



**magnitude
surveys**

**Geophysical Survey Report
of
Land at Grazeley**

**For
Orion Heritage**

**On Behalf Of
Hallam Land Management
And
Wilson Enterprises**

Magnitude Surveys Ref: MSSU211

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Abstract

Magnitude Surveys was commissioned to assess the subsurface archaeological potential of a c. 237ha area of land surrounding the village of Grazeley, Berkshire. A fluxgate gradiometer survey was successfully completed across most of the site. Several small areas were inaccessible or unsuitable for survey. Anomalies classified as archaeological origin have been identified through the centre of the site. Croft and toft settlement features have been identified in the west of the site with characteristic narrow land parcels. Similar types of features have been identified elsewhere and are also considered to represent historic agricultural activity. Overall, the geophysical results primarily reflect agricultural activity, with former field boundaries, ploughing regimes, and drainage networks identified. A former brickwork has been identified in the south-west. Anomalies of a natural origin are evident throughout the site, particularly through the east—following the banks of Foudry Brook.

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1. Introduction

- 1.1. Magnitude Surveys Ltd (MS) was commissioned by Orion Heritage on behalf of Hallam Land Management and Wilson Enterprises to undertake a geophysical survey on a c.237ha area of land off Mortimer Road, Grazeley, Berkshire (SU 69810 66670).
- 1.2. The geophysical survey comprised hand-pulled and quad-towed, cart-mounted fluxgate gradiometer survey.
- 1.3. The survey was conducted in line with the current best practice guidelines produced by Historic England (David et al., 2008), the Chartered Institute for Archaeologists (CIfA, 2014) and the European Archaeological Council (Schmidt et al., 2015).
- 1.4. The survey was undertaken in several tranches between 21 November 2017 and 02 May 2018 on the basis of crop stages and ground conditions.

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 of Archaeological Prospection).
- 2.2. Director Graeme Attwood is a Member of CIfA, as well as the Secretary of GeoSIG, the CIfA Geophysics Special Interest Group. Director Finnegan Pope-Carter is a Fellow of the London Geological Society, the chartered UK body for geophysicists and geologists, as well as a member of GeoSIG, the CIfA Geophysics Special Interest Group. Director Chrys Harris has a PhD in archaeological geophysics from the University of Bradford and is the Vice-Chair of the International Society for Archaeological Prospection.
- 2.3. All MS managers have relevant degree qualifications to archaeology or geophysics. All MS field and office staff have relevant archaeology or geophysics degrees and/or field experience.

3. Objectives

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

4. Geographic Background

4.1. The site surrounds the village of Grazeley which is located c.6.8km south of Reading in the county of Berkshire (Figure 1). Survey was undertaken across a mixture of arable and pasture fields. The site is bounded by the A33 in the east, a railway line crosses the site in the west, and further fields bound the north and south. Lambwood Hill passes through the middle of the site, while Pump lane extends through the western half, and two small unnamed roads cross through the south east. Foudry Brook passes through the eastern half of the site (Figure 2).

4.2. Survey considerations:

Survey Area	Ground Conditions	Further Notes
1	Arable field covered in young winter wheat crop with flat topography.	The area was bounded by hedgerows. A slightly raised trackway was present in the southwest corner.
2	Arable field covered in young winter wheat crop with flat topography. Ground conditions were fairly muddy at the time of survey.	The area was bounded by hedgerows, and a metal fence in the southeast.
3	Debris.	Unsurveyable due to spread of debris across the area.
4	Arable field covered in young winter wheat crop with flat topography. Ground conditions were fairly muddy at the time of survey.	The area was bounded by hedgerows.
5	Arable field covered in young winter wheat crop with flat topography. Ground conditions were fairly muddy at the time of survey. To the southwest was a section of flat pasture land.	The area was bounded by hedgerows. The southwest pasture area of the site was crossed by large muddy tractor track in its southwest corner.
6	Arable field covered in young winter wheat crop with flat topography.	A stream bounded the eastern edge of the area, hedgerows bounded the north and northwest. A wire fence lined the southern extent. Trees and a ditched boundary bordered the west.
7	Pasture field with flat topography, a large section to the west was waterlogged at the time of survey. A ditch extends west from the eastern boundary.	A wire fence bounded the east, hedgerows bounded the west, and a ditched boundary lined the north. The southern survey extent backed onto a working industrial yard.
8	Paddocks.	Contained horses which could not be moved. Not surveyed.
9	Arable field covered in a young winter wheat crop with flat topography.	Wire fences bounded the area in the east and west, hedgerows bounded the north and south, a ditch also rang along the northern boundary. A row of telegraph poles extended across the

		southern half of the area SW-NE then continued north along the eastern boundary. A line of trees in the eastern half of the area precluded survey.
10	Arable field covered in a young rapeseed crop, mostly flat with a slight slope in the east down from north to south.	A stream bounded the field along the western boundary, wooden fences bounded the south and east, and a ditch bounded the north. A public footpath crossed the centre of the field NW-SE. Two pillboxes were present on the western boundary one in the north and one central. A telegraph line crossed the northwest corner of the site NE-SW, and a service marker was present central to the eastern boundary.
11	Arable field covered in a winter wheat crop with flat topography. A boggy patch of land was present central to the western boundary.	Hedgerows bounded the area to the north, south, east and west. The southwest corner was bounded by a high metal fence surrounding a school grounds. Some items discarded through fly tipping were evident on the northwest boundary. A telegraph line ran NE-SW along the western half of the field
12	Private garden.	Unsurveyable – Access through private housing.
13	Private garden.	Unsurveyable – Access through private housing.
14	Flat, arable field covered in a young rapeseed crop, some patches of land in the east were bare of crop and had slightly rougher ground conditions.	A metal fence bounded the south, hedgerows bounded the east and west, and ditch boundary lined by hedgerow bounded the north. Telegraph poles crossed the area centrally from east to west, with one extending north from the centre.
15	Private garden.	Unsurveyable – Access through private housing.
16	Flat, arable field covered in a young rapeseed crop to the north, and a taller rapeseed crop to the south.	Hedgerows bounded the area to north, east and west, and a ditched boundary and hedgerow lined the south. A row of telegraph poles crossed the area E-W in the northern half of the field.
17	A meadow with flat topography.	This area was entirely surrounded by hedgerows. Powerlines ran along the western and northern boundaries.
18	Pasture field with a flat topography. Deep tractor ruts in the northern half of the field prevented small areas from being surveyed.	Hedgerows bounded the south, east and west. A wire fence bounded the north.
19	Arable field covered in a winter wheat crop. The field was fairly muddy at the time of survey with flat topography.	Wire fencing bounded the west, a mixture of wire fencing and hedgerows bounded the north, hedgerows bounded the south and east. A pylon was located the southwest of the area and the powerlines extended N-S.
20	Arable field covered in a young rapeseed crop with flat topography.	Hedgerows bounded the area to the south, west, southeast and northeast. Part of the eastern boundary backed onto gardens of houses from Mortimer Road. A ditched boundary bordered the north.
21		Unsurveyable – Rough vegetation and trees cover the area.

22	Arable field covered in a winter wheat crop. A gentle slope upwards from south to north. Some wet patches of the ground in the south of the area, and in the northwest corner.	Wire fences bounded the area in the north and west, hedgerows bounded the south and east. A pylon was located central to the western half of the field and powerlines extended north and south from this.
23	Pasture field with a gentle slope upwards from south to north. A deeply rutted area in the northeast prevented a small section of survey.	Wire fences bounded the area in east and the northeast corner, hedgerows bounded the north, south and west.
24	Pasture field with a gentle slope upwards from south to north. A pond occupied the centre of the field.	Hedgerows bounded the area to the north, south and northeast. A wire fence was present in the southeast and a chain link fence bounded the west. A small brick circular structure north of the pond may have been a former well. A pylon and a radio mast were present along the northern boundary, the powerlines ran N-S. To the southeast piles of gravel prevented a small amount of survey.
25	Arable field covered in young winter wheat crop with flat topography. Patches of mud in the southeast and southwest prevented survey.	The area was bounded by hedgerows, on the northern edge wire fencing was also present, in the east the hedgerow contained scattered debris and some wire fencing. A row of telegraph poles crossed the eastern half of the area SW-NE.
26	Arable field covered in young winter wheat crop with flat topography. The northern and southern edge of the field were waterlogged at the time of survey.	Hedgerows lined with wire fences bounded the area
27	Private garden.	Unsurveyable – Access through private housing.
28	Arable field covered in a winter wheat crop with flat topography.	Garden fences lined the western boundaries, with a farm track to the north, hedgerows in the east, and a mix of hedgerows and open field in the south. Three telegraph poles run N-S central to the north of the area.
29	Arable field covered in a winter wheat crop with flat topography.	Hedgerows bounded the area to the south, east and west, the northern edge was open into Area 28.
30	Arable field covered in young winter wheat crop with flat topography.	Hedgerows bounded the area to the south, east and west, a wire fence was present on the northern edge. A row of telegraph poles crossed the western half of the area SW-NE.
31	Arable field recently harvested with flat topography. Very muddy field with patches completely waterlogged.	Electric fences bounded the area, and one internal electric fence split the field in the east. A short ditch extended south from the northern boundary which was surveyed around.
32	Arable field recently rolled, flat in the east, with a slope up from north to south in the	Bounded to the north by a banked ditch, woodland to the east, a combination of

	southwest. A small area incentral to the southern boundary could not be surveyed due to extremely	hedgerows and wooden fencing to the south, and a hedgerow to the west.
33	Overgrown.	Unsurveyable – Access over a stream.
34	Pasture field, with flat topography. Some boggy areas were present in the south and east.	Surrounded by electric fences.

- 4.3. The underlying geology comprises London clay formation – clay, silt and sand across the site. A large proportion of the site has no superficial deposits recorded (Areas 18, 23, 22, 24, 20, 26, 25, 27, 34, 33 and large portions of Areas 9, 10, 16, 30, 31, 32 and the western half of 28). Superficial deposits in Areas 17, 19, 1,2,3,4,14, 15, 29, 7 comprise river terrace deposits – sand and gravel, as does the majority of Area 11, the western edges of Areas 9 and 10, the eastern edge of 28, 30, 31, 32 and 16. A thin vein of Alluvium – clay, silt, sand and gravel covers Area 5, 6 and the northern tip of 11. (British Geological Survey, 2018).
- 4.4. The soils consist slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils in the north and west, and slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils in the south and east (Soilscapes, 2018).

5. Archaeological Background

- 5.1. The following section provides a brief archaeological background of the site and its vicinity from a desk-based assessment produced by CgMs Consulting (2015).
- 5.2. There is little evidence for Palaeolithic activity in the area beyond a single flint flake recorded at Diddenham Manor Farm. The primary evidence for Mesolithic and Neolithic activity is derived from flint assemblage and lithic remains to the north of site.
- 5.3. Hartley Court Farm also has recorded evidence of Late Bronze Age settlement and field systems; a flint scatter directly north of this may indicate either a second settlement or a continuation of the first. Settlement activity was also revealed in a large-scale investigation at Green Park. Two further settlements, one west of the northern end of site (MWB6475-6494), and one c.400m northwest of the site (MWB3046&3047) have been dated to the Late Bronze Age. A Bronze Age ring ditch, pottery and flint artefacts have all been record in the same area (MWB3010, 9692, 9704, 9710).
- 5.4. Cropmarks identified along Foudry Brook, which runs north-south through the east of site site, indicate possible settlement and associated field systems of presumed Iron Age or Roman date. North of the M4 at Reading Business Park and Little Lea Farm, c.2.1km north of site, excavation has uncovered Iron Age field systems, Roman enclosures and indications of settlement sites adjacent to the Foudry Brook. A Middle Iron Age settlement and iron production site is recorded at Three Mile Cross, c.1.1km east of the site (WK15715), north of this is a Late Iron Age or early Roman settlement (WK15616). Similar dated features have been excavated off Mere oak Lane and along the A33, c.600m east. A Roman settlement has been identified north of Hartley Court Farm c.980m north of site, and the putative line of a Roman road cuts through the site NE-SW. However, there is no evidence to support this line of the road and it may pass east of the site.

- 5.5. Anglo-Saxon and early Medieval evidence is scarce with no Saxon remains known within the site. A pit or possible hearth east of the site at Three Mile Cross are the only recorded Saxon remains in the wider area. Grazeley and Grazeley Green are Medieval in origin, and ridge and furrow earthworks are evident within the site (MWK15681). Cropmarks of a Medieval farmstead are recorded at Hartley Cross Farm, and a possible Medieval settlement may be located north of this. Medieval pits, wells, ditches, pottery and a trackway have been identified at Pingewood (MWB2992, 9687, 3050-3056).
- 5.6. Post Medieval remains on the site include cropmarks of a trackway, boundary ditches and ridge and furrow. A series of pill boxes run west of the A33 at Grazeley and roughly parallel with Foudry Brook. These formed the Stop Line against possible German invasion and were created in 1940-41.

6. Methodology

6.1. Data Collection

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

6.1.2. Table of survey strategies:

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

6.1.3. The magnetic data were collected using MS' bespoke hand-pulled and quad-towed cart systems.

6.1.3.1. MS' cart system was comprised of Bartington Instruments Grad 13 Digital Three-Axis Gradiometers. Positional referencing was through a Hemisphere S321 GNSS Smart Antenna RTK GPS outputting in NMEA mode to ensure high positional accuracy of collected measurements. The Hemisphere S321 GNSS Smart Antenna is accurate to 0.008m + 1ppm in the horizontal and 0.015m + 1ppm in the vertical.

6.1.3.2. 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.

6.1.3.3. In hand-pulled configuration, rows of temporary sight markers were established in each survey area to guide the surveyor and ensure full coverage with the cart. In quad-towed configuration, a navigation system was integrated with the RTK GPS 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 Historic England's standards for "raw or minimally processed data" (see sect 4.2 in David et al., 2008: 11).

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

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

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

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

6.3. Data Visualisation and Interpretation

6.3.1. This report presents the gradient of the sensors' total field data as greyscale images, as well as the total field data from the upper and/or 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 at different plotting ranges have been used for data interpretation. Greyscale images were interpreted alongside the XY trace plots; XY trace plots visualise the magnitude and form of the geophysical response, aiding in anomaly interpretation.

6.3.2. Geophysical results have been interpreted using greyscale images and XY traces in a layered environment, overlaid against open street maps, satellite imagery, historic maps, LiDAR data, and soil and geology maps. Google Earth (2018) was also consulted, to compare the results with recent land usages.

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 of further work in order to constantly improve our knowledge and service.

7.2. Discussion

7.2.1. The geophysical results are presented in consideration with historic maps (Figure 4).

7.2.2. The fluxgate gradiometer survey has responded well to the survey area's environment. Most of the areas are generally free from modern intrusions and waste, which has allowed for the detection of a range different types of responses. However, the archaeological features purported on site via cropmark analysis (see 5.4. and 5.6.) do not exhibit magnetic contrast within the results, despite being clear in aerial photography. Previous trenching in the northeast of the site (Wessex Archaeology 1999) also failed to identify many of the cropmark features. Many of the features that were identified through trenching were reported as being very shallow and comprising of a fill very similar to the surrounding material, some also contained groundwater. In this case the magnetic enhancement of any ditches may be weakened or suppressed by the contribution of waterlogging and may not be detected due to the similarity with the surrounding soils. Elsewhere many of the cropmarks do appear to correlate with anomalies in the geophysical results, including former field boundaries and natural deposits.

