin.

12.2 Data relating to historic maps and other records

Magnetic anomaly groups **4** and **5** represent a ditch that made of part of the small iron age enclosure that was the principal target of the survey (HER MDV941). Group **5** is distinguished from group **4** as it is discrete in the data.

Anomaly group **6** is interpreted as stony material in a gap on the south-western side of the ditch represented by groups **4** and **5**. This stony material is either a surface of the original entrance or was used to fill in the ditch at a later date, perhaps during work associated with the ride that was mapped as passing through this point on historic Ordnance Survey maps between 1880 and at least 1989. As can be seen from the RCHME map (Figure 3) of the earthworks that made up the enclosure prior to the land being cleared of trees and ploughed (as discussed in Sections 9.1 and 10.2), there is no gap in this south-western area of the earthworks and, indeed, a gap is present on the eastward side of the enclosure which is not reflected in anomaly group **4**. Speculatively, the ditch may have been continuous when the enclosure was in use and the eastern entrance had a drawbridge across the ditch whilst the south-western gap in the ditch reflects a later breach. This would explain the presence of a gap in the eastern earthworks without a corresponding gap in the ditch. Further archaeological investigation is required to resolve the location of the enclosure entrance.

It is also apparent from Figure 3, that the shape and location of group **4** does not exactly correspond to that of the earthworks depicted on the RCHME map (RCHME, 1989). Whilst the shape and width of magnetic anomalies do not conform to their physical cause, this difference between the two sets of evidence is too great to be the result of magnetic anomaly variations. Whilst one explanation is that group **4** represents a different phase of enclosure, it should be remembered that the earthworks survey was completed within woodland which would compromise its accuracy to some extent. Also, it is inevitable that the earthworks survey includes slumping and other depreciation of the original structure. In the authors' opinion, the surveys represent the same feature.

12.3 Data with no previous archaeological provenance

Magnetic anomaly groups **1** and **3** may reflect ground disturbance with possible archaeological deposits reflected by the enhanced magnetic responses in these two areas.

Group **2** may represent a sub-circular archaeological deposit such as partially ploughed out ring-ditch. In this case, however, the irregular shape of the anomaly group may reflect a fortuitous grouping of several anomalies representing ground disturbance or natural deposits.

Groups **7** and **8** may represent disturbed ground and possible archaeological material associated with the ploughed-out enclosure earthworks.

13 Conclusions

The differences in magnetic responses across the Survey Area were sufficient to be able to differentiate between anomalies representing possible buried archaeology and background magnetic responses.

Ten magnetic anomaly groups were characterised as representing potential archaeological deposits. Of these, two anomaly groups (4 and 5) are likely to represent the ditch of the enclosure that is the main target of this survey. There is a gap in the anomaly pattern representing the ditch on its south-western side that does not correspond to any gap in the enclosure earthworks recorded on a Royal Commission on the Historical Monuments of England (RCHME) map of the monument (RCHME, 1989). One group (6) may reflect a stony deposit in this gap. It may reflect either the surface of an original gap in the enclosure ditch or a later in-filling of the ditch. A gap shown in the RCHME earthworks map on the enclosure's eastern side is not reflected by the geophysical survey data which shows the anomaly group representing the enclosure ditch as continuous at this point. The questions raised about which, if either, of the gaps is an original entrance can only be resolved through archaeological excavation.

Two anomaly groups (1 and 3) may represent disturbed ground with archaeological material and another (2) could possibly represent a sub-circular archaeological feature such as a ring-ditch although all three may represent natural deposits or ground disrupted during the clearance of the woods across the site. Two groups (7 and 8) may represent disturbed ground and deposits associated with the ploughed-out enclosure bank.

The anomaly groups representing the enclosure ditch do not coincide exactly with the earthworks of the enclosure as depicted on the RCHME earthworks survey (*ibid*) but it is thought that the earthworks survey and this geophysical survey depict the same feature, rather than two distinct phases of enclosure, and that the geophysical data is likely to be more positionally accurate as it made use of later GPS technology and was not hampered by the presence of woodland. Moreover, the RCHME earthworks map records a relatively low set of earthworks and are bound to reflect slumping of the banks and other depreciation of the monument over time.

14 Disclaimer

The description and discussion of the results presented in this report are the authors', based on their interpretation of the survey data. Every effort has been made to provide accurate descriptions and interpretations of the geophysical data set. The nature of archaeological geophysical surveying is such that interpretations based on geophysical data, while informative, can only be provisional. Geophysical surveys are a cost-effective early step in the multi-phase process that is archaeology.

15 Archive

15.1 Online Access to the Index of archaeological investigationS (OASIS)

OASIS ID: substrat1-328063

The OASIS entry has been completed and the boundary file and report uploaded with six months delay in publication.

15.2 Substrata Limited archive

A full archive of this survey will be held by Substrata Limited on cloud and local hard drive storage as specified in Appendix 3.

15.3 Archaeological Data Service (ADS)

Depending on local authority policy, an archive may be deposited with the ADS as specified in Appendix 3.

15.4 Historic Environment Record (HER)

Subject to any contractual requirements on confidentiality, a PDF or printed copy of the report will be submitted to the appropriate HER within six months of completion.

