



**magnitude
surveys**

**Geophysical Survey Report
Of**

**Proposed Quarry, Brockley Wood,
Belstead, Suffolk**

**For
Cotswold Archaeology**

Magnitude Surveys Ref: MSTM970

OASIS Number: magnitud1_422966

Parish Code: BSD 035

January 2023



magnitude surveys

Unit 17, Commerce Court

Challenge Way

Bradford

BD4 8NW

01274 926020

info@magnitudesurveys.co.uk

Report By:

Jake Dolan BSc FGS, Liz Topping BSc MSc

Report Approved By:

Finnegan Pope-Carter BSc (Hons) MSc FGS

Issue Date:

30 January 2023

Abstract

Magnitude Surveys was commissioned to assess the subsurface archaeological potential of a c. 34.35ha area of land at Proposed Quarry, Brockley Wood, Belstead, Ipswich. A fluxgate gradiometer survey was successfully completed across the survey area. The survey identified a probable prehistoric field system orientated in an orthogonal pattern. Weak linear and strong discrete anomalies may relate to this field system though it is not possible to be certain of this interpretation. Natural deposits are highlighted by anomalies relating to superficial glacial outwash. Agricultural activity has been identified, including two former field boundaries and a footpath depicted historical mapping, and linear trends caused by the modern usage of the area for potato cultivation. Several discrete and linear anomalies have been interpreted as 'Undetermined' throughout the survey area. Magnetic disturbance is mostly limited to the edges of the survey area.

Contents

Abstract.....	2
List of Figures	4
1. Introduction	5
2. Quality Assurance	5
3. Objectives.....	5
4. Geographic Background.....	6
5. Archaeological Background.....	7
6. Methodology.....	7
6.1. Data Collection	7
6.2. Data Processing	8
6.3. Data Visualisation and Interpretation	8
7. Results.....	9
7.1. Qualification	9
7.2. Discussion	9
7.3. Interpretation	10
7.3.1. General Statements	10
7.3.2. Magnetic Results - Specific Anomalies.....	11
8. Conclusions	12
9. Archiving	13
10. Copyright.....	13
11. References	13
12. Project Metadata	14
13. Document History	14

List of Figures

Figure 1:	Site Location	1:25,000 @ A4
Figure 2:	Location of Survey Areas	1:10,000 @ A4
Figure 3:	Magnetic Total Field (Lower Sensor) (Overview)	1:4,000 @ A3
Figure 4:	Magnetic Interpretation over Historical Mapping and Satellite Imagery (Overview)	1:4,000 @ A3
Figure 5:	Magnetic Gradient (Areas 3 and 4)	1:1,500 @ A3
Figure 6:	Magnetic Interpretation (Areas 3 and 4)	1:1,500 @ A3
Figure 7:	XY Trace Plot (Areas 3 and 4)	1:1,500 @ A3
Figure 8:	Magnetic Gradient (Areas 1 & 2)	1:1,500 @ A3
Figure 9:	Magnetic Interpretation (Areas 1 & 2)	1:1,500 @ A3
Figure 10:	XY Trace Plot (Areas 1 & 2)	1:1,500 @ A3
Figure 11:	Magnetic Gradient (Areas 1 & 6)	1:1,500 @ A3
Figure 12:	Magnetic Interpretation (Areas 1 & 6)	1:1,500 @ A3
Figure 13:	XY Trace Plot (Areas 1 & 6)	1:1,500 @ A3
Figure 14:	Magnetic Gradient (Areas 1, 5 & 6)	1:1,500 @ A3
Figure 15:	Magnetic Interpretation (Areas 1, 5 & 6)	1:1,500 @ A3
Figure 16:	XY Trace Plot (Areas 1, 5 & 6)	1:1,500 @ A3

1. Introduction

- 1.1. Magnitude Surveys Ltd (MS) was commissioned by Cotswold Archaeology to undertake a geophysical survey over a c. 34.35ha area of land at Proposed Quarry, Brockley Wood, Belstead, Suffolk (TM 1172 4004).
- 1.2. The geophysical survey comprised hand-carried, GNSS-positioned fluxgate gradiometer survey. Magnetic survey is the standard primary geophysical method for archaeological applications in the UK due to its ability to detect a range of different features. The technique is particularly suited for detecting fired or magnetically enhanced features, such as ditches, pits, kilns, sunken featured buildings (SFBs) and industrial activity (David *et al.*, 2008).
- 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 for Archaeologists (CifA, 2020) and the European Archaeological Council (Schmidt *et al.*, 2015).
- 1.4. It was conducted in line with a WSI produced by MS (Rigby, W., 2021).
- 1.5. The survey initially commenced on 14th June 2021 and took 5 days and recommenced on 20th October 2021 and took 1 day to complete.

2. Quality Assurance

- 2.1. Magnitude Surveys is a Registered Organisation of the Chartered Institute for Archaeologists (CifA), the chartered UK body for archaeologists, and a corporate member of ISAP (International Society for Archaeological Prospection).
- 2.2. The directors of MS are involved in cutting edge research and the development of guidance/policy. Specifically, Dr Chrys Harris has a PhD in archaeological geophysics from the University of Bradford, is a Member of CifA and is the Vice-Chair of the International Society for Archaeological Prospection (ISAP); Finnegan Pope-Carter has an MSc in archaeological geophysics and is a Fellow of the London Geological Society, as well as a member of GeoSIG (CifA Geophysics Special Interest Group); Dr Kayt Armstrong has a PhD in archaeological geophysics from Bournemouth University, is a Member of CifA, the Editor of ISAP News, and is the UK Management Committee representative for the COST Action SAGA; Dr Paul Johnson has a PhD in archaeology from the University of Southampton, is a Fellow of the Society of Antiquaries of London, has been a member of the ISAP Management Committee since 2015, and is currently the nominated representative for the EAA Archaeological Prospection Community to the board of the European Archaeological Association.
- 2.3. All MS managers, field and office staff have degree qualifications relevant to archaeology or geophysics and/or field experience.

3. Objectives

- 3.1. The objective of this geophysical survey was to assess the subsurface archaeological potential of the survey area.

4. Geographic Background

4.1. The survey area was located c. 1.25km southwest of Belstead, Suffolk (Figure 1). Gradiometer survey was undertaken across six arable fields. The A12 borders the survey area along its northern and north-western edge, while Brockley Wood borders its southern edge. Further arable fields and Charity Farm border the survey area to the northeast and east (Figure 2).

4.2. Survey considerations:

Survey Area	Ground Conditions	Further Notes
1	The field was an arable potato field consisting of deep furrows and ridges. The field sloped down gently towards the north.	The area was surrounded by woodland on all sides except the north, where it was bounded by hedgerow to the northwest and an overgrown area to the northeast.
2	The field was an arable potato field consisting of deep furrows and ridges. The field sloped down steeply towards the north.	The area was bordered to the south and east by hedgerow separating the area from Area 1, by a treeline separating the area from a small stream to the north, and by a treeline and embankment separating the area from the A12 to the west.
3	The field was an arable potato field consisting of deep furrows and ridges. The field sloped down steeply towards the south.	The area was enclosed by treelines on every side. This separated the area from Area 4 to the north, to Charity Farm to the east, to a small stream and an overgrown area to the south and to an embankment and the A12 to the west.
4	The field was an arable potato field consisting of deep furrows and ridges. The field sloped down gently towards the south.	The area was enclosed by a treeline on every side. This separated the area from further agricultural fields to the north and east, Area 3 to the south and an embankment and the A12 to the west.
5	The field was an arable field of stubble cereal crop. The field sloped gently down to the east.	The area was enclosed by treelines to the north, east and south and by a wooden fence to the west. The A12 road is located parallel to the eastern edge of the survey area. A tree was located in the northeast of the survey area.
6	The field was an arable field of stubble cereal crop. The field sloped down to the west.	The area was enclosed by treelines to the east and south and by a wooden fence to the west. The A12 road is located parallel to the eastern edge of the survey area. Tall grass was located parallel to the eastern edge of the survey area.