7.2.3. The variation of superficial geology on the site (see 4.3.) has been reflected within the results. Sand and gravel deposits are recorded in the north, while southern superficial deposits are largely unrecorded. The northern half of the site generally displays a greater amount of natural deposits than in the south. These are mainly concentrated along the vein of river terrace deposits, which follows the route of Foudry Brook from the northern end into the south-east.

7.2.4. Agricultural activity is evident across the site and represents different phases of activity. Anomalies associated with ploughing, drains, and former field boundaries are common throughout. Anomalies classified as 'Archaeological' in origin through the centre of the area are all associated with these agricultural features, occurring perpendicular to former field boundaries. They are considered to reflect Medieval 'toft and croft' features; those in Areas 19 and 22, to the south-west, can be associated with features

mapped on the 1st Edition Ordnance Survey. A number of rectilinear anomalies and trends have been classified as 'Undetermined' in origin. Many of these are likely to be resultant from anthropogenic activity; although a specific origin is not clear.

7.2.5. The effect of modern activity across the site is low. However, as expected over such a large site, a number of services have been detected producing strong ferrous type responses in several fields. The presence of a railway line in west has produced a ferrous effect on the immediately adjacent fields. Spreads of modern debris have been recorded in many of the fields on a small scale but has seriously impacted the northern halves of Areas 11 and 17, in the north-west, and Area 34, in the south-east. The remnants of industrial activity associated with the brick works in the south-west has also produced high-contrast, overshadowing responses in the south-west.

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. **Undetermined** – Anomalies are classified as Undetermined when the anomaly origin is ambiguous through the geophysical results and there is no supporting or correlative evidence to warrant a more certain classification. These anomalies are likely to be the result of geological, pedological or agricultural processes, although an archaeological origin cannot be entirely ruled out. Undetermined anomalies are generally not ferrous in nature.
- 7.3.1.3. **Ferrous (Discrete/Spread)** – Discrete ferrous-like, dipolar anomalies are likely to be the result of modern metallic disturbance on or near the ground surface. A ferrous spread refers to a concentrated deposition of these discrete, dipolar anomalies. Broad dipolar ferrous responses from modern metallic features, such as fences, gates, neighbouring buildings and services, may mask any weaker underlying archaeological anomalies should they be present.

7.3.2. Magnetic Results - Specific Anomalies (Northern End)

- 7.3.2.1. The northern end of site encompasses Areas 1, 2, 4, 5, 6, 7 and 9. The impact of modern activity is more evident in the fields closer to Grazeley Green Road, as these fields are located nearer to built up areas. Areas 4, 5, and 6, towards Foudry Brook, are quieter in nature, with a greater number of natural responses that are likely resultant from fluvial processes. Agricultural activity has also been identified, including former field boundaries, ploughing trends, and drains, along with 'Undetermined' responses.
- 7.3.2.2. **Agricultural** – Area 1, in the north-west, contains several drains, services and former field boundaries: **[1a]** represents a former field boundary which was recorded on historic maps from 1872 to 1968. To the west is a network of services **[1b]**. The correlation of the services with former field boundaries suggests some of the services may have been placed within the ditches of

former field boundaries which correlate with their location on historic maps. A greater density of ferrous debris and disturbances is visible around the services; however, a distinct linear response terminating at the services [1c] correlates with a relatively modern trackway dating from 1968 which was still present at the date of survey (see 4.2.).

- 7.3.2.3. **Undetermined** – A rectilinear alignment of material abuts the trackway [1c] at 90°. Similar types of configurations are detected elsewhere across the site; although in this instance the anomalies are less clear and occur with a more recent feature and have therefore been classified as ‘Undetermined’. Weak ‘Undetermined’ linear trends in the fields to the east (Areas 2, 5, and 6) may also reflect agricultural processes.
- 7.3.2.4. **Agricultural** – The remnants of further field former field boundaries have been detected in Areas 5 and 6 [5a & 6a]. These have been identified as rectilinear alignments of debris material. [5a] is recorded on historic OS maps throughout 1872-1976, while [6a] is more recent on the 1911-1912 OS mapping.
- 7.3.2.5. **Agricultural/Undetermined** – The nature of Area 9 is distinct from the previous fields. Although the features in Area 9 are generally weak in magnetic contrast, linear responses associated with drains and ploughing have been detected. A greater number of anomalies have been classified as ‘Undetermined’ due to this subtle contrast. These are likely to reflect a combination of natural or agricultural features; an archaeological origin is not clear for any of these responses but cannot be entirely ruled out.

7.3.3. Magnetic Results - Specific Anomalies (Eastern End)

- 7.3.3.1. The eastern end of site encompasses Areas 10, 11, 28, 29, 30, 31, 32, 34, which are located both sides of the course of Foudry Brook. A swathe of natural deposits occurs along the length of the Brook and are indicative of fluvial processes. Agricultural activity has been identified in most areas and is demonstrated by drains, ploughing trends, and former field boundaries. In Area 10, several rectilinear responses abut the former boundaries at 90° and could indicate a historic agricultural usage. Overall, the background of the eastern end is relatively quiet nature, except for an area of debris in across Areas 34 and the north of Area 11.
- 7.3.3.2. **Agricultural** – The extent of the ferrous debris in Area 11 [11a] closely follows the line of a former field boundary recorded on historic mapping from 1872 to 1976. Recorded former field boundaries have been identified in Area 10 in the east of the site, [10a], most of these are present on historic maps from 1877 to 1961, only the central anomalies aligned sub E-W are present until 1971 marked as a footpath.
- 7.3.3.3. **Agricultural/Undetermined** – At several locations along [10a] are rectilinear spread of material or weak rectilinear trends which appear to abut the boundary at 90° [10b] but are not recorded on available mapping. Given this juxtaposition and the similarity in response to [10a], it is likely they reflect an

associated feature, of possible agricultural use. A more ambiguous response toward the north of Area 10 [10c] is less clear and has been classified as 'Undetermined'.

- 7.3.3.4. **Agricultural** – A distinct linear anomaly in the south of Area 10 [10d] runs parallel to the historic field boundaries and may reflect an unmapped boundary. A boundary has also been detected in a north south alignment in Area 31 [31a].
- 7.3.3.5. **Agricultural** – Area 28, directly west of Area 10, contains a further former field boundary to the south, this has changed over time. [28b] is first recorded on the 1872 OS County Map only extended c.150m, later in 1976 this continued a further c.60m east before the entire boundary was removed post 1983. The canalisation of Foudry Beck between 1961-1968 allowed the extension of field boundary [28b] in 1976, the intervening period had the land marked as a marsh. Area 29, south of Area 28, also has a field boundary which has changed over time, in 1872 [29a] extended the full width of Area 29, later in 1912 the boundary only crossed the eastern half only, before disappearing entirely by 1968.
- 7.3.3.6. **Undetermined** – Most of the 'Undetermined' responses along the eastern end are characterised by weak, linear trends. [31b], in the southeast of the site, is a very weak positive anomaly which is difficult to differentiate from background magnetic levels. [31b] comprises a N-S aligned response c.60m long which is abutted by two E-W aligned c.15m in length anomalies. This is a similar configuration as seen near field boundaries to the north [10b and 10c], [31b] occurs in relative isolation. Therefore an 'Undetermined' classification has been ascribed.
- 7.3.3.7. **Services and Ferrous (Spread)** – Ferrous spread in the southeast of Area 28 (central to the site), [28c], follows the path of a Foundry Brook before it was canalised in the 1960s. A mixed material has been used to infill of the original course of the brook which has produced a strong ferrous response. A larger spread of magnetic disturbance is present in the west of Area 10, this covers an area marked with former ponds and possibly some structures on the 1872 OS mapping. The demolition of structures and resultant debris likely causes the magnetic disturbance in this area.

7.3.4. Magnetic Results - Specific Anomalies (Western End)

- 7.3.4.1. The western end of site (Areas 14, 16, 17, 18, 19, 20, 22, 23, 24, 25, and 26) encompasses more built up areas than other parts of the site. Despite this, the background is relatively quiet across the area is punctuated by a service running east-west through the centre (Areas 19, 20, 23), another in the south-west (Area 24), and minor interference produced by the powerlines to the west (Areas 19 and 22). Disturbances associated with the former brick works to the south-west, Area 24, also overshadow this area. Natural responses are more evident near to Foudry Brook, in Area 14, and are similar to those in the eastern end. Agricultural activity, in the form of ploughing trends, drains and former

field boundaries has been identified across the western end. Anomalies of a probable and possible archaeological origin have been classified through the centre of the western end. These are considered to represent Medieval croft and tofts.

- 7.3.4.2. **Probable Archaeology** – A series of small ditch-like anomalies and rectilinear enclosures have been detected along the eastern boundaries of Areas 19 and 22, adjacent to Pump Lane in the west of the site [19a & 22a]. These narrow, parallel land parcels are characteristic of Medieval activity, specifically croft and toft features. The magnetic response of these features is masked in the south of Area 19 by a service line, and all have been slightly distorted by subsequent agricultural and modern activity, it is likely that the full extent of the enclosures and their subdivisions are partly obscured. Despite this, measurements show a variety of enclosure sizes with the smallest being approximately 10m x 10m in the south of Area 22, and the largest approximately 44m x 27m towards the north of Area 19. A small area of ridge and furrow ploughing has been detected within the crofts in Area 19 [19b]. These Medieval structures survived until relatively recently with further evidence of the croft and toft land strips recorded on OS County Mapping from 1872.
- 7.3.4.3. **Possible Archaeology** – Immediately, to the north-east of these, in Area 16, is a weak ditch-like anomaly [16a] in the southwest which forms a small enclosure c.35m X 19m orientated NW-SE. This orientation does align with the field boundary to the south, but it is not clear if [16a] relates to the croft and toft features.
- 7.3.4.4. **Agricultural/Possible Archaeology** – Similar small land parcels to those in Area 19 have been identified central to Area 20 [20a], less than 200m east from those described above. However, the magnetic response is severely fragmented with divisions being difficult to define. The 1872 mapping does not appear to show structures within each of the land parcels in Area 20 but does show the former boundaries [20b] which define the northern and southern limit of [20a]. Given the similarity of response and configuration to the more coherent features in Area 19 and 22, it is possible [20a] also represent former croft and toft land strips, which may have fallen from use prior to those in Areas 19 and 22.
- 7.3.4.5. **Undetermined** – An apparent linear alignment of material abutting the former field boundary in Area 16 [16b] is less similar to the possible croft and toft features but may indicate former agricultural processes.
- 7.3.4.6. **Agricultural** – Several other former field boundaries have been detected across the area. These are mainly identifiable as spread of material, reflecting the remnant fill. [14a, 18a, 22b, 23a, 28a]. [14b & 19d] may reflect unmapped field boundaries.
- 7.3.4.7. **Modern/Industrial** – Towards south of the western end, a strong ferrous anomaly [24a] measuring c.30m x 25m in the northeast corner of Area 24 correlates with the location of a “Brick Works” recorded on OS Mapping from

1899 to 1961. A small well was located to the north of the brick works structure; however, the magnetic signal for this has been overwhelmed by that of the brick works. Surrounding this feature, a spread of highly ferrous material has been detected, likely debris from the brick works or the industrial yard now present to the east.

- 7.3.4.8. **Agricultural** – Weak, parallel linear trends typical of modern ploughing regimes are common across these areas. In Area 20, the ploughing alignments are divided by [20b] a former field boundary which crosses the area on a sub E-W alignment, suggesting that these ploughing trends date from when this boundary was intact. Areas 24 and 28 contain similar agricultural trends, however due to the small number of the trends a confident ploughing interpretation cannot be applied, drainage or other agricultural processes could also be possible.

8. Conclusions

- 8.1. A fluxgate gradiometer survey has been successfully undertaken across most of the site. The survey has revealed a history of agricultural use of the area, demonstrated by former field boundaries, ploughing regimes, drainage and further agricultural trends. Evidence of Medieval, and later, occupation has also been identified in the west of the site in the form of narrow croft and toft land parcels.
- 8.2. Modern activity is present in the form of multiple services running through the site, as well as drains and modern ploughing regimes. Ferrous anomalies are generally small and scattered throughout the site. The broad ferrous anomalies at the edges of the fields can be attributed to adjacent fencing and structures. Only a small number of areas have been significantly impacted by ferrous waste.
- 8.3. Anomalies have been classified as 'Undetermined' where a specific origin is ambiguous through the geophysical results. Many of these anomalies are ephemeral sinuous or linear responses and likely result from a combination of geological, agricultural or modern activity.
- 8.4. Overall, the technique has been effective across the site and has detected a range of different types of responses, both strong and weak in magnitude. However, archaeological cropmark features identified through aerial photography in the north-east of site are not clear within the results. Many of these cropmarks could not be correlated with features during previous trial trenching or were difficult to identify in excavations. Therefore, the poor detection in the magnetic results is not to be unexpected. Waterlogged areas across the site may contribute to weakened or suppressed magnetic enhancement and fills very similar to that of the surrounding soils which do not have sufficient magnetic contrast from the surrounding soil to be detected with this technique. Elsewhere many of the cropmarks do appear to correlate with anomalies in the geophysical results, including former field boundaries and natural deposits.

