

GEOPHYSICAL SURVEY REPORT

sumo

Survey

**GEOPHYSICS FOR
ARCHAEOLOGY &
ENGINEERING**

Road Bypass and Junction 15 of the M1 - Northamptonshire

Client
CgMs Consulting

Survey Report
11110

Date
September 2017

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GEOPHYSICAL SURVEY REPORT

Project name: **Roade Bypass and Junction 15 of the M1 - Northamptonshire**
SUMO Job reference: **11110**

Client:
CgMs Consulting

Survey date: **29 March – 5 April, 10 April – 18 April, 31 August & 1 September 2017**
Report date: **25 September 2017**

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DIGITAL CONTENT (Archive Data)

- Minimally Processed Greyscale Images and XY Trace Plots in DWG format
- Digital Copies of Report Text and Figures (both PDF and native formats)

1 SUMMARY OF RESULTS

A detailed magnetometer survey was conducted over approximately 64ha of arable farmland and grassland. Two areas of probable later prehistoric settlement activity have been detected, along with further possible evidence of industrial activity. Former field boundaries, ridge and furrow and evidence of modern ploughing indicate that the site has a largely agricultural past. The remaining features include areas of magnetic debris, trackways, land drains, underground services and areas of natural magnetic variation.

2 INTRODUCTION

2.1 Background synopsis

SUMO Services Ltd were commissioned to undertake a geophysical survey of an area outlined for the construction of Roade Bypass and Phase 2 of works at Junction 15 of the M1. This survey forms part of an archaeological investigation being undertaken by **CgMs Consulting**.

2.2 Site details

NGR / Postcode	The Roade Bypass area is centred around NGR SP 747 516 / NN7 2ND. The area at Junction 15 of the M1 is centred around NGR SP 743 546 / NN7 3AG.
Location	The Roade Bypass site comprises 15 parcels of land curving around the west of the village of Roade, Northamptonshire. Blisworth Road runs through the north of the area, with a dismantled railway running through the south. The Junction 15 area comprises 4 fields, each bound to the west by the London and North Western Railway.
HER/SMR	Northamptonshire
District	South Northamptonshire
Parish	Junction 15: Milton Malsor CP Roade: Roade CP in the north; Stoke Bruerne CP in the south
Topography	Mostly flat, slight undulations
Current Land Use	Arable, pasture and horse grazing
Weather	Sunny, dry
Geology	Roade Bypass - Solid: Blisworth Limestone Formation – Limestone across most of the area. Rutland Formation – mudstone across the southern end of the site. Superficial: Oadby Member – diamicton across the majority of the area. Junction 15 – Solid: Whitby Mudstone Formation – mudstone. Superficial: Oadby Member – diamicton across the site, with a small area of mid Pleistocene Glaciofluvial Deposits – sand and gravel, in the north-west corner (BGS 2017).
Soils	Roade Bypass - Hanslope Association (411d) across the majority of the area, with Denchworth Association (712b) across the south. Junction 15 – Hanslope Association (411d) across most of the area, with small area of Wick 1 Association (541r) in the north-west corner. Hanslope soils comprise calcareous clayey soils, Denchworth soils comprise clayey soils with similar fine loamy over clayey soils, and the

	Wick 1 soils comprise coarse loamy and sandy soils, locally over gravel (SSEW 1983).
Archaeology	A search of Northamptonshire HER identifies several possible enclosures and ditches within close proximity of the survey area(s), one of which is located within the site itself (MNN125297), at the southern extent of the survey area (Northamptonshire CC 2017).
Survey Methods	Magnetometer survey (fluxgate gradiometer)
Study Area	64.8ha – approximately 0.8ha could not be surveyed due to livestock and overgrown vegetation.

2.3 Aims and Objectives

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

3 METHODS, PROCESSING & PRESENTATION

3.1 Standards & Guidance

This report and all fieldwork have been conducted in accordance with the latest guidance documents issued by Historic England (EH 2008) (then English Heritage) and the Chartered Institute for Archaeologists (IfA 2002 & CfA 2014).

3.2 Survey methods

Detailed magnetic survey was chosen as an efficient and effective method of locating archaeological anomalies.

Technique	Instrument	Traverse Interval	Sample Interval
Magnetometer	Bartington Grad 601-2	1.0m	0.25m

More information regarding this technique is included in Appendix A

3.3 Data Processing

The following basic processing steps have been carried out on the data used in this report:

De-stripe
De-stagger
Interpolate

3.4 Presentation of results and interpretation

The presentation of the results for each site involves a grey-scale plot of processed data. Magnetic anomalies are identified, interpreted and plotted onto the 'Interpretation' drawings. The minimally processed data are provided as a greyscale image in the Archive Data Folder with an XY trace plot in CAD format. A CAD viewer is also provided.

When interpreting the results, several factors are taken into consideration, including the nature of archaeological features being investigated and the local conditions at the site (geology, pedology, topography etc.). Anomalies are categorised by their potential origin. Where

responses can be related to other existing evidence, the anomalies will be given specific categories, such as: *Abbey Wall* or *Roman Road*. Where the interpretation is based largely on the geophysical data, levels of confidence are implied, for example: *Probable*, or *Possible Archaeology*. The former is used for a confident interpretation, based on anomaly definition and/or other corroborative data such as cropmarks. Poor anomaly definition, a lack of clear patterns to the responses and an absence of other supporting data reduces confidence, hence the classification *Possible*.

4 RESULTS

The survey has been divided into 20 survey areas (Areas 1-20) and, where considered appropriate, specific anomalies have been given numerical labels [1] [2] and these appear in the text below, as well as on the Interpretation Figure(s).

4.1 **Probable Archaeology**

- 4.1.1 A positive, sub-rectangular anomaly, some 37m x30m in size, [1] has been identified in Area 17, and corresponds with the location of a cropmark visible on aerial photographs (MNN125297) likely to be representative of a former enclosure, containing small discrete responses which are likely to relate to backfilled pits. To the north-west of the enclosure further linear anomalies [2] have been detected. These are indicative of cut features and may relate to a larger enclosure / field system associated with [1], and form part of one area of settlement.
- 4.1.2 A weak, sub-rectangular and linear anomaly [3] has been detected in Area 3. This is indicative of a small former enclosure and boundary ditch. Also in Area 3, to the north of anomaly [3], a weak curvilinear response [4] has been identified. This is likely to relate to a larger enclosure, though the full extent of the response cannot be determined. These responses are likely to be a result of a further area of prehistoric settlement activity.
- 4.1.3 The morphology of all of the probable archaeological responses detected indicates that they are likely to have a late prehistoric origin.

4.2 **Possible Archaeology**

- 4.2.1 A number of small discrete responses and an area of increased response [5] can be seen in Area 17. These may relate to small backfilled pits or areas of industrial activity. Their proximity to a sub-rectangular enclosure and ditches [1-2] indicates that they may be related to this, though their exact origin cannot be determined with confidence. These provide further evidence of settlement activity in the area.
- 4.2.2 A band of enhanced magnetic response [6] runs from the cut features in the north of Area 17, towards the sub-rectangular enclosure [1]. This may be related to a former boundary ditch, though the strength of the response suggests it may have a natural origin.
- 4.2.3 Positive, parallel linear anomalies [7] in Area 16 may be associated with a former trackway, possibly associated with the settlement evidence to the south. However, it is also possible that the features are an agricultural effect, especially given that the ridge and furrow cultivation detected across the area follows the same alignment.
- 4.2.4 Further weak linear and curvilinear anomalies have been detected in Areas 1, 4, 16 and 17. These may be related to former cut features, such as ditches, though their lack of context

and weak response makes further interpretation difficult. It is equally possible that they are a result of agricultural activity, i.e. field boundaries.

4.3 **Former Field Boundary**

4.3.1 Positive linear anomalies [8-9], corresponding with the locations of former field boundaries, have been detected in Areas 6 and 17. Both of the boundaries are visible on available historic mapping from 1884 to 1993.

4.3.2 An area of enhanced magnetic response in Area 11 also corresponds with the location of a former field boundary, visible on available mapping from 1884 to 1990.

4.3.3 A positive linear anomaly [10] running roughly east-west in Area 10 may relate to a former field boundary, but is not visible on available mapping.

4.4 **Agricultural – Ploughing, Land Drains, Trackways**

4.4.1 Widely spaced, parallel linear anomalies are visible in Areas 1-4, 8, 11-12 and 16-18; they are a result of ridge and furrow cultivation.

4.4.2 Evidence of modern ploughing is visible in Areas 1, 5-6 and 7-9, in the form of magnetically weak, closely spaced, parallel linear anomalies.

4.4.3 Strong magnetic linear anomalies are visible in Areas 5 and 18. These are related to modern farm tracks, visible on aerial photographs and modern mapping.

4.4.4 Magnetically weak linear anomalies in Area 8, and strong positive linear anomalies with associated negative responses in Area 5 are likely to be related to land drains.

4.5 **Natural / Geological / Pedological / Topographic**

4.5.1 Several areas of sinuous and amorphous magnetic variation have been detected across the site (Areas 1-3, 10, 12-13 and 17-18). These are typical of natural responses detected across superficial deposits of diamicton.

4.6 **Uncertain**

4.6.1 Several positive linear and small discrete responses are visible across the site. These may be archaeological, agricultural or natural in origin. The anomalies do not form clear features, and many provide weak responses, hence their classification as being of 'uncertain' origin.

4.6.2 A large area of strong magnetic debris [11] in Area 1 also falls into this category. The strength and nature of the response suggests that it has a modern origin, and may relate to an area of made ground. Similar responses are detected over infilled ponds/gravel pits, however there is no evidence for any such feature in this location on available historic mapping.

4.6.3 Areas of increased magnetic response [12] have been detected in the north of Area 16. It is possible that these are associated with the archaeological remains to the south; however, they are thought more likely to be of modern or agricultural origin.

4.7 **Ferrous / Magnetic Disturbance**

4.7.1 Strong bipolar linear anomalies in Areas 5 and 6 are related to underground services, such as pipes or cables.

- 4.7.2 Areas of weak scattered magnetic debris are visible in Areas 1, 3, 3, 6-7 and 10. These are of modern origin, and likely relate to ferrous debris/rubbish within the topsoil.
- 4.7.3 Ferrous responses close to boundaries are due to adjacent fences and gates. Smaller scale ferrous anomalies ("iron spikes") are present throughout the data and their form is best illustrated in the XY trace plots. These responses are characteristic of small pieces of ferrous debris (or brick / tile) in the topsoil and are commonly assigned a modern origin. Only the most prominent of these are highlighted on the interpretation diagram.

5 DATA APPRAISAL & CONFIDENCE ASSESSMENT

- 5.1 Heritage England guidelines (EH 2008) Table 4 states that the typical magnetic response on limestone is good, however over mudstone and diamicton results can be variable. The detection of areas of prehistoric settlement activity along with further linear anomalies and enclosures, suggests that this survey is likely to have detected any archaeological features, where present.

6 CONCLUSION

- 6.1 The survey at Roade and Junction 15 of the M1 has identified two areas of likely prehistoric settlement activity, comprising a sub-rectangular enclosure, linear anomalies and small discrete responses. An area of possible industrial activity has also been detected, though it is possible that this is modern in origin.