16 Acknowledgements

Substrata would like to thank Bill Horner, County Archaeologist, Devon County Council Environment Group a for commissioning us to complete this survey

17 Bibliography

Archaeology Data Service, (undated). *Archaeology Data Service/Digital Antiquity Guides to Good Practice: Geophysical Data in Archaeology*. 2nd Edition. [online]. Available at: http://guides.archaeologydataservice.ac.uk/g2gp/Geophysics_Toc [Accessed 5 Sep. 2018]

British Geological Survey, (undated). *Geology of Britain viewer, 1:50000 scale data*. [online]. Available at: <http://www.bgs.ac.uk/discovering-Geology/geologyOfBritain/viewer.html> [Accessed 9 Sep. 2018]

Chartered Institute for Archaeologists, (2014). *Code of conduct*. [pdf]. Available at: <https://www.archaeologists.net/sites/default/files/CodesofConduct.pdf> [Accessed 5 Sep. 2018]

Chartered Institute for Archaeologists, (2014b). *Standard and guidance archaeological geophysical survey*. [pdf]. Available at: https://www.archaeologists.net/sites/default/files/CIFAS%26GGeophysics_2.pdf [Accessed 5 Sep. 2018]

Clark, A. (2000). *Seeing Beneath the Soil, Prospecting methods in archaeology*. London: Routledge

Devon County Council, (undated). *Historic Environment map*. [online]. Available at: <https://new.devon.gov.uk/historicenvironment/> [Accessed 9 Sep. 2018]

Europae Archaeologiae Consilium, (undated). *EAC Guidelines for the Use of Geophysics in Archaeology, Questions to Ask and Points to Consider*. EAC Guidelines 2. [pdf]. Available at: http://old.european-archaeological-council.org/files/eac_guidelines_2_final.pdf [Accessed 5 Sep. 2018]

Historic England, (undated). *Heritage Gateway*. [online]. Available at: <http://www.heritagegateway.org.uk/Gateway/> [Accessed 9 Sep. 2018].

LandIS, (undated). *Cranfield Soils and Agrifood Institute Soilscales*. [online]. Available at: <http://www.landis.org.uk/soilscales/> [Accessed 5 Sep. 2018]

Ministry of Housing, Communities & Local Government, (2018). *National Planning Policy Framework*. [pdf]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/728643/Revised_NPPF_2018.pdf [Accessed 3 Aug. 2018]

Old-Maps, (undated). *old-maps.co.uk*. [online]. Available at: <https://www.old-maps.co.uk/#/> [Accessed 9 Sep. 2018]

RCHME (Royal Commission on the Historical Monuments of England), (1989). [title not as published] *Lee Wood in the parish of Marwood, surveyed at 1:2500*. Devon County Council Historic Environment Record MDV941, survey reference SDV84015

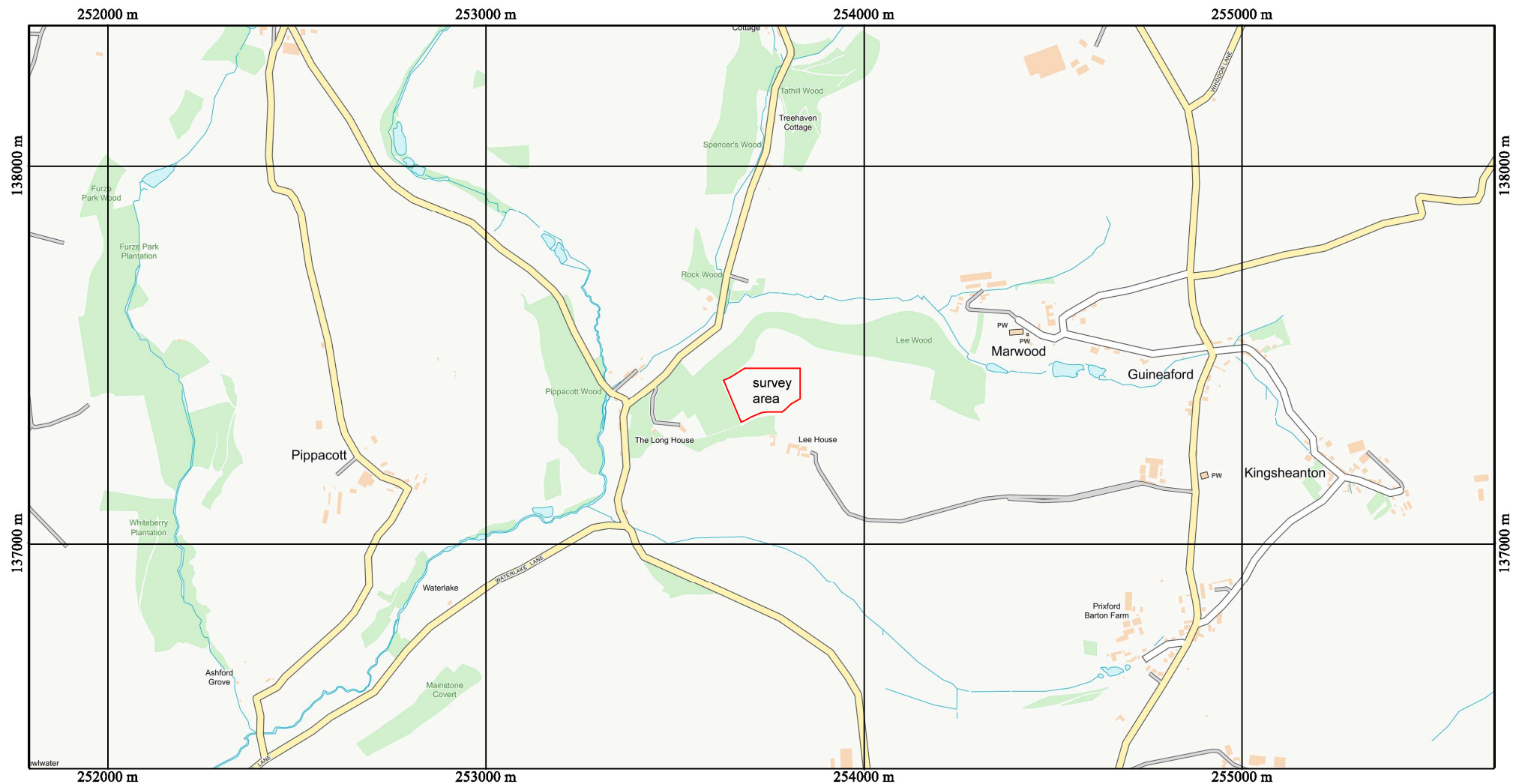
Substrata Ltd, (2018). *Survey Method Statement, An archaeological magnetometer survey, Chapel Farm, Marwood, Barnstaple, Devon*. Barnstaple: Substrata Ltd unpublished document 1802CHA-M-1