9. Archiving

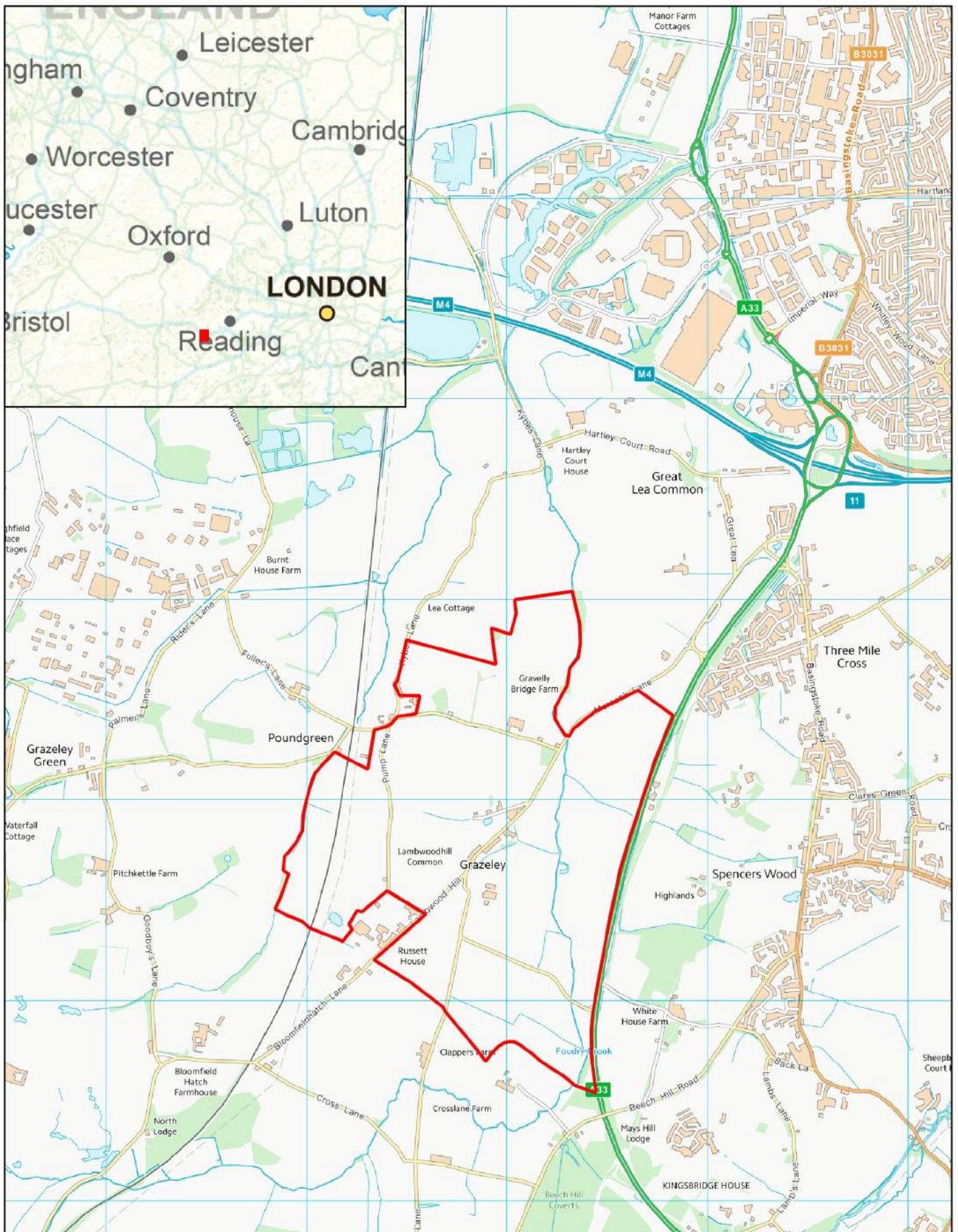
- 9.1. MS maintains an in-house digital archive, which is based on Schmidt and Ernenwein (2013). This stores the collected measurements, minimally processed data, georeferenced and un-georeferenced images, XY traces and a copy of the final report.
- 9.2. MS contributes reports to the ADS Grey Literature Library upon permission from the client, subject to the any dictated time embargoes.

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11. References

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MSSU211 - Land at Grazeley, Berkshire

Figure 1 - Site Location

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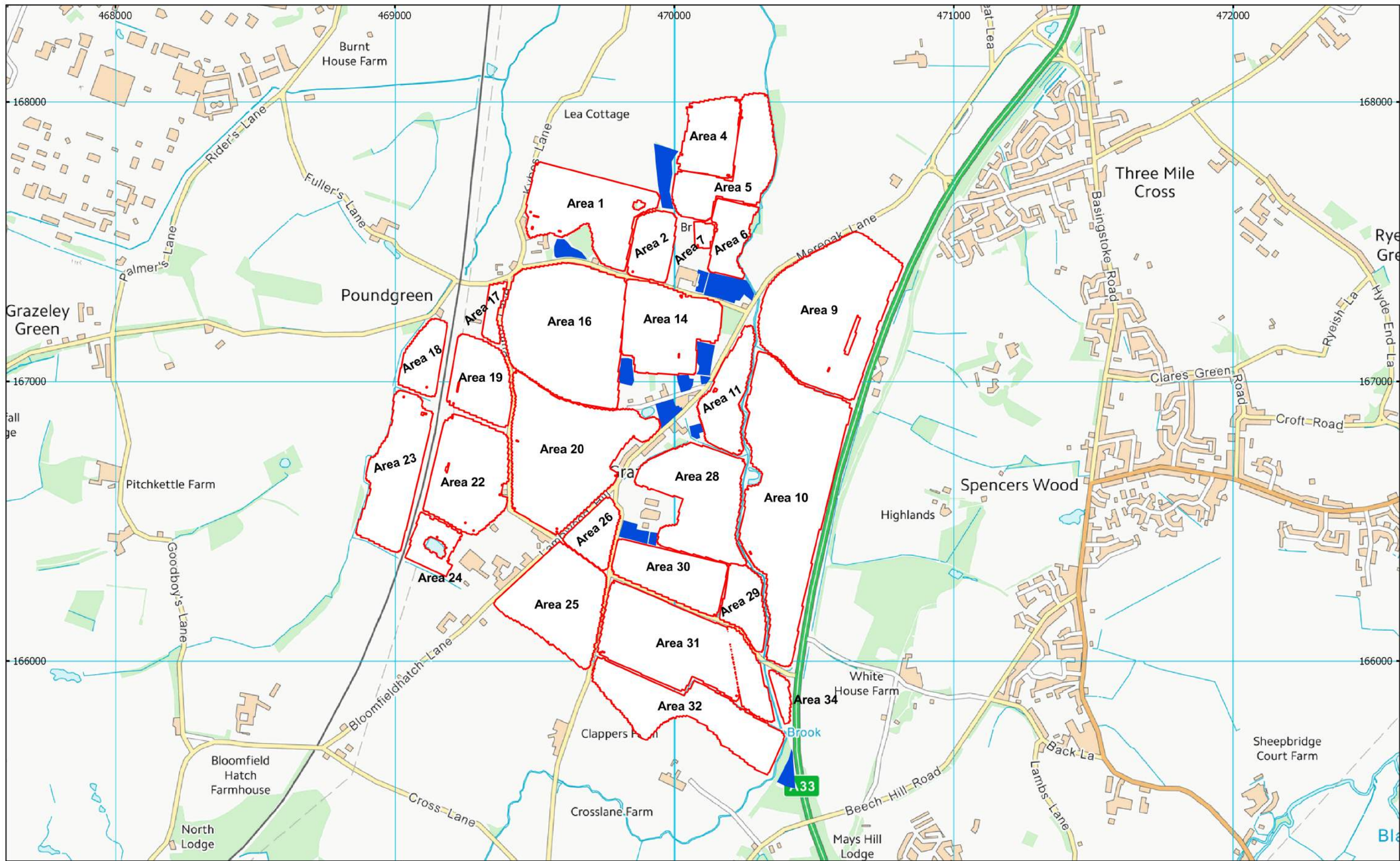
 Site Boundary



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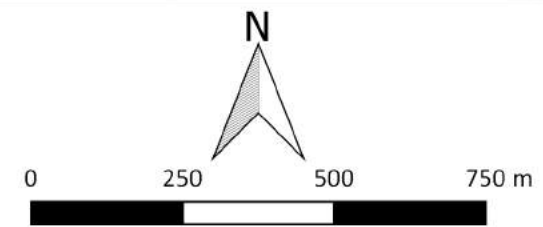



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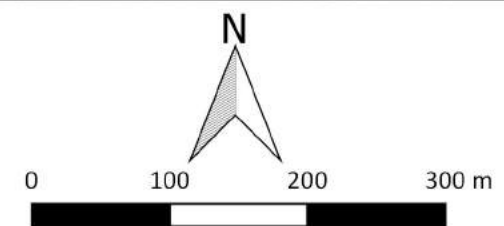
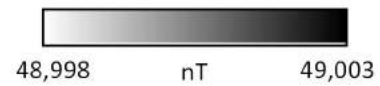
MSSU211 - Land at Grazeley, Berkshire
 Figure 2 - Location of Survey Areas
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- Survey Areas
- Unsurveyable

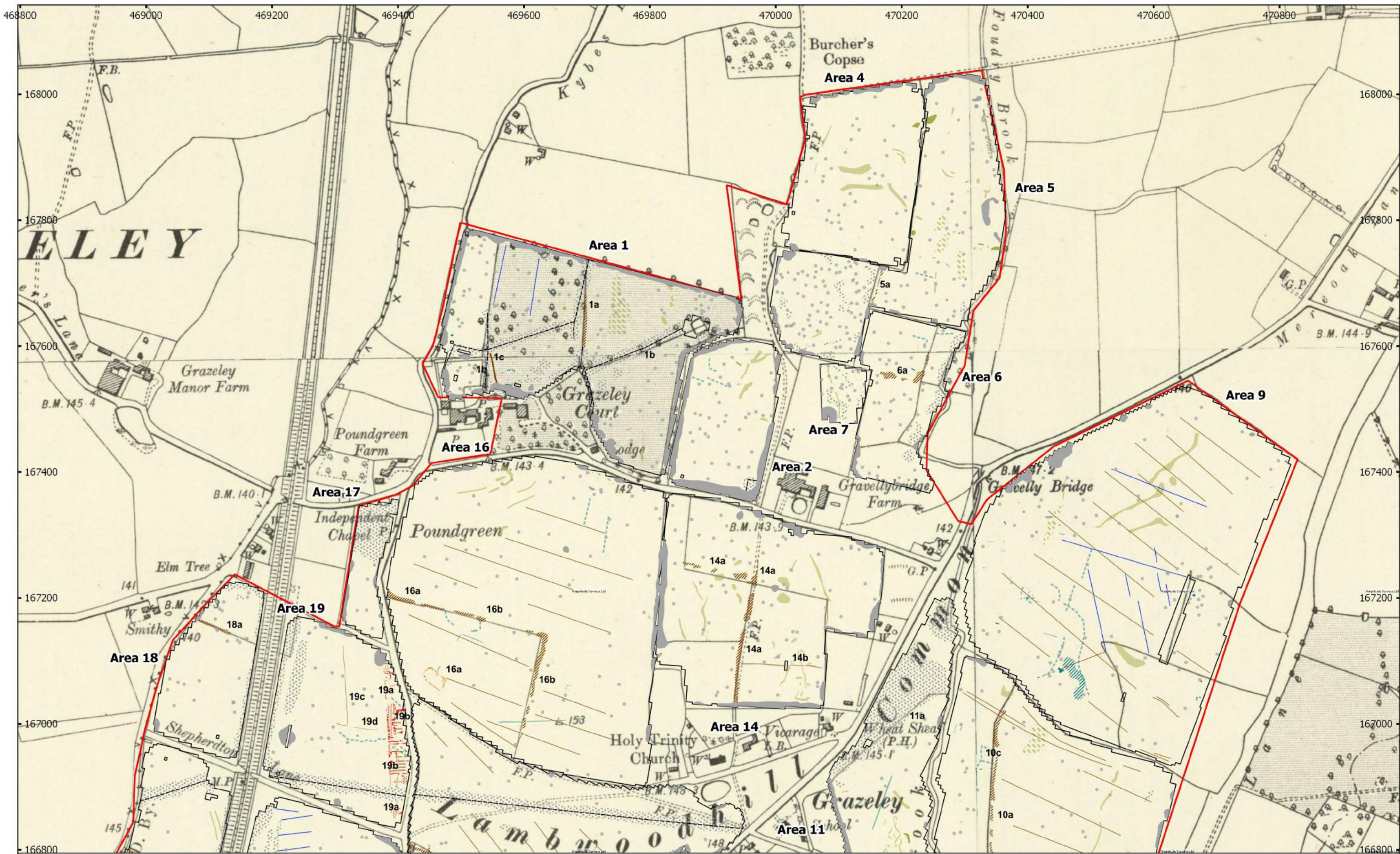




MSSU211 - Land at Grazeley, Berkshire
 Figure 3 - Magnetic Total Field (Lower Sensor)
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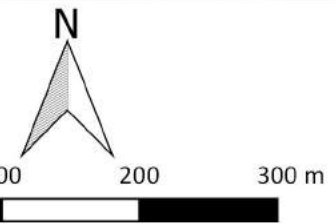


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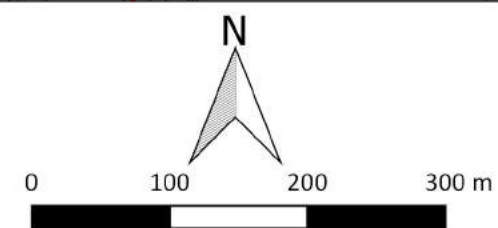
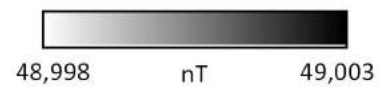
MSSU211 - Land at Grazeley, Berkshire
 Figure 4 - Magnetic Interpretation: Overview (Northern Half)
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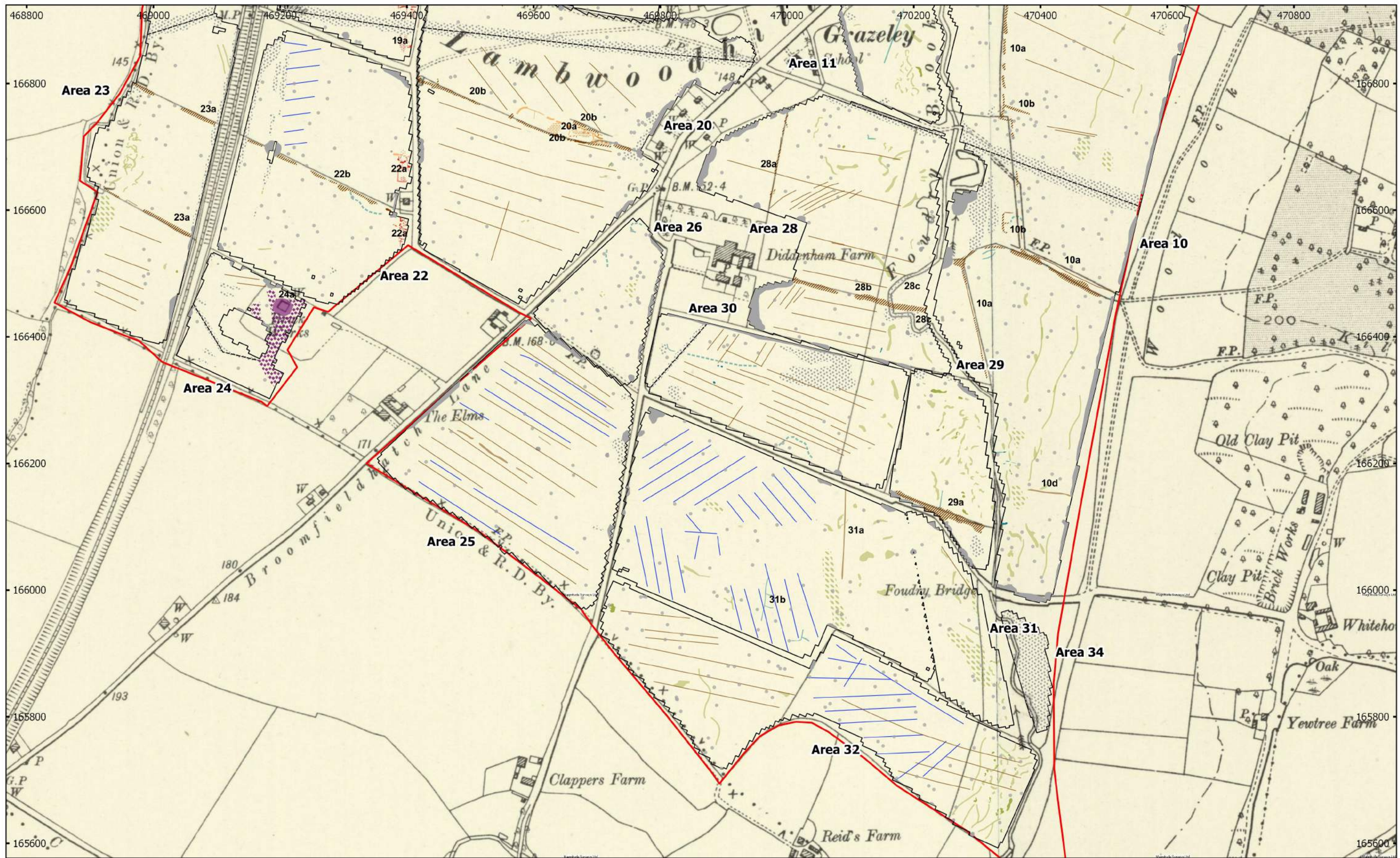
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	Archaeology Possible (Spread)				Natural (Trend)		