Evidence of ridge and furrow, former field boundaries and modern ploughing across much of the area indicate that the site has a largely agricultural past.

Areas of magnetic debris and disturbance are a result of nearby ferrous metal objects, such as fences and underground services.

7 REFERENCES

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Appendix A - Technical Information: Magnetometer Survey Method

Grid Positioning

For hand held gradiometers the location of the survey grids has been plotted together with the referencing information. Grids were set out using a Trimble R8 Real Time Kinematic (RTK) VRS Now GNSS GPS system.

An RTK GPS (Real-time Kinematic Global Positioning System) can locate a point on the ground to a far greater accuracy than a standard GPS unit. A standard GPS suffers from errors created by satellite orbit errors, clock errors and atmospheric interference, resulting in an accuracy of 5m-10m. An RTK system uses a single base station receiver and a number of mobile units. The base station re-broadcasts the phase of the carrier it measured, and the mobile units compare their own phase measurements with those they received from the base station. This results in an accuracy of around 0.01m.

Technique	Instrument	Traverse Interval	Sample Interval
Magnetometer	Bartington Grad 601-2	1m	0.25m

Instrumentation: **Bartington Grad 601-2**

Bartington instruments operate in a gradiometer configuration which comprises fluxgate sensors mounted vertically, set 1.0m apart. The fluxgate gradiometer suppresses any diurnal or regional effects. The instruments are carried, or cart mounted, with the bottom sensor approximately 0.1-0.3m from the ground surface. At each survey station, the difference in the magnetic field between the two fluxgates is measured in nanoTesla (nT). The sensitivity of the instrument can be adjusted; for most archaeological surveys the most sensitive range (0.1nT) is used. Generally, features up to 1m deep may be detected by this method, though strongly magnetic objects may be visible at greater depths. The Bartington instrument can collect two lines of data per traverse with gradiometer units mounted laterally with a separation of 1.0m. The readings are logged consecutively into the data logger which in turn is daily down-loaded into a portable computer whilst on site. At the end of each site survey, data is transferred to the office for processing and presentation.

Data Processing

Zero Mean Traverse	This process sets the background mean of each traverse within each grid to zero. The operation removes striping effects and edge discontinuities over the whole of the data set.
Step Correction (De-stagger)	When gradiometer data are collected in 'zig-zag' fashion, stepping errors can sometimes arise. These occur because of a slight difference in the speed of walking on the forward and reverse traverses. The result is a staggered effect in the data, which is particularly noticeable on linear anomalies. This process corrects these errors.

Display

Greyscale/ Colourscale Plot	This format divides a given range of readings into a set number of classes. Each class is represented by a specific shade of grey, the intensity increasing with value. All values above the given range are allocated the same shade (maximum intensity); similarly, all values below the given range are represented by the minimum intensity shade. Similar plots can be produced in colour, either using a wide range of colours or by selecting two or three colours to represent positive and negative values. The assigned range (plotting levels) can be adjusted to emphasise different anomalies in the data-set.
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Interpretation Categories

In certain circumstances (usually when there is corroborative evidence from desk-based or excavation data) very specific interpretations can be assigned to magnetic anomalies (for example, *Roman Road, Wall, etc.*) and where appropriate, such interpretations will be applied. The list below outlines the generic categories commonly used in the interpretation of the results.

<i>Archaeology / Probable Archaeology</i>	This term is used when the form, nature and pattern of the responses are clearly or very probably archaeological and /or if corroborative evidence is available. These anomalies, whilst considered anthropogenic, could be of any age.
<i>Possible Archaeology</i>	These anomalies exhibit either weak signal strength and / or poor definition, or form incomplete archaeological patterns, thereby reducing the level of confidence in the interpretation. Although the archaeological interpretation is favoured, they may be the result of variable soil depth, plough damage or even aliasing as a result of data collection orientation.
<i>Industrial / Burnt-Fired</i>	Strong magnetic anomalies that, due to their shape and form or the context in which they are found, suggest the presence of kilns, ovens, corn dryers, metal-working areas or hearths. It should be noted that in many instances modern ferrous material can produce similar magnetic anomalies.
<i>Former Field Boundary (probable & possible)</i>	Anomalies that correspond to former boundaries indicated on historic mapping, or which are clearly a continuation of existing land divisions. Possible denotes less confidence where the anomaly may not be shown on historic mapping but nevertheless the anomaly displays all the characteristics of a field boundary.
<i>Ridge & Furrow</i>	Parallel linear anomalies whose broad spacing suggests ridge and furrow cultivation. In some cases, the response may be the result of more recent agricultural activity.
<i>Agriculture (ploughing)</i>	Parallel linear anomalies or trends with a narrower spacing, sometimes aligned with existing boundaries, indicating more recent cultivation regimes.
<i>Land Drain</i>	Weakly magnetic linear anomalies, quite often appearing in series forming parallel and herringbone patterns. Smaller drains may lead and empty into larger diameter pipes, which in turn usually lead to local streams and ponds. These are indicative of clay fired land drains.
<i>Natural</i>	These responses form clear patterns in geographical zones where natural variations are known to produce significant magnetic distortions.
<i>Magnetic Disturbance</i>	Broad zones of strong dipolar anomalies, commonly found in places where modern ferrous or fired materials (e.g. brick rubble) are present. They are presumed to be modern.
<i>Service</i>	Magnetically strong anomalies, usually forming linear features are indicative of ferrous pipes/cables. Sometimes other materials (e.g. pvc) or the fill of the trench can cause weaker magnetic responses which can be identified from their uniform linearity.
<i>Ferrous</i>	This type of response is associated with ferrous material and may result from small items in the topsoil, larger buried objects such as pipes, or above ground features such as fence lines or pylons. Ferrous responses are usually regarded as modern. Individual burnt stones, fired bricks or igneous rocks can produce responses similar to ferrous material.
<i>Uncertain Origin</i>	Anomalies which stand out from the background magnetic variation, yet whose form and lack of patterning gives little clue as to their origin. Often the characteristics and distribution of the responses straddle the categories of <i>Possible Archaeology / Natural</i> or (in the case of linear responses) <i>Possible Archaeology / Agriculture</i> ; occasionally they are simply of an unusual form.

Where appropriate some anomalies will be further classified according to their form (positive or negative) and relative strength and coherence (trend: weak and poorly defined).

Appendix B - Technical Information: Magnetic Theory

Detailed magnetic survey can be used to effectively define areas of past human activity by mapping spatial variation and contrast in the magnetic properties of soil, subsoil and bedrock. Although the changes in the magnetic field resulting from differing features in the soil are usually weak, changes as small as 0.1 nanoTeslas (nT) in an overall field strength of 48,000 (nT), can be accurately detected.

Weakly magnetic iron minerals are always present within the soil and areas of enhancement relate to increases in *magnetic susceptibility* and permanently magnetised *thermoremanent* material.

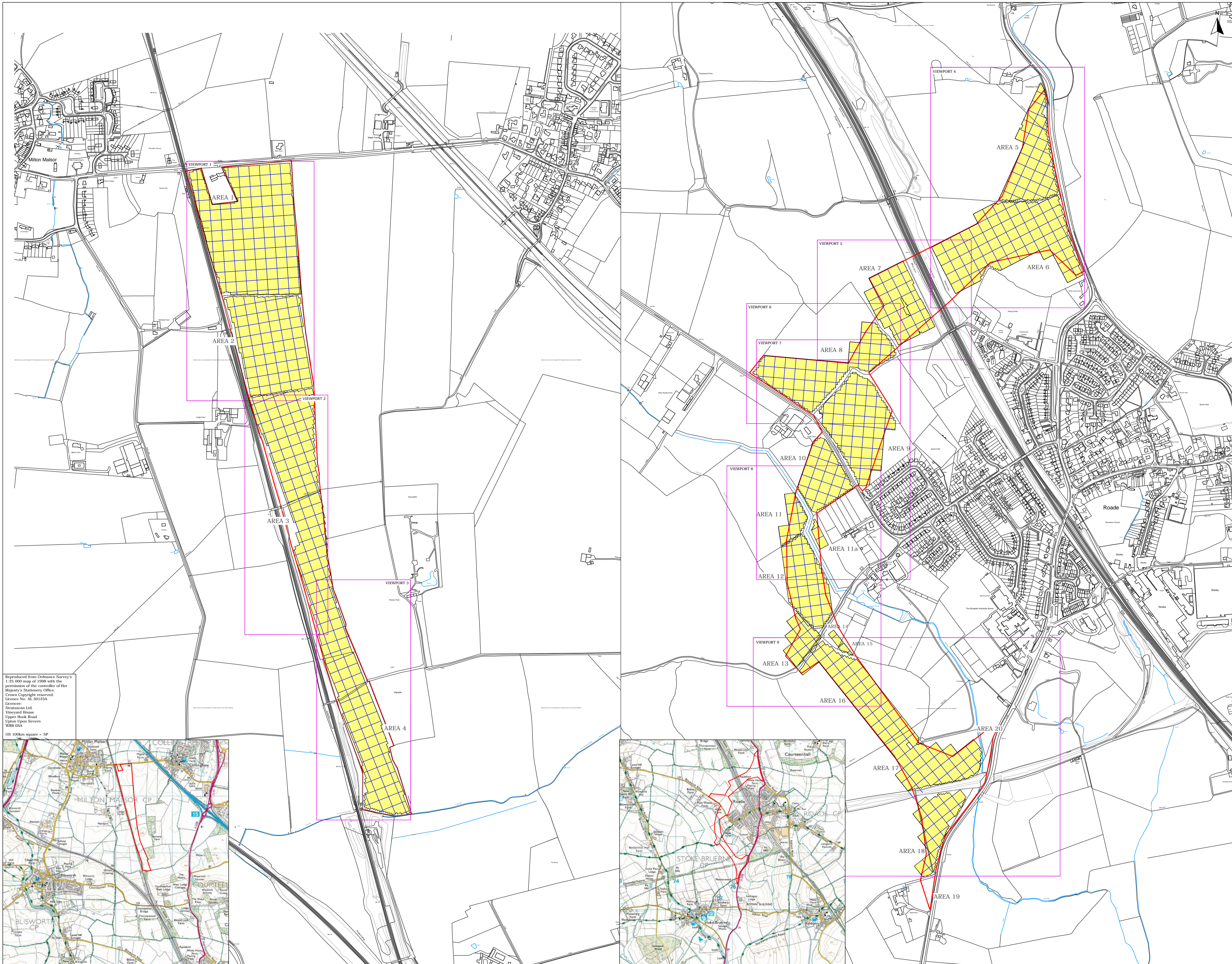
Magnetic susceptibility relates to the induced magnetism of a material when in the presence of a magnetic field. This magnetism can be considered as effectively permanent as it exists within the Earth's magnetic field. Magnetic susceptibility can become enhanced due to burning and complex biological or fermentation processes.

Thermoremanence is a permanent magnetism acquired by iron minerals that, after heating to a specific temperature known as the Curie Point, are effectively demagnetised followed by re-magnetisation by the Earth's magnetic field on cooling. Thermoremanent archaeological features can include hearths and kilns; material such as brick and tile may be magnetised through the same process.

