



## APPENDIX 13.1 - ARCHAEOLOGICAL DESK BASED ASSESSMENT

---

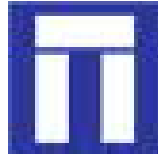
Not updated



## APPENDIX 13.2 - GEOPHYSICAL SURVEY (ARCHAEOLOGY)

---

Not updated



# A29 Realignment, Eastergate, West Sussex

Detailed Gradiometer Survey Report

Report Ref.: 235270.03  
July 2020



© Wessex Archaeology Ltd 2020, all rights reserved

Portway House  
Old Sarum Park  
Salisbury  
Wiltshire  
SP4 6EB

[www.wessexarch.co.uk](http://www.wessexarch.co.uk)

Wessex Archaeology Ltd is a company limited by guarantee registered in England, company number 1712772. It is also a Charity registered in England and Wales number 287786, and in Scotland, Scottish Charity number SC042630. Our registered office is at Portway House, Old Sarum Park, Salisbury, Wiltshire, SP4 6EB

#### Disclaimer

The material contained in this document was designed for an individual client and was prepared solely for the benefit of that client. The material contained in this document does not necessarily stand on its own and is not intended to nor should it be relied upon by any third party. To the fullest extent permitted by law Wessex Archaeology will not be liable by reason of breach of contract negligence or otherwise for any loss or damage (whether direct indirect or consequential) occasioned to any person acting or omitting to act or refraining from acting in reliance upon the material contained in this document arising from or connected with any error or omission in the material contained in the document. Loss or damage as referred to above shall be deemed to include, but is not limited to, any loss of profits or anticipated profits damage to reputation or goodwill loss of business or anticipated business damages costs expenses incurred or payable to any third party (in all cases whether direct indirect or consequential) or any other direct indirect or consequential loss or damage

## Document Information

Document title	A29 Realignment, Eastergate, West Sussex
Document subtitle	Detailed Gradiometer Survey Report
Document reference	235270.03
Client name	WSP UK
Address	London UK Headquarters WSP House 70 Chancery Lane London WC2A 1AF
Site location	Eastergate
County	West Sussex
National grid reference	495250 105650 (SU 95250 05650)
Statutory designations	None
Planning authority	West Sussex County Council
WA project name	A29 Realignment, Eastergate, West Sussex
WA project code	235270
Date of fieldwork	17/06/2020 – 18/06/2020
Fieldwork directed by	Brett Howard
Project management by	Tom Richardson
Document compiled by	Alexander Schmidt
Contributions from	Nicholas Crabb
Graphics by	Alexander Schmidt

**Quality Assurance**

Issue and date	Status	Author	Approved by
1 07/07/2020	Draft for client comment	AJS	NLC





## Contents

Summary .....	ii
Acknowledgements.....	ii
<b>1 INTRODUCTION .....</b>	<b>1</b>
1.1 Project background.....	1
1.2 Scope of document.....	1
1.3 The site.....	1
<b>2 ARCHAEOLOGICAL BACKGROUND.....</b>	<b>2</b>
<b>3 METHODOLOGY .....</b>	<b>3</b>
3.1 Introduction.....	3
3.2 Aims and objectives.....	3
3.3 Fieldwork methodology.....	4
3.4 Data processing.....	4
<b>4 GEOPHYSICAL SURVEY RESULTS AND INTERPRETATION .....</b>	<b>4</b>
4.1 Introduction.....	4
4.2 Gradiometer survey results and interpretation .....	5
<b>5 DISCUSSION .....</b>	<b>6</b>
<b>REFERENCES .....</b>	<b>7</b>
Bibliography.....	7
Cartographic and documentary sources.....	7
Online resources.....	7
<b>APPENDICES .....</b>	<b>8</b>
Appendix 1: Survey Equipment and Data Processing.....	8
Appendix 2: Geophysical Interpretation .....	10
Appendix 3: OASIS form .....	11

## List of Figures

<b>Figure 1</b>	Site location and survey extents
<b>Figure 2</b>	Detailed gradiometer survey results: greyscale plot (Section 2)
<b>Figure 3</b>	Detailed gradiometer survey results: interpretation (Section 2)
<b>Figure 4</b>	Detailed gradiometer survey results: greyscale plot (Section 3 - North)
<b>Figure 5</b>	Detailed gradiometer survey results: interpretation (Section 3 - North)
<b>Figure 6</b>	Detailed gradiometer survey results: greyscale plot (Section 3 - South)
<b>Figure 7</b>	Detailed gradiometer survey results: interpretation (Section 3 - South)
<b>Figure 8</b>	Detailed gradiometer survey results: greyscale plot (Section 4)
<b>Figure 9</b>	Detailed gradiometer survey results: interpretation (Section 4)



## Summary

A detailed gradiometer survey was conducted over land at Eastergate, West Sussex (centred on NGR 495250 105650). The project was commissioned by WSP UK with the aim of establishing the presence, or otherwise, and nature of detectable archaeological features in support of a planning application for the development of the site for the A29 realignment works.

The site comprises four sections of arable fields located along the proposed route, with a proposed total survey area of 9 ha. The geophysical survey was undertaken on 17 and 18 June 2020 and has demonstrated the presence of a number of anomalies of potential archaeological interest. Section 1 was deemed unsuitable for survey due to over growing vegetation. Section 2 was cut prior to survey but the section of cut vegetation did not correspond to the proposed survey area. As much as was possible was surveyed in this area. Section 3 and 4 were surveyed in their entirety.

The detailed gradiometer survey has been successful in identifying anomalies considered likely to be archaeological in origin. A distinct parallel alignment of positive anomalies has been identified in Section 3 that could indicate a former trackway. It is possible that this defined a former field system that could relate to the Iron Age and Roman-British activity noted in the surrounding area.

Several further ditch-like anomalies have been identified in the survey results in Section 2 and 3. However, these cannot be confidently interpreted as archaeological in origin and are as likely to relate to modern agricultural activity. Similarly, numerous pit-like anomalies have been identified throughout all sections of the survey. It is not possible to confirm an archaeological origin for these, and they may simply relate to localised variations in the underlying superficial deposits.

In addition, a former field boundary noted on historical OS mapping dating to 1875 has been identified in Section 3 along with another weaker alignment that may indicate an earlier, unrecorded field boundary.

The remaining anomalies are likely to be modern in provenance, pertaining to modern agricultural activity, a trackway as well as a former road visible in aerial imagery.

## Acknowledgements

Wessex Archaeology would like to thank WSP UK for commissioning the geophysical survey. The assistance of Paul Riggott is gratefully acknowledged in this regard.

The fieldwork was undertaken by Brett Howard and Scott Chaussee. Alexander Schmidt processed and interpreted the geophysical data, wrote the report and prepared the illustrations. The geophysical work was quality controlled by Nicholas Crabb. The project was managed on behalf of Wessex Archaeology by Tom Richardson.





# A29 Realignment, Eastergate, West Sussex

## Detailed Gradiometer Survey Report

### 1 INTRODUCTION

#### 1.1 Project background

1.1.1 Wessex Archaeology was commissioned by WSP UK to carry out a geophysical survey at Eastergate, West Sussex (centred on NGR 495250 105650) (**Figure 1**). The survey forms part of an ongoing programme of archaeological works being undertaken in support of a planning application for the construction of a new 1.2km-long single carriageway road as part of the A29 realignment works.

#### 1.2 Scope of document

1.2.1 This report presents a brief description of the methodology followed by the detailed survey results and the archaeological interpretation of the geophysical data.