Appendix 1 Figures

General Guidance

The anomalies represented in the survey plots provided in this appendix are magnetic anomalies. The apparent size of such anomalies and anomaly patterns are unlikely to correspond exactly with the dimensions of any associated archaeological features .

A rough rule for interpreting magnetic anomalies is that the width of an anomaly at half its maximum reading is equal to the width of the buried feature, or its depth if this is greater (Clark, 2000: 83). Caution must be applied when using this rule as it depends on the anomalies being clearly identifiable and distinct from adjacent anomalies. In northern latitudes the position of the maximum of a magnetic anomaly will be displaced slightly to the south of any associated physical feature.



British Grid
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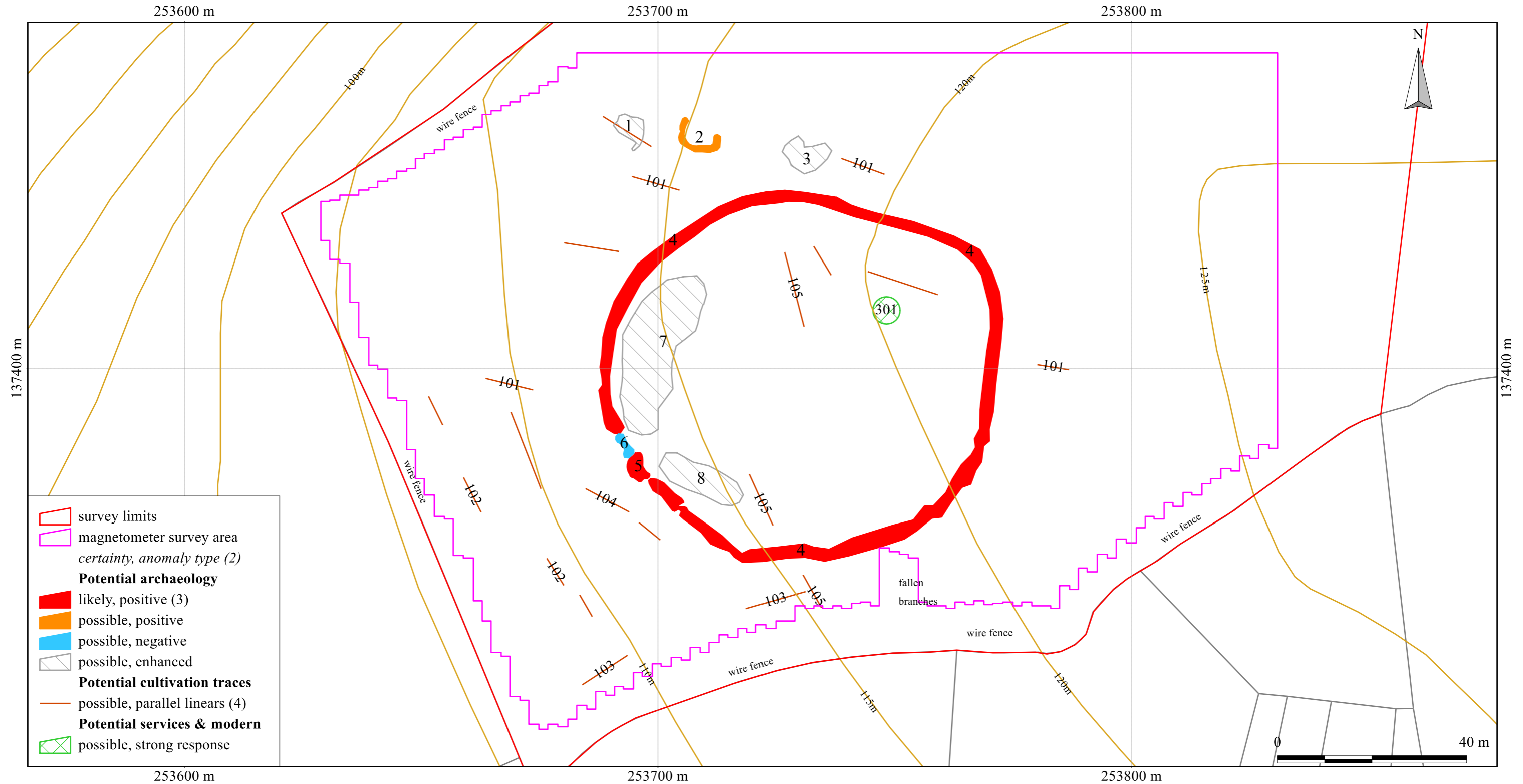
Scale: 1:10000 @ A3. Spatial Units: Meter. Do not scale off this drawing