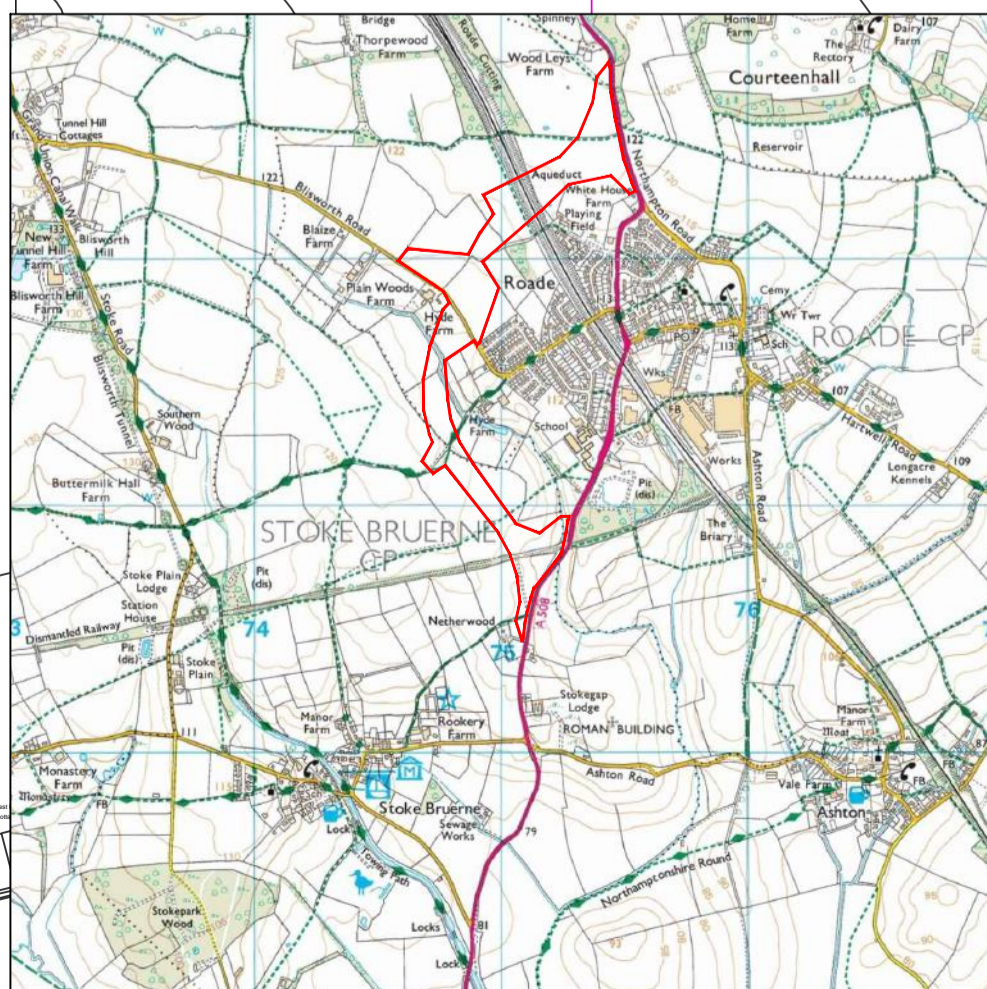
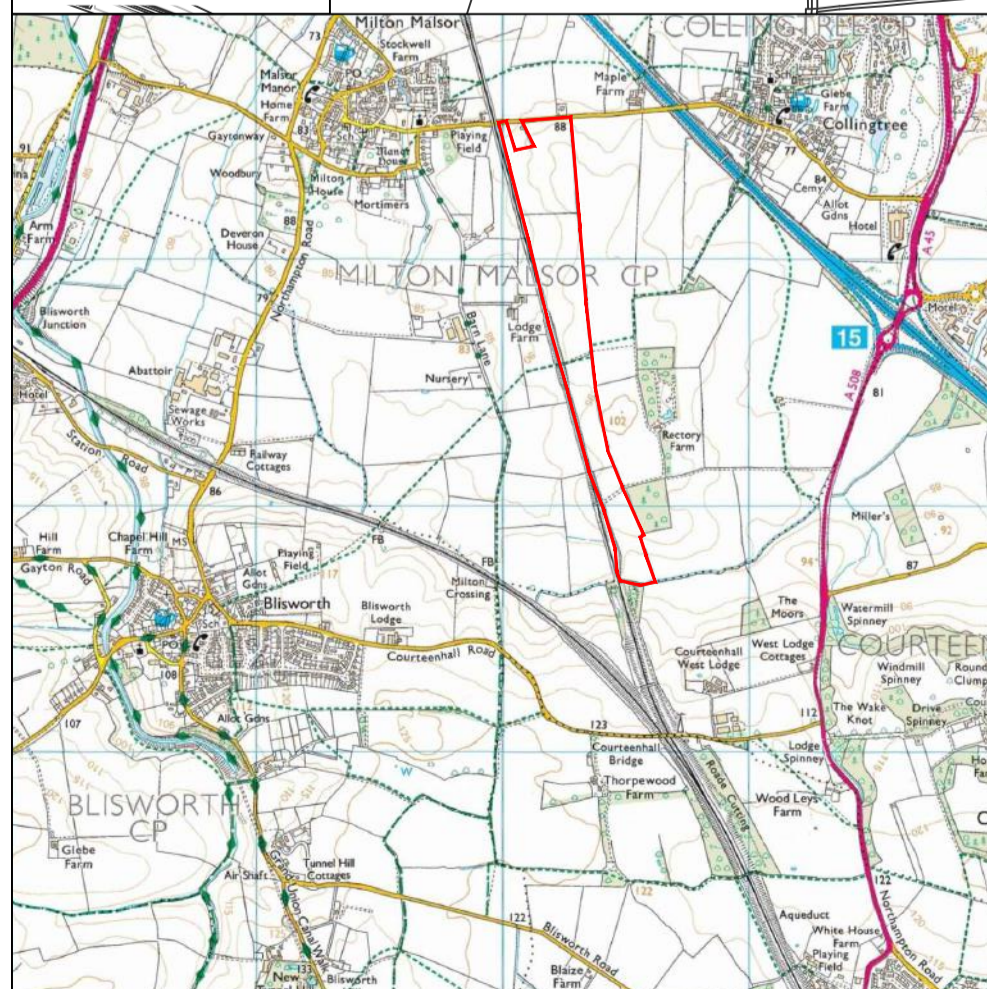
Silting and deliberate infilling of ditches and pits with magnetically enhanced soil creates a relative contrast against the much lower levels of magnetism within the subsoil into which the feature is cut. Systematic mapping of magnetic anomalies will produce linear and discrete areas of enhancement allowing assessment and characterisation of subsurface features. Material such as subsoil and non-magnetic bedrock used to create former earthworks and walls may be mapped as areas of lower enhancement compared to surrounding soils.


Magnetic survey is carried out using a fluxgate gradiometer which is a passive instrument consisting of two sensors mounted vertically 1m apart. The instrument is carried about 30cm above the ground surface and the top sensor measures the Earth's magnetic field whilst the lower sensor measures the same field but is also more affected by any localised buried feature. The difference between the two sensors will relate to the strength of a magnetic field created by this feature, if no field is present the difference will be close to zero as the magnetic field measured by both sensors will be the same.

Factors affecting the magnetic survey may include soil type, local geology, previous human activity and disturbance from modern services.



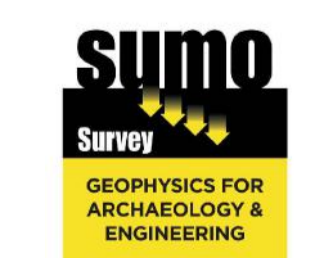
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 Licensee: Stratacon Ltd, Vineyard House, Upper Hook Road, Upon Upon Severn, WIS9 0GS
 OS 100km square = SP



 Survey Area - showing 30m grid

 Site Location

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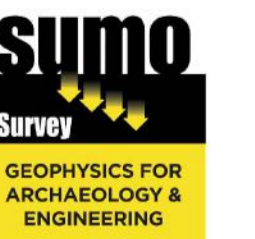
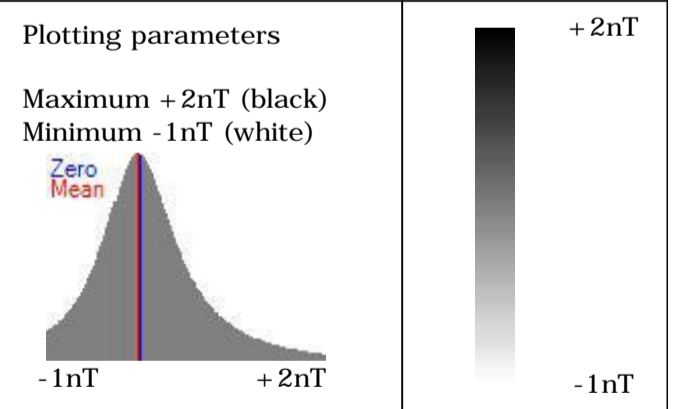


Title: SITE LOCATION DIAGRAM AND LOCATION OF SURVEY AREA

Client: CgMs CONSULTING

Project: 11110 - ROADE BYPASS AND JUNCTION 15, M1 - NORTHAMPTONSHIRE

Scale: 1:5000 @ A1
 0m 100 200 300m Fig No: 01



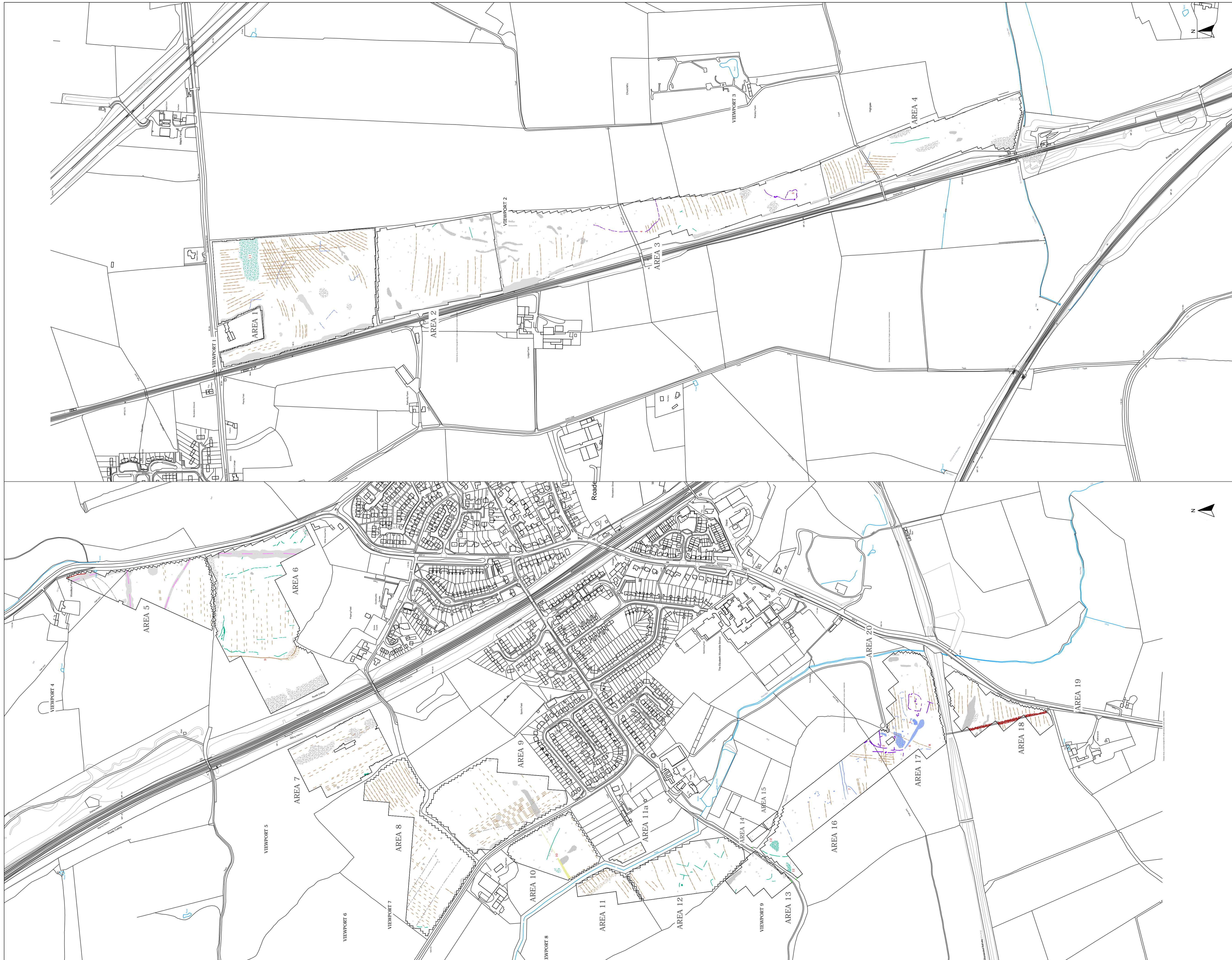
Title:
MAGNETOMETER SURVEY - GREYSCALE PLOT
- OVERVIEW