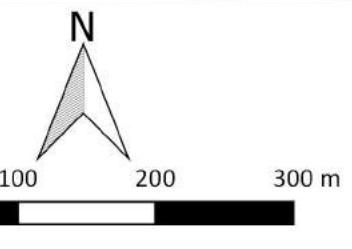
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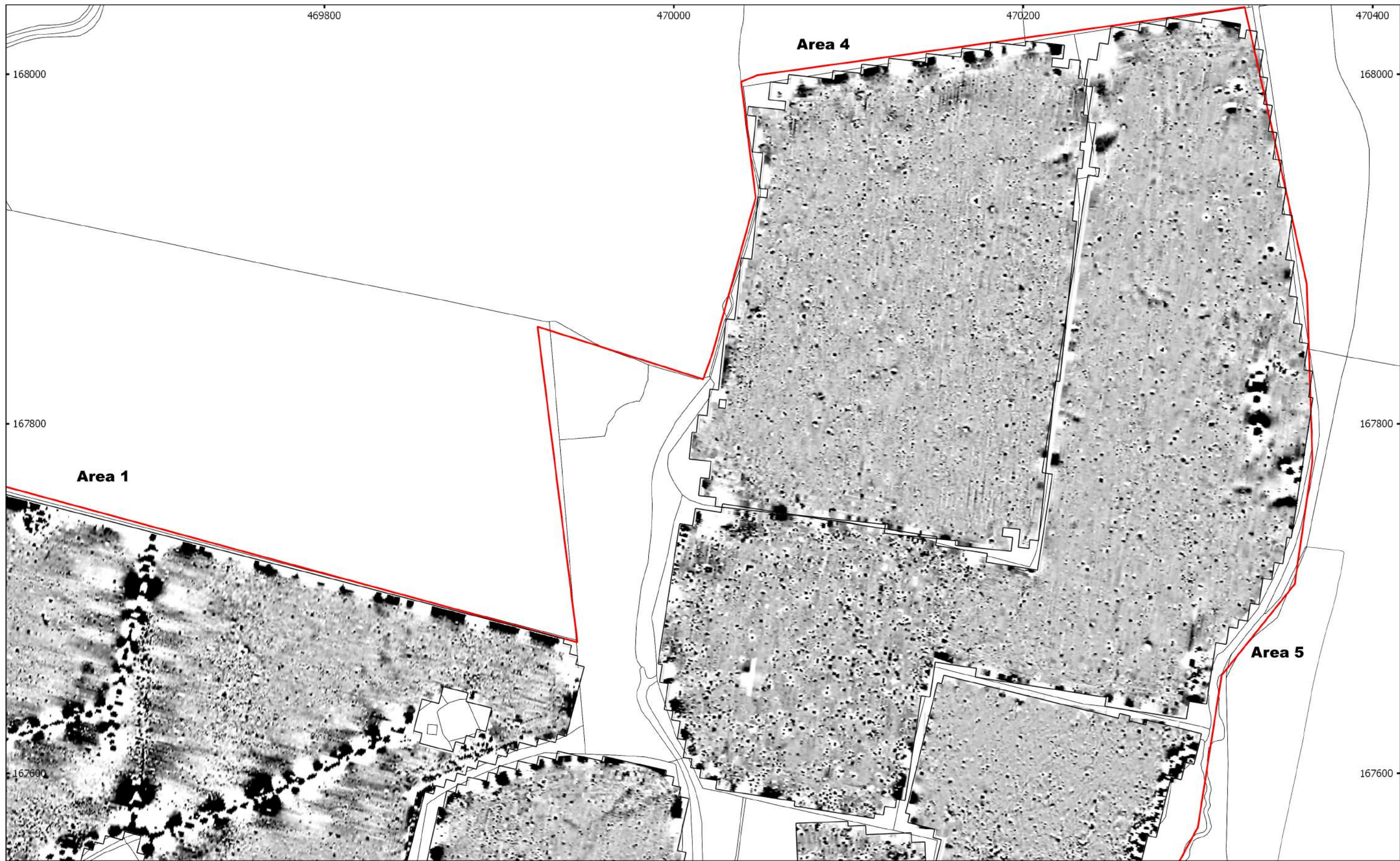




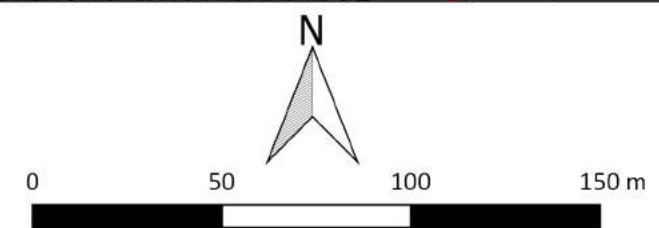
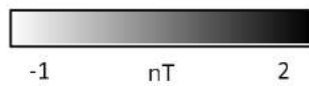
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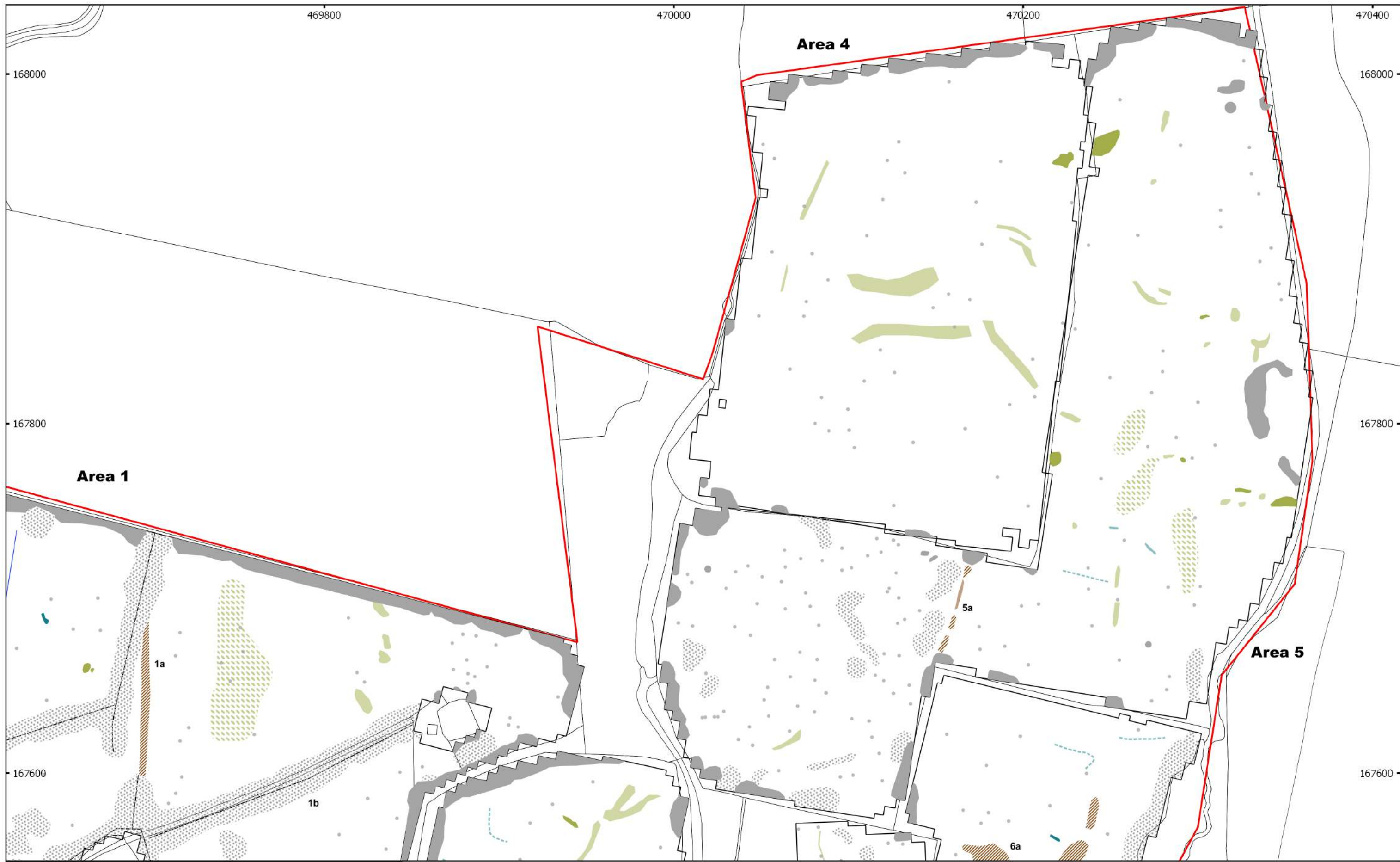
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	Archaeology Probable (Spread)		Agricultural (Spread)		Natural (Strong)		Undetermined (Trend)
	Archaeology Possible (Strong)		Agricultural (Trend)		Natural (Weak)		Industrial (Spread)
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	Archaeology Possible (Spread)		Service		Natural (Trend)		





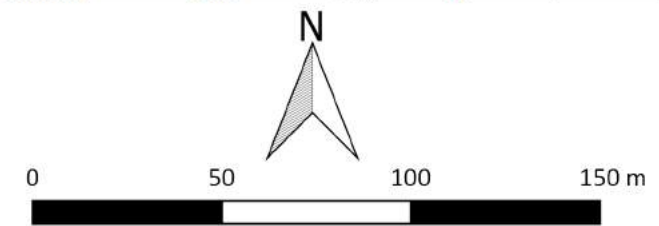
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Figure 7 - Magnetic Gradient (Northern End)
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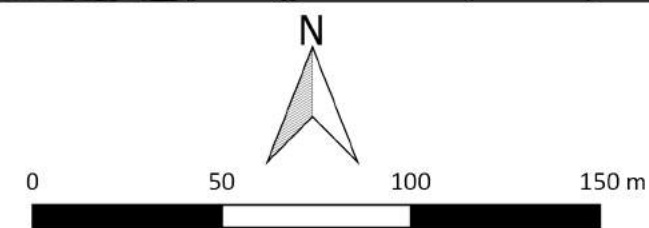
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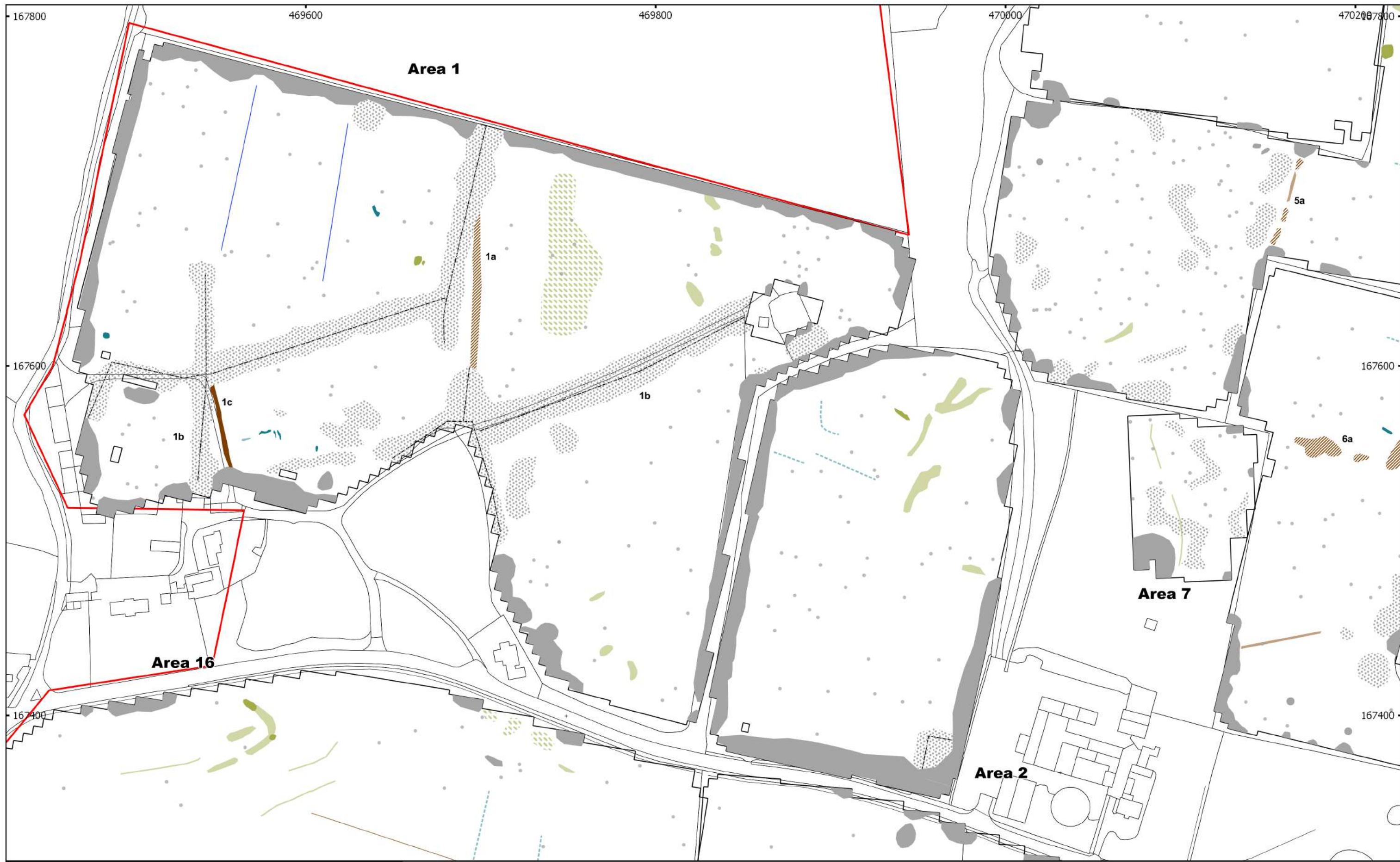
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| Drainage Feature | Natural (Spread) | Service | Undetermined (Strong) |