Geophysical survey: Copyright Substrata Limited.
 Base map: © Crown copyright and database rights
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An archaeological magnetometer survey
 Chapel Farm, Marwood, Barnstaple, Devon
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 Report: 1802CHA-R-1

Figure 1: location map

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British Grid
 centre X: 253722.06 m, centre Y: 137394.45 m

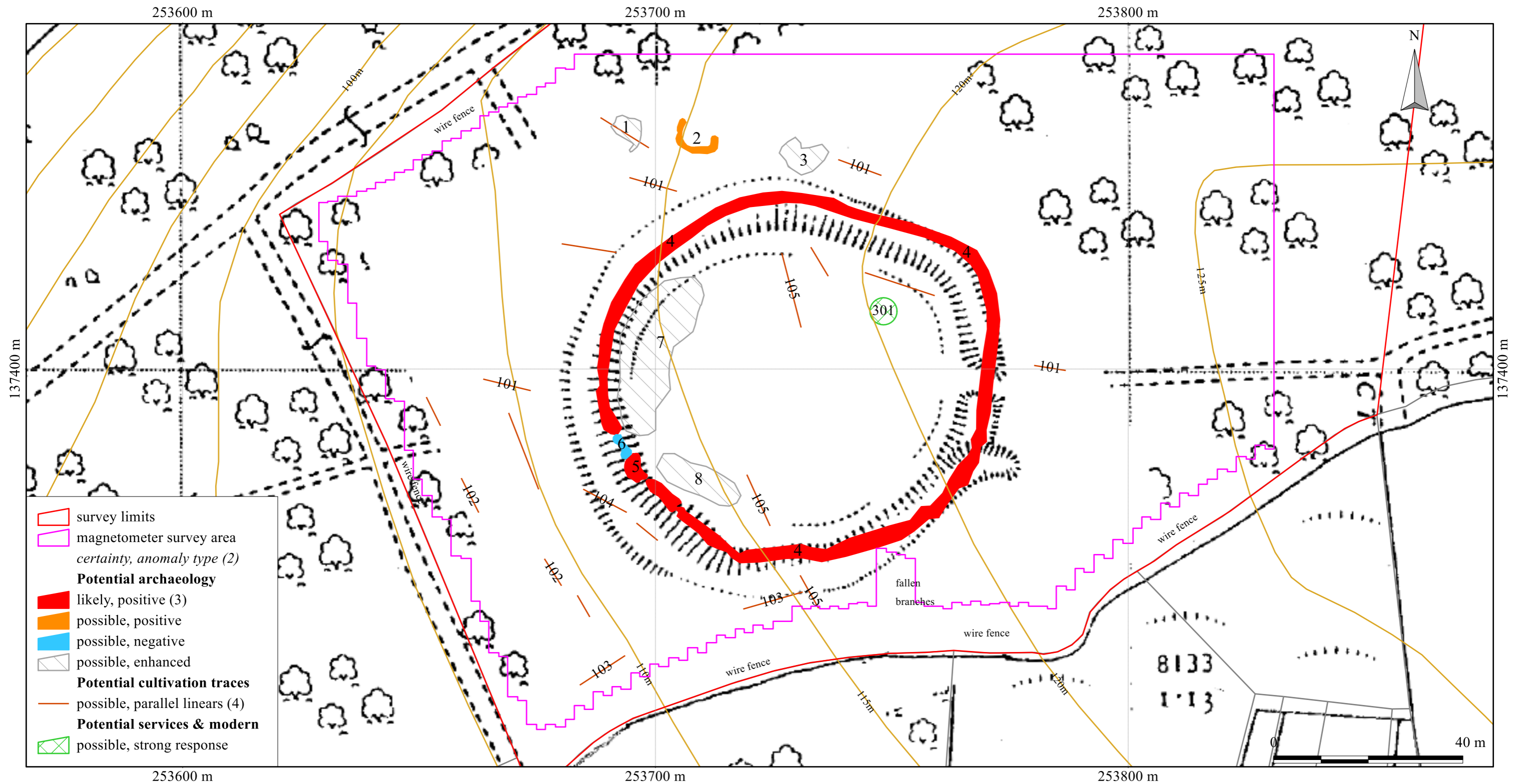
Scale: 1:800 @ A3. Spatial Units: Meter. Do not scale off this drawing

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Figure 2: survey interpretation

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British Grid
centre X: 253722.06 m, centre Y: 137394.45 m