Client:
CgMs CONSULTING

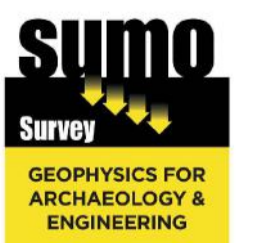
Project:
11110 - ROADE BYPASS AND JUNCTION 15, M1
- NORTHAMPTONSHIRE

Scale: 1:4000 @ A1
0m 40 80 120 160 200 240m

Fig No:
02



KEY	
	Probable archaeology (positive/trend)
	Possible archaeology (positive/area of increased response/trend)
	Former field boundary (corroborated)
	Former field boundary (conjectural)
	Track (corroborated)
	Ridge and furrow
	Agriculture (e.g. ploughing)
	Land drain
	Natural (e.g. geological or pedological)
	Magnetic disturbance
	Service
	Fences
	Uncertain (positive/area of increased response/negative/trend)



Title: **MAGNETOMETER SURVEY - INTERPRETATION - OVERVIEW**

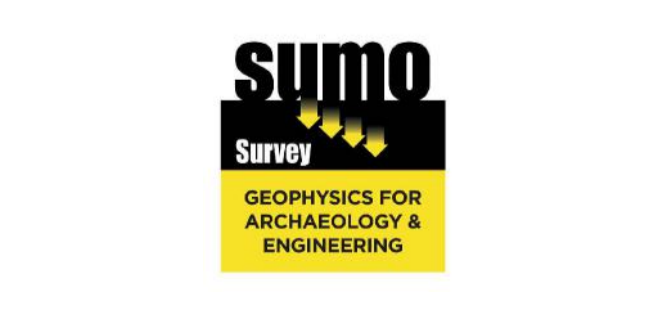
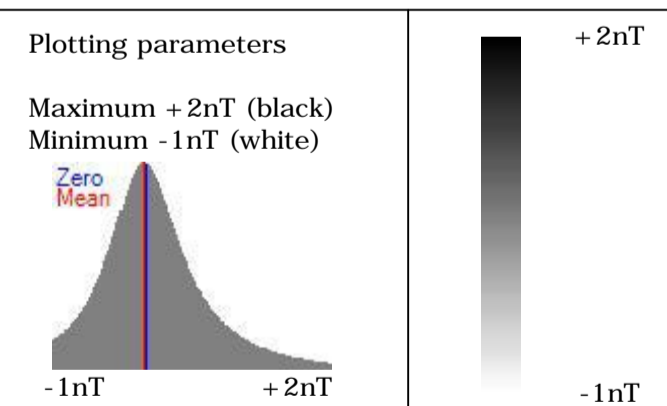
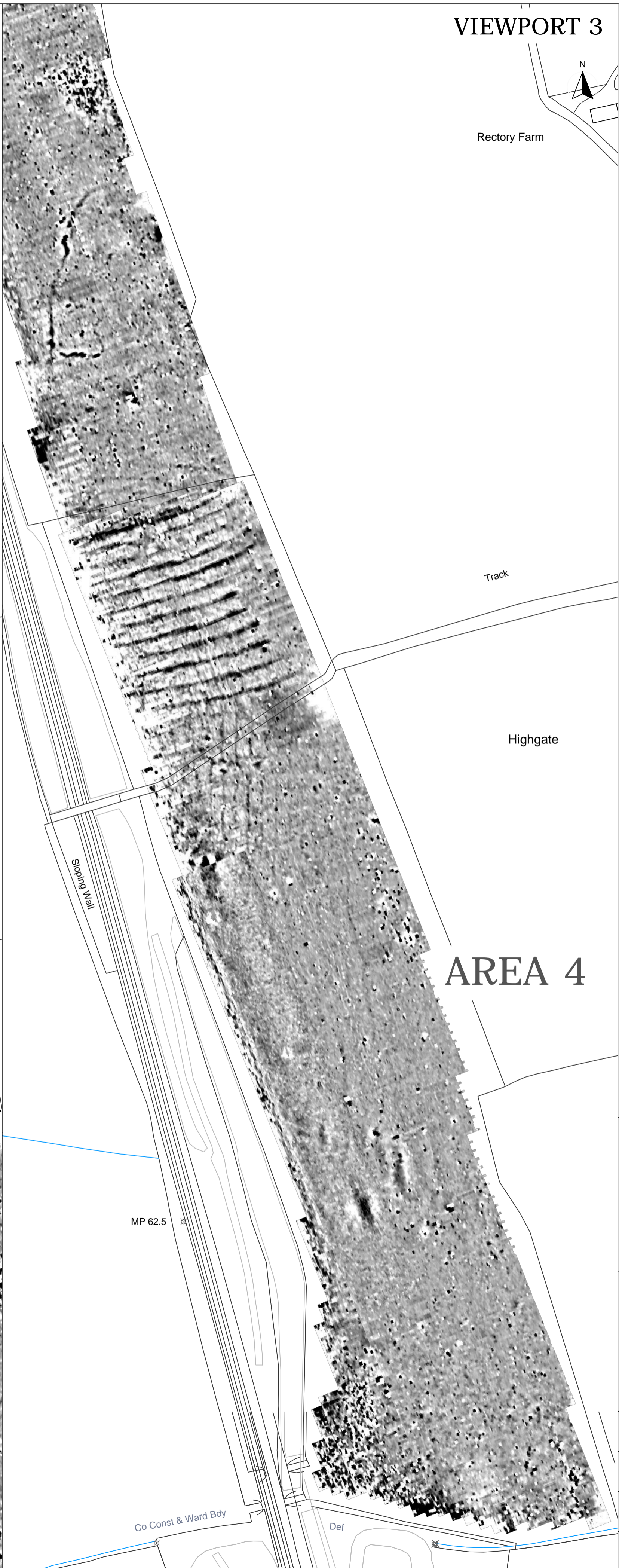
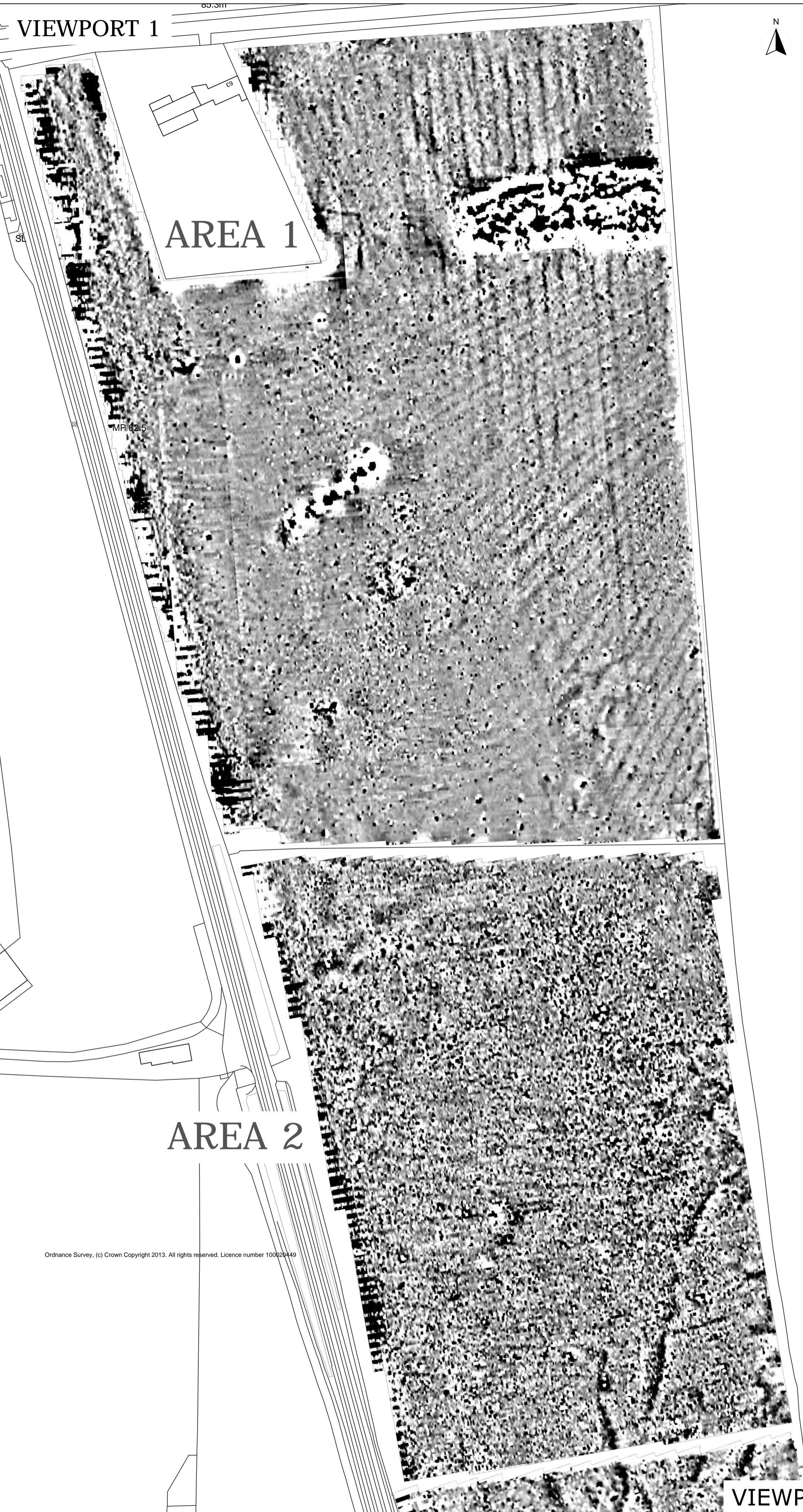
Client: **CgMs CONSULTING**