#### 1.3 The site

1.3.1 The site is located on the north-east side of the village of Eastergate, 8.8 km east of Chichester and 7.1 km north-west of Littlehampton in the county of West Sussex.

1.3.2 The scheme comprises a 'L-shape' route running from Fontwell Avenue in the north-west towards Downview Road and Ewens Gardens in the east, then turning south towards Barnham road (B2233). The survey area covers sections of four arable fields located along the route, with a proposed total survey area of 9 ha. In the north-western extent it is bounded by the road at Fontwell Avenue and an area of woodland is located to the east (Section 1). Section 2 has open agricultural land to the north and south, with woodland to the east and west. Section 3 is bounded by woodland to the east and residential properties at Downview Road and Ewens Gardens to the east. The southern portion of the route (Section 4) leads onto the village of Eastergate and is bounded by industrial buildings.

1.3.3 The site is on a gradual south/south-east facing slope, rising from 11 m above Ordnance Datum (aOD) at the southern-most area (Section 4) to 16 m aOD at the northern-most area (Section 1).

1.3.4 The solid geology comprises clay, silt, and sand of the London Clay Formation with overlying superficial geological deposits of gravel, sand, silt, and clay (Head), forming a dry river valley along the western edge of the site (BGS 2020). In the north-western and southern extent of the site, River Terrace Deposits are recorded in geotechnical investigations showing a typical Quaternary succession for this part of the coastal plain (ASE 2019).

1.3.5 The soils underlying the site are likely to consist of typical argillic brown earths of the 5711 (Charity 1) association (SSEW SE Sheet 6 1983). Soils derived from such geological parent material have been shown to produce magnetic contrasts acceptable for the detection of archaeological remains through magnetometer survey.



## 2 ARCHAEOLOGICAL BACKGROUND

### 2.1 Introduction

2.1.1 A draft archaeological desk-based assessment (DBA) has been prepared by WSP UK for the site, which examined the potential for the survival of buried archaeological remains within the development area and a 1 km study area (WSP 2020). The following background is not exhaustive but is summarised from aspects of the DBA considered relevant to the interpretation of the geophysical survey data.

### 2.2 Summary of the archaeological resource

2.2.1 The site is located on the West Sussex lower coastal plain, which is of considerable geological and archaeological interest with regard to the Pleistocene and Palaeolithic periods. A Palaeolithic axe has been recorded on Walberton Lane, 1.2 km to the north-east of the site. A number of Mesolithic flints were found during an evaluation at Fontwell Avenue, 800 m north of the site. Further finds of Mesolithic flint flakes have been discovered at Norton Spinney, 1 km south-west of the site, and at Croft Cottages, 1.1km south-west of the site, which may represent flint working sites.

2.2.2 In the western part of the site, a single flint flake fragment of late pre-historic date was found during archaeological monitoring of a geotechnical investigation (ASE 2019).

2.2.3 Two pits possibly dating the Neolithic were recorded during an evaluation at Westergate, 350 m to the west of the site. Neolithic flints were found during an evaluation at Fontwell Avenue and on a ploughed field 1.2 km to the south-west of the site. A flint blade of late Neolithic or Bronze Age date was also found in Barnham Nurseries, 800 m south-east of the site.

2.2.4 There is some evidence for Bronze Age activity in the area. A post-hole has been recorded during evaluations at Westergate Community College 650m to the south-west of the site. In addition, residual bronze finds were recorded at Ivy Lane, 850 m to the south-west of the site and Late Bronze Age ditches were revealed during an evaluation at Westergate. At Arundel Road, 1.3 km north-east of the site, a possible late Bronze Age or early Iron Age ditch is recorded. Closer to the site, a Late Bronze Age urn was discovered at Eastergate Lane, 100 m north of the site.

2.2.5 Early Iron Age pottery was recorded during an evaluation at Westergate Community College, 650 m to the south-west of the site. At Arundel Road, 1.2 km north of the site, part of a linear ditch was also exposed which contained some early Iron Age pottery.

2.2.6 At Barnham Road, 650 m to the south-east of the site, there are linear cut features dating to the Iron Age and Romano-British period. Further Iron Age and Romano-British gullies have also been identified at Barnham Manor, 200 m to the south-east of the site and cut features of Romano-British date were also recorded at Westergate Community College. In addition, A Roman roof tile was recorded at Church Lane, 500 m south-west of the site and the geoarchaeological monitoring of the geotechnical investigations on the site in 2018 (ASE 2019) recorded a prehistoric flint flake and possible Roman tile.

2.2.7 The site lies 400 m to the south of the presumed route of the Roman road from Chichester to Arundel. Recent work using LiDAR images and aerial photographs has identified sections of road 950 m to the north of the site. The site of a possible Roman villa has been suggested in the field to the south of St. George's Church, Eastergate, 750 m to the south-west of the site, where finds of Romano-British date and crop marks indicate the site of a Roman building.

2.2.8 Early medieval settlement at Eastergate is thought to have been in the area of St. George's Church, 700 m to the south-west of the site. Saxo-Norman features were recorded at



Westergate Community College. Saxo-Norman pits, ditches, and pottery were revealed at Ivy Lane, 850 m to the south-west of the site.

- 2.2.9 Later medieval features were recorded at Westergate Community College and at Ivy Lane. Ditches containing pottery dated to the 11th to 13th centuries were revealed at Church Lane. A manor house was recorded at Eastergate in 1379, in the location of the later Manor Farmhouse, 675 m to the south-west of the site. The Northfield, between Barnham Road and Fontwell Avenue, which would likely have included the area of the site, was open fields during the later medieval period.
- 2.2.10 There are numerous Grade I, II and II\* Listed buildings noted throughout the settlements of Eastergate to the south-west of the site and Walberton to the north-east. The 18th century Choller Farmhouse is the closest, being located 350 m east of the eastern portion of the scheme. Cartographic evidence suggests that during the 20th century the site was limited to agricultural management features, such as boundary ditches or quarrying pits. Any buried remains of the early 19th century Eastergate Workhouse, in the western part of the site will have been removed by later quarrying.

### 3 METHODOLOGY

#### 3.1 Introduction

- 3.1.1 The geophysical survey was undertaken by Wessex Archaeology's in-house geophysics team between 17 and 18 June 2020. Field conditions at the time of the survey were generally good throughout and an overall coverage of 8.4 ha was achieved. Section 1 was unsuitable for survey due to overgrown vegetation and although Section 2 was cut prior to survey, this did not correspond to the proposed survey area, but an area slightly to the south was surveyed. Section 3 and 4 were surveyed in their entirety, aside from minor reductions owing to present field boundaries and other obstacles.
- 3.1.2 The methods and standards employed throughout the geophysical survey conform to that set out in the Written Scheme of Investigation (WSP 2020), as well as to current best practice, and guidance outlined by the Chartered Institute for Archaeologists' (CIfA 2014) and European Archaeologiae Consilium (Schmidt *et al.* 2015).

#### 3.2 Aims and objectives

- 3.2.1 The aims of the survey comprise the following:
- To determine, as far as is reasonably possible, the nature of the detectable archaeological resource within a specified area using appropriate methods and practices; and
  - To inform either the scope and nature of any further archaeological work that may be required; or the formation of a mitigation strategy (to offset the impact of the development on the archaeological resource); or a management strategy.
- 3.2.2 In order to achieve the above aims, the objectives of the geophysical survey are:
- To conduct a geophysical survey of the proposed site area, covering as much of the specified area as possible, allowing for on-site obstructions.
  - To provide a fully illustrated survey report which will set out the project background, identify the presence and extent of any geophysical anomalies.