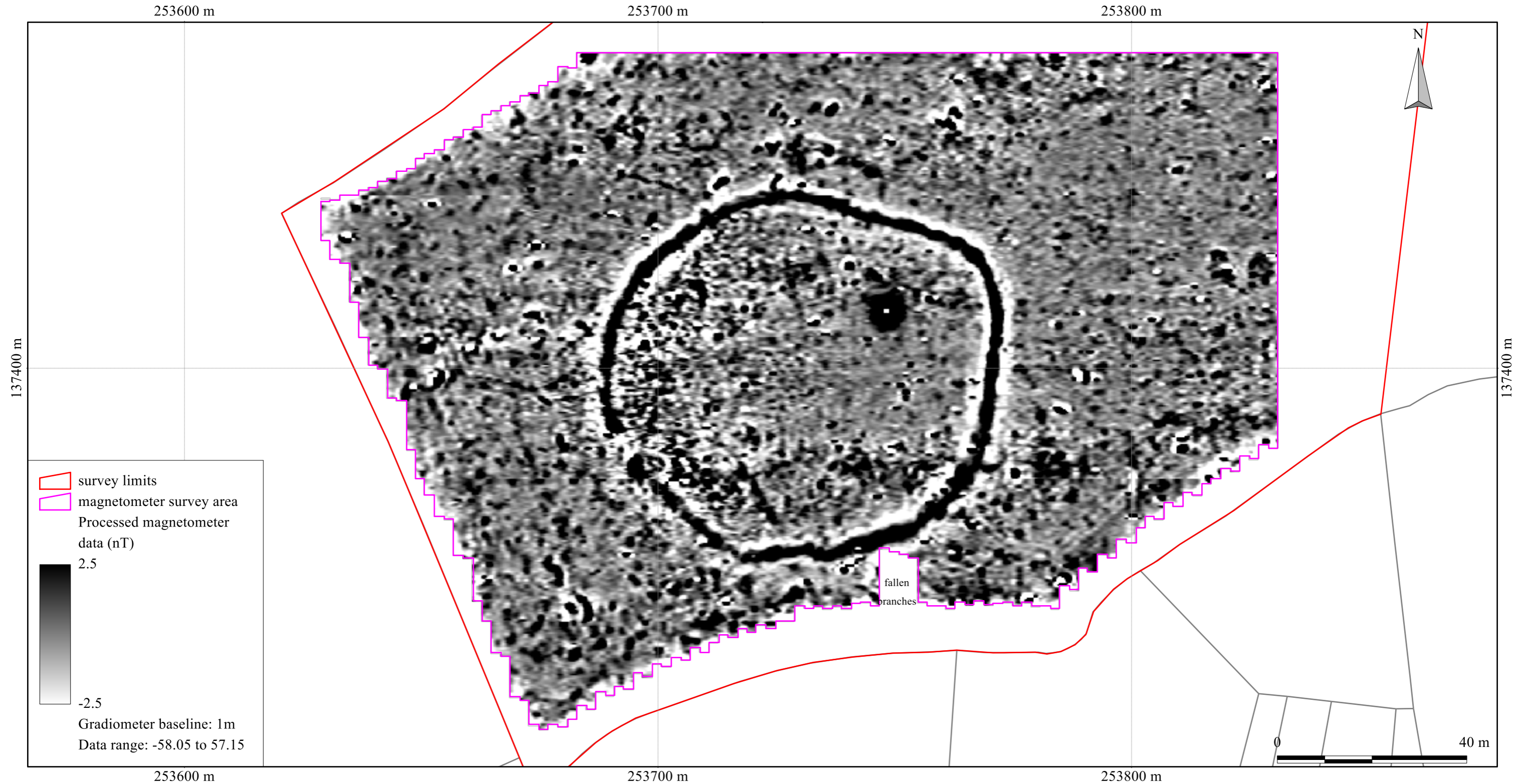
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Scale: 1:800 @ A3. Spatial Units: Meter. Do not scale off this drawing

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Report: 1802CHA-R-1

Figure 3: survey interpretation with RCHME earthworks map (RCHME, 1989)

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British Grid
 centre X: 253722.06 m, centre Y: 137394.45 m

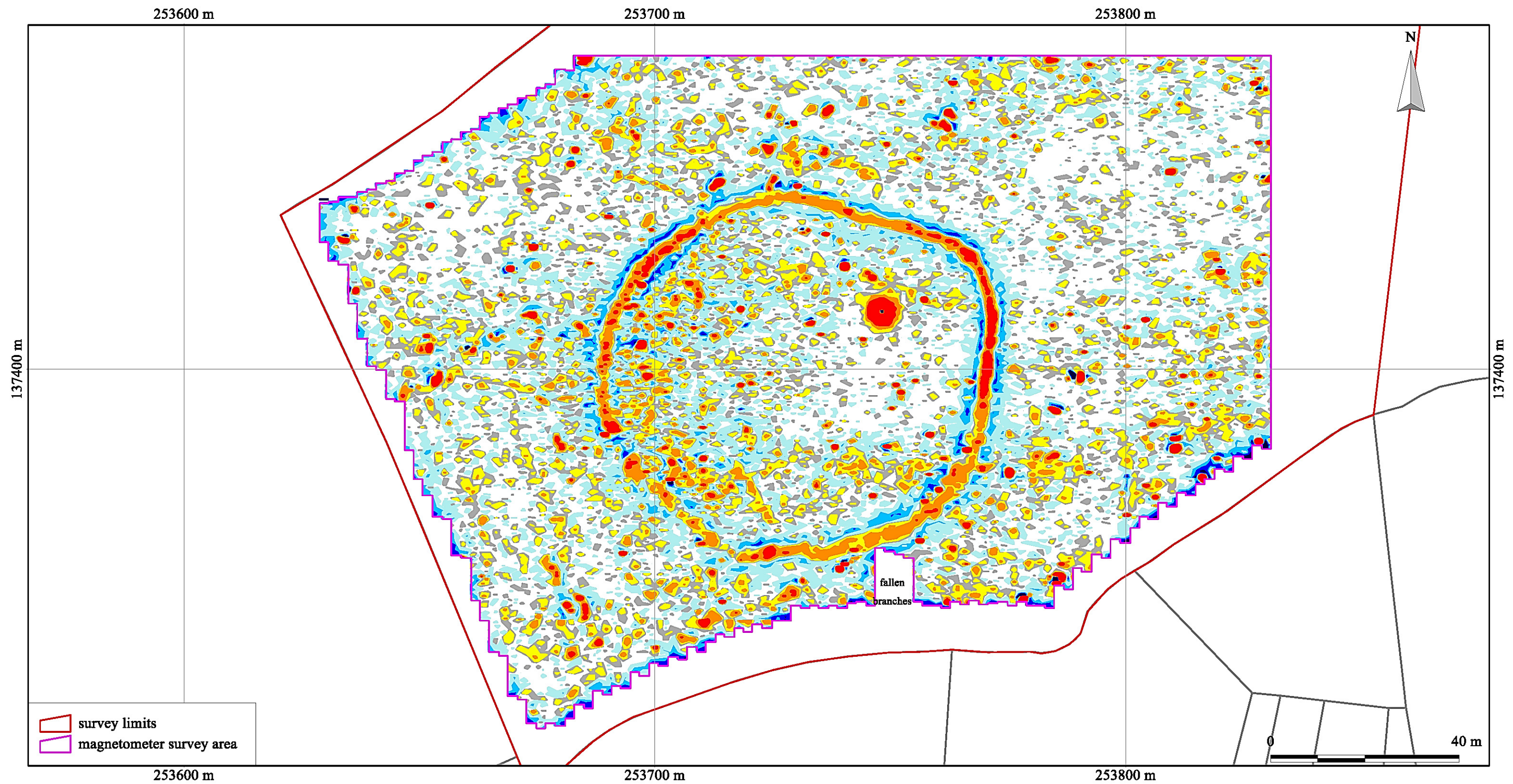
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Scale: 1:800 @ A3. Spatial Units: Meter. Do not scale off this drawing