Project: **11110 - ROAD BYPASS AND JUNCTION 15, M1 - NORTHAMPTONSHIRE**

Scale: 1:4000 @ A1

0m 40 80 120 160 200 240m

Fig No: **03**



Title: MAGNETOMETER SURVEY - GREyscale PLOT - AREAS 1-4

Client: CgMs CONSULTING

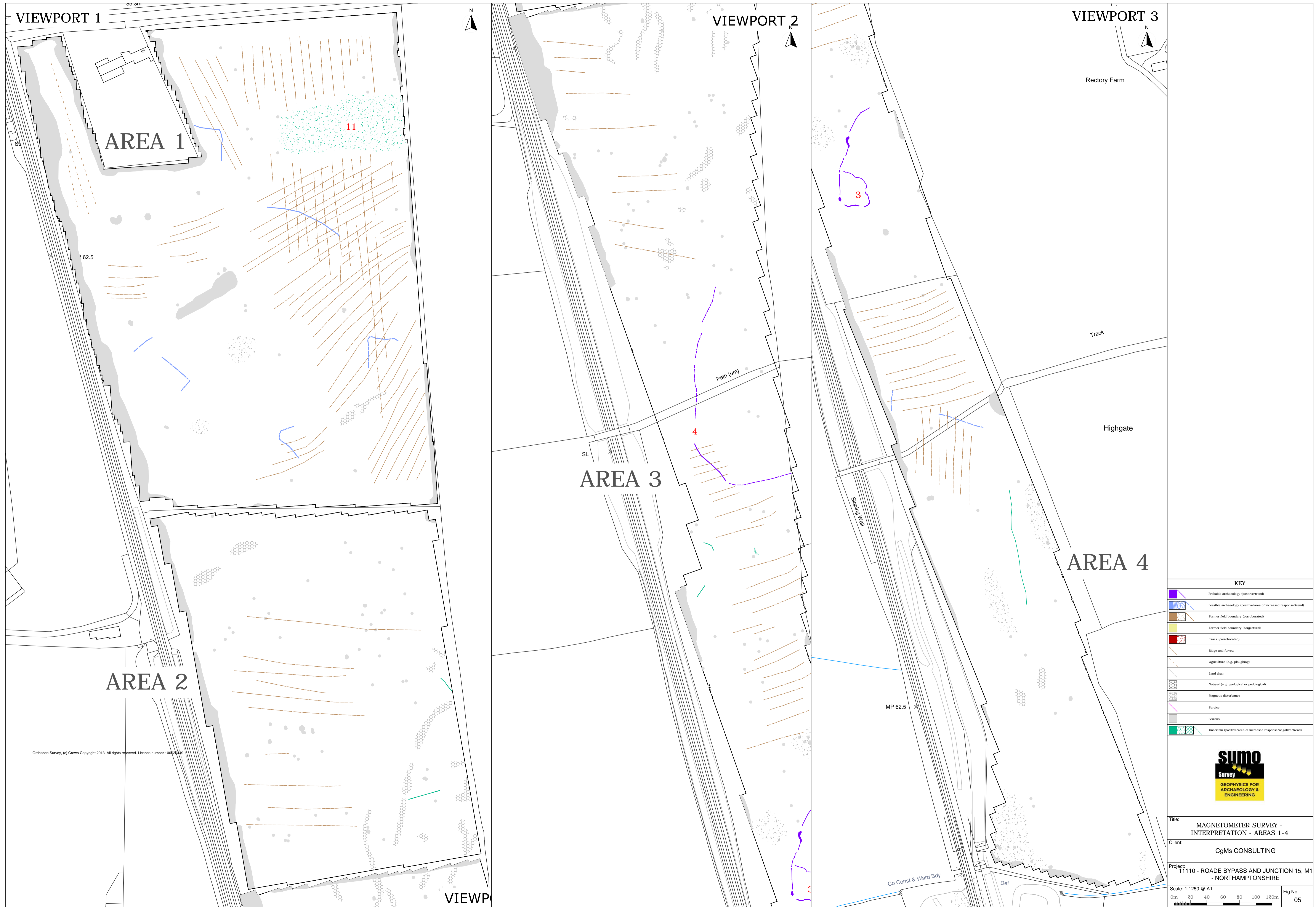
Project: 11110 - ROADE BYPASS AND JUNCTION 15, M1 - NORTHAMPTONSHIRE

Scale: 1:1250 @ A1

0m 20 40 60 80 100 120m

Fig No: 04

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VIEWPORT 1

VIEWPORT 2

VIEWPORT 3

AREA 1

AREA 3

AREA 4

AREA 2

VIEWPORT

Rectory Farm

Track

Highgate

SL

Path (um)

Sloping N

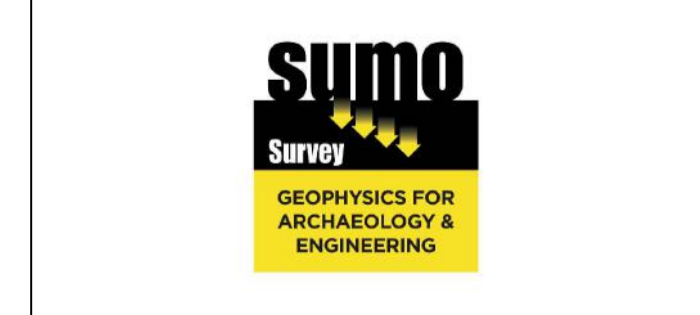
MP 62.5

Co Const & Ward Bdy

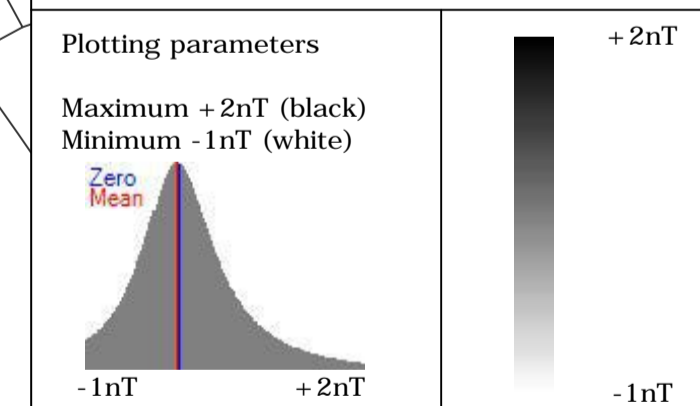
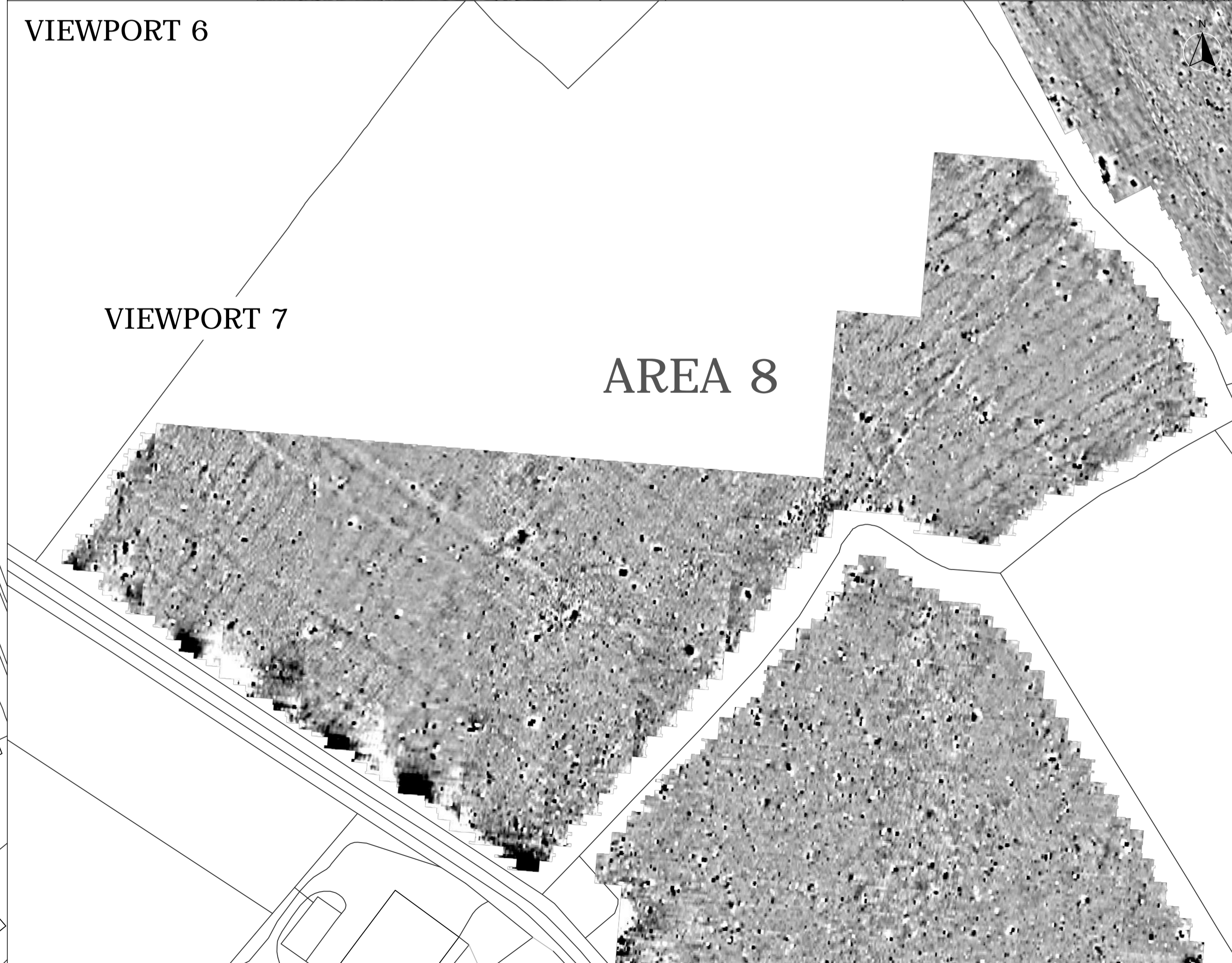
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KEY	
	Probable archaeology (positive/trend)
	Possible archaeology (positive/area of increased response/trend)
	Former field boundary (corroborated)
	Former field boundary (conjectural)
	Track (corroborated)
	Ridge and furrow
	Agriculture (e.g. ploughing)
	Land drain
	Natural (e.g. geological or pedological)
	Magnetic disturbance
	Service
	Fences
	Uncertain (positive/area of increased response/negative/trend)



Title: MAGNETOMETER SURVEY - INTERPRETATION - AREAS 1-4
 Client: CgMs CONSULTING
 Project: 11110 - ROADE BYPASS AND JUNCTION 15, M1 - NORTHAMPTONSHIRE
 Scale: 1:1250 @ A1
 0m 20 40 60 80 100 120m
 Fig No: 05