4.3. The underlying geology comprises Quaternary and Neogene sands and gravels of the Crag Formation. The superficial deposits within the area are quite varied and relate to Quaternary glacial outwash. Most of the survey area is covered by sands and gravels of the Lowestoft Formation, with Diamicton of the Lowestoft Formation recorded in Area 5. A band of Diamicton is located collocating with the stream that separates Areas 2 and 3. Finally, small pockets of lacustrine clays and silts are located within Area 1 (British Geological Survey, 2023).

4.4. The soils consist of freely draining, slightly acid, loamy soils across most of the survey area except the northern half of Area 4 and west of Area 5, where the soils have impeded drainage. (Soilscapes, 2023).

5. Archaeological Background

- 5.1. Awaiting background information (DBA or other) from the client.
- 5.2. A cursory search of the Ipswich HER was undertaken to help inform interpretation of the geophysical data (Heritage Gateway 2021). Cropmarks likely to relate to possible prehistoric field systems have been identified in the north-eastern corner of Area 3, which continue into fields to the east of the survey area (MSZ27319, MSF4658, MSZ27320, MSF4659).

6. Methodology

6.1. Data Collection

6.1.1. Magnetometer surveys are generally the most cost effective and suitable geophysical technique for the detection of archaeology in England. Therefore, a magnetometer survey should be the preferred geophysical technique unless its use is precluded by any specific survey objectives or the site environment. For this site, no factors precluded the recommendation of a standard magnetometer survey. Geophysical survey therefore comprised the magnetic method as described in the following section.

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

6.1.3. Table of survey strategies:

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

6.1.4. The magnetic data were collected using MS' bespoke hand-carried GNSS-positioned system.

6.1.4.1. MS' hand-carried system was comprised of Bartington Instruments Grad 13 Digital Three-Axis Gradiometers. Positional referencing was through a multi-channel, multi-constellation GNSS Smart Antenna RTK GPS outputting in NMEA mode to ensure high positional accuracy of collected measurements. The RTK GPS is accurate to 0.008m + 1ppm in the horizontal and 0.015m + 1ppm in the vertical.

6.1.4.2. Magnetic and GPS data were stored on an SD card within MS' bespoke datalogger. The datalogger was continuously synced, via an in-field Wi-Fi unit, to servers within MS' offices. This allowed for data collection, processing and visualisation to be monitored in real-time as fieldwork was ongoing.

6.1.4.3. A navigation system was integrated with the RTK GPS, which was used to guide the surveyor. Data were collected by traversing the survey area along the longest possible lines, ensuring efficient collection and processing.

6.2. Data Processing

6.2.1. Magnetic data were processed in bespoke in-house software produced by MS. Processing steps conform to the EAC and Historic England guidelines for 'minimally enhanced data' (see Section 3.8 in Schmidt *et al.*, 2015: 33 and Section IV.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, as well as the total field data from the lower sensors. The gradient of the sensors minimises external interferences and reduces the blown-out responses from ferrous and other high contrast material. However, the contrast of weak or ephemeral anomalies can be reduced through the process of calculating the gradient. Consequently, some features can be clearer in the respective gradient or total field datasets. Multiple greyscale images of the gradient and total field at different plotting ranges have been used for data interpretation. Greyscale images should be viewed alongside the XY trace plot (Figures 7, 10, 13 & 16). XY trace plots visualise the magnitude and form of the geophysical response, aiding anomaly interpretation.

6.3.2. Geophysical results have been interpreted using greyscale images and XY traces in a layered environment, overlaid against open street maps, satellite imagery, historical maps, LiDAR data, and soil and geology maps. Google Earth (2023) was also consulted, to compare the results with recent land use.

6.3.3. Geodetic position of results – All vector and raster data have been projected into OSGB36 (ESPG27700) and can be provided upon request in ESRI Shapefile (.SHP) and Geotiff (.TIF) respectively. Figures are provided with raster and vector data projected against OS Open Data.

7. Results

7.1. Qualification

7.1.1. Geophysical results 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 from further work, in order to constantly improve our knowledge and service.

7.2. Discussion

7.2.1. The geophysical results are presented in combination with satellite imagery and historical maps (Figure 4).

7.2.2. A fluxgate gradiometer survey was successfully completed across the survey area. The quality of the magnetic data collected has been affected by the current usage of the area for potato cultivation, where the deep furrows and ridges have created a streaking pattern throughout the data (Figure 3). Additionally, natural bands relating to the glacial superficial deposits of the area have also created disturbances in the magnetic background (Figures 3 and 4), as well as deposits of natural material identified in the south of the survey area at the base of the slope adjacent to the A12. Despite this, the survey has identified anomalies of archaeological and agricultural origin. Modern strong ferrous disturbance is largely limited to the field edges.

7.2.3. Anomalies of probable archaeological origins have been identified in the north of the survey area, with strong linear anomalies (typical of cut features such as ditches) forming an orthogonal pattern (Figures 5 and 6). These anomalies do not correlate with any former field boundaries known from historical OS mapping or satellite imagery, and their axis cuts across the post-medieval field layout (Figure 4). Cropmarks of a field system extending eastwards from the north east of Area 3, as mentioned above (see Section 5.2), have previously been identified outside the area subject to geophysical survey. The anomalies identified in the geophysical survey have therefore been interpreted as possible extensions of the system of cropmarks towards the north and west.

7.2.4. Weak linear anomalies in the north and south of the area, some of which share a similar orientation to the prehistoric field system, may indicate additional associated boundaries. They have been categorised as 'Possible Archaeology' to reflect a more tentative interpretation where they are particularly weak, fragmented or isolated. The 'Undetermined' category has been used for a number of linear anomalies of similar dimensions and distribution; the difference of category reflects a decreased level of

confidence as the latter are difficult to distinguish from those of potential natural or agricultural origin, but for which an archaeological origin cannot be ruled out.

- 7.2.5. A series of discrete anomalies with strong magnetic signals have been detected within the area of the possible prehistoric field system. These may relate to possible pits or similar archaeological features; however, they also align with a former footpath marked on the 2nd Edition OS map, meaning that a completely certain interpretation cannot be made.
- 7.2.6. Two former post-medieval field boundaries have also been detected and identified as such by comparison with the historical mapping (Figure 4). Evidence for more recent agriculture includes anomalies relating to the ridges and furrows of modern potato farming.
- 7.2.7. Natural geological variation has been detected, with weak amorphous bands and 'speckles' identified across the survey area. In the central part of the survey area, more pronounced, strong anomalies are probably caused by glacial outwash deposits.
- 7.2.8. Anomalies associated with the construction of the A12 road have been detected in the south of the survey area, these are made up of natural deposits and ferrous material (Figure 4). An area of magnetic disturbance, in addition to some weak anomalies of an undetermined origin within, may also be caused by the construction of the road. However, the fragmentation of these anomalies makes their interpretation uncertain, and an archaeological origin cannot be ruled out.

7.3. Interpretation

7.3.1. General Statements

- 7.3.1.1. Geophysical anomalies will be discussed broadly as classification types across the survey area. Only anomalies that are distinctive or unusual will be discussed individually.
- 7.3.1.2. **Ferrous (Spike)** – Discrete dipolar anomalies are likely to be the result of isolated pieces of modern ferrous debris on or near the ground surface.
- 7.3.1.3. **Magnetic Disturbance** – The strong anomalies produced by extant metallic structures, typically including fencing, pylons, vehicles and service pipes, have been classified as 'Magnetic Disturbance'. These magnetic 'haloes' will obscure weaker anomalies relating to nearby features, should they be present, often over a greater footprint than the structure causing them.
- 7.3.1.4. **Undetermined** – Anomalies are classified as Undetermined when the origin of the geophysical anomaly is ambiguous and there is no supporting contextual evidence to justify 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 distinct from those caused by ferrous sources.