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Figure 4: shade plot of processed data

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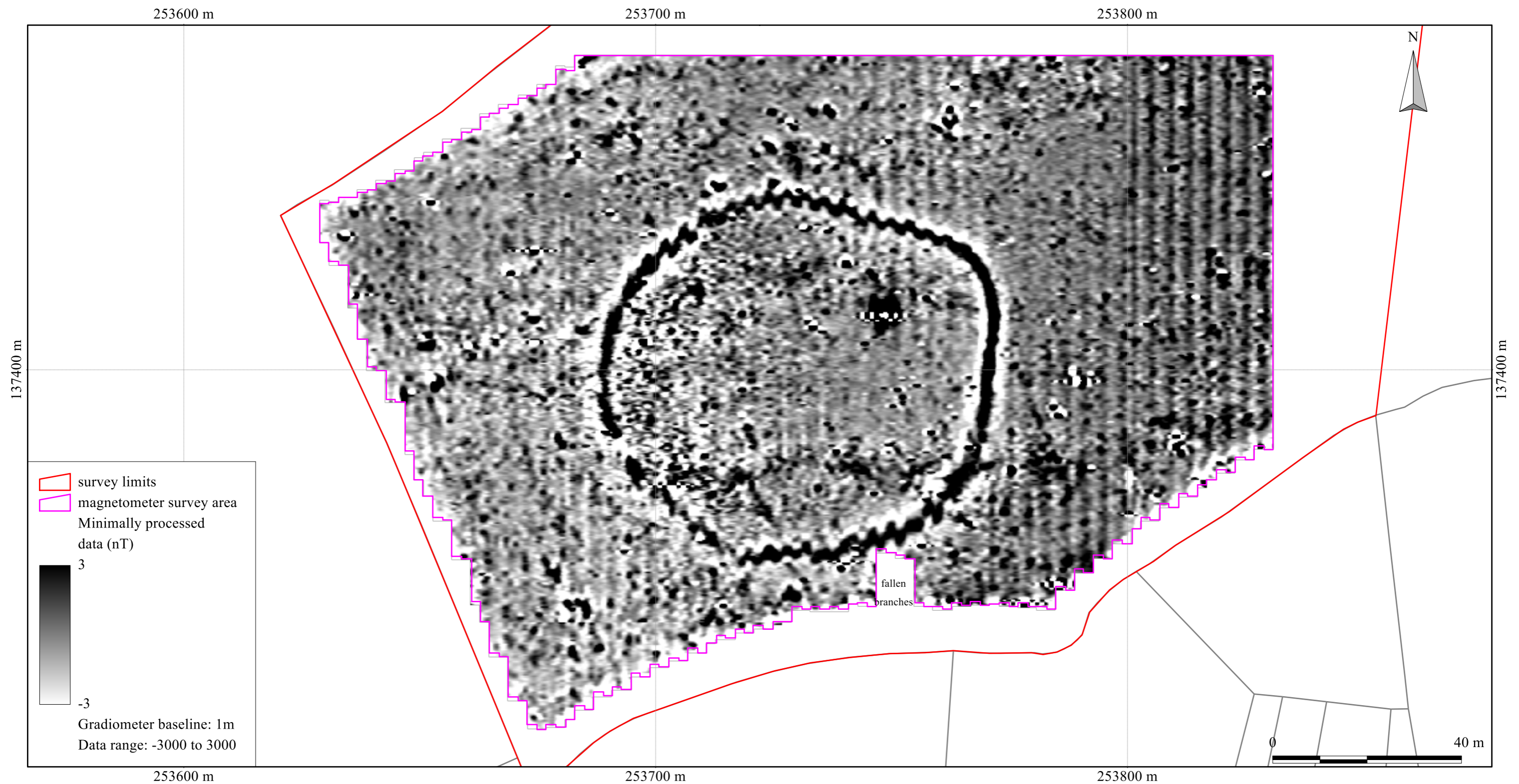