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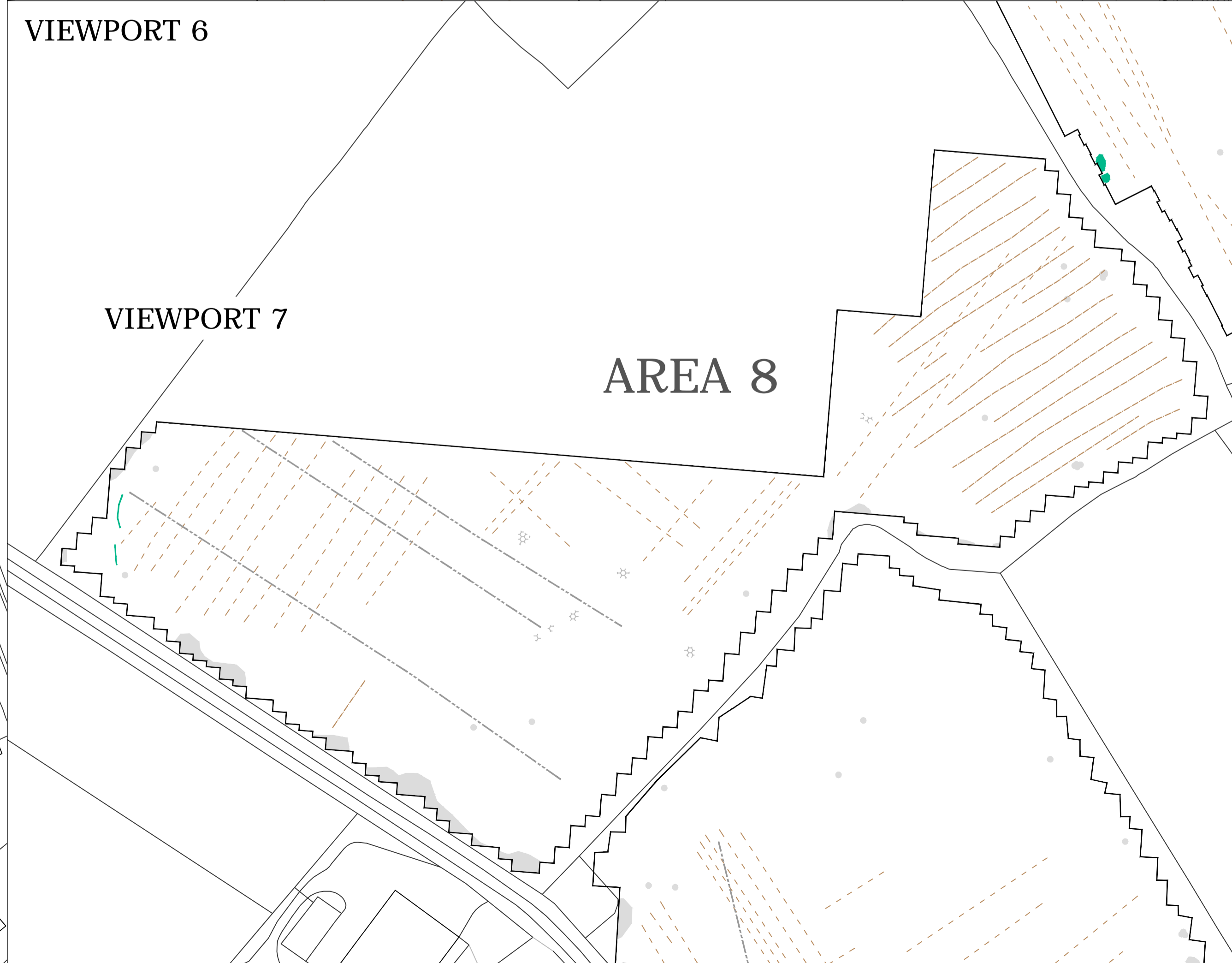
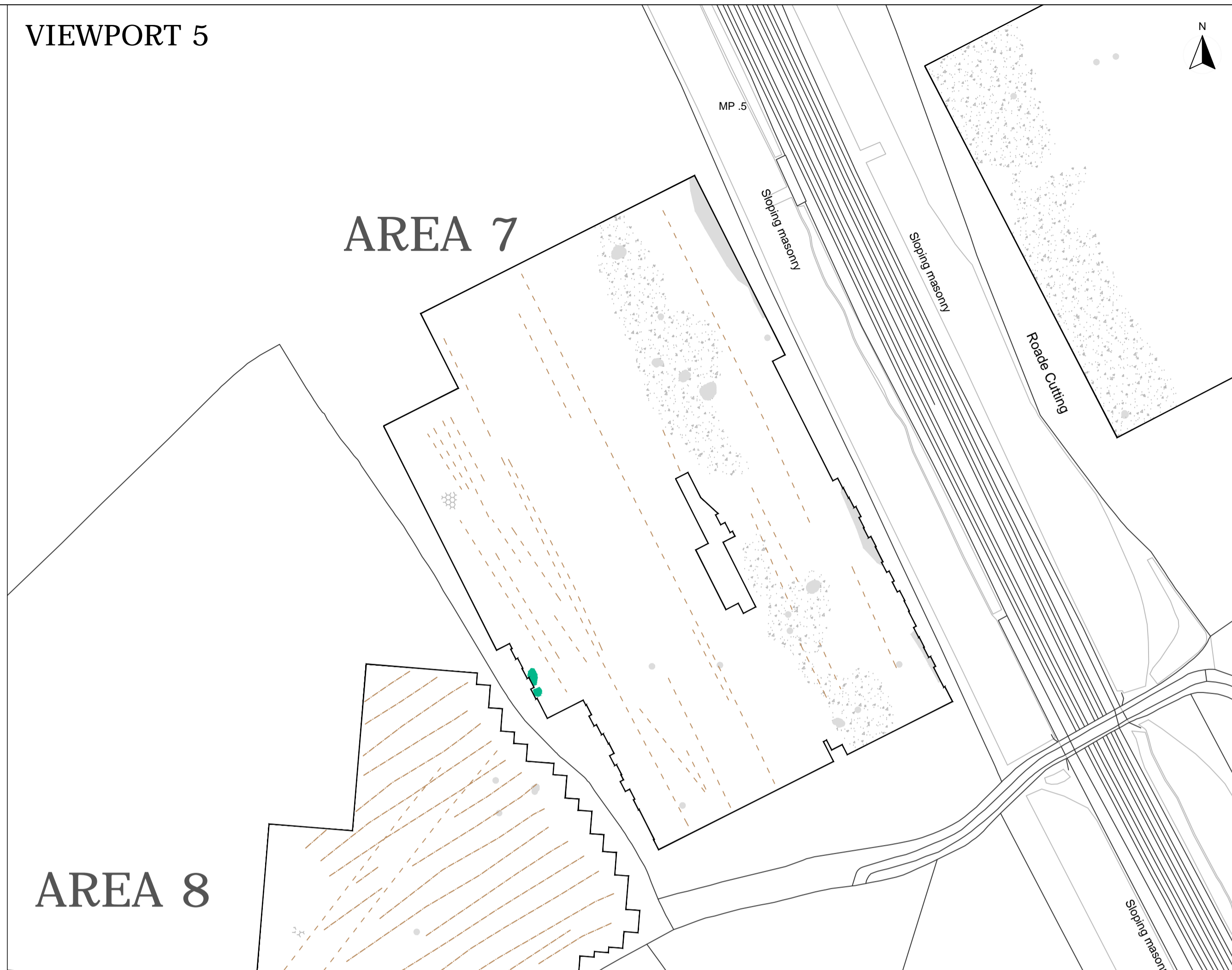
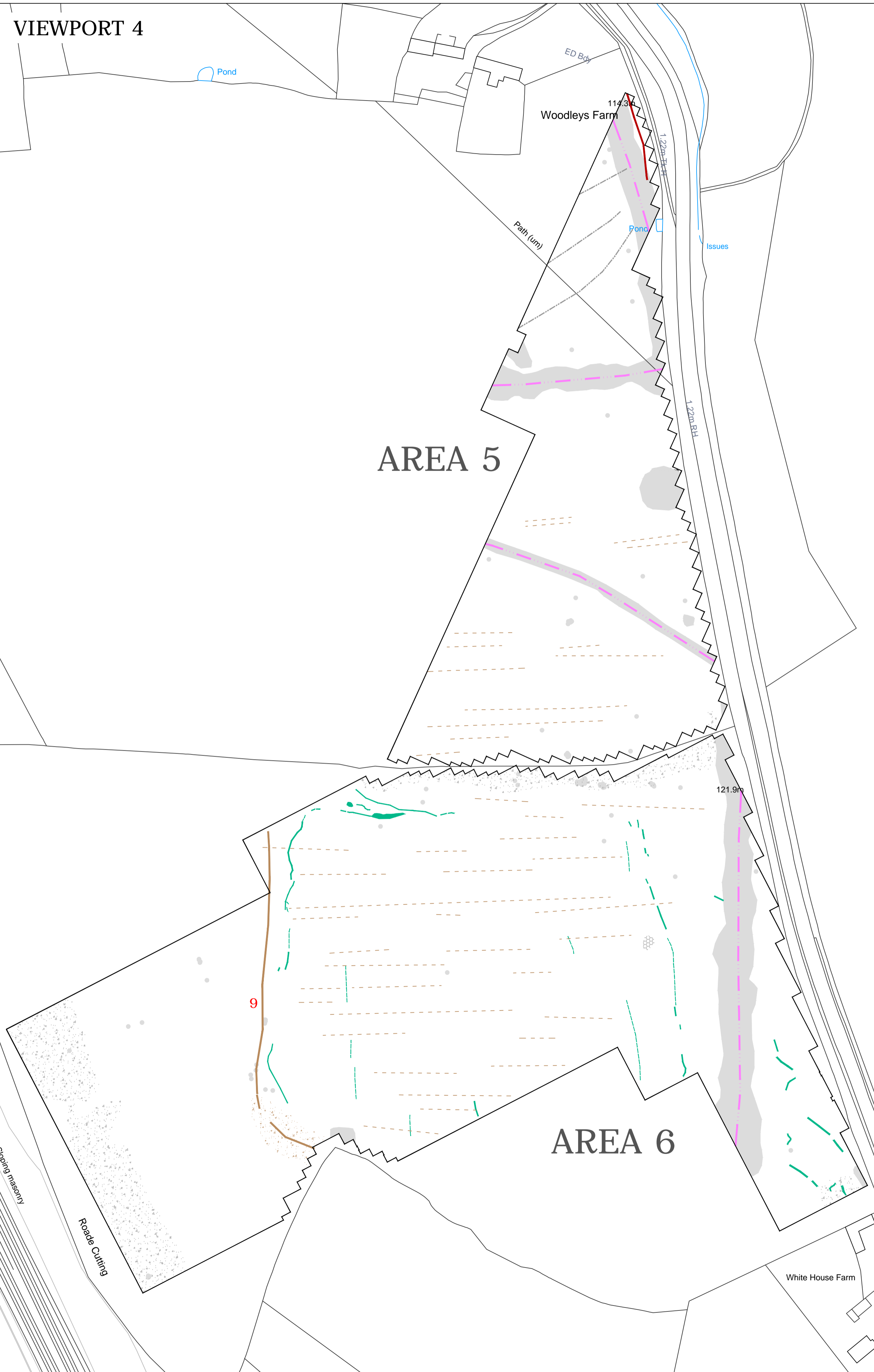
Title:
MAGNETOMETER SURVEY - GREYSCALE PLOT
- AREAS 5-8