7.3.2. Magnetic Results - Specific Anomalies

- 7.3.2.1. **Archaeology Probable (Strong and Weak)** – A series of linear anomalies [3a, 4a] have been identified running throughout Areas 3 and 4 (Figures 5 and 6). These anomalies are aligned in an orthogonal pattern, abutting or intersecting each other at 90-degree angles. The grouping of these anomalies suggests a series of rectilinear ditched enclosures or a field system. No such system is identifiable on this axis on the available historical mapping. However, as previously noted (Section 7.2.3), the features may form an extension to those known from cropmarks in adjacent fields to the east.
- 7.3.2.2. **Archaeology Possible (Strong)** – Several strong, discrete anomalies [4b] have been identified within and in close proximity to the previously identified possible prehistoric field system [3a, 4a] (Figures 5 and 6). These anomalies are roughly aligned in a straight north-south line and may represent pits within the field system. However, these anomalies also correlate with the line of a former footpath depicted on historical mapping and may be associated with this later feature [4d] (Figure 4).
- 7.3.2.3. **Archaeology Possible (Weak)** – Weak linear anomalies with a similar orientation to the field system of [3a] and [4a] have been identified to the south of Area 4 [4c], and southwest of Area 1 [1a] (Figures 6 and 9). Though these anomalies have a similar orientation to the field system towards the north of the survey their signal is much weaker, and sometimes with a negative signal [1a].
- 7.3.2.4. **Natural (Strong)** – Several large, amorphous anomalies [3b] have been identified in Area 3 (Figures 5 and 6). These anomalies do not have a typically ferrous signal but are still magnetically enhanced and run directly perpendicular to the slope of the field. These anomalies probably relate to the glacial superficial deposits in the area, likely being an outwash feature.
- 7.3.2.5. **Natural (Strong)** – Multiple discrete anomalies have been detected in the southwest and centre of Area 6 (Figure 11, 12, 14 and 15). This area lies directly to the west of the A12 road and at the base of a slope (Section 4.2), and could be related to the collection of sediments washing down the hill.
- 7.3.2.6. **Agricultural (Strong and Weak)** – A line of magnetic disturbance [3c] has been identified in the western half of Area 3, which collocates with a former field boundary found on historical mapping (Figures 3 and 4). Another linear anomaly, detected in Area 5 (Figures 14 and 15) is identified on historical mapping (Figure 4) as a former field boundary, with a possible unmapped extension to the southeast. A third linear anomaly runs on a north-south orientation through the centre of Area 4 [4d]. This anomaly collocates with a former footpath on 2nd Edition mapping, making it distinct from the other anomalies of similar signal strength that relate to the probable prehistoric field system.

8. Conclusions

- 8.1. A fluxgate gradiometer survey has successfully been completed across the survey area. Despite the magnetic data being affected by disturbance from potato cultivation and glacial superficial deposits, the geophysical survey has detected a range of anomalies of probable and possible archaeological, agricultural, natural and undetermined origin. Limited magnetic disturbance within the survey area is predominantly confined to noise from field edges which has aided in the interpretation of archaeological anomalies.
- 8.2. Linear anomalies of probable archaeological origin have been identified in the north of the survey area orientated in an orthogonal pattern which did not correlate with former field boundaries or features on historical mapping. These anomalies likely relate to other prehistoric field systems found in an Ipswich HER search of nearby fields.
- 8.3. Possible archaeological linear and discrete anomalies have been identified in the north and the south of the survey area that may correlate with the anomalies that form the prehistoric field system, however their differing signal and locations mean that a certain interpretation cannot be made.
- 8.4. Agricultural activity has been interpreted with two former field boundary and footpath identified on 2nd Edition OS Mapping, and agricultural trends associated with modern potato cultivation.
- 8.5. Natural anomalies have been identified across the survey area and are likely related to the underlying superficial glacial outwash deposits, and to the movements of sediments across the topography.
- 8.6. Anomalies of an undetermined origin have been identified across the survey area. A more conclusive classification cannot be provided from the geophysical data alone, due to the lack of any further diagnostic supportive evidence. Whilst these anomalies are likely to have a modern or agricultural origin, an archaeological origin cannot be ruled out.

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 reports to the ADS Grey Literature Library upon permission from the client, subject to any dictated time embargoes.

10. Copyright

- 10.1. Copyright and 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

- British Geological Survey, 2023. Geology of Britain. Ipswich/Suffolk.
[<http://mapapps.bgs.ac.uk/geologyofbritain/home.html/>]. Accessed 22/06/2023.
- Chartered Institute for Archaeologists, 2020. Standards and guidance for archaeological geophysical survey. ClfA.
- David, A., Linford, N., Linford, P. and Martin, L., 2008. Geophysical survey in archaeological field evaluation: research and professional services guidelines (2nd edition). Historic England.
- Google Earth, 2023. Google Earth Pro V 7.1.7.2606.
- Heritage Gateway, 2021. Ipswich/Suffolk
[https://www.heritagegateway.org.uk/gateway/advanced_search.aspx]. Accessed 22/06/2021
- Olsen, N., Toffner-Clausen, L., Sabaka, T.J., Brauer, P., Merayo, J.M.G., Jorgensen, J.L., Leger, J.M., Nielsen, O.V., Primdahl, F., and Risbo, T., 2003. Calibration of the Orsted vector magnetometer. Earth Planets Space 55: 11-18.
- Rigby, W., 2021. Written Scheme of Investigation for a Geophysical Survey of Quarry Brockley Wood, Belstead, Suffolk. Mag Ref: MSTM970.
- Schmidt, A. and Ernenwein, E., 2013. Guide to good practice: geophysical data in archaeology (2nd edition). Oxbow Books: Oxford.
- Schmidt, A., Linford, P., Linford, N., David, A., Gaffney, C., Sarris, A. and Fassbinder, J., 2015. Guidelines for the use of geophysics in archaeology: questions to ask and points to consider. EAC Guidelines 2. European Archaeological Council: Belgium.
- Soilscapes, 2023. Ipswich, Suffolk. Cranfield University, National Soil Resources Institute.
[<http://landis.org.uk>]. Accessed 22/06/2023.

12. Project Metadata

MS Job Code	MSTM970
Project Name	Quarry Brockley Wood, Belstead
Client	Cotswold Archaeology
Grid Reference	TM 1172 4004
Survey Techniques	Magnetometry
Survey Size (ha)	34.35ha (Magnetometry)
Survey Dates	2021-06-14 to 2021-10-20
Project Lead	William Rigby BA MA PCifA
Project Officer	William Rigby BA MA PCifA
HER Event No	BSD 035
OASIS No	magnitud1_422966
S42 Licence No	N/A
Report Version	1.0

13. Document History

Version	Comments	Author	Checked By	Date
0.1	Initial draft for Project Lead to Review	JD	LS	23 June 2021
0.2	Corrections from Project Lead	JD	LS	24 June 2021
0.3	Draft for Director Approval	JD, RL	WR	28 June 2021
0.4	Additional Areas added to report, draft for Director approval	LT	FPC	29 October 2021
1.0	Report issued as Final	AL	AL	30 January 2023