- To determine the general nature of anomalies, and where possible provide an interpretation and commentary on their archaeological potential (qualified by 'possible', 'probable' or 'known') and likely heritage significance.
- To provide accompanying digital survey data.

### 3.3 Fieldwork methodology

- 3.3.1 The cart-based gradiometer system used a Leica Captivate RTK GNSS instrument, which receives corrections from a network of reference stations operated by the Ordnance Survey (OS) and Leica Geosystems. Such instruments allow positions to be determined with a precision of 0.02 m in real-time and therefore exceeds European Archaeologiae Consilium recommendations (Schmidt *et al.* 2015).
- 3.3.2 The detailed gradiometer survey was undertaken using four Bartington Grad-01-1000L gradiometers spaced at 1 m intervals and mounted on a non-magnetic cart. Data were collected with an effective sensitivity of 0.03 nT at a rate of 10 Hz, producing intervals of 0.15 m along transects spaced 4 m apart.

### 3.4 Data processing

- 3.4.1 Data from the survey were subjected to minimal correction processes. This included a High Pass Filter with uniform median weighting (600 point diameter), applied to remove low frequency noise associated with variation between the sensors along and between adjacent traverses. An interpolation used to grid the data and discard overlaps where transects have been collected too close together.
- 3.4.2 Further details of the geophysical and survey equipment, methods and processing are described in **Appendix 1**.

## 4 GEOPHYSICAL SURVEY RESULTS AND INTERPRETATION

### 4.1 Introduction

- 4.1.1 The detailed gradiometer survey has identified magnetic anomalies across the site. Results are presented as a series of greyscale plots and archaeological interpretations at a scale of 1:1500 (**Figures 2 to 9**). The data are displayed at -2 nT (white) to +3 nT (black) for the greyscale image.
- 4.1.2 The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous responses, burnt or fired objects, and magnetic trends (**Figure 3, 5, 7 and 9**). Full definitions of the interpretation terms used in this report are provided in **Appendix 2**.
- 4.1.3 Numerous ferrous anomalies are visible throughout the dataset. These are presumed to be modern in provenance and are not referred to, unless considered relevant to the archaeological interpretation.
- 4.1.4 It should be noted that small, weakly magnetised features may produce responses that are below the detection threshold of magnetometers. It may therefore be the case that more archaeological features may be present than have been identified through geophysical survey.
- 4.1.5 Gradiometer survey may not detect all services present on site. This report and accompanying illustrations should not be used as the sole source for service locations and appropriate equipment (e.g. CAT and Genny) should be used to confirm the location of buried services before any trenches are opened on site.



## 4.2 Gradiometer survey results and interpretation

- 4.2.1 The geophysical survey has identified a number of features that are considered to be possible archaeological remains. These are predominantly located in Section 3 and are associated with linear ditch features.
- 4.2.2 Two parallel positive, linear anomalies have been identified traversing the northern portion of Section 3 on a north-west to south-east alignment at **4000** and **4001 (Figure 5)**. The anomalies are weak and highly fragmented, but in total traverse the survey area for a distance 232 m. The two anomalies are spaced 6 m apart and are 1 m wide. These indicate parallel ditches either side of a possible trackway. Several perpendicular trends are noted to the north-east and south-west of the anomalies, which could represent further ditch-like features associated with this, but these are too weak to confidently interpret.
- 4.2.3 Towards the southern extent of the scheme, several further linear anomalies have been identified. To the south of Section 3, at **4002 (Figure 7)**, a weakly positive anomaly is located perpendicular to the projected alignment of **4000/4001** and could indicate a further ditch-like feature. It is possible that collectively these anomalies form part of a wider field system of unknown date, but further investigation would be required to confirm this.
- 4.2.4 In the centre of Section 2, a short positive linear anomaly at **4003 (Figure 3)** has been identified parallel to the anomalies at **4000/4001**. In addition, further weakly positive linear anomalies have also been identified throughout Section 2 and 3 (**4004 – 4006**). These are interpreted as possible archaeology and could indicate further ditch-like features associated with those in Section 3. However, these anomalies could equally relate to modern agricultural activity or natural variations in the underlying deposits.
- 4.2.5 A large, weakly positive discrete anomaly has been identified in the west of Section 3 at **4007 (Figure 5)**. This is 11 m in diameter. It is poorly defined, which suggests that it is associated with natural variation in the underlying superficial deposits. However, the circular form suggests that it could be associated with an archaeological feature. For example, it may relate to a large pit-like feature possibly associated with material extraction recorded in the wider surrounding area.
- 4.2.6 Numerous discrete positive anomalies have been identified throughout the survey results. These are 1 – 2 m in diameter and indicate pit-like features. Notable examples of these are seen at **4008** and **4009** in the south of Section 3, which could in turn be associated with wider archaeological activity. However, similar to the anomaly at **4007**, it is equally possible these are natural in origin, pertaining to localised variation in the magnetic susceptibility of the underlying superficial deposits.
- 4.2.7 A weakly dipolar, fragmented linear anomaly has been identified traversing the northern portion of Section 3 on a west-north-west to east-south-east alignment at **4009 (Figure 5)**. This anomaly corresponds to a former field boundary visible on historical OS mapping (1875). A parallel alignment of increased magnetic responses is noted 80 m to the north at **4010**. It is possible this also indicates the position of a former field boundary due to its alignment, although this is not recorded on any available mapping.
- 4.2.8 Three areas of increased magnetic response have been identified across the site. The first is located in the south-east of Section 2 at **4011**, the second is located to the south of Section 3 at **4012**, and the third is located in Section 4 at **4012**. These anomalies are thought to be modern. The anomaly at **4011** corresponds to an access point to the land parcel and is likely associated with compacted ground. The anomaly at **4012** is stronger and corresponds to a former road or trackway visible on aerial images (Google Earth 2020). The anomaly at **4013**, is a stronger, dipolar anomaly and is noted traversing Section 4 on a north-north-east to south-south-west alignment, corresponding with a modern trackway.



## 5 DISCUSSION

- 5.1.1 The detailed gradiometer survey has been successful in identifying anomalies considered possible archaeology. A distinct parallel alignment of positive anomalies has been identified in Section 3 that could relate to a former trackway. It is possible that this defines a former field system and could be part of the wider Romano-British landscape surrounding the Roman road noted north of the site.
- 5.1.2 Several further ditch-like anomalies have been identified in the survey results in Section 2 and 3. However, these cannot be confidently interpreted as archaeological in origin and are as likely to indicate modern agricultural activity. Similarly, numerous pit-like anomalies have been identified throughout all sections of the survey that may indicate wider settlement activity, but it is not possible to confirm an archaeological origin for these, and they may simply relate to localised variations in the underlying superficial deposits.
- 5.1.3 In addition, a former field boundary noted on historical OS mapping dating to 1875 has been identified in Section 3 along with another weaker alignment that may indicate an earlier, unrecorded field boundary.
- 5.1.4 The remaining anomalies are likely to be modern in provenance, pertaining to modern agricultural activity, a trackway as well as a former road visible in aerial imagery.



## REFERENCES

### Bibliography

Archaeology South East 2019 *A Geoarchaeological Watching Brief during SI Investigations on the route of the proposed A29 Realignment at Eastergate, West Sussex*

Chartered Institute for Archaeologists [CIfA] 2014 *Standards and guidance for archaeological geophysical survey*. Reading, CIfA

Schmidt, A, Linford, P, Linford, N, David, A, Gaffney, C, Sarris, A and Fassbinder, J. 2015 *Guidelines for the use of geophysics in archaeology: questions to ask and points to consider*. EAC Guidelines 2, Belgium: European Archaeological Council.