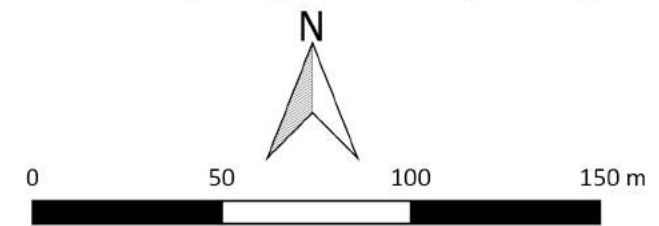
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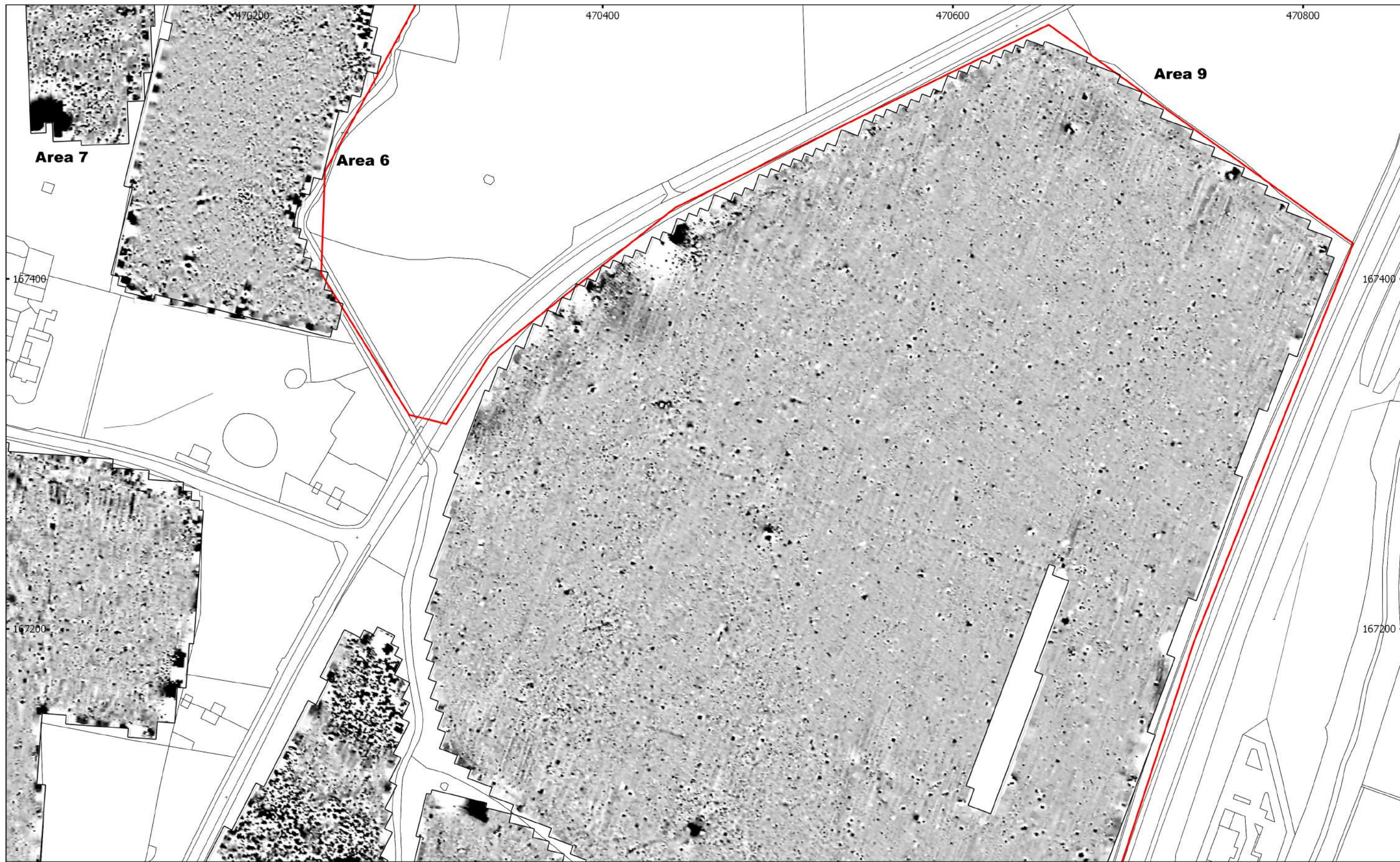




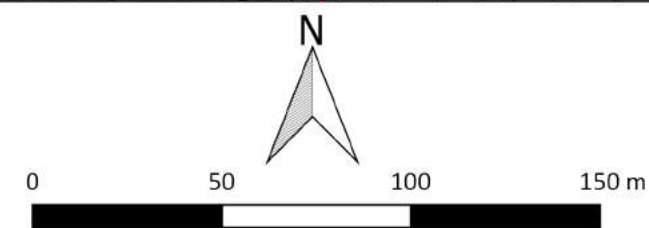
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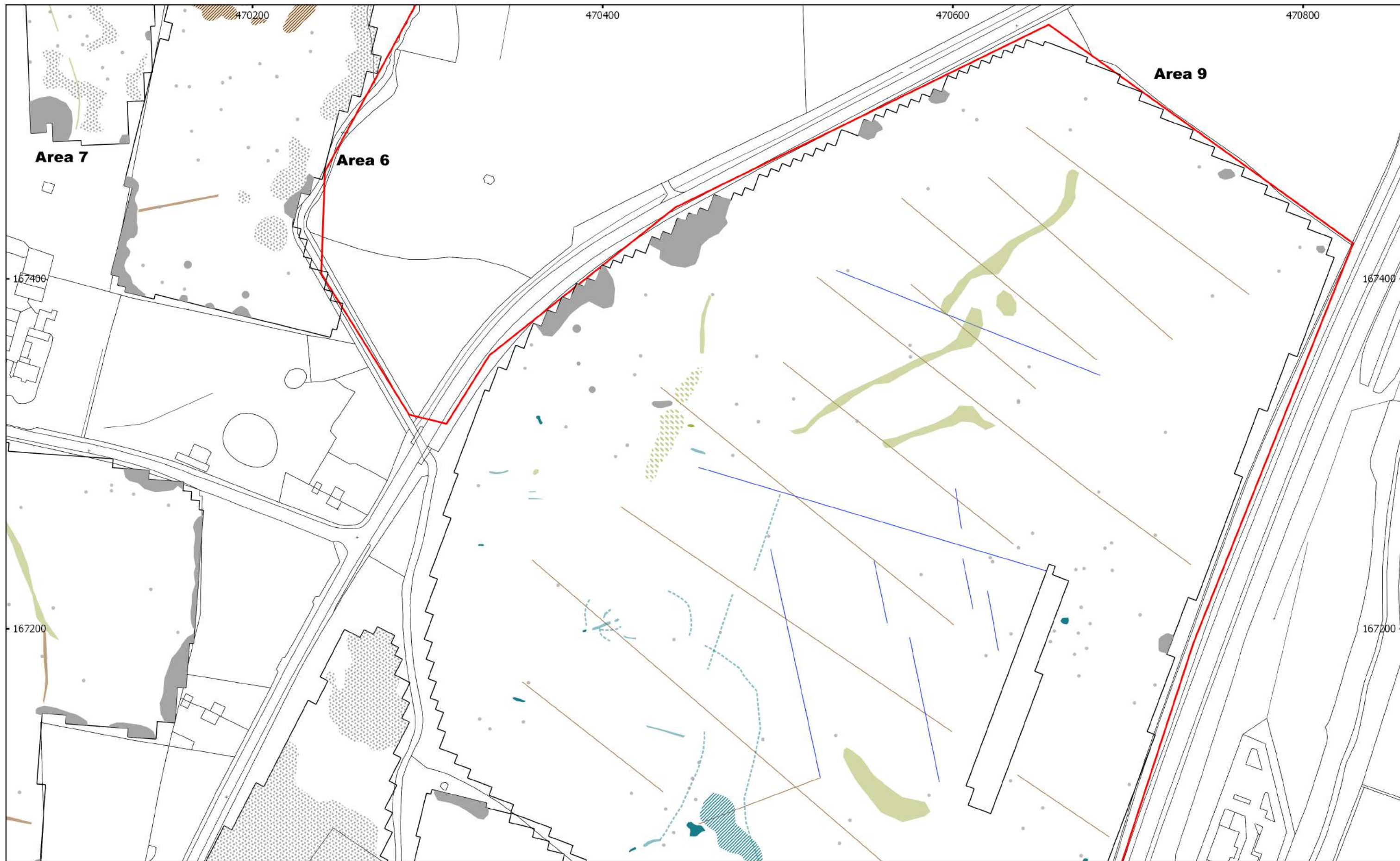
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| Agricultural (Trend) | Natural (Spread) | | |





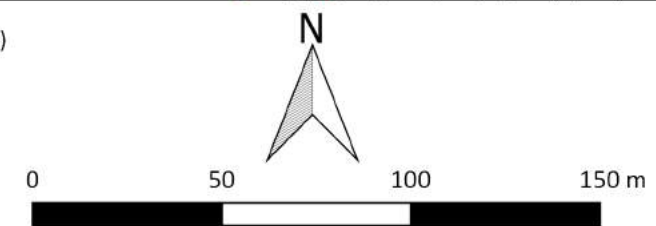
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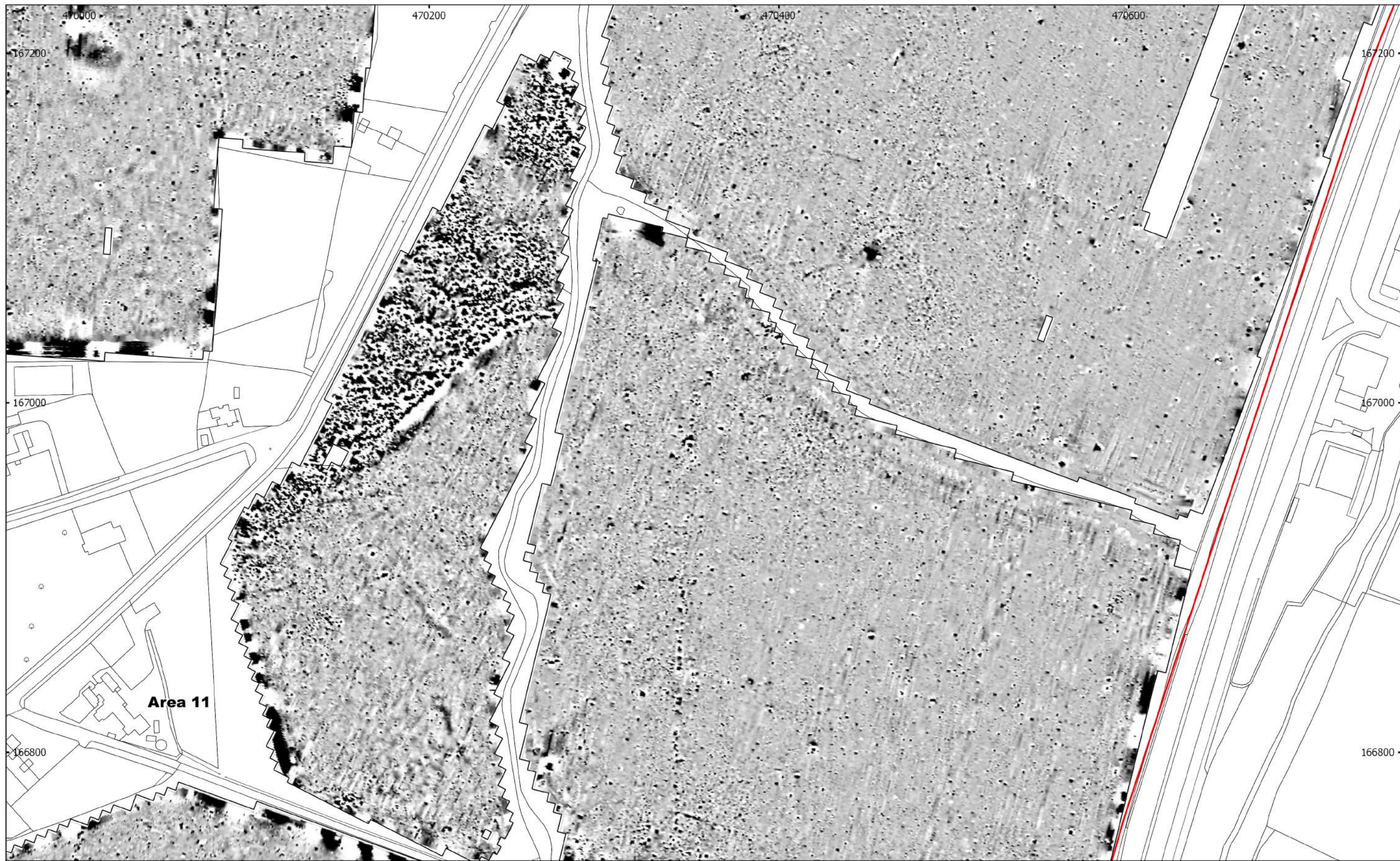




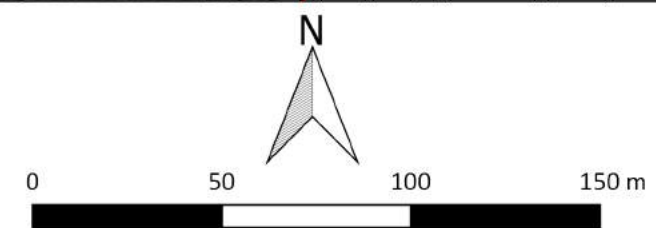
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| Agricultural (Weak) | Drainage Feature | Ferrous (Dipolar) | Undetermined (Spread) |
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| Natural (Spread) | | | |