MSTM970 - Proposed Quarry, Brockley Wood, Belstead, Suffolk

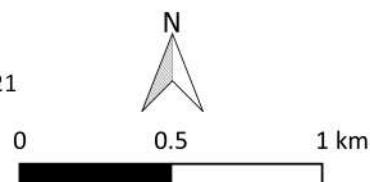
Figure 1 - Site Location

1:25,000 @ A4

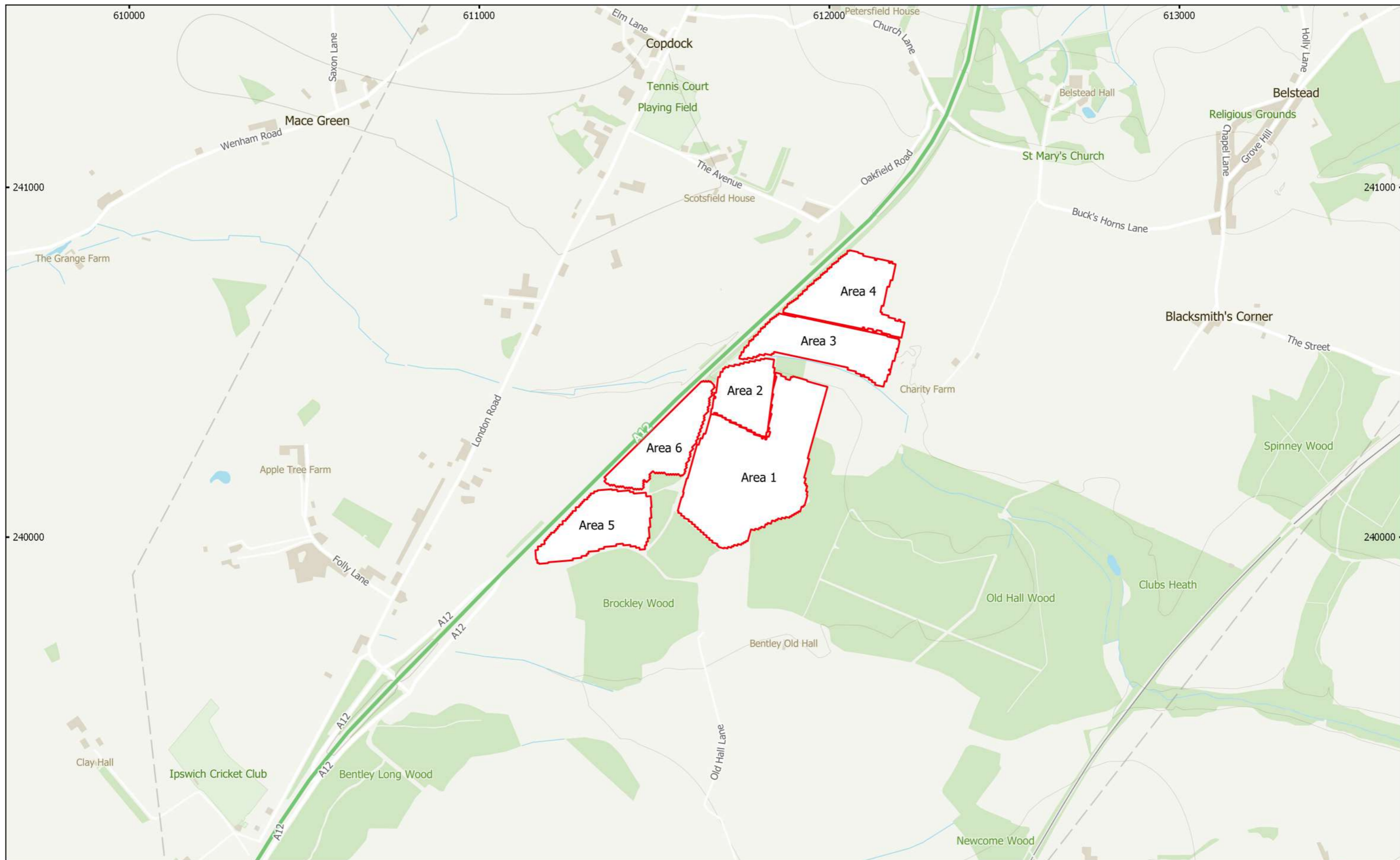
Copyright Magnitude Surveys Ltd 2021

Contains Ordnance Survey data © Crown Copyright and database right 2021


 Site Boundary

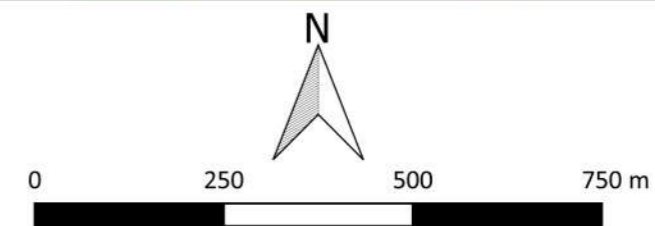


**magnitude
surveys**



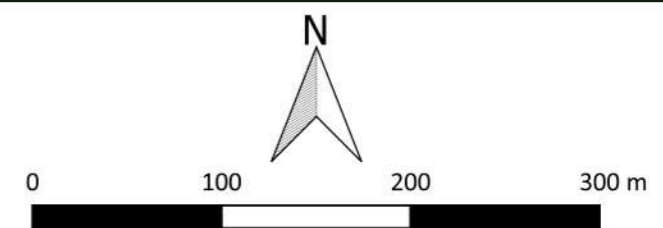
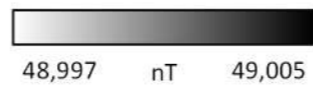
MSTM970 - Proposed Quarry, Brockley Wood, Belstead, Suffolk
 Figure 2 - Location of Survey Areas
 1:10,000 @ A3
 Copyright Magnitude Surveys Ltd 2021
 Contains Ordnance Survey data © Crown Copyright and database right 2021

 Survey Extent





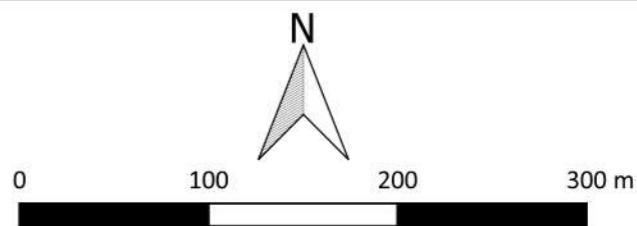
MSTM970 - Proposed Quarry, Brockley Wood, Belstead, Suffolk
 Figure 3 - Magnetic Total Field (Lower Sensor) (Overview)
 1:4,000 @ A3
 Copyright Magnitude Surveys Ltd 2021
 Contains Ordnance Survey data © Crown Copyright and database right 2021





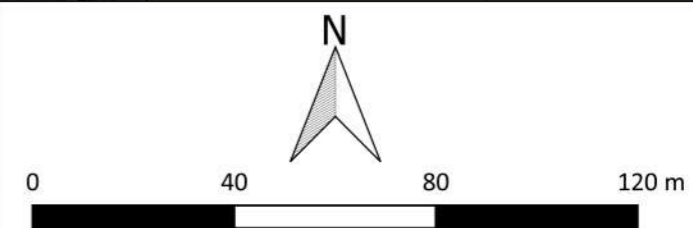
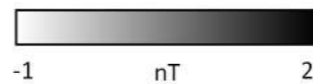
MSTM970 - Proposed Quarry, Brockley Wood, Belstead, Suffolk
 Figure 4 - Magnetic Interpretation Over Historical Maps and Satellite Imagery (Overview)
 1:4,000 @ A3
 Copyright Magnitude Surveys Ltd 2021
 Contains Ordnance Survey data © Crown Copyright and database right 2021

- | | | |
|-------------------------------|----------------------|-------------------------|
| Archaeology Probable (Strong) | Agricultural (Weak) | Ferrous/Debris (Spread) |
| Archaeology Probable (Weak) | Natural (Strong) | Undetermined (Strong) |
| Archaeology Possible (Strong) | Natural (Weak) | Undetermined (Weak) |
| Archaeology Possible (Weak) | Natural (Zone) | Agricultural (Trend) |
| Agricultural (Strong) | Magnetic Disturbance | Ferrous (Spike) |





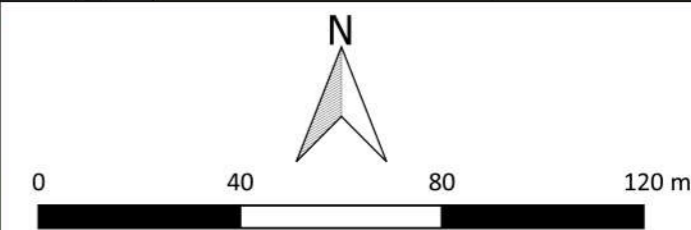
MSTM970 - Proposed Quarry, Brockley Wood, Belstead, Suffolk
 Figure 5 - Magnetic Gradient (Areas 3 & 4)
 1:1,500 @ A3
 Copyright Magnitude Surveys Ltd 2021
 Contains Ordnance Survey data © Crown Copyright and database right 2021