WSP 2020 *A29 Realignment: Archaeological Desk-Based Assessment*

WSP 2020 *A29 Realignment: Written Scheme of Investigation for an Archaeological Geophysical Survey*.

### Cartographic and documentary sources

Ordnance Survey 1983 *Soil Survey of England and Wales Sheet 6, Soils of South-East England*. Southampton.

### Online resources

British Geological Survey Geology of Britain Viewer (accessed June 2020)  
<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

Google Earth (accessed June 2020)

Heritage Gateway (accessed June 2020) <https://www.heritagegateway.org.uk/gateway/>

Magic Maps (accessed June 2020) <https://magic.defra.gov.uk/MagicMap.aspx>

National Library of Scotland (accessed June 2020) <https://maps.nls.uk/geo/explore>

Old Maps (accessed June 2020) <https://www.old-maps.co.uk>



## APPENDICES

### Appendix 1: Survey Equipment and Data Processing

#### Survey methods and equipment

The magnetic data for this project were acquired using a non-magnetic cart fitted with four SenSys FGM650 magnetic gradiometers. The instrument has four sensor assemblies fixed horizontally 1 m apart allowing four traverses to be recorded simultaneously. Each sensor contains two fluxgate magnetometers arranged vertically with a 1 m separation and measures the difference between the vertical components of the total magnetic field within each sensor array. This arrangement of magnetometers suppresses any diurnal or low frequency effects.

Data were collected with an effective sensitivity of 0.02 nT at a rate of 20 Hz, producing intervals of 0.08 m along transects spaced 4 m apart.

The cart-based system relies upon accurate GPS location data which is collected using a Leica Viva system with rover and base station. This receives corrections from a network of reference stations operated by the Ordnance Survey and Leica Geosystems, allowing positions to be determined with a precision of 0.02m in real-time and therefore exceed the level of accuracy recommended by European Archaeologiae Consilium recommendations (Schmidt *et al.* 2015) for geophysical surveys.

Data may be collected with a higher sample density where complex archaeological anomalies are encountered, to aid the detection and characterisation of small and ephemeral features. Data may be collected at up to 0.125 m intervals along traverses spaced up to 0.25m apart.

#### Post-processing

The magnetic data collected during the detail survey are downloaded for processing and analysis using both commercial and in-house software. This software allows for both the data and the images to be processed in order to enhance the results for analysis; however, it should be noted that minimal data processing is conducted so as not to distort the anomalies.

The cart-based system generally requires a lesser amount of post-processing than the handheld fluxgate gradiometer instrument. This is largely because mounting the gradiometers on the cart reduces the occurrence of operator error; caused by inconsistent walking speeds and deviation in traverse position due to varying ground cover and topography.

Typical data and image processing steps may include:

- GPS DeStripe – Determines the median of each transect and then subtracts that value from each datapoint in the transect. May be used to remove the striping effect seen within a survey caused by directional effects, drift, etc.
- High Pass Filter - Uses either a uniformly or Gaussian weighted window to remove high or low frequency components in a survey.
- GPS Base Interpolation – Sets the X & Y interval of the interpolated data and the track radius (area around each datapoint that is included in the interpolated result).
- High-pass filter – calculates the mean/median of all the values within a specified window and subtracts the mean from the centre value resulting in the removal of low frequency noise.





- Discard Overlaps - Intended to eliminate a track(s) that have been collected too close to one another. Without this, the results of the interpolation process can be distorted as it tries to accommodate very close points with potentially differing values.

Typical displays of the data used during processing and analysis:

- XY Plot – Presents the data as a trace or graph line for each traverse. Each traverse is displaced down the image to produce a stacked profile effect. This type of image is useful as it shows the full range of individual anomalies. XY plots are available upon request.
- Greyscale – Presents the data in plan using a greyscale to indicate the relative strength of the signal at each measurement point. These plots can be produced in colour to highlight certain features but generally greyscale plots are used during analysis of the data.



## Appendix 2: Geophysical Interpretation

The interpretation methodology used by Wessex Archaeology separates the anomalies into four main categories: archaeological, modern, agricultural, and uncertain origin/geological.

The archaeological category is used for features when the form, nature and pattern of the anomaly are indicative of archaeological material. Further sources of information such as aerial photographs may also have been incorporated in providing the final interpretation. This category is further sub-divided into three groups, implying a decreasing level of confidence:

- Archaeology – used when there is a clear geophysical response and anthropogenic pattern.
- Possible archaeology – used for features which give a response, but which form no discernible pattern or trend.

The modern category is used for anomalies that are presumed to be relatively modern in date:

- Ferrous – used for responses caused by ferrous material. These anomalies are likely to be of modern origin.
- Modern service – used for responses considered relating to cables and pipes; most are composed of ferrous/ceramic material although services made from non-magnetic material can sometimes be observed.

The agricultural category is used for the following:

- Former field boundaries – used for ditch sections that correspond to the position of boundaries marked on earlier mapping.
- Ridge and furrow – used for broad and diffuse linear anomalies that are considered to indicate areas of former ridge and furrow.
- Ploughing – used for well-defined narrow linear responses, usually aligned parallel to existing field boundaries.
- Drainage – used to define the course of ceramic field drains that are visible in the data as a series of repeating bipolar (black and white) responses.

The uncertain origin/geological category is used for features when the form, nature and pattern of the anomaly are not sufficient to warrant a classification as an archaeological feature. This category is further sub-divided into:

- Increased magnetic response – used for areas dominated by indistinct anomalies which may have some archaeological potential.
- Trend – used for low amplitude or indistinct linear anomalies.
- Superficial geology – used for diffuse edged spreads considered to relate to shallow geological deposits. They can be distinguished as areas of positive, negative, or broad bipolar (positive and negative) anomalies.



### Appendix 3: OASIS form

#### Project Details:

<b>Project name</b>		A29 Realignment, Eastergate, West Sussex			
<b>Type of project</b>		Detailed gradiometer survey (Field evaluation)			
<b>Project description</b>		<p>The detailed gradiometer survey has been successful in identifying anomalies considered likely to be archaeological in origin. A distinct parallel alignment of positive anomalies has been identified in Section 3 that could indicate a former trackway that in turn may be associated with the Roman road noted north of site. Numerous examples of Romano-British finds are noted in the surrounding landscape. Several further ditch-like anomalies have been identified in the survey results in Section 2 and 3. However, due to their discrete nature, these cannot be confidently interpreted as archaeological in origin and are as likely indicate modern agricultural activity.</p> <p>Numerous pit-like anomalies have been identified throughout all sections of the survey that may indicate wider settlement activity such as extraction or refuse pits. However, it is equally possible these anomalies are natural in origin pertaining to localised variation in the underlying deposits.</p> <p>In addition, a former field boundary noted on historical OS mapping dating to 1875 has also been identified in Section 3 along with another weaker alignment that may indicate an earlier, unrecorded field boundary. However, this is not clear from the survey results.</p> <p>The remaining anomalies are likely to be modern in provenience, pertaining to modern agricultural activity, a trackway as well as a former road visible in aerial imagery.</p>			
<b>Project dates</b>		<b>Start:</b> 17-06-2020		<b>End:</b> 18-06-2020	
<b>Previous work</b>		Yes			
<b>Future work</b>		Not known			
<b>Project Code:</b>	235270	<b>HER event no.</b>	N/A	<b>OASIS form ID:</b>	wessexar1-
		<b>NMR no.</b>	N/A		
		<b>SM no.</b>	N/A		
<b>Planning Application Ref.</b>					
<b>Site Status</b>		None			
<b>Land use</b>		Cultivated Land 3			
<b>Monument type</b>				<b>Period</b>	