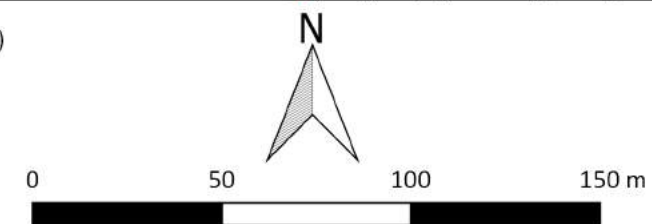
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Figure 13 - Magnetic Gradient (Eastern End)
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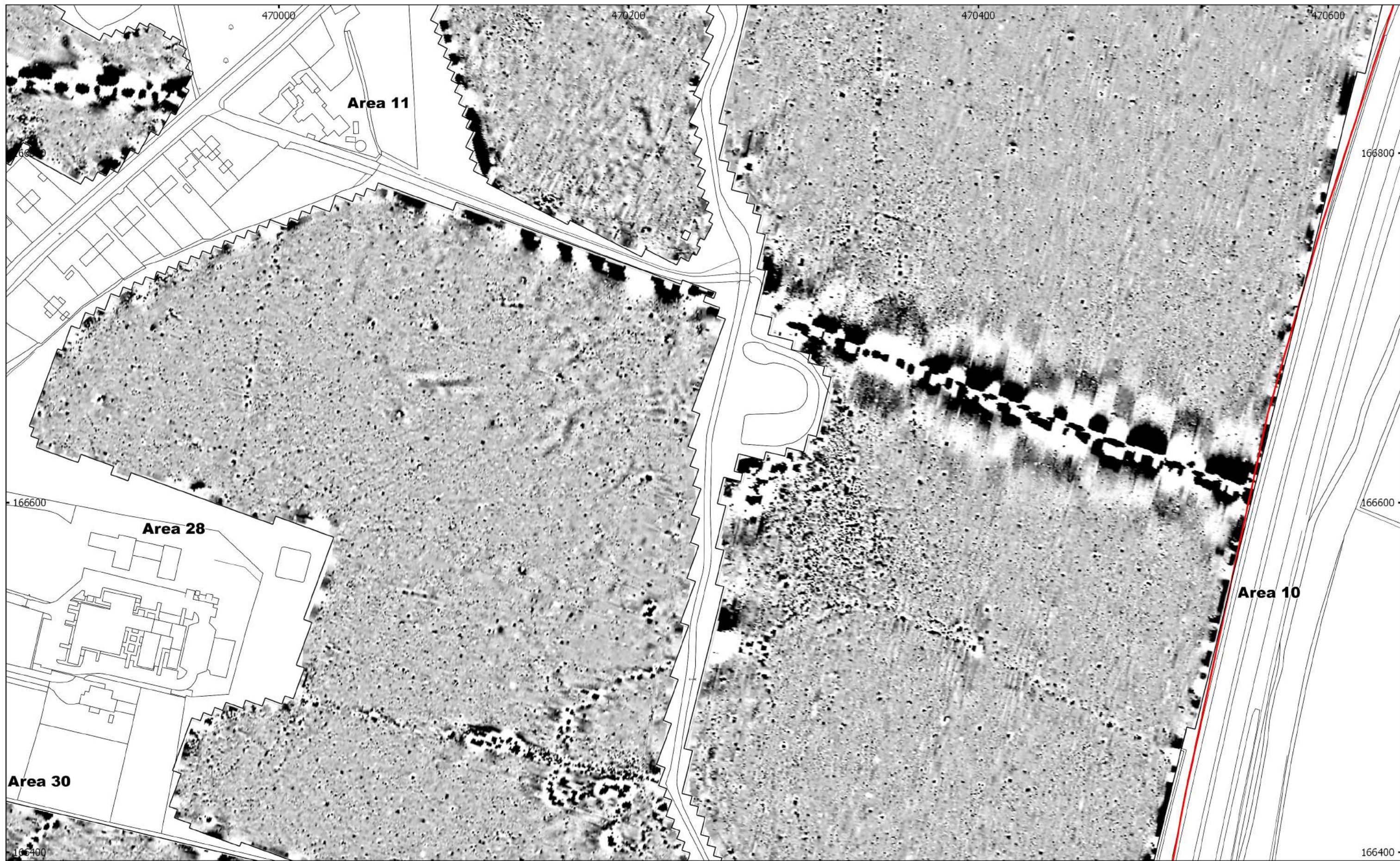




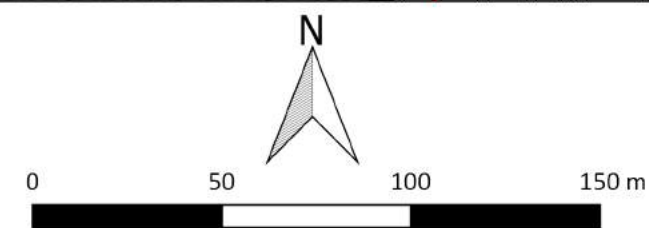
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| Agricultural (Weak) | Natural (Strong) | Ferrous (Spread)/Disturbance | Undetermined (Spread) |
| Agricultural (Spread) | Natural (Weak) | Service | Undetermined (Trend) |
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| Drainage Feature | Ferrous (Dipolar) | | |





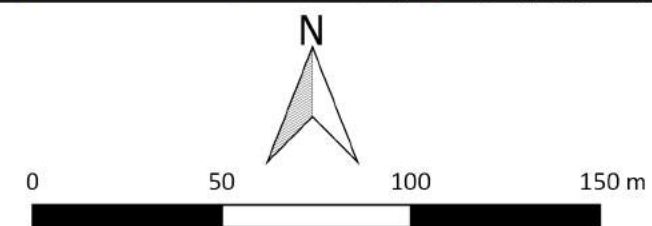
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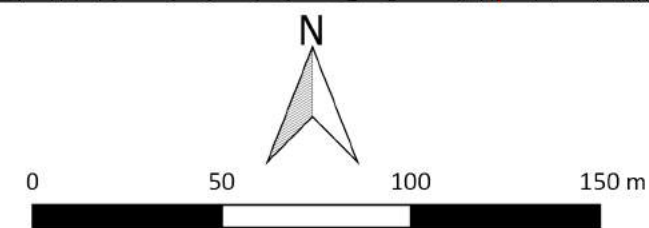
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| Agricultural (Weak) | Natural (Strong) | Ferrous (Dipolar) | Undetermined (Weak) |
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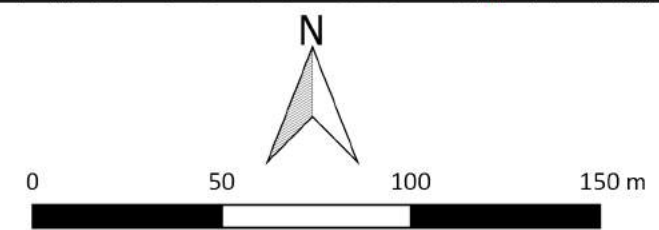
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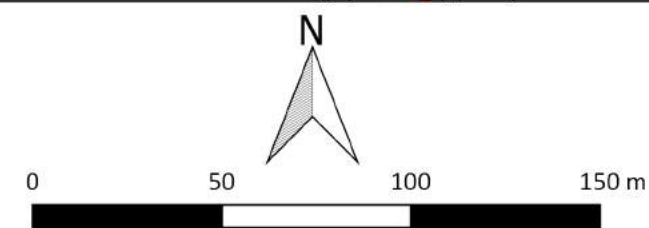
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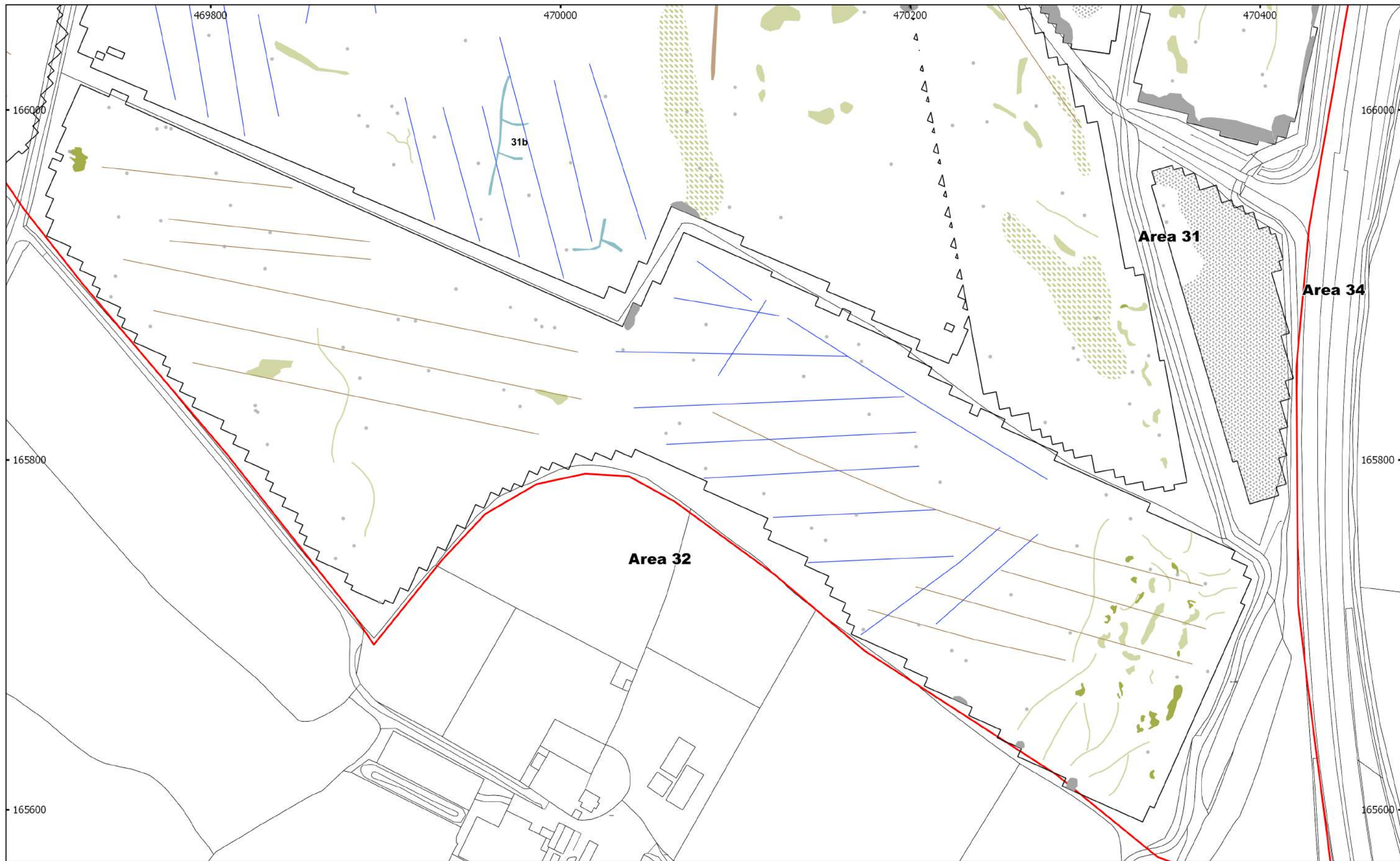
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| Natural (Spread) | | | |





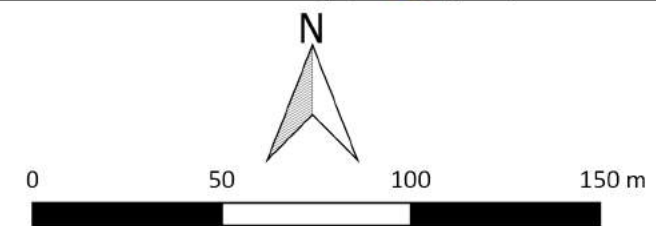
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Figure 19 - Magnetic Gradient (Eastern End)
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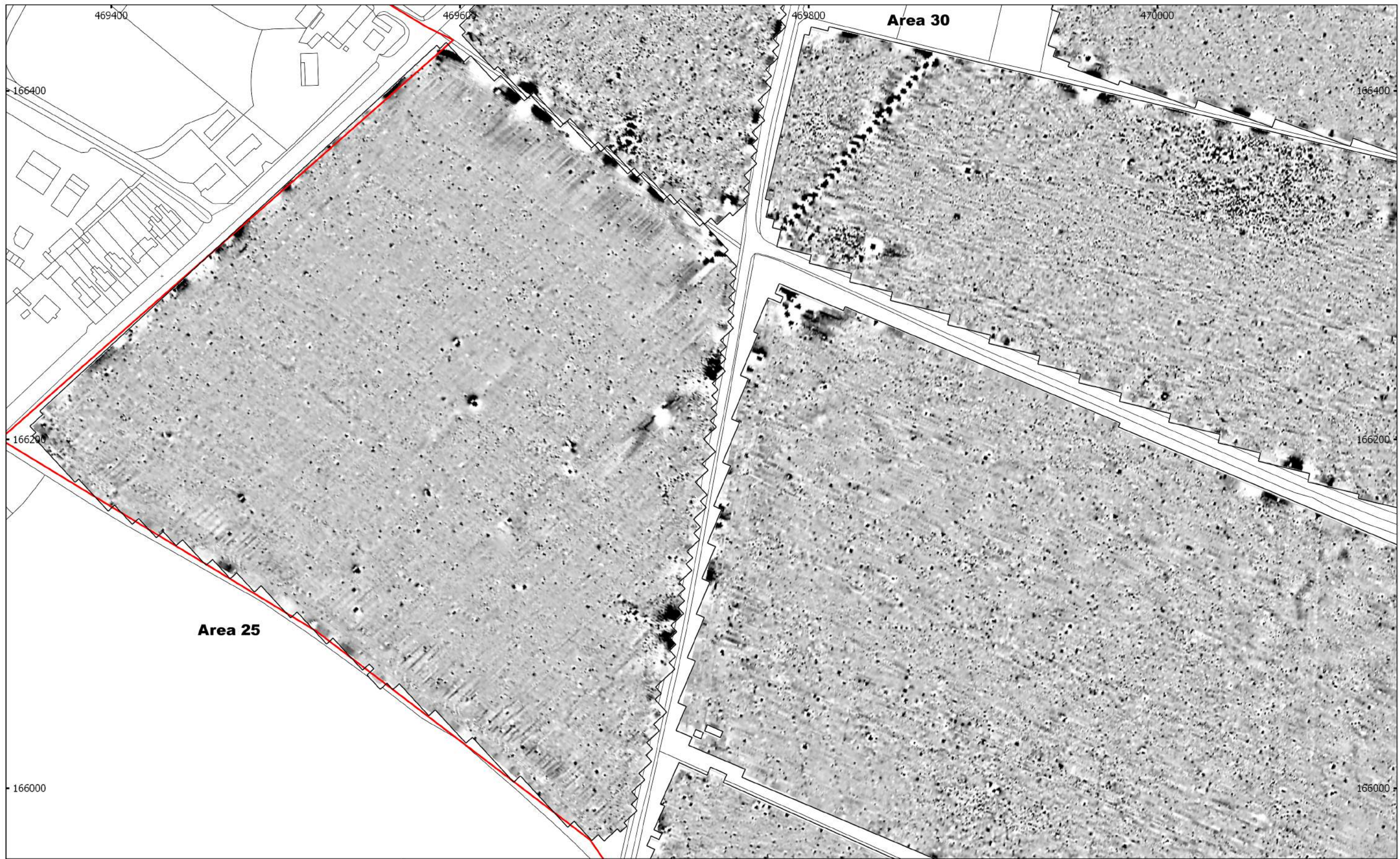




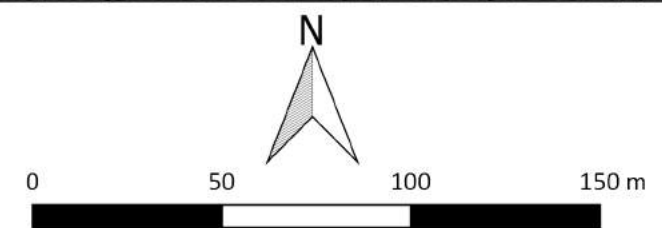
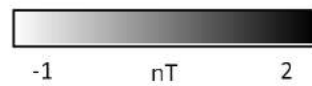
MSSU211 - Land at Grazeley, Berkshire
 Figure 20 - Magnetic Interpretation (Eastern End)
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| Agricultural (Weak) | Drainage Feature | Natural (Spread) | Undetermined (Weak) |
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| Natural (Weak) | Ferrous (Spread)/Disturbance | | |