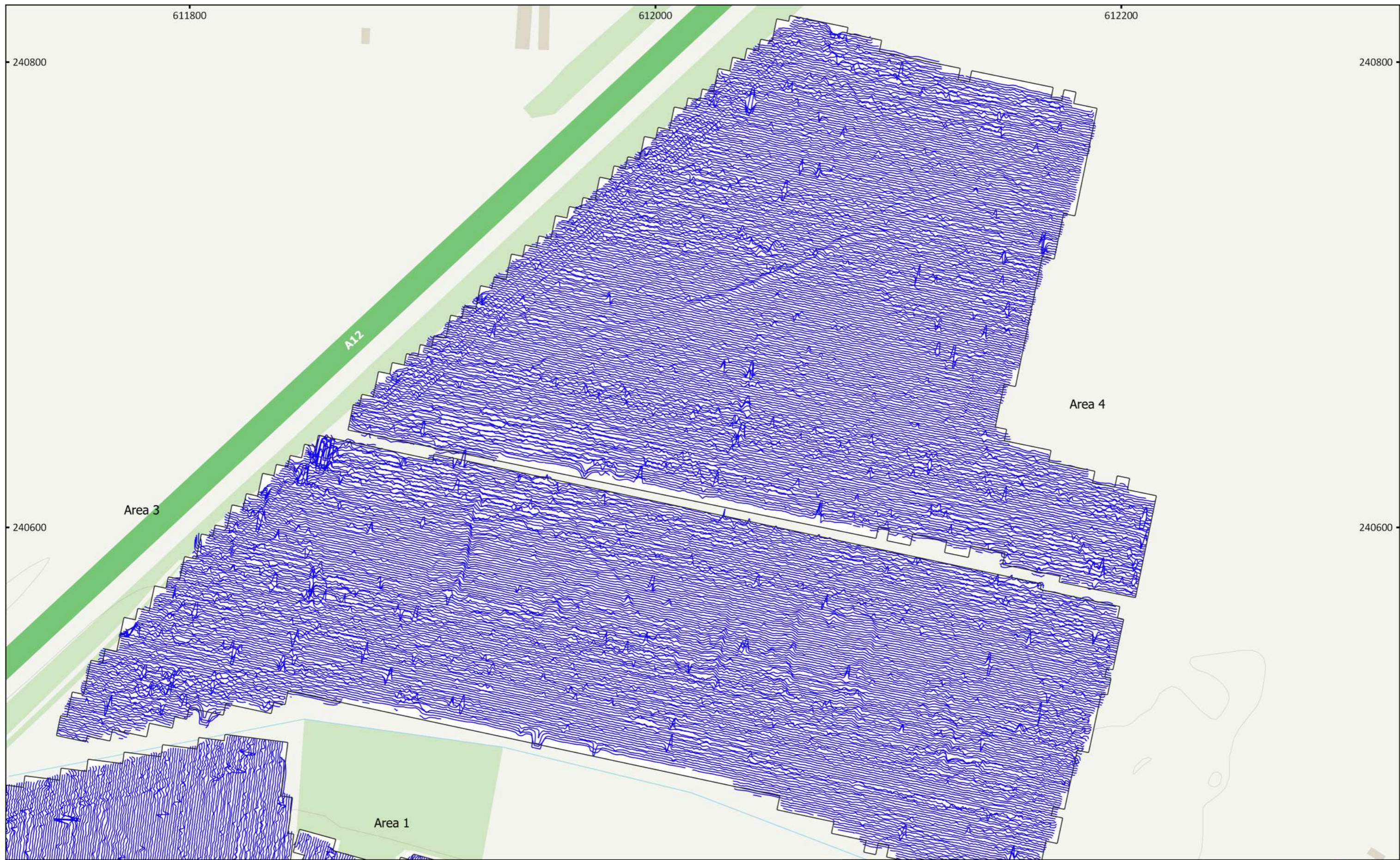




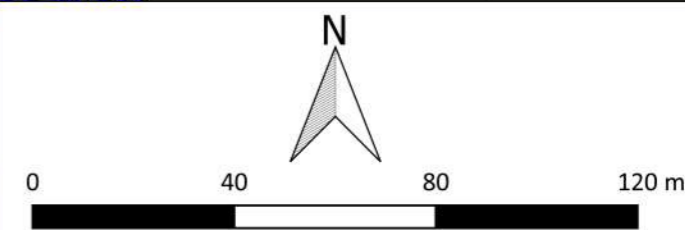
MSTM970 - Proposed Quarry, Brockley Wood, Belstead, Suffolk
 Figure 6 - Magnetic Interpretation (Areas 3 & 4)
 1:1,500 @ A3
 Copyright Magnitude Surveys Ltd 2021
 Contains Ordnance Survey data © Crown Copyright and database right 2021

- | | |
|--|---|
| ■ Archaeology Probable (Strong) | ■ Natural (Weak) |
| ■ Archaeology Probable (Weak) | ■ Natural (Zone) |
| ■ Archaeology Possible (Strong) | ■ Magnetic Disturbance |
| ■ Archaeology Possible (Weak) | ■ Undetermined (Weak) |
| ■ Agricultural (Strong) | — Agricultural (Trend) |
| ■ Agricultural (Weak) | • Ferrous (Spike) |
| ■ Natural (Strong) | |



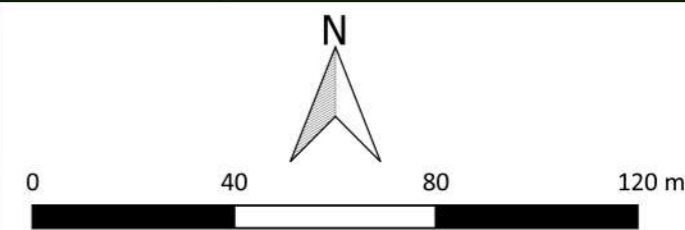
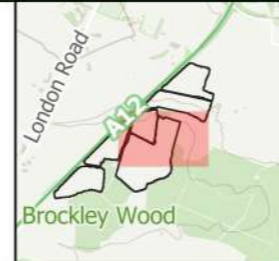
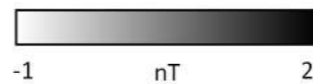


MSTM970 - Proposed Quarry, Brockley Wood, Belstead, Suffolk
 Figure 7 - XY Trace Plot (Areas 3 & 4)
 30nT/cm at 1:1,500 @ A3
 Copyright Magnitude Surveys Ltd 2021
 Contains Ordnance Survey data © Crown Copyright and database right 2021





MSTM970 - Proposed Quarry, Brockley Wood, Belstead, Suffolk
 Figure 8 - Magnetic Gradient (Areas 1 & 2)
 1:1,500 @ A3
 Copyright Magnitude Surveys Ltd 2021
 Contains Ordnance Survey data © Crown Copyright and database right 2021