#### Project Location:

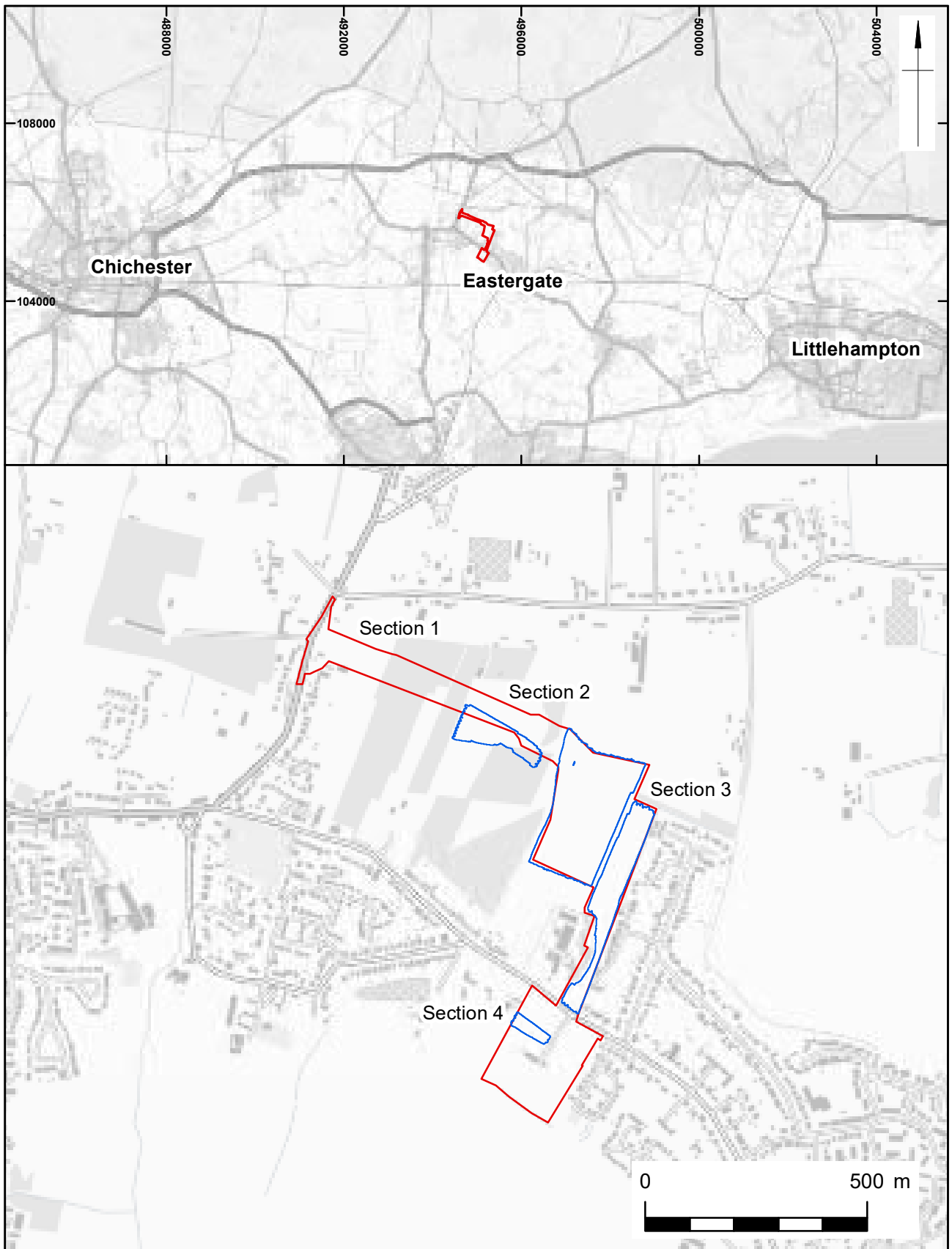
<b>Site Address</b>	Barnham Road, West Barnham, Westergate			<b>Postcode</b>	PO22 0ES
<b>County</b>	West Sussex	<b>District</b>		<b>Parish</b>	
<b>Study Area</b>	9 ha	<b>Height OD</b>	11 – 16 m aOD	<b>NGR</b>	495250 105650



#### Project Creators:

<b>Name of Organisation</b>		Wessex Archaeology			
<b>Project brief originator</b>		WSP UK	<b>Project design originator</b>		Wessex Archaeology
<b>Project Manager</b>		Tom Richardson	<b>Project Supervisor</b>		Brett Howard
<b>Sponsor or funding body</b>		WSP UK	<b>Type of Sponsor</b>		Client

#### Project Archive and Bibliography:

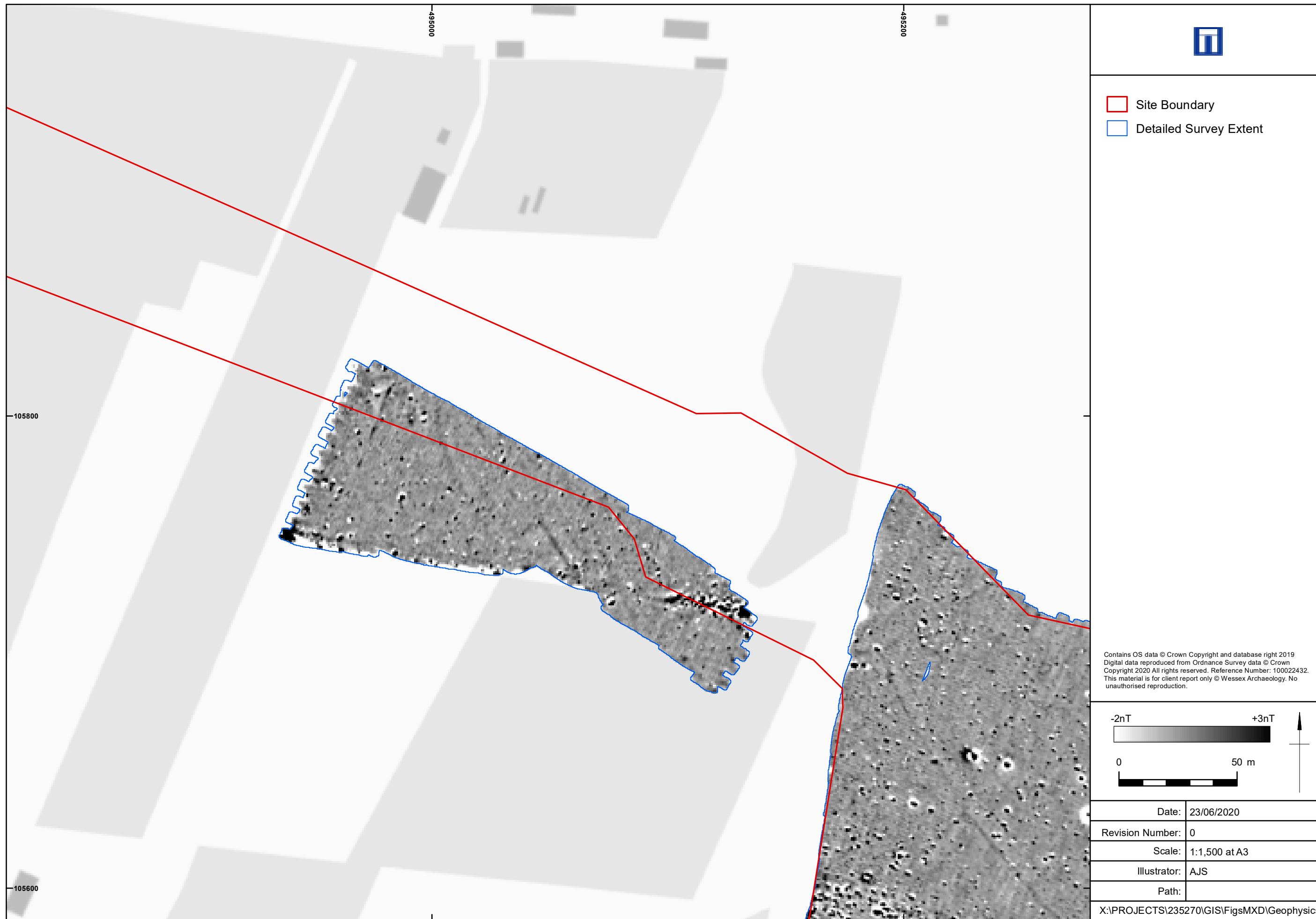
<b>Physical archive</b>	N/A	<b>Digital Archive</b>	Geophysical survey and report	<b>Paper Archive</b>	N/A
<b>Report title</b>	A29 Realignment, Eastergate, West Sussex Detailed Gradiometer Survey Report			<b>Date</b>	2020
<b>Author</b>	Wessex Archaeology	<b>Description</b>	Unpublished report	<b>Report ref.</b>	235270.03



