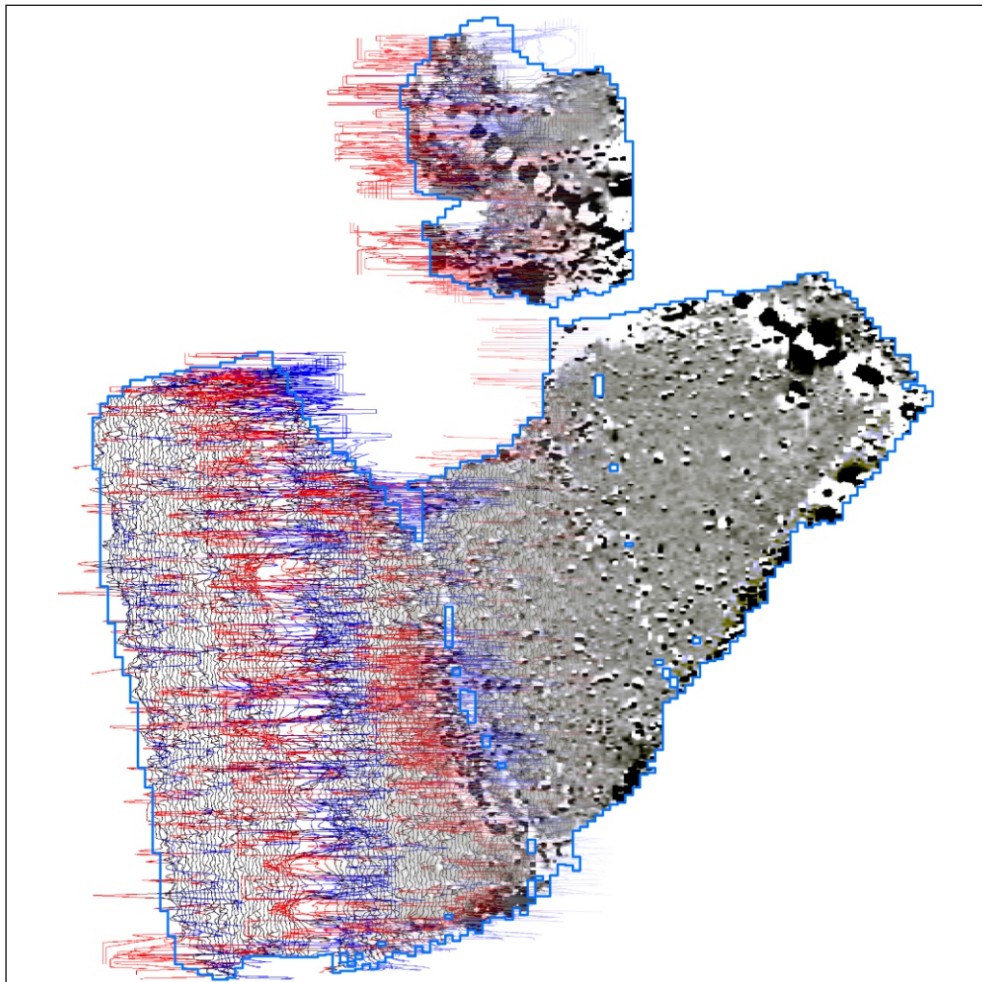




making sense of heritage

# Land at Ash Manor Ash Green, Surrey

Detailed Gradiometer Survey Report



Ref: 108790.01  
June 2015



**Land at Ash Manor  
Ash Green, Surrey**

**Detailed Gradiometer Survey Report**

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**June 2015**

**WA Ref. 108790.01**



## Quality Assurance

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# Land at Ash Manor Ash Green, Surrey

## Detailed Gradiometer Survey Report

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# **Land at Ash Manor Ash Green, Surrey**

## **Detailed Gradiometer Survey Report**

### **Summary**

Wessex Archaeology was commissioned by St Edmunds Development Ltd. to undertake a detailed gradiometer survey over land at Ash Manor, Ash Green, Surrey (centred on NGR 490146, 150313). The aim of the survey was to establish the presence, or otherwise, and nature of detectable archaeological features ahead of the development of the site.

The survey area consists of two fields bounded on the south and east sides by Ash Green Road, with a minor track to the west and surrounded by further fields to the north. The site covers a total area of 2.96ha, of which 2.2ha was surveyed. A small portion (0.76ha) of the site extent was un-surveyable due to additional fences within the survey areas restricting movement and large tractor parts at the edges of one field preventing access. The geophysical survey was undertaken on 30<sup>th</sup> April 2015.

The detailed gradiometer survey has demonstrated the presence of magnetic anomalies that are of low archaeological interest. A possible former, modern field boundary has also been identified in conjunction with numerous faint linear trends of unknown origin. In addition, further anomalies associated with modern services and areas of superficial geology are also present.



# **Land at Ash Manor Ash Green, Surrey**

## **Detailed Gradiometer Survey Report**

### **Acknowledgements**

Wessex Archaeology would like to thank St Edmunds Developments Ltd. for commissioning the geophysical survey.