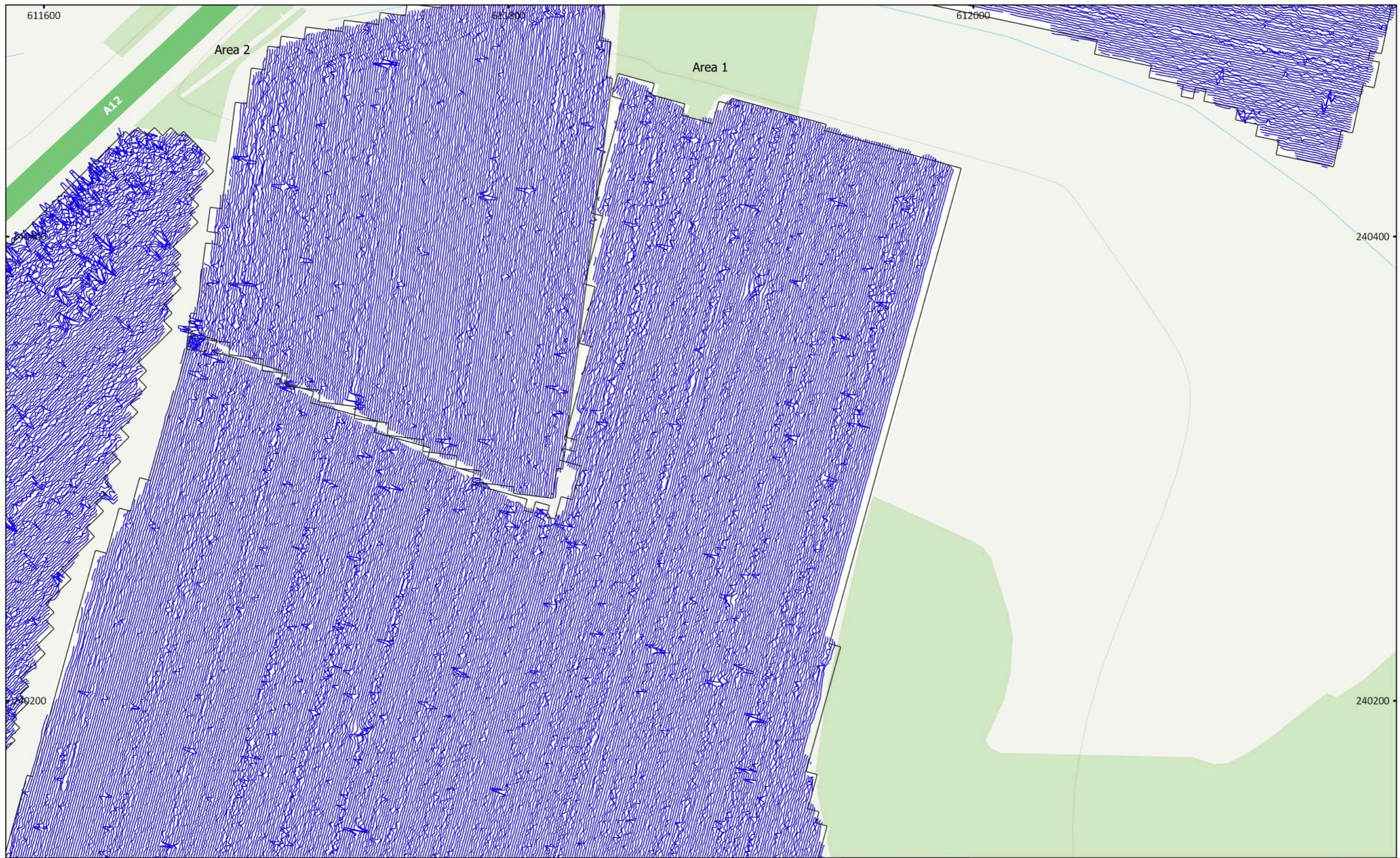
MSTM970 - Proposed Quarry, Brockley Wood, Belstead, Suffolk
 Figure 9 - Magnetic Interpretation (Areas 1 & 2)
 1:1,500 @ A3
 Copyright Magnitude Surveys Ltd 2021
 Contains Ordnance Survey data © Crown Copyright and database right 2021

- | | | | |
|-------------------|-----------------------------|-------------------|-------------------------|
| Orange line | Archaeology Possible (Weak) | Dotted green area | Ferrous/Debris (Spread) |
| Dark green shape | Natural (Strong) | Dark blue shape | Undetermined (Strong) |
| Light green shape | Natural (Weak) | Light blue shape | Undetermined (Weak) |
| Dotted green area | Natural (Zone) | Thin brown line | Agricultural (Trend) |
| Grey shape | Magnetic Disturbance | Small grey dot | Ferrous (Spike) |

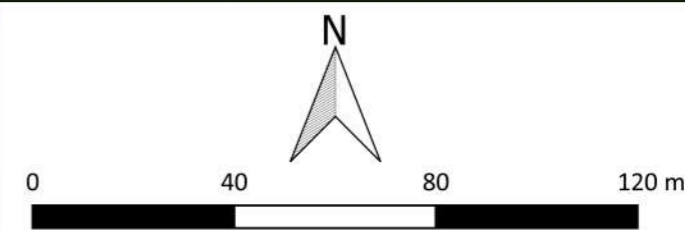
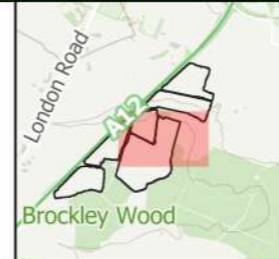


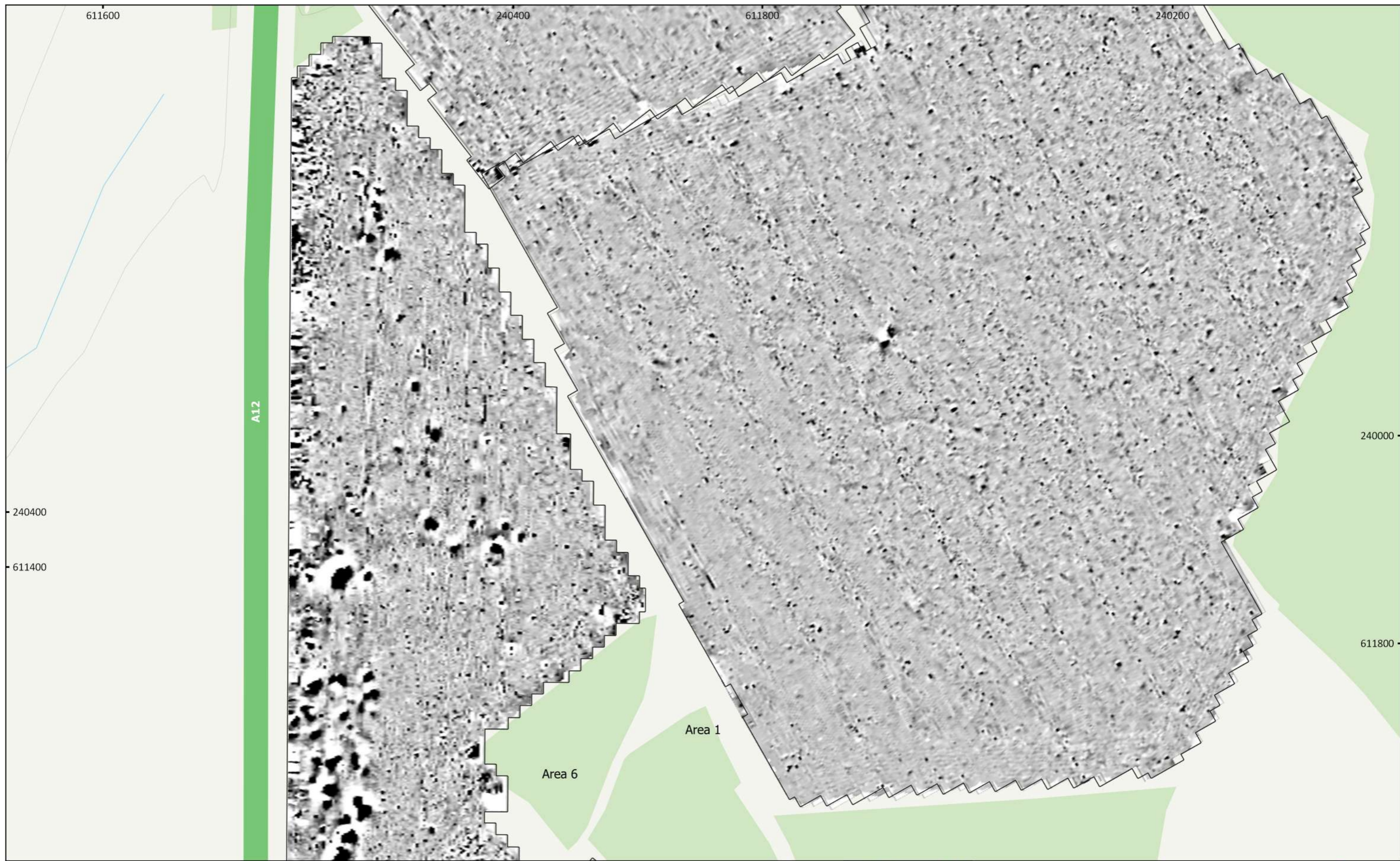
0 40 80 120 m

magnitude surveys

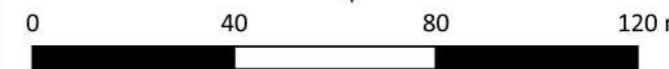
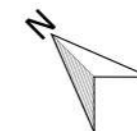
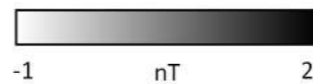