 Site Boundary  	Contains OS data © Crown Copyright and database right 2019 Digital data reproduced from Ordnance Survey data © Crown Copyright (2020) All rights reserved. Reference Number: 100022432. This material is for client report only © Wessex Archaeology. No unauthorised reproduction.			
	Date:	18/06/2020	Revision Number:	0
	Scale:	1:125,000 & 1:12,500 at A4	Illustrator:	AJS
	Path:	X:\PROJECTS\235270\GIS\FigsMXD\Geophysics		

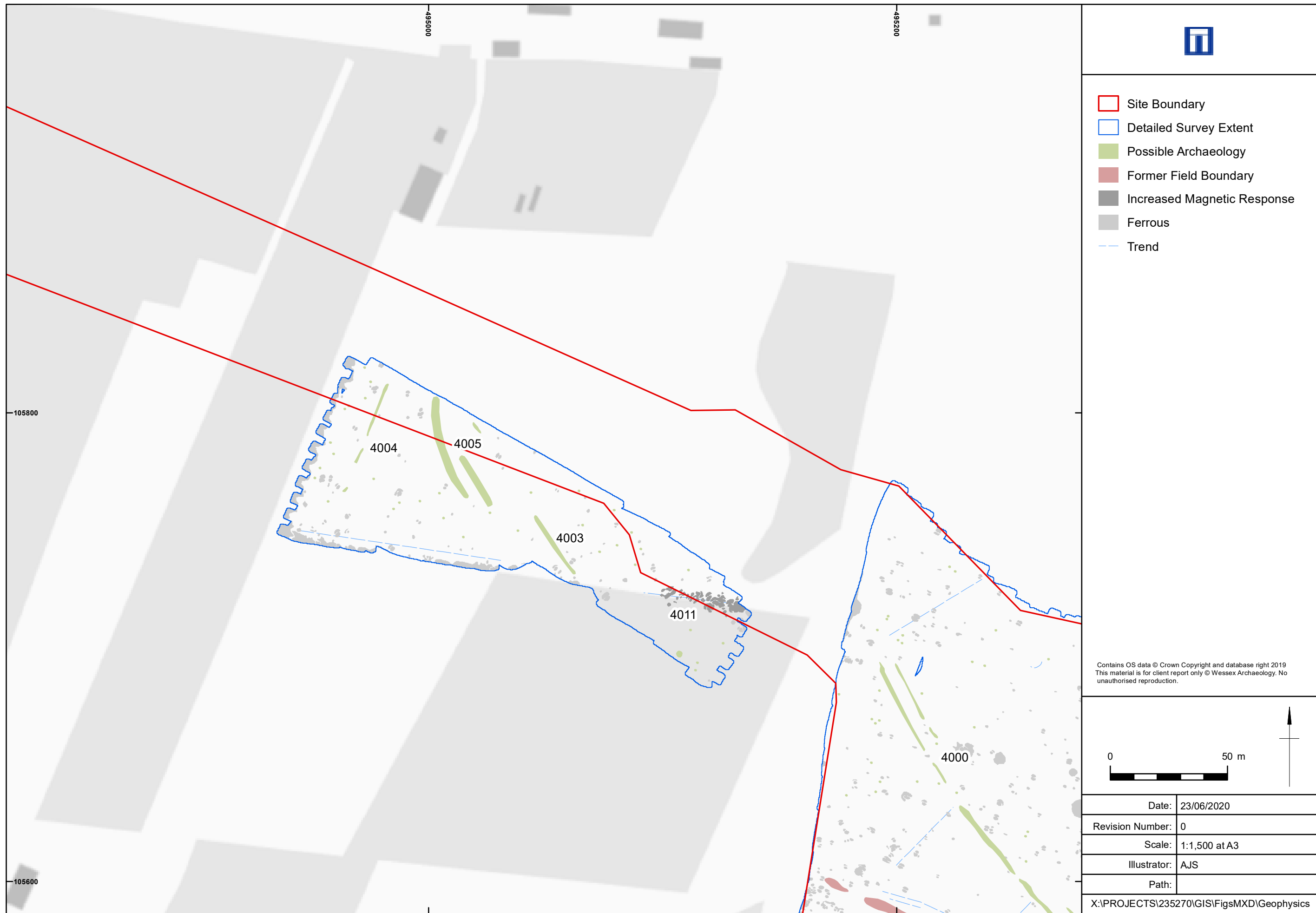