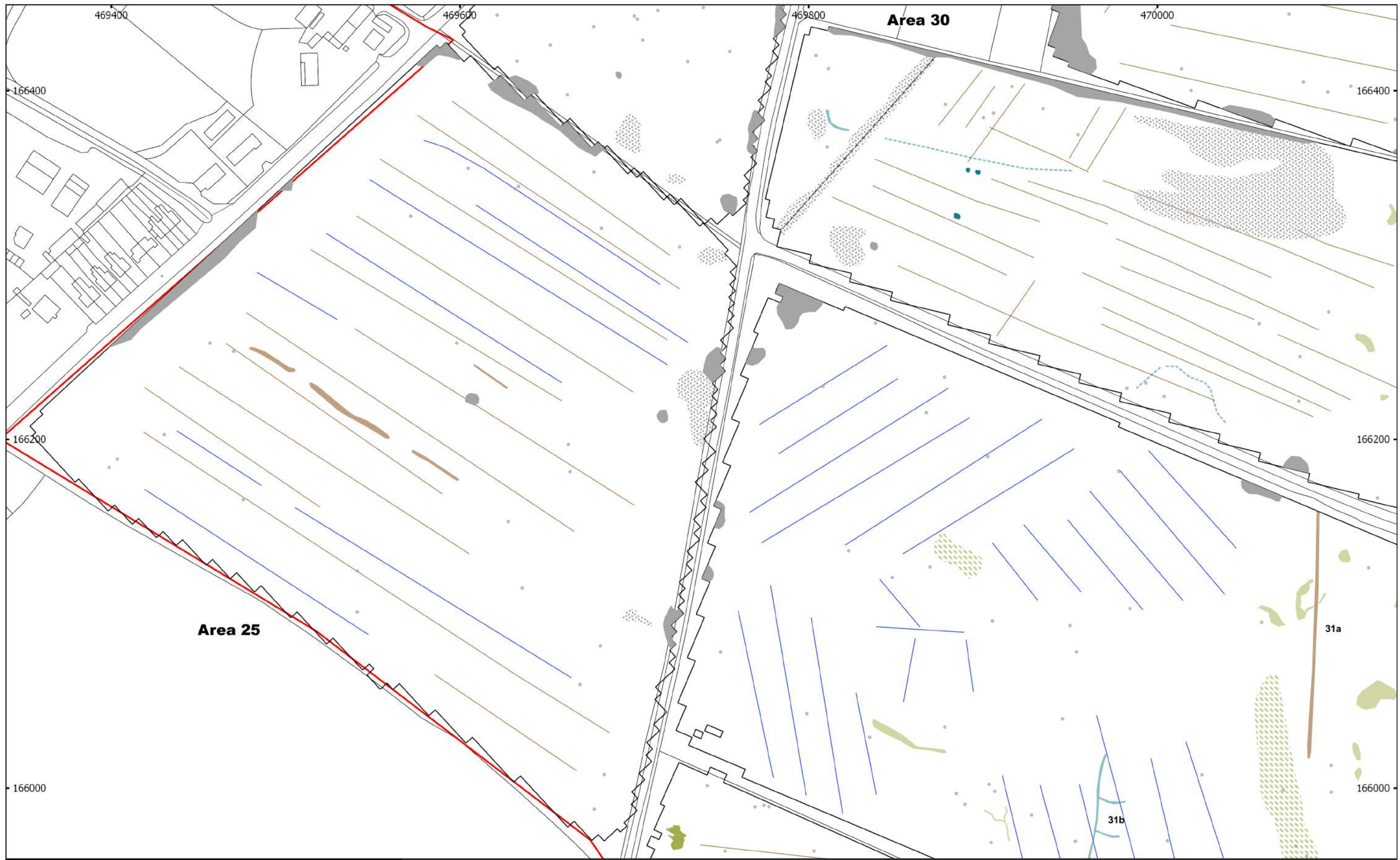




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Figure 21 - Magnetic Gradient (Eastern End)
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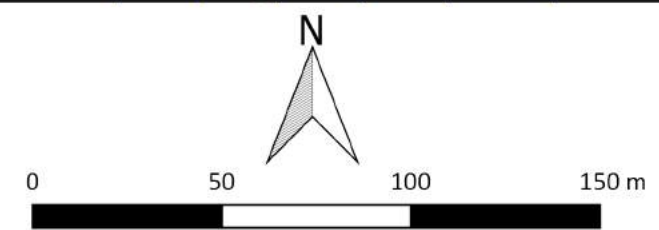


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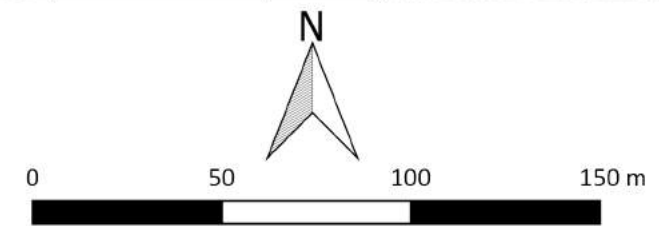
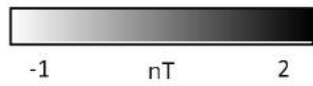
MSSU211 - Land at Grazeley, Berkshire
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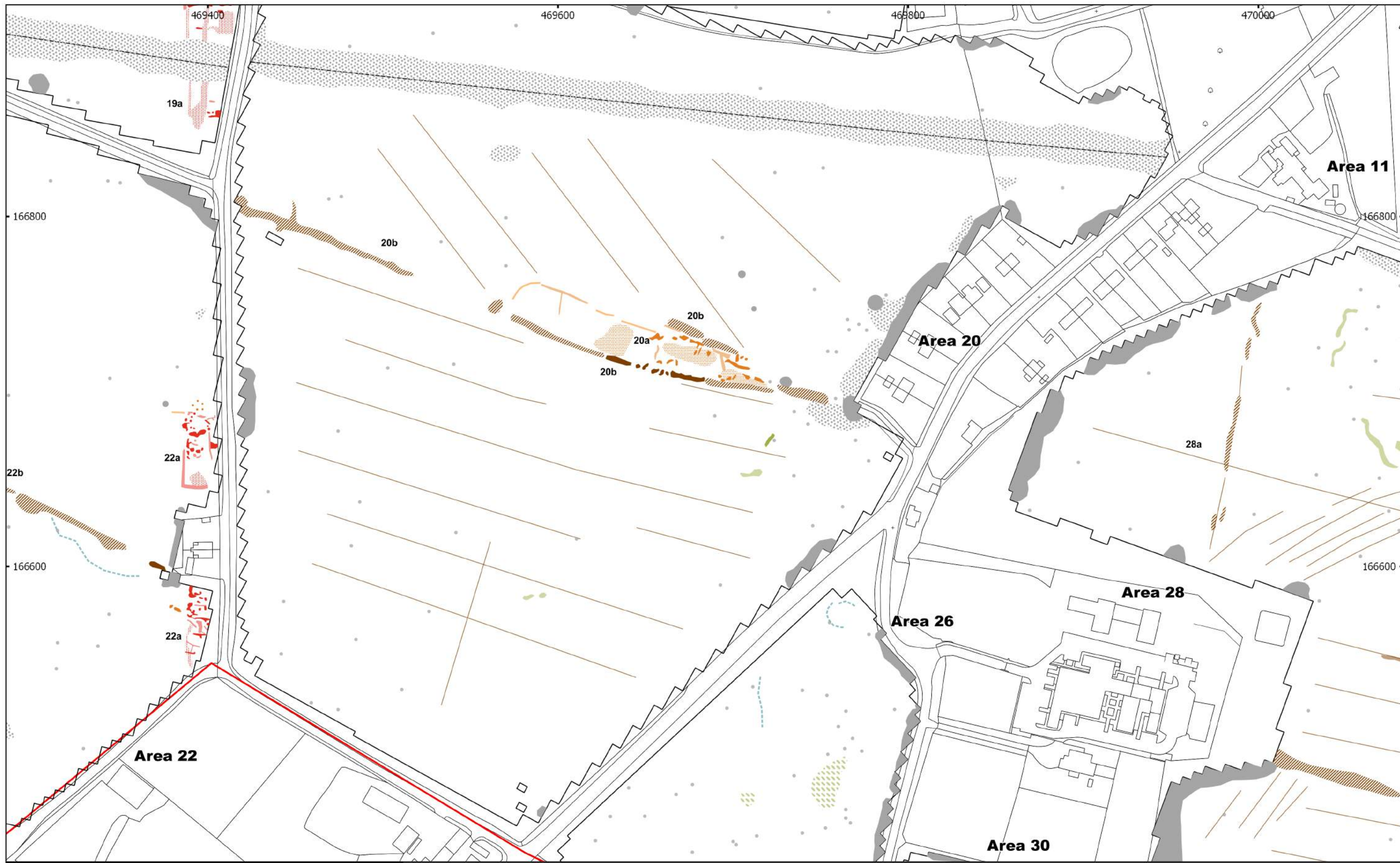
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|----------------------|------------------|------------------------------|-----------------------|
| Agricultural (Weak) | Natural (Strong) | Ferrous (Dipolar) | Undetermined (Weak) |
| Agricultural (Trend) | Natural (Weak) | Ferrous (Spread)/Disturbance | Undetermined (Trend) |
| Drainage Feature | Natural (Spread) | Service | Undetermined (Strong) |





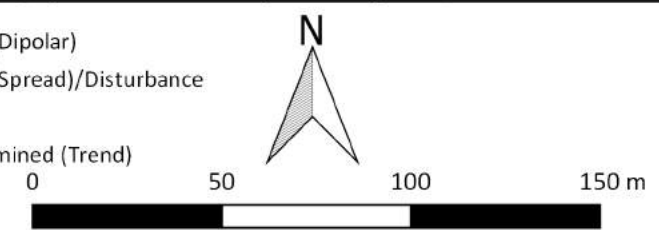
MSSU211 - Land at Grazeley, Berkshire
 Figure 23 - Magnetic Gradient (Western End)
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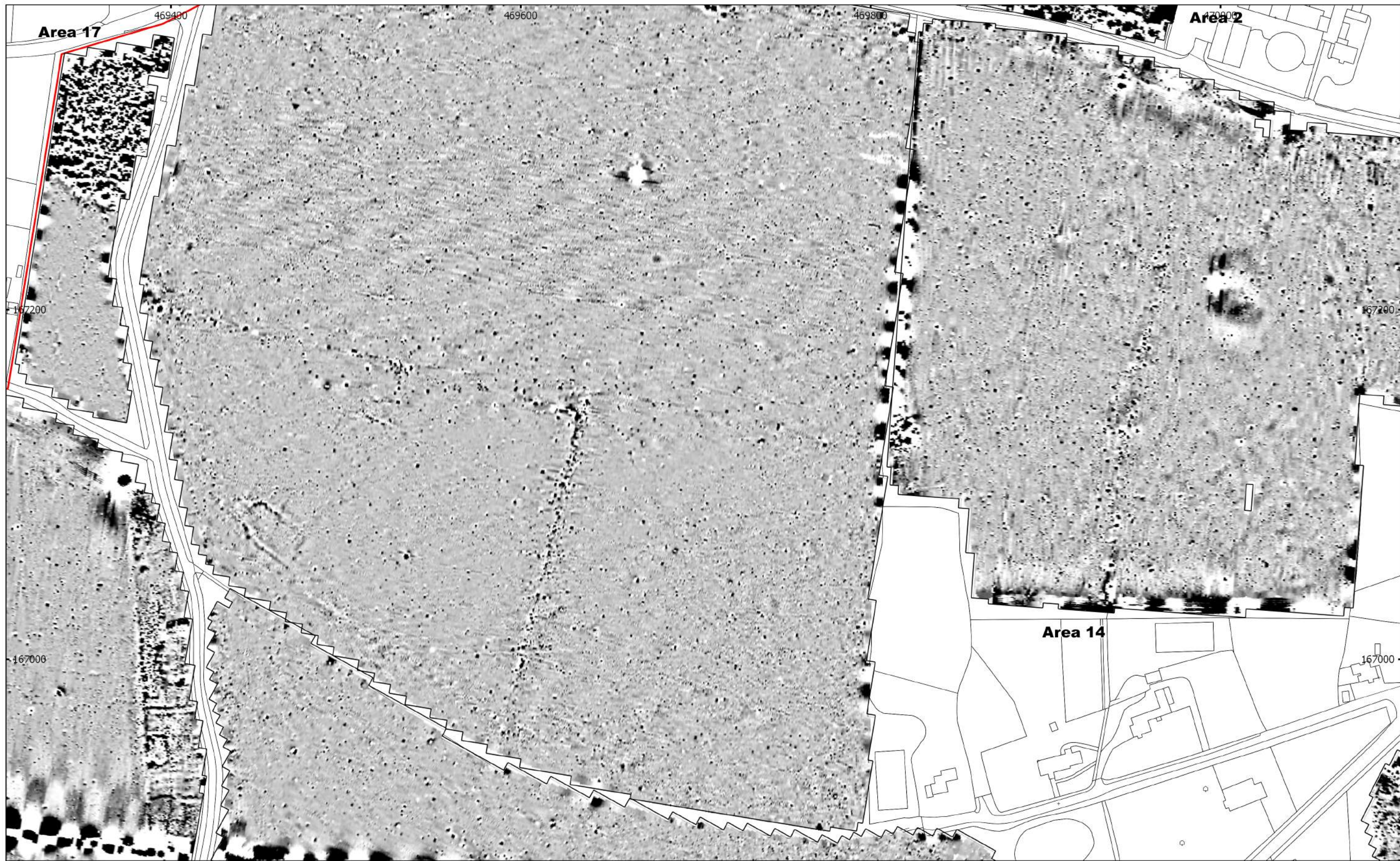




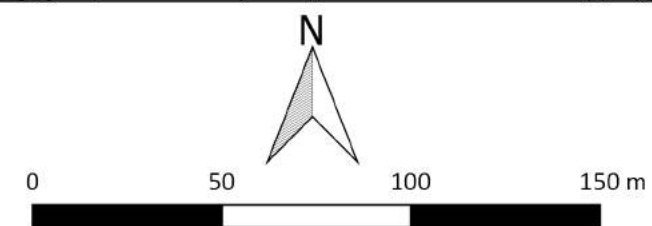
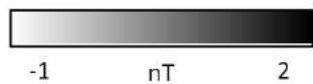
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 Figure 24 - Magnetic Interpretation (Western End)
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- | | | | |
|-------------------------------|-------------------------------|-----------------------|------------------------------|
| Archaeology Probable (Strong) | Archaeology Possible (Spread) | Agricultural (Spread) | Ferrous (Dipolar) |
| Archaeology Probable (Weak) | Archaeology Probable (Trend) | Agricultural (Trend) | Ferrous (Spread)/Disturbance |
| Archaeology Probable (Spread) | Archaeology Possible (Trend) | Natural (Strong) | Service |
| Archaeology Possible (Strong) | Agricultural (Strong) | Natural (Weak) | Undetermined (Trend) |
| Archaeology Possible (Weak) | Agricultural (Weak) | Natural (Spread) | |