MSTM970 - Proposed Quarry, Brockley Wood, Belstead, Suffolk
 Figure 10 - XY Trace Plot (Areas 1 & 2)
 30nT/cm at 1:1,500 @ A3
 Copyright Magnitude Surveys Ltd 2021
 Contains Ordnance Survey data © Crown Copyright and database right 2021





MSTM970 - Proposed Quarry, Brockley Wood, Belstead, Suffolk
 Figure 11 - Magnetic Gradient (Areas 1 & 6)
 1:1,500 @ A3
 Copyright Magnitude Surveys Ltd 2021
 Contains Ordnance Survey data © Crown Copyright and database right 2021



magnitude
surveys

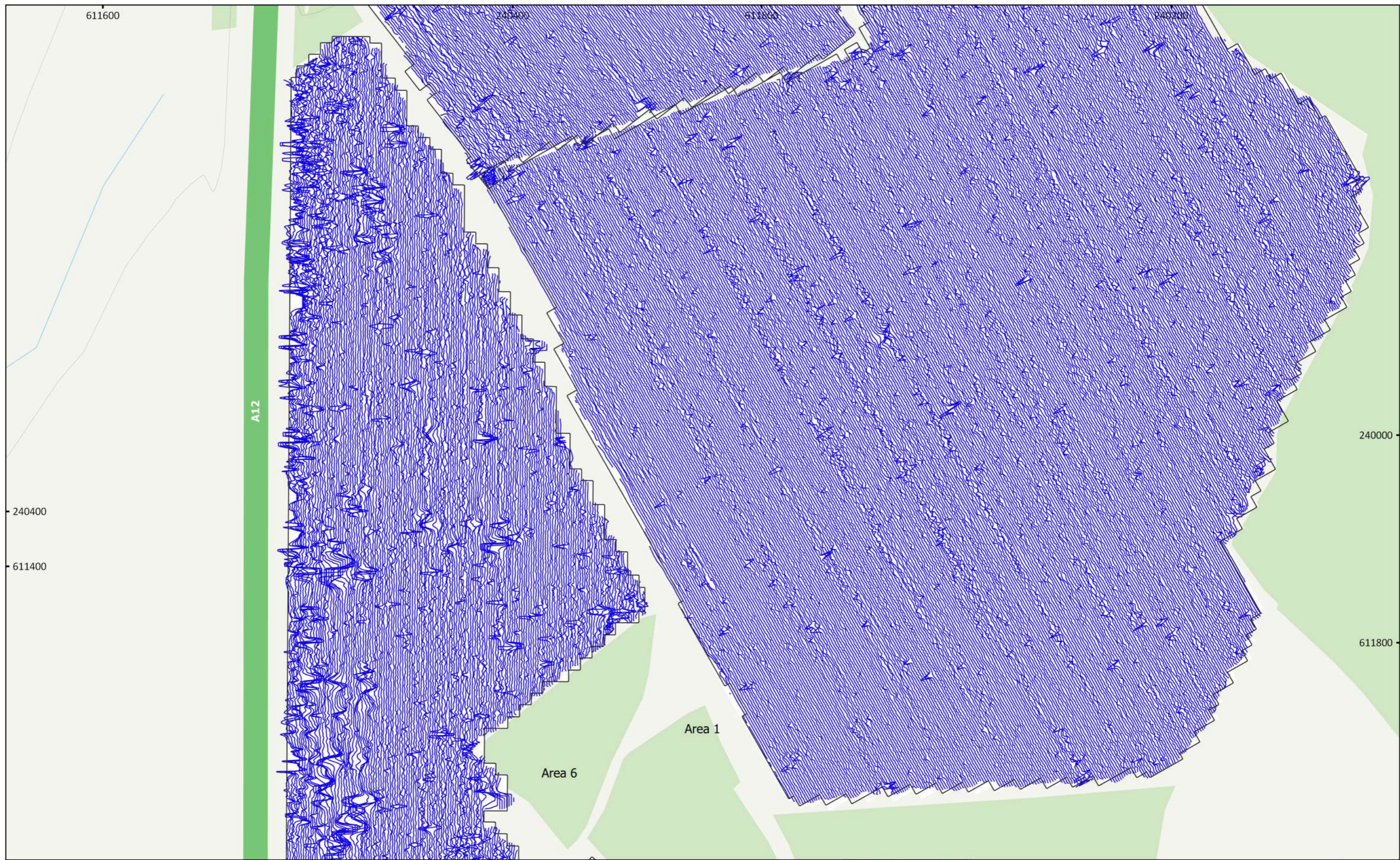


MSTM970 - Proposed Quarry, Brockley Wood, Belstead, Suffolk
 Figure 12 - Magnetic Interpretation (Areas 1 & 6)
 1:1,500 @ A3
 Copyright Magnitude Surveys Ltd 2021
 Contains Ordnance Survey data © Crown Copyright and database right 2021

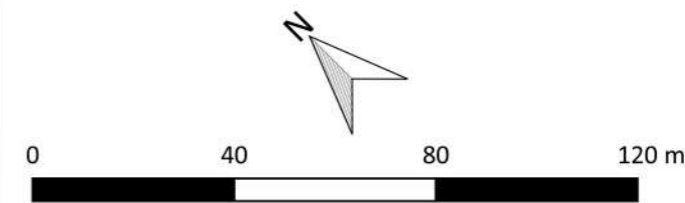
- | | |
|--|--|
| <ul style="list-style-type: none"> — Archaeology Possible (Weak) — Natural (Strong) — Natural (Weak) ••• Natural (Zone) — Magnetic Disturbance | <ul style="list-style-type: none"> ••• Ferrous/Debris (Spread) — Undetermined (Strong) — Undetermined (Weak) — Agricultural (Trend) • Ferrous (Spike) |
|--|--|



**magnitude
surveys**

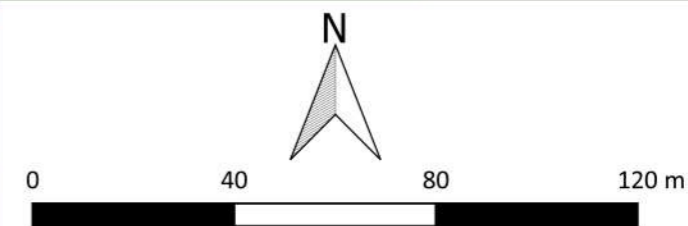
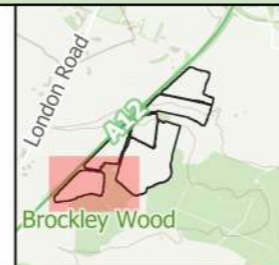