Client:
CgMs CONSULTING


Project:
11110 - ROADE BYPASS AND JUNCTION 15, M1
- NORTHAMPTONSHIRE

Scale: 1:1250 @ A1
0m 20 40 60 80 100 120m

Fig No:
06



KEY	
	Probable archaeology (positive/trend)
	Possible archaeology (positive/area of increased response/trend)
	Former field boundary (corroborated)
	Former field boundary (conjectural)
	Track (corroborated)
	Ridge and furrow
	Agriculture (e.g. ploughing)
	Land drain
	Natural (e.g. geological or pedological)
	Magnetic disturbance
	Service
	Fences
	Uncertain (positive/area of increased response/negative/trend)



sumo
Survey
GEOPHYSICS FOR
ARCHAEOLOGY &
ENGINEERING

Title: **MAGNETOMETER SURVEY -
INTERPRETATION - AREAS 5-8**

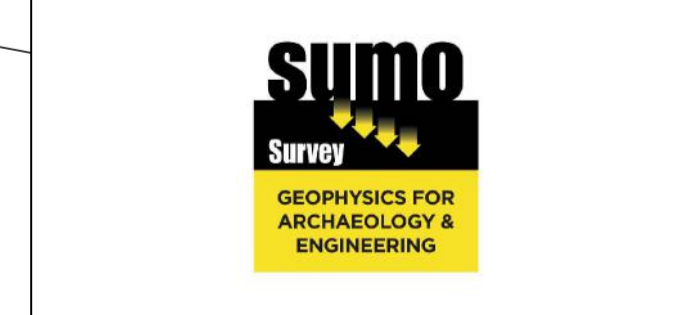
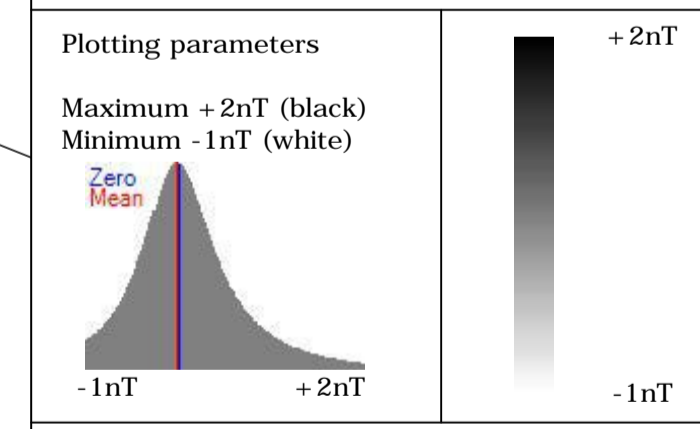
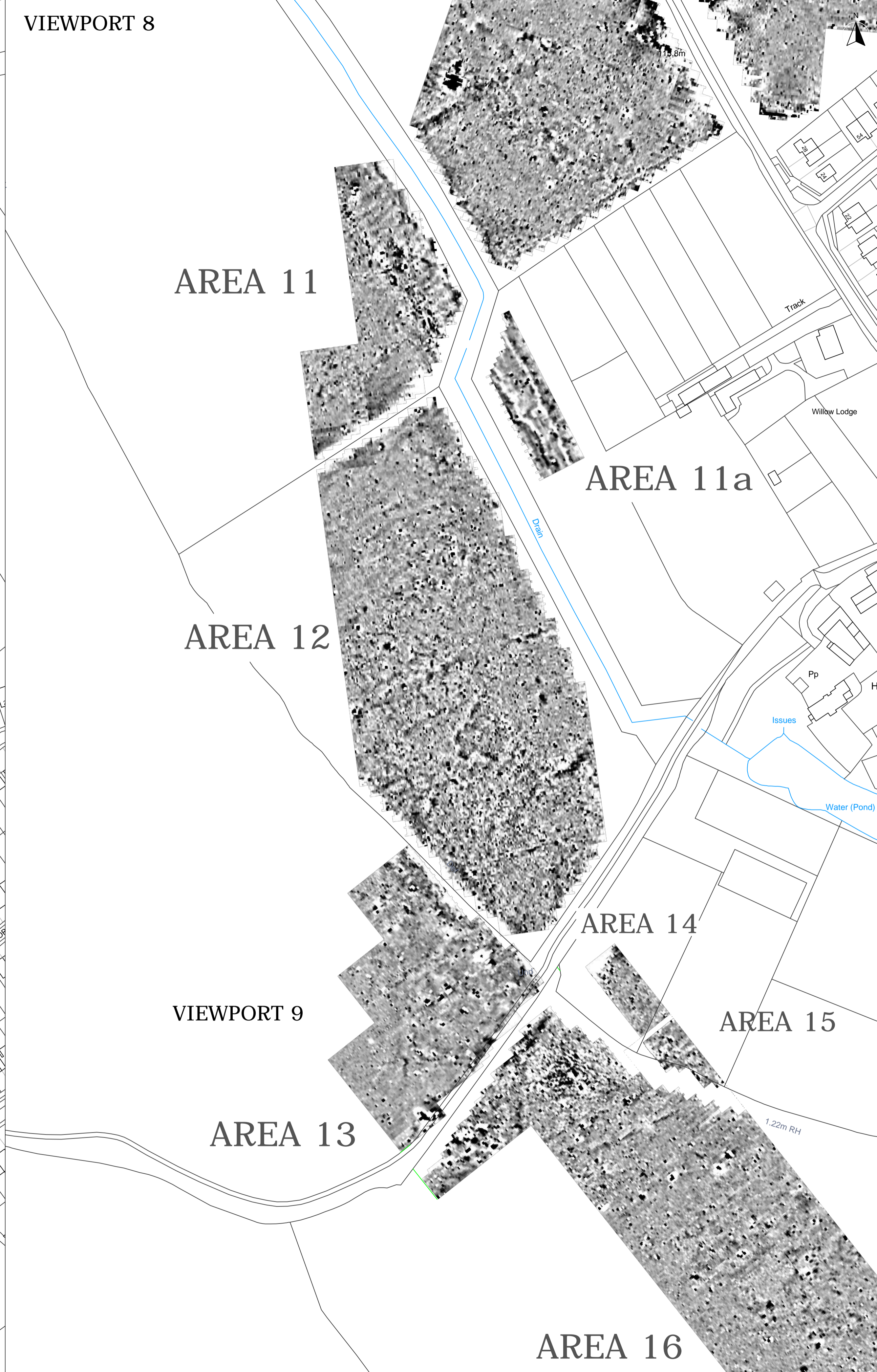
Client: **CgMs CONSULTING**

Project: **11110 - ROADE BYPASS AND JUNCTION 15, M1
- NORTHAMPTONSHIRE**

Scale: 1:1250 @ A1

0m 20 40 60 80 100 120m

Fig No: **07**



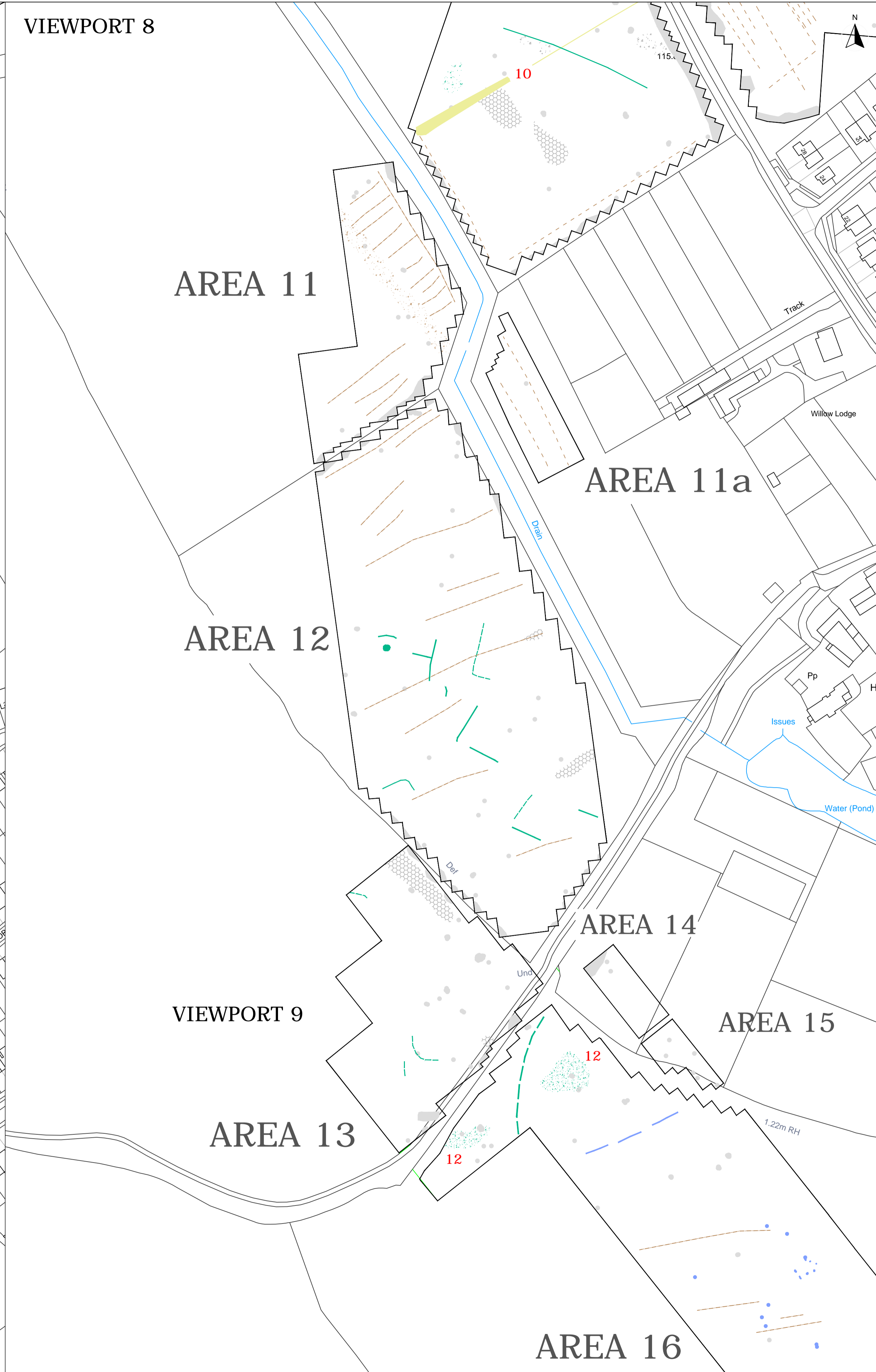
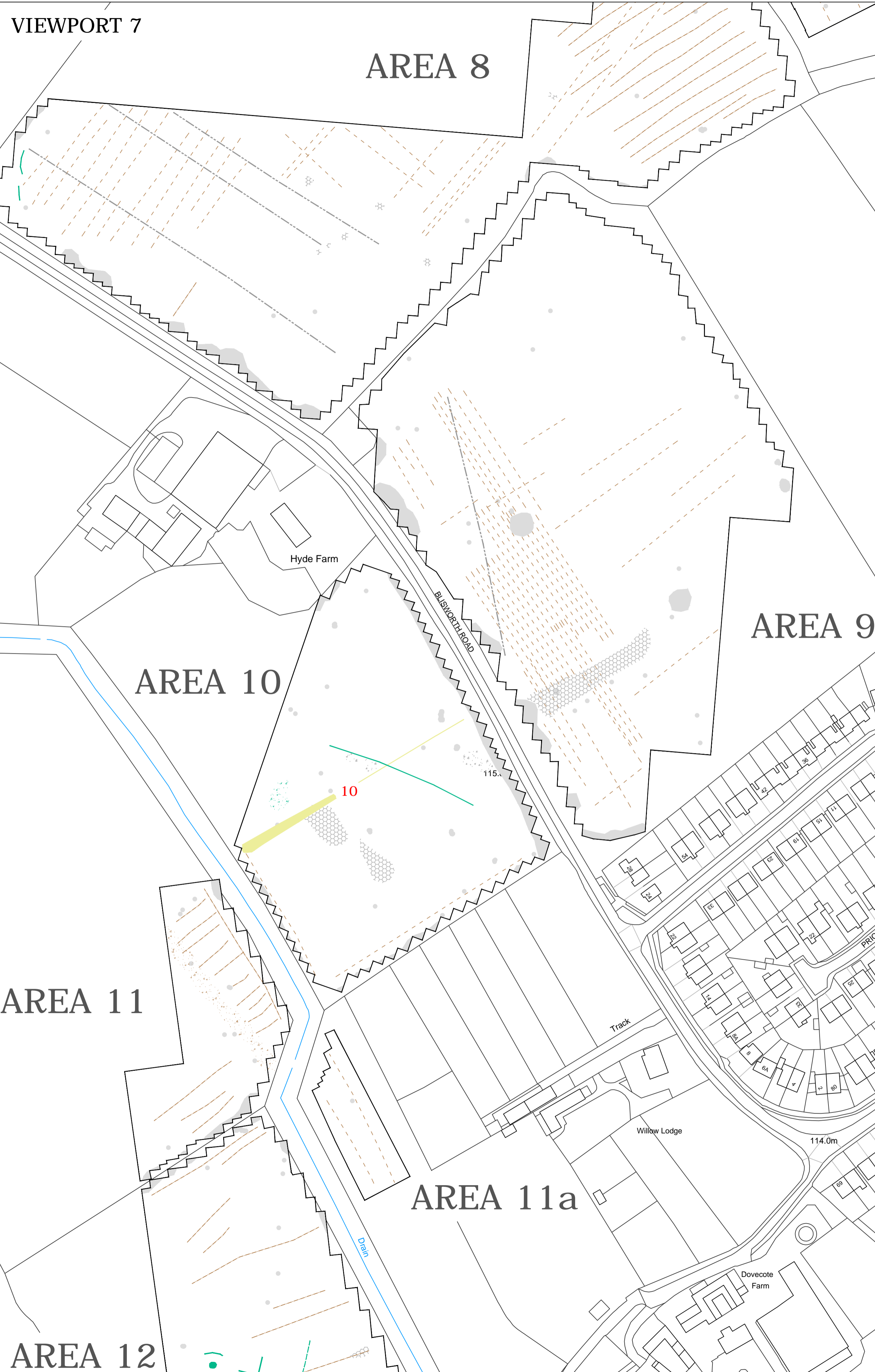
Title:
MAGNETOMETER SURVEY - GREYSCALE PLOT
- AREAS 9-15