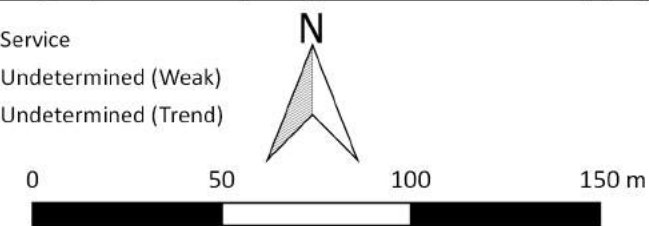
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 Figure 25 - Magnetic Gradient (Western End)
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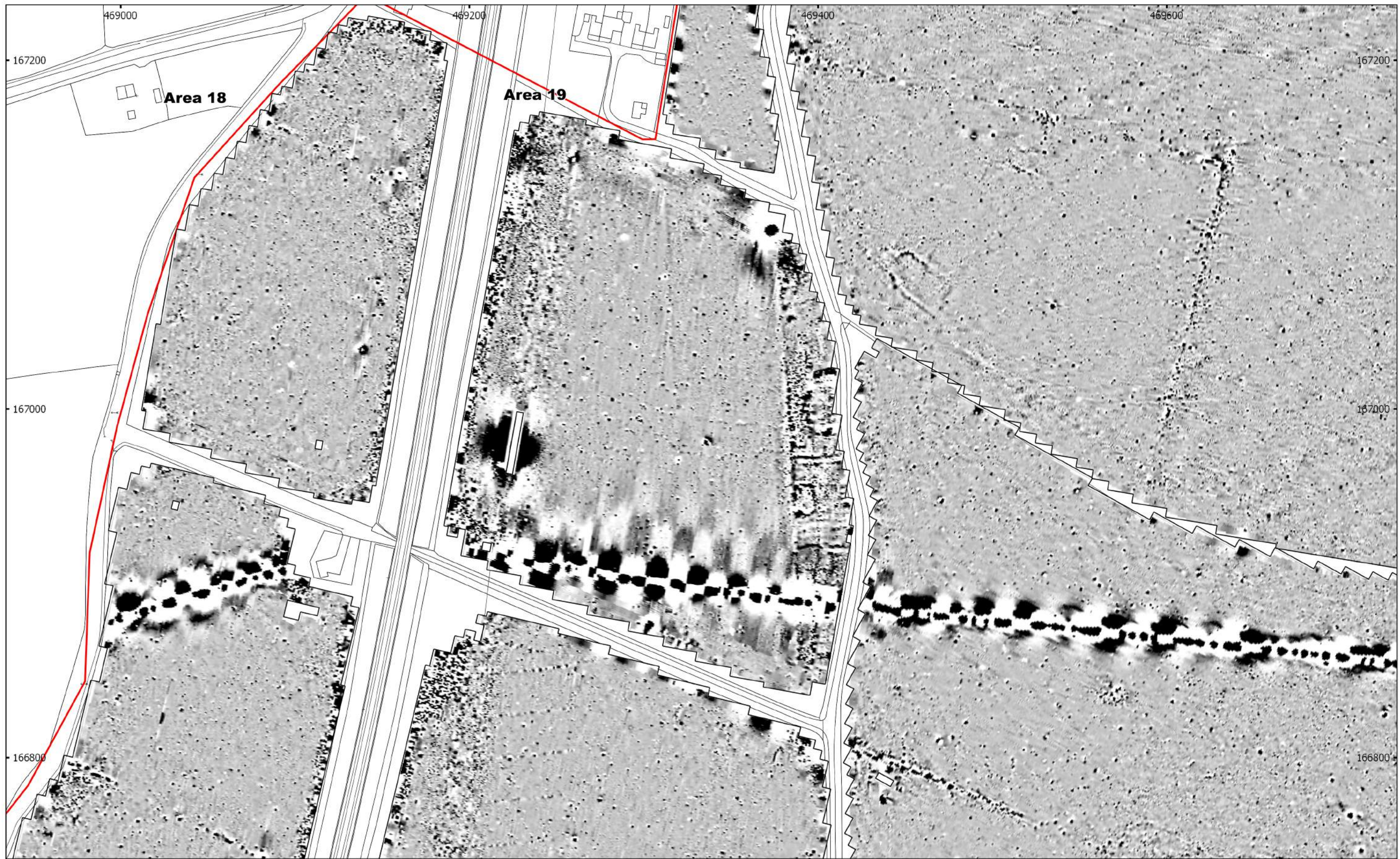




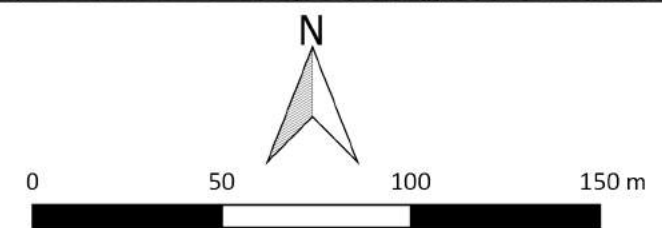
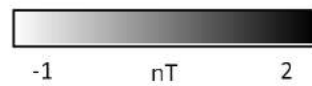
MSSU211 - Land at Grazeley, Berkshire
 Figure 26 - Magnetic Interpretation (Western End)
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- | | | | |
|-------------------------------|-------------------------------|--------------------------|----------------------|
| Archaeology Probable (Strong) | Archaeology Possible (Weak) | Agricultural (Trend) | Service |
| Archaeology Probable (Weak) | Archaeology Possible (Spread) | Ridge and Furrow (Trend) | Undetermined (Weak) |
| Archaeology Probable (Spread) | Archaeology Probable (Trend) | Natural (Weak) | Undetermined (Trend) |
| Archaeology Possible (Strong) | Agricultural (Weak) | Ferrous (Dipolar) | |
| Agricultural (Spread) | Ferrous (Spread)/Disturbance | | |

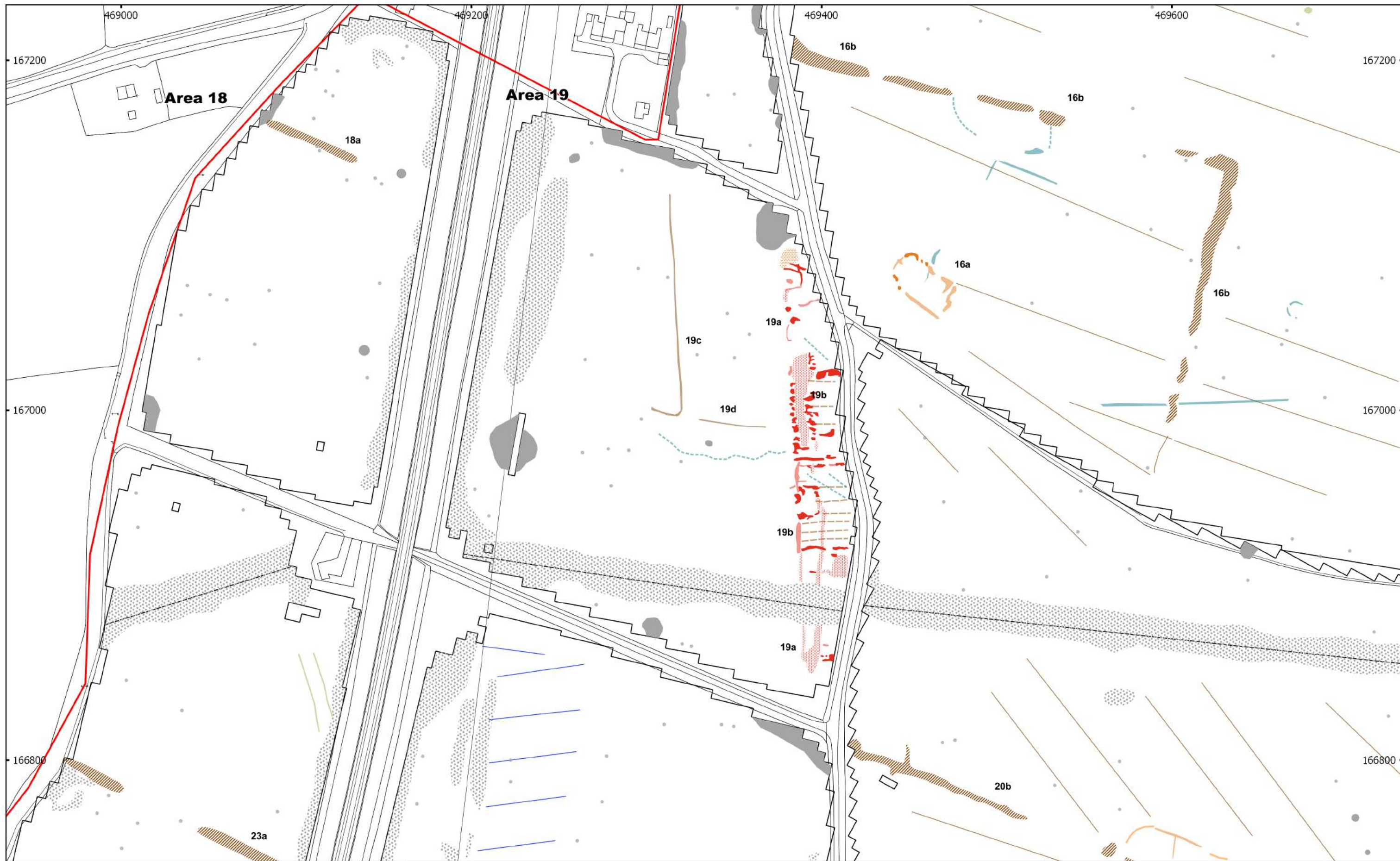




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Figure 27 - Magnetic Gradient (Western End)
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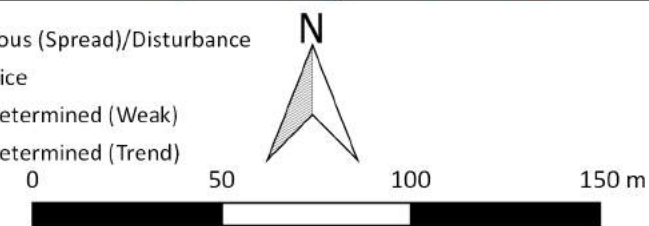


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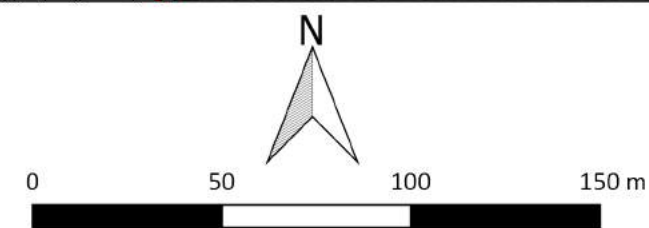
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 Figure 28 - Magnetic Interpretation (Western End)
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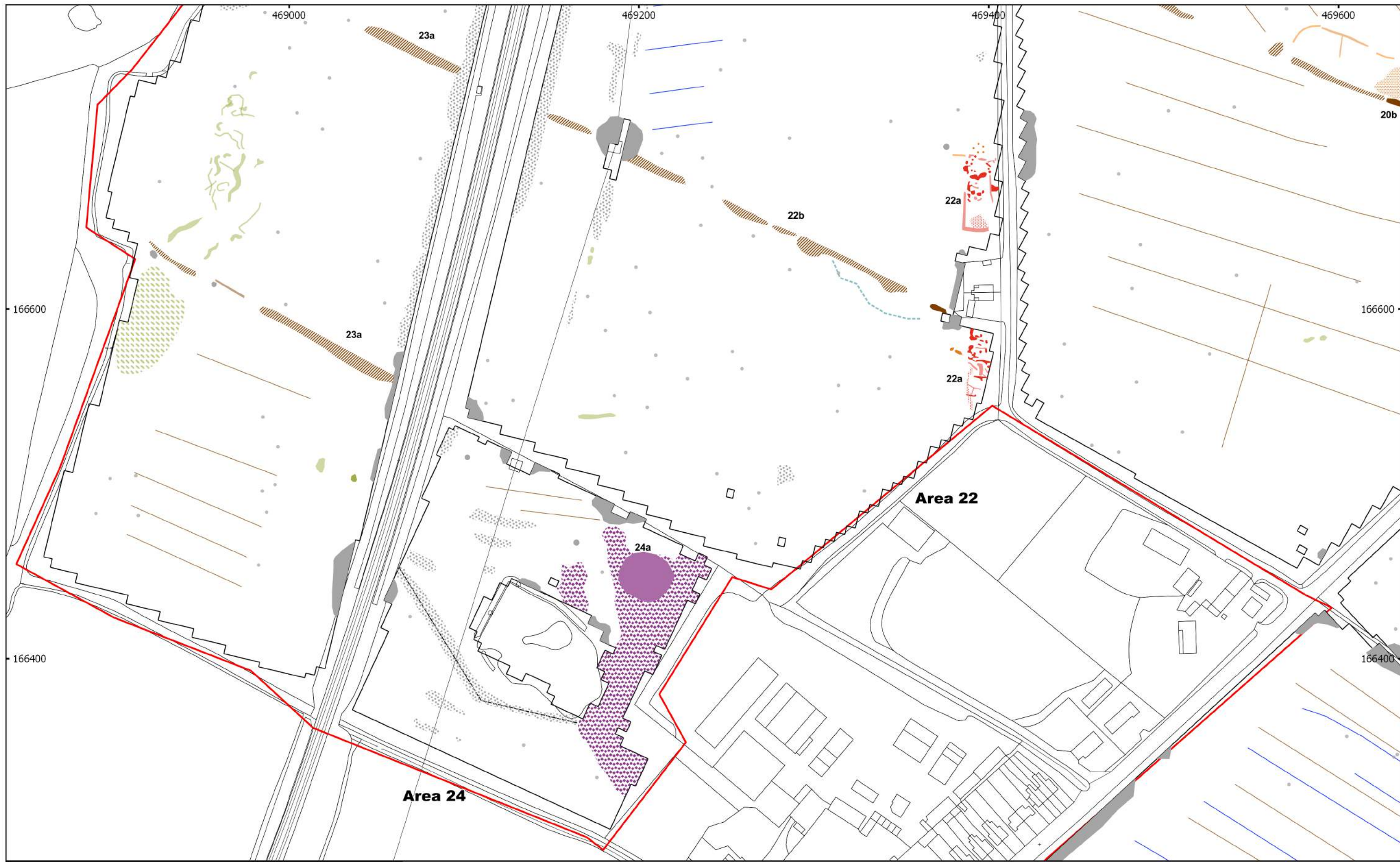
- | | | | |
|-------------------------------|-------------------------------|--------------------------|------------------------------|
| Archaeology Probable (Strong) | Archaeology Possible (Spread) | Agricultural (Trend) | Ferrous (Spread)/Disturbance |
| Archaeology Probable (Weak) | Archaeology Probable (Trend) | Ridge and Furrow (Trend) | Service |
| Archaeology Probable (Spread) | Archaeology Possible (Trend) | Drainage Feature | Undetermined (Weak) |
| Archaeology Possible (Strong) | Agricultural (Weak) | Natural (Weak) | Undetermined (Trend) |
| Archaeology Possible (Weak) | Agricultural (Spread) | Ferrous (Dipolar) | |





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Figure 29 - Magnetic Gradient (Western End)
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|-------------------------------|-------------------------------|-----------------------|------------------------------|
| Archaeology Probable (Strong) | Archaeology Possible (Spread) | Agricultural (Spread) | Ferrous (Dipolar) |
| Archaeology Probable (Weak) | Archaeology Probable (Trend) | Agricultural (Trend) | Ferrous (Spread)/Disturbance |
| Archaeology Probable (Spread) | Archaeology Possible (Trend) | Drainage Feature | Service |
| Archaeology Possible (Strong) | Agricultural (Strong) | Natural (Strong) | Undetermined (Trend) |
| Archaeology Possible (Weak) | Agricultural (Weak) | Natural (Weak) | |
| | | Natural (Spread) | |