Site location and survey extent

Figure 1



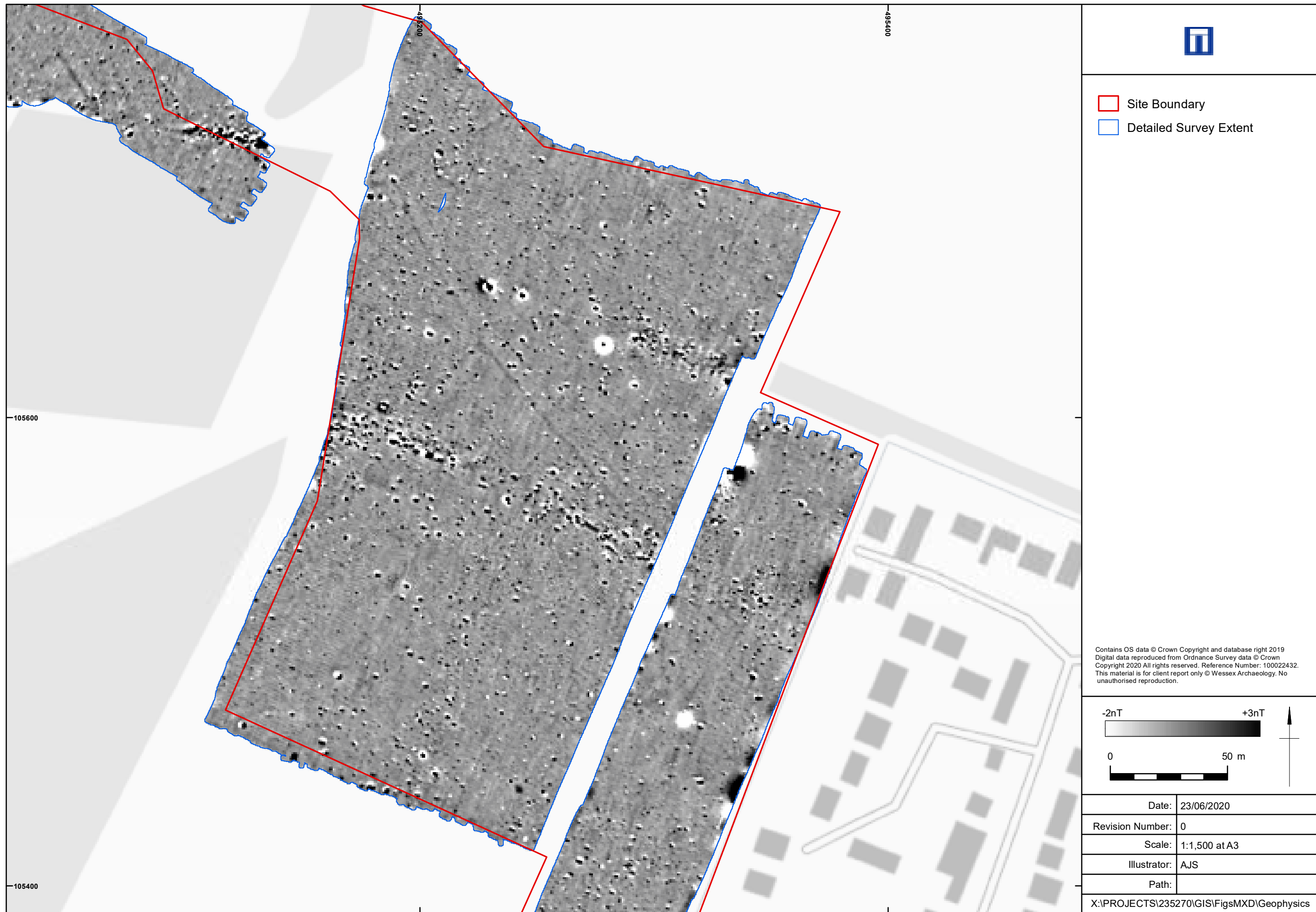
Detailed gradiometer survey results: greyscale plot (section 2)

Figure 2



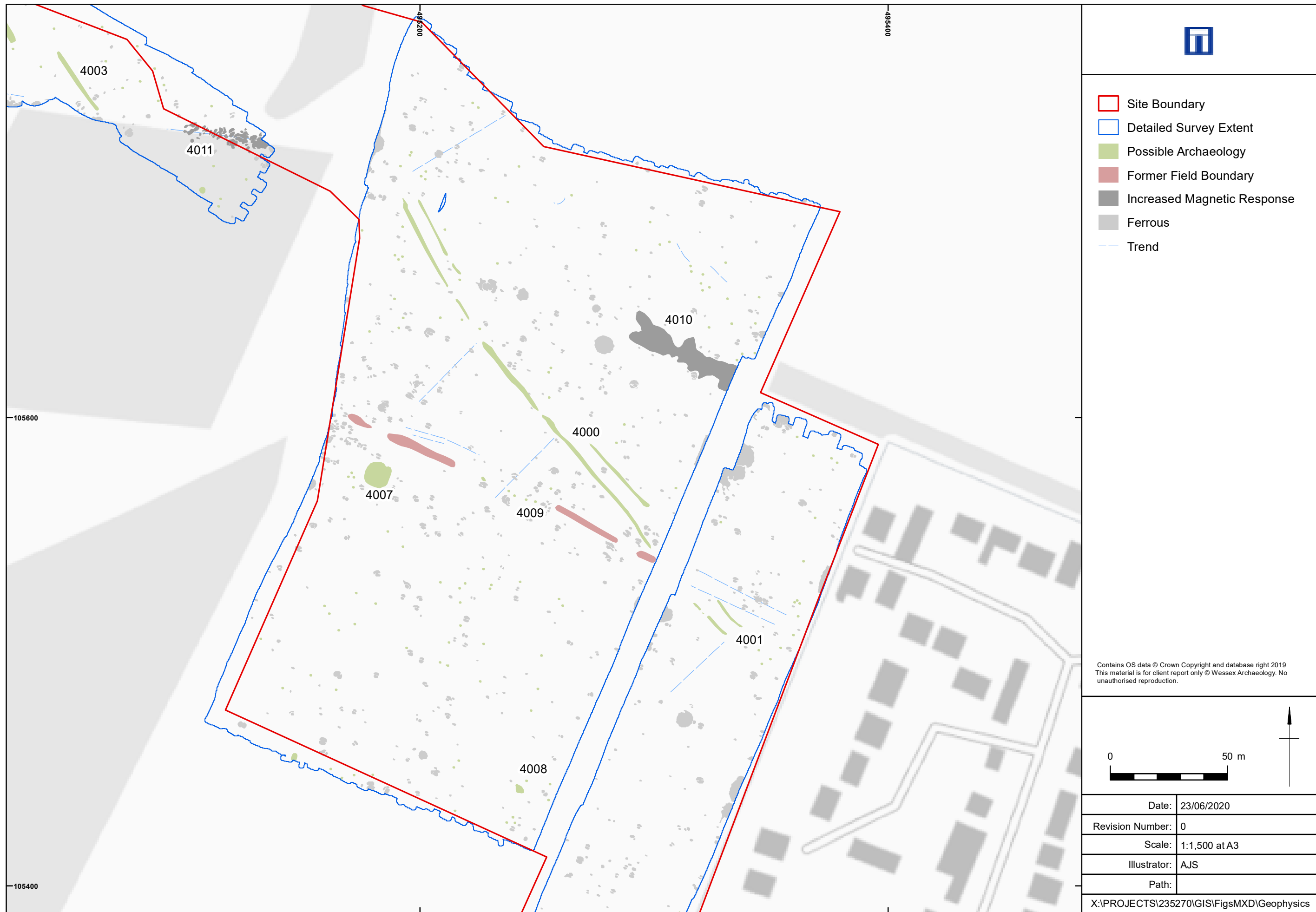
Detailed gradiometer survey results: interpretation (section 2)

Figure 3



Detailed gradiometer survey results: greyscale plot (section 3 - north)

Figure 4



Detailed gradiometer survey results: interpretation (section 3 - north)