▭ survey limits
▭ magnetometer survey area

British Grid
 centre X: 253722.06 m, centre Y: 137394.45 m

Scale: 1:800 @ A3. Spatial Units: Meter. Do not scale off this drawing

Geophysical survey: Copyright Substrata Limited.
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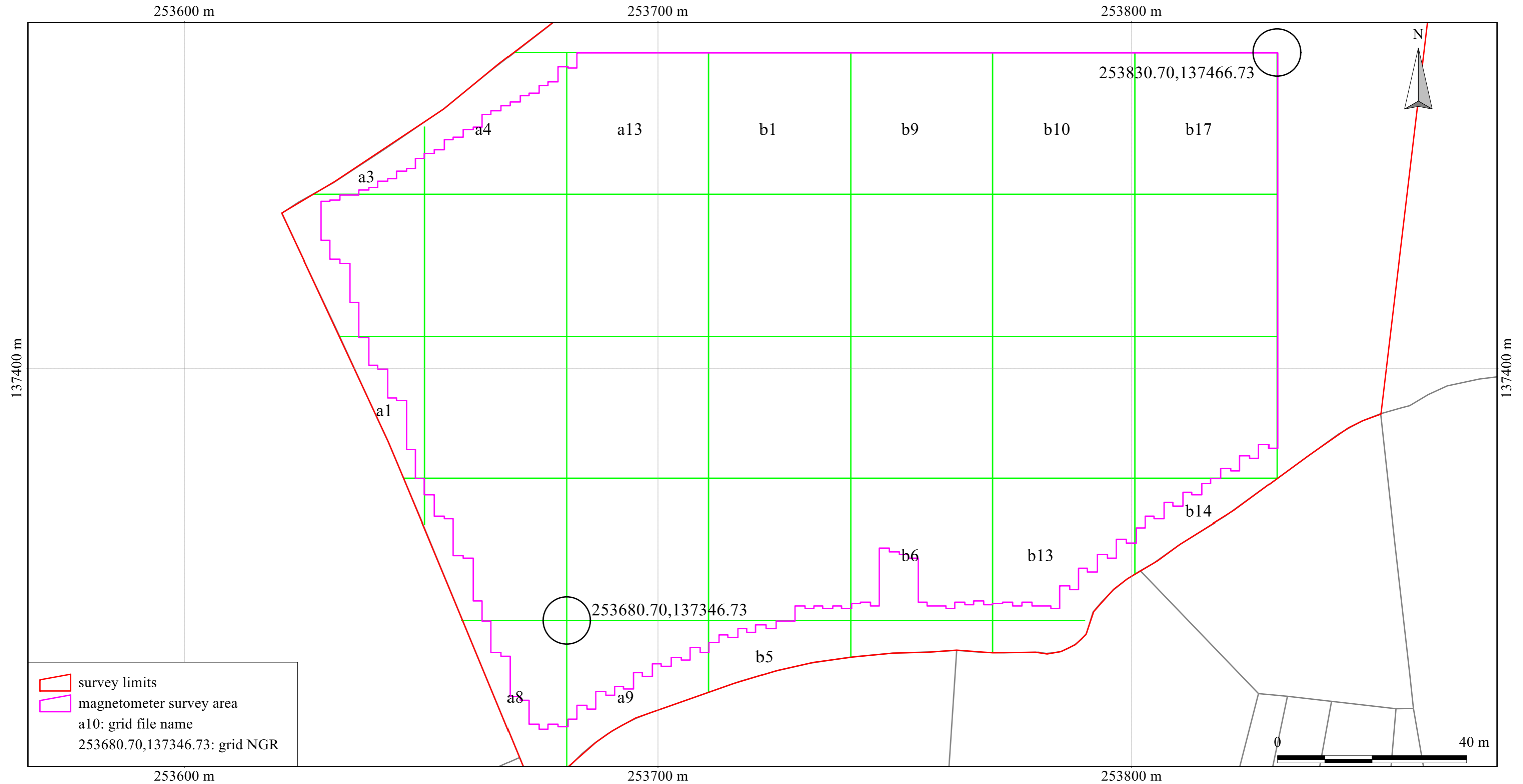
▭ survey limits
▭ magnetometer survey area
 Minimally processed data (nT)
 3
 -3
 Gradiometer baseline: 1m
 Data range: -3000 to 3000

British Grid
 centre X: 253722.06 m, centre Y: 137394.45 m

Scale: 1:800 @ A3. Spatial Units: Meter. Do not scale off this drawing

Geophysical survey: Copyright Substrata Limited.
 Base map: © Crown copyright and database rights
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Figure 6: shade plot of unprocessed data



▭ survey limits
▭ magnetometer survey area
 a10: grid file name
 253680.70,137346.73: grid NGR

British Grid
 centre X: 253722.06 m, centre Y: 137394.45 m

Scale: 1:800 @ A3. Spatial Units: Meter. Do not scale off this drawing

Geophysical survey: Copyright Substrata Limited.
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Appendix 2 Tables

Site: Chapel Farm, Marwood, Barnstaple, Devon
 Centred on NGR (E/N): 253726,137398