Client:
CgMs CONSULTING

Project:
11110 - ROADE BYPASS AND JUNCTION 15, M1
- NORTHAMPTONSHIRE

Scale: 1:1250 @ A1
0m 20 40 60 80 100 120m

Fig No:
08



KEY

	Probable archaeology (positive/trend)
	Possible archaeology (positive/area of increased response/trend)
	Former field boundary (corroborated)
	Former field boundary (conjectural)
	Track (corroborated)
	Ridge and furrow
	Agriculture (e.g. ploughing)
	Land drain
	Natural (e.g. geological or pedological)
	Magnetic disturbance
	Service
	Ferrous
	Uncertain (positive/area of increased response/negative/trend)

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Title: MAGNETOMETER SURVEY -
INTERPRETATION - AREAS 9-15

Client: CgMs CONSULTING

Project: 11110 - ROADE BYPASS AND JUNCTION 15, M1
- NORTHAMPTONSHIRE

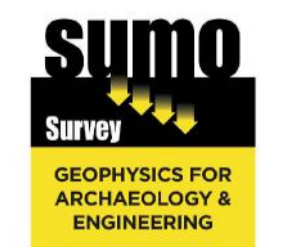
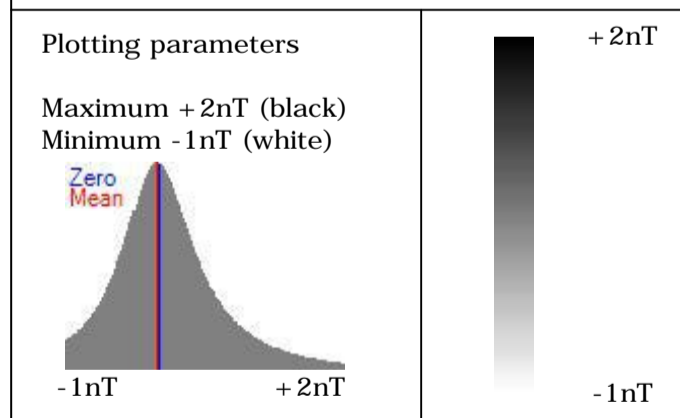
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Fig No: 09



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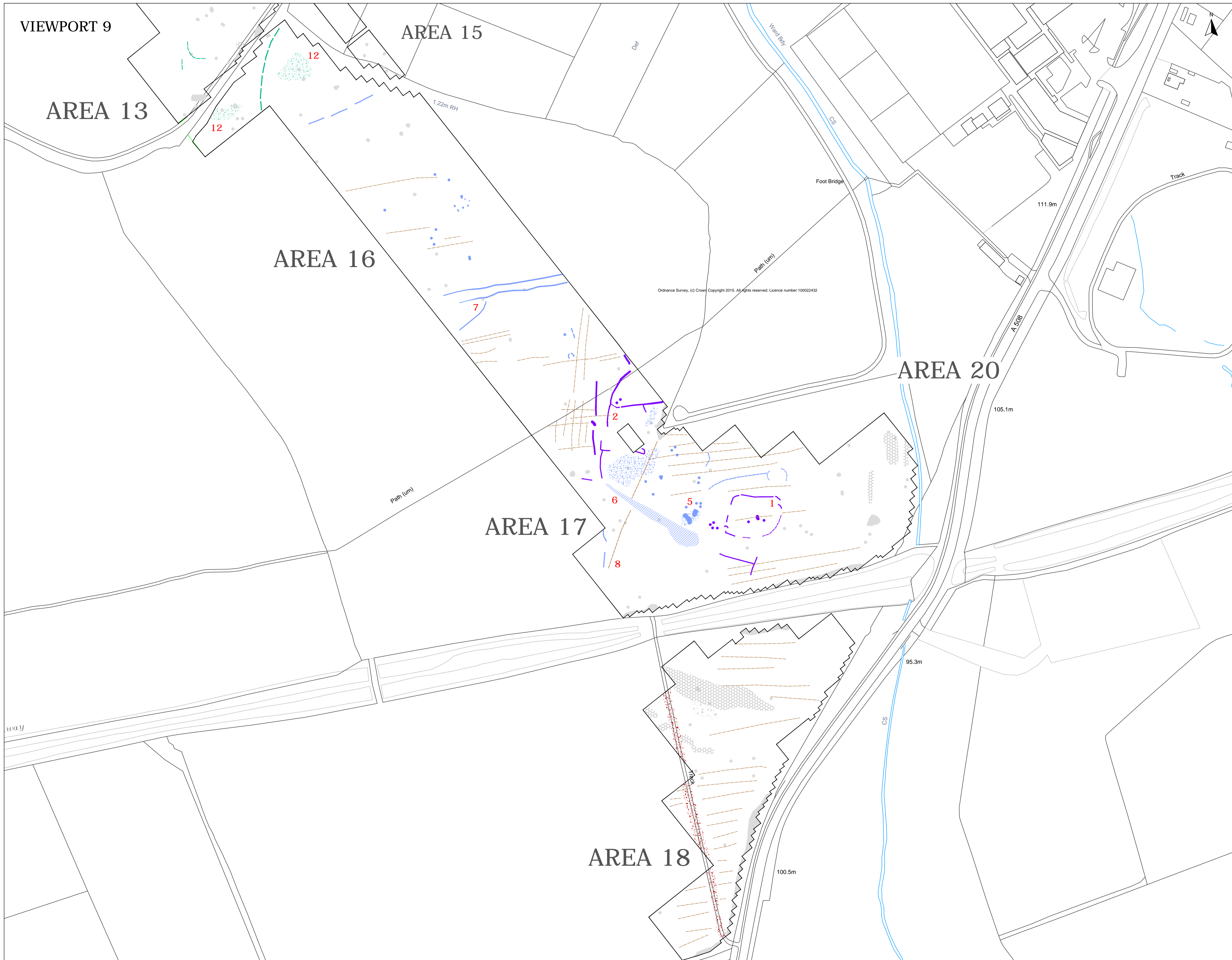


Title:
MAGNETOMETER SURVEY - GREYSCALE PLOT
- AREAS 16-18

Client:
CgMs CONSULTING

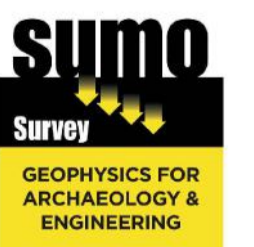
Project:
11110 - ROADE BYPASS AND JUNCTION 15, M1
- NORTHAMPTONSHIRE

Scale: 1:1250 @ A1
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Fig No: 10

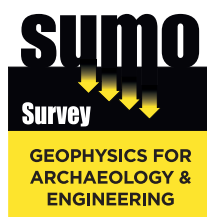


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KEY	
	Probable archaeology (positive/trend)
	Possible archaeology (positive/area of increased response/trend)
	Former field boundary (corroborated)
	Former field boundary (conjectural)
	Track (corroborated)
	Ridge and furrow
	Agriculture (e.g. ploughing)
	Land drain
	Natural (e.g. geological or pedological)
	Magnetic disturbance
	Service
	Ferrous
	Uncertain (positive/area of increased response/negative/trend)



Title: MAGNETOMETER SURVEY - INTERPRETATION - AREAS 16-18
 Client: CgMs CONSULTING
 Project: 11110 - ROADE BYPASS AND JUNCTION 15, M1 - NORTHAMPTONSHIRE
 Scale: 1:1250 @ A1
 0m 20 40 60 80 100 120m Fig No: 11



- Archaeological
- Geophysical
- Laser Scanning
- Measured Building
- Topographic
- Utility Mapping

SUMO Services Ltd, incorporated under the laws of England and Wales,
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