The fieldwork was directed by Patrick Dresch with assistance from Laura Andrews and Diana Chard. Diana Chard processed and interpreted the geophysical data in addition to writing this report. The geophysical work was quality controlled by Elizabeth Richley. Sian Reynolds conducted the desk-based research on the archaeological background of the site. Illustrations were prepared by Garreth Davey. The project was managed on behalf of Wessex Archaeology by Lucy Learmonth.



# Land at Ash Manor Ash Green, Surrey

## Detailed Gradiometer Survey Report

### 1 INTRODUCTION

#### 1.1 Project background

1.1.1 Wessex Archaeology was commissioned by St Edmunds Developments Ltd. to carry out a geophysical survey over land at Ash Manor, Ash Green, Surrey (**Figure 1**), hereafter “the Site” (centred on NGR 490146, 150313). The survey forms part of the programme of archaeological works being undertaken in support of the future development of the Site.

1.1.2 The aim of the geophysical survey was to establish the presence/absence, extent and character of detectable archaeological remains within the confines of the area available for survey.

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

#### 1.2 Site location and topography

1.2.1 The Site is located immediately east of the town of Aldershot and approximately 8km west of the town Guildford.

1.2.2 The Site occupies a total area of 2.96ha of land across two pasture fields. These fields contain a number of horses, with the larger field further sub-divided into three areas by temporary fencing at the time of survey. The extent of the Site is defined by Ash Green road to the south and east, surrounded by further fields to the north and a minor track way leading to Ash Manor on the west and surrounded by further fields to the north.

1.2.3 The majority of the site sits at 83m above Ordnance Datum (aOD) with some of the eastern extents dipping slightly to 82m aOD.

#### 1.3 Soils and geology

1.3.1 The bedrock geology of the Site is recorded as clay, silt and sand of the London Clay Formation. Superficial deposits overlying this are of poorly stratified and sorted gravel, sand and clay (BGS 2015).

1.3.2 The soils underlying the Site are likely to consist of the fine loam and clay soils of 711g (Wickham 3) association (SSEW SE Sheet 6 1983). These are often waterlogged and usually are associated with coniferous woodland and wet lowland heath habitats. Soils derived from such geological parent material have demonstrated the production of magnetic contrasts acceptable for the detection of archaeological remains through magnetometer survey.

#### 1.4 Archaeological background

1.4.1 Upon agreement with the Archaeological Officer for Surrey County Council, a comprehensive desk-based research was conducted on the historical background of the site in support of the geophysical survey. This research examines the potential for the survival of buried archaeological remains within the development area. This comprehensive background research has been



compiled on the basis of information provided by the Surrey Historic Environment Record (SHER) and the National Heritage List for England (NHLE) and the results are provided below.

- 1.4.2 There are no designated historical assets within the Site area. There are no identified World Heritage Sites, Scheduled Monuments, Registered Parks and Gardens, Conservation Areas or Historic Battlefields identified within the Study Area however 12 Grade II and 1 Grade II\* listed buildings are recorded.

*Prehistoric*

- 1.4.3 The evidence relating to prehistoric activity in the area of the Site is limited. The Site lies on nutrient-poor clay soils and is unlikely to have been desirable for intensive land clearance in advance of agriculture, consequently the majority of monuments and find spots dating to the prehistoric are situated south of the chalk ridge which forms the Hog's Back 2km to the south.
- 1.4.4 Trial trench evaluation at South Lane c.600m west by south-west from the Site (TVAS, 2013) recorded a pit which contained evidence of iron working in the form of slag and possible furnace fragments, and pottery dating to the late Iron Age. Such industrial activity is likely to have taken place apart from the contemporary settlement focus, but the latter is likely to have been located in the general area.
- 1.4.5 These finds, to the east and west of the Site, suggest that, despite the paucity of recorded remains, the local landscape was to some extent settled and utilised in the later prehistoric period.

*Romano British*

- 1.4.6 The Romano-British period in Surrey is incompletely understood, largely a result of limited development and associated fieldwork taking place across the agricultural landscape, and the dense woodland which covered much of the Low Weald prior to the Saxon period (ibid.). The Roman road network focused on the commercial capital of London 50km to the north-east of the Site. The major roads linking London to Silchester and London to Chichester are well documented 15km to the north-west and 25km to the south-east respectively. It is assumed that the landscape between these two routes was accessed by additional roads, in particular, the London-Winchester road whose course is projected beyond the accepted eastern limit at Farnham,) and subsequently recorded in the SHER as passing through the southern part of the Site (Bird 1987). There is also a possible alternate route running south-west to north-east across the northern part of the Site.
- 1.4.7 Topography and place-name analysis suggests that the London-Winchester road ran to the north of the Hog's Back, but despite the projected course recorded in the SHER, there is no assertion that it is likely to traverse the Site itself.
- 1.4.8 The acidic soils of Surrey's heathland are unlikely to have been attractive for agricultural use during the Romano-British period, a trend seen in similar landscape types such as the extensive heathland of the New Forest. Villas and known 'farm' sites have been recorded along the assumed course of the London-Winchester road (Allen et al. 2015). This suggests that the Site lay in a settled area of Roman Surrey, one that included the temple sites of Wanborough, 2km to the east, and Farley Heath, 20km to the south-east.