anomaly group	anomaly characterisation certainty & class	anomaly form	additional archaeological characterisation	comments	supporting evidence
1	possible, enhanced	irregular	disturbed ground with possible archaeological deposits		
2	possible, positive	sub-circular	archaeological deposit or coincidental anomaly grouping	anomaly group may represent a sub-circular deposit but this is by no means certain - may well be a coincidental pattern of ground disturbance	
3	possible, enhanced	irregular	disturbed ground with possible archaeological deposits		
4	likely, positive	sub-circular	enclosure ditch	anomaly group coincides with, and likely represents, an earthwork recorded as an enclosure, possibly iron age: note that it does not exactly correspond to earthworks mapped by the RCHME	DCC HER MDV941 Ordnance Survey maps 1889 1:2500 to at least 1989 1:10000
5	likely, positive	irregular	part of enclosure ditch		
6	possible, negative extant	linear	stony deposit either connected to the gap (entrance?) in group 4 or later in-fill		Ordnance Survey maps 1889 1:2500 to 1989 1:10000
7	possible, enhanced	broad curvilinear	disturbed ground with spread of possible archaeological material - associated with rampart?		
8	possible, enhanced		disturbed ground with spread of possible archaeological material - associated with rampart?		
101	possible, parallel linears		cultivation, ground clearance traces, or land drains		
102	possible, parallel linears		cultivation or ground clearance traces		
103	possible, parallel linears		cultivation, ground clearance traces, or land drains		
104	possible, parallel linears		cultivation or ground clearance traces		
105	possible, parallel linears		cultivation or ground clearance traces		
301	possible, strong response		modern material	anomaly group has a very strong negative response - too much for stony material - possible ferrous material?	

Table 1: data analysis

<p>Grid <i>Method of Fixing:</i> DGPS set-out using pre-planned survey grids and Ordnance Survey coordinates. <i>Composition:</i> 30m by 30m grids <i>Recording:</i> Geo-referenced and recorded using digital map tiles. <i>DGPS used:</i> Spectra Precision PM5V2 GPS with external antenna and survey pole and DigiTerra Explorer 7 as the survey control program.</p>	
<p>Equipment <i>Instrument:</i> Bartington Instruments grad601-2 <i>Firmware:</i> version 6.1</p>	<p>Data Capture <i>Sample Interval:</i> 0.125m <i>Traverse Interval:</i> 1 metre <i>Traverse Method:</i> zigzag <i>Traverse Orientation:</i> GN</p>
<p>Data Processing, Analysis and Presentation Software IntelliCAD 8.4 DW Consulting TerraSurveyor3 Manifold System 8 GIS Microsoft Corp. Office 365: Excel, Publisher, Word Adobe Systems Inc Adobe Acrobat 9 Pro Extended</p>	

Table 2: methodology information

Instrument Type:	Bartington Grad 601
Units:	nT
Direction of 1st Traverse:	0 deg
Collection Method:	ZigZag
Sensors:	2 @ 0.00 m spacing.
Dummy Value:	32702
Dimensions	
Composite Size (readings):	2400 x 210
Survey Size (meters):	150 m x 210 m
Grid Size:	30 m x 30 m
X Interval:	0.0625 m (surveyed @ 0.125 m)
Y Interval:	1 m
Stats	
Max:	57.15
Min:	-58.05
Std Dev:	3.09
Mean:	0.25
Median:	0.00
PROGRAM	
Name:	TerraSurveyor
Version:	3.0.33.6
Processes: 7	
1	Base Layer
2	Clip at 1.00 SD
3	DeStripe Median Sensors: Grids: All
4	De Stagger: Grids: All By: 0 intervals, 75.00cm
5	De Stagger: Grids: b8.xgd By: 0 intervals, -25.00cm
6	De Stagger: Grids: b4.xgd By: 0 intervals, -25.00cm
7	Interpolate: Match X & Y Doubled.

Table 3: processed data metadata

Instrument Type:	Bartington Grad 601
Units:	nT
Direction of 1st Traverse:	0 deg
Collection Method:	ZigZag
Sensors:	2 @ 0.00 m spacing.
Dummy Value:	32702
Dimensions	
Composite Size (readings):	1200 x 210
Survey Size (meters):	150 m x 210 m
Grid Size:	30 m x 30 m
X Interval:	0.125 m
Y Interval:	1 m
Stats	
Max:	3000.00
Min:	-3000.00
Std Dev:	47.25
Mean:	-0.35
Median:	-0.30
PROGRAM	
Name:	TerraSurveyor
Version:	3.0.33.6
Processes: 1	
1 Base Layer	

Table 4: minimally processed data metadata

Appendix 3 Project archive contents

A3.1 Substrata Limited archive

A full archive of this survey will be held by Substrata Limited on cloud and local hard drive storage as follows:

Report:	Adobe PDF (.pdf), Microsoft Publisher (.pub)
Raw grid data files:	DW Consulting TerraSurveyor 3 (.xgd) and CSV (.xyz)
Raw data composite files:	CSV (.xyz)
Minimally processed data composite files:	DW Consulting TerraSurveyor 3 (.xgd) and CSV (.xyz)
Final data processing composite files:	DW Consulting TerraSurveyor 3 (.xgd) and CSV (.xyz)
GIS project:	GIS project Manifold 8 (.map)
Survey interpretation:	ESRI shape files
AutoCAD version of the survey interpretation: (if generated)	AutoCAD (.dwg)
All project working files:	IntelliCAD 8.4 Microsoft Corp. Office 365: Excel, Publisher, Word Adobe Systems Inc Adobe Acrobat 9 Pro Extended

A3.2 Online Access to the Index of archaeological investigationS (OASIS)

Metadata:	online form
Georeferenced survey boundary file:	ESRI shape file
Report:	Adobe PDF (.pdf)

A3.3 Archaeological Data Service

Depending on local authority policy, an archive may be deposited with the ADS as follows:

Raw data composite file:	CSV (xyz)
Processed data plot:	rendered images in TIFF format
Survey grid plot:	image in TIFF format
Details of data processing:	image in TIFF format
Interpretation plot:	rendered images in TIFF format
Metadata:	Microsoft Excel format

A3.4 Historic Environment Record (HER)

Subject to any contractual requirements on confidentiality, a PDF copy of the report will be submitted to the appropriate HER within 6 months of the completion of this report via the OASIS process or by other means, depending on the relevant HER process.