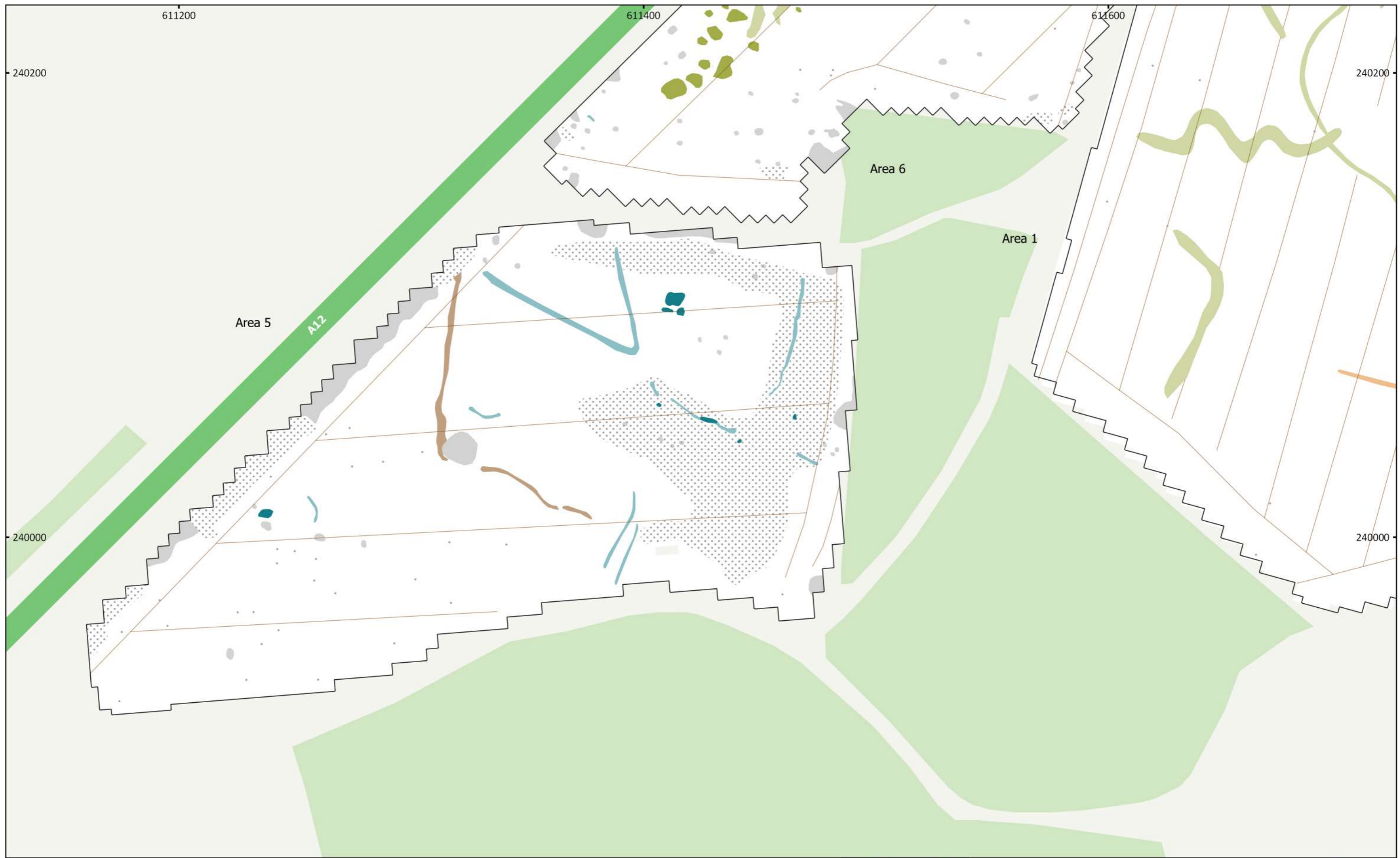
MSTM970 - Proposed Quarry, Brockley Wood, Belstead, Suffolk
 Figure 13 - XY Trace Plot (Areas 1 & 6)
 30nT/cm at 1:1,500 @ A3
 Copyright Magnitude Surveys Ltd 2021
 Contains Ordnance Survey data © Crown Copyright and database right 2021





MSTM970 - Proposed Quarry, Brockley Wood, Belstead, Suffolk
 Figure 14 - Magnetic Gradient (Areas 1, 5 & 6)
 1:1,500 @ A3
 Copyright Magnitude Surveys Ltd 2021
 Contains Ordnance Survey data © Crown Copyright and database right 2021



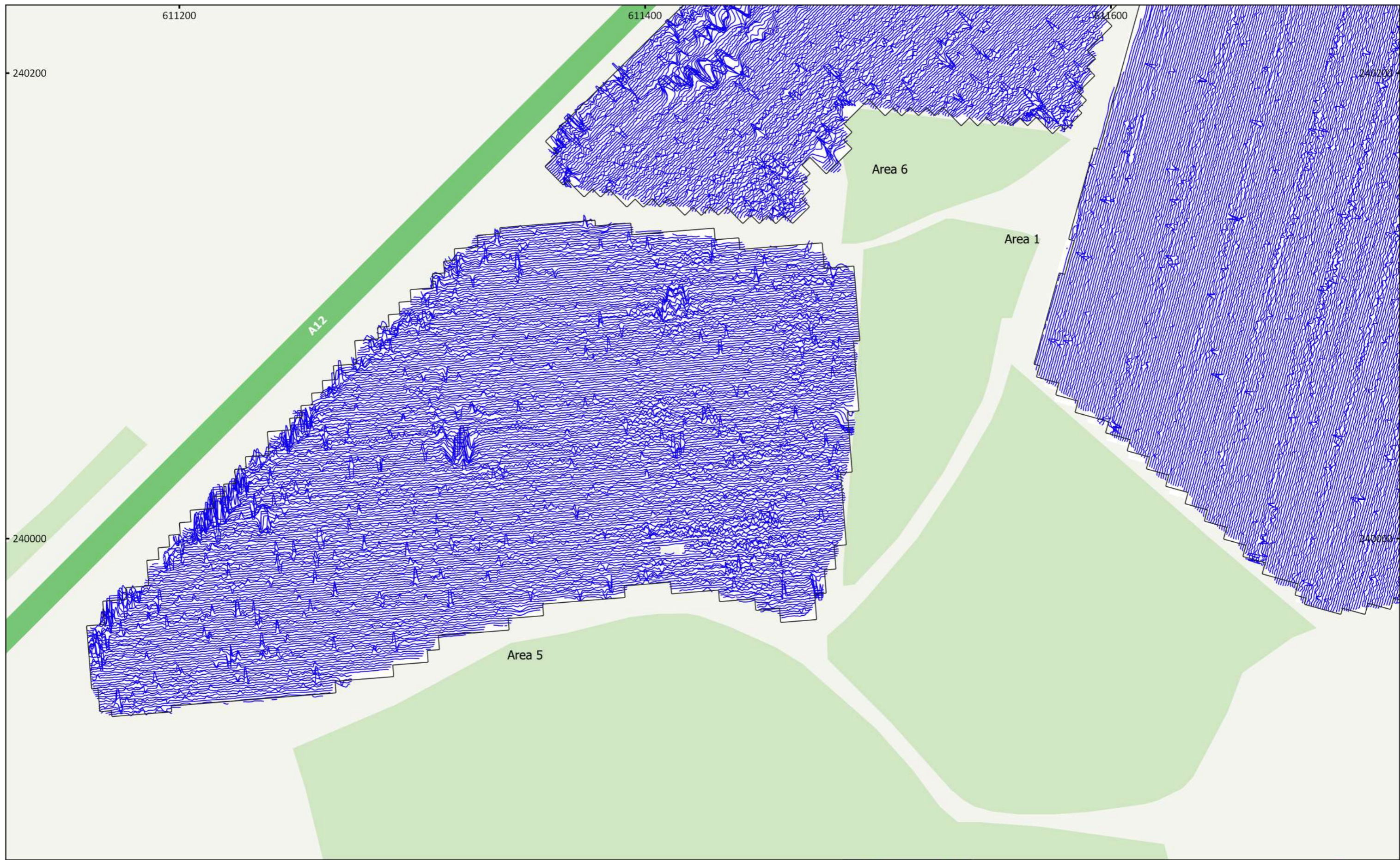


MSTM970 - Proposed Quarry, Brockley Wood, Belstead, Suffolk
 Figure 15 - Magnetic Interpretation (Areas 1, 5 & 6)
 1:1,500 @ A3
 Copyright Magnitude Surveys Ltd 2021
 Contains Ordnance Survey data © Crown Copyright and database right 2021

- | | |
|--|---|
| <ul style="list-style-type: none"> — Archaeology Possible (Weak) — Agricultural (Weak) — Natural (Strong) — Natural (Weak) — Magnetic Disturbance | <ul style="list-style-type: none"> Ferrous/Debris (Spread) Undetermined (Strong) Undetermined (Weak) Agricultural (Trend) • Ferrous (Spike) |
|--|---|



**magnitude
surveys**



MSTM970 - Proposed Quarry, Brockley Wood, Belstead, Suffolk
 Figure 16 - XY Trace Plot (Areas 1, 5 & 6)
 30nT/cm at 1:1,500 @ A3
 Copyright Magnitude Surveys Ltd 2021
 Contains Ordnance Survey data © Crown Copyright and database right 2021