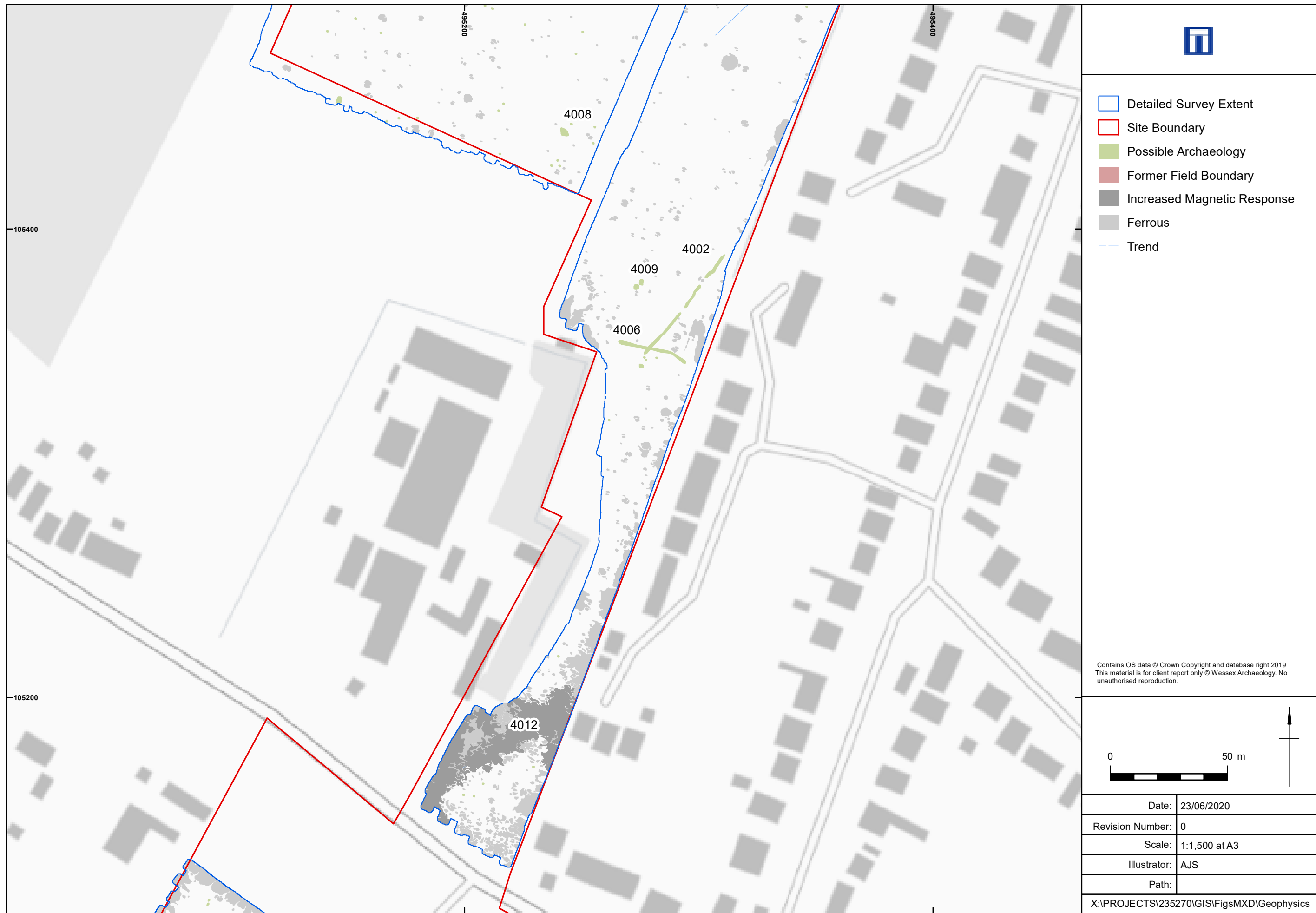
Figure 5





Detailed gradiometer survey results: greyscale plot (section 3 - south)

Figure 6



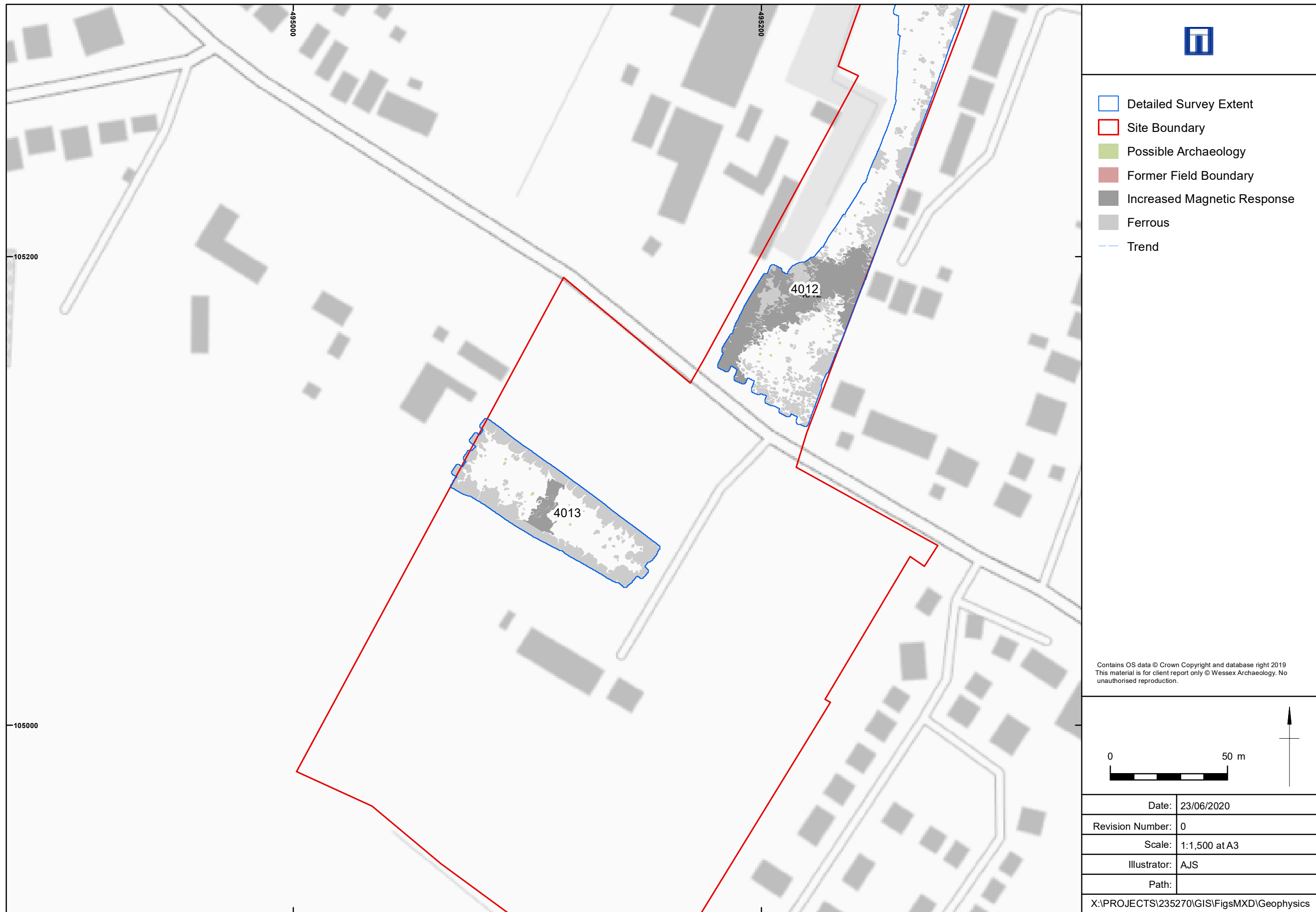
Detailed gradiometer survey results: interpretation (section 3 - south)

Figure 7



Detailed gradiometer survey results: greyscale plot (section 4)

Figure 8



Detailed gradiometer survey results: interpretation (section 4)

Figure 9



Wessex Archaeology Ltd registered office Portway House, Old Sarum Park, Salisbury, Wiltshire SP4 6EB  
Tel: 01722 326867 Fax: 01722 337562 info@wessexarch.co.uk www.wessexarch.co.uk