*Saxon, medieval and post-medieval*

- 1.4.9 Very little is known of the early medieval period in the wider landscape. The pre-Domesday settlement of the area appears to have been a largely dispersed, low-density occupation taking the form of numerous individual farmsteads and manors. Larger centres recorded in the Domesday survey around the Site include Wanborough and Compton. The area to the west of Wanborough is absent of Domesday settlements until the populated centres of Farnborough to the north-west and Farnham to the south-west are reached. This is a reflection of the density of woodland, which continued to dominate this area in the early medieval period.





- 1.4.10 St Peter's church in Ash has 12<sup>th</sup> and 13<sup>th</sup> century fabric and it is likely that this village was the settlement focus of the local area throughout the medieval period. To the east of Ash, adjacent to the Site, lay the moated manor site at Ash Green, a royal residence in the 14<sup>th</sup> and 15<sup>th</sup> centuries, recorded as 'greatly decayed' by 1459. The current building, which occupies the site, north-west dates from the early 16th century.
- 1.4.11 The Area of High Archaeological Potential, which surrounds Ash Manor, extends into the Site a short distance, and the proximity of the current buildings to the Site boundaries suggests that features associated with medieval/post-medieval occupation and land management may be present within the proposed development area. The surviving water-filled southern arm of the Ash Manor moat is located within the application area and the remainder of the moat (excluding a further surviving portion to the north-west) having been filled in leaving a slight, un-surveyable depression in the ground surface. Historic mapping of the moated manor site does not give a sufficiently detailed depiction of the shape and size of the moat prior to its decommissioning to assess its full extent.
- 1.4.12 The trial trench evaluation carried out to the south of Ash Lane (TVAS, 2013) recorded a concentration of features in the eastern part of the site dated to the 14<sup>th</sup> century (with some evidence of earlier, 11<sup>th</sup>/12<sup>th</sup> century activity). The high proportion of pottery wasters within the assemblage points to a nearby production site. Further recorded instances of pottery assemblages including wasters are present in the SHER data 300m east of the Site at South Lane and Church Lane. It would appear that the eastern edge of the village was a late medieval/post-medieval pottery production area of some significance, with further possible kiln sites at Drover's Way and Ash Green Lane, 95m and 650m to the south-west of the Site respectively. The Site, therefore, lies within a known pottery production area of both medieval and post-medieval date, which may be viewed as of regional importance.
- 1.4.13 The 1768 Rocque Map of Surrey shows the wider landscape of the Site as defined agricultural field systems with scattered farmsteads and villages at Wick, Flaxford and Normandy, and a denser settlement foci at Ash and Tongham. Large areas of common or heath are shown to the north and south-west. A common feature highlighted in this map is the segregation of specific areas set aside as 'greens', commonly reflected in place-names. The moated manor site of Ash Green with associated ancillary buildings and parkland occupies the south-western part of the Site, extending towards Foreman Road and Ash Green Road. The remainder of the Site is depicted as agricultural land.

*19<sup>th</sup> century and modern*

- 1.4.14 Historic map regression indicates that little to no boundary removal has occurred within the Site since the publication of the first edition Ordnance Survey map in the late 19<sup>th</sup> century. Prior to this, the greatest landscape change to have occurred in the vicinity of the Site would have been the construction of the South Eastern Railway which abuts the north-eastern boundary of the Site, in the mid-19<sup>th</sup> century.
- 1.4.15 Whilst some residential development has spread eastwards towards the Site in the 20<sup>th</sup> century, the overall character of the landscape remains largely rural, with surviving areas of woodland, retaining much of its post-medieval field patterns.

*Summary of key points*

- 1.4.16 Consultation of cartographic and documentary sources suggests that the Site lay in agricultural land from at least the post-medieval period. There is no evidence of structures or extractive works being carried out within the Site and the potential for survival of burial archaeological remains is thought to be good.
- 1.4.17 It is possible that additional structures or evidence of land use associated with Ash Manor may extend within the Site, but the quality of the early mapping is not high enough to confirm this.



- 1.4.18 The course of the Roman roads shown in the SHER as potentially running through the Site are not well defined and any evidence relating to this period may help to further refine the projections.
- 1.4.19 The SHER records a significant number of possible medieval kiln sites and occurrences of waster sherds to the east of Ash. The Site lies within this zone and could provide more information on the developed pottery industry that appears to have taken place in this area.

## 2 METHODOLOGY

### 2.1 Introduction

- 2.1.1 The detailed gradiometer survey was conducted using a Bartington Grad 601-2 dual fluxgate gradiometer system. The survey was conducted in accordance with English Heritage guidelines (English Heritage 2008).
- 2.1.2 The geophysical survey was undertaken by Wessex Archaeology's in-house geophysics team on the 30<sup>th</sup> April 2015. Field conditions at the time of the survey were good, with dry warm weather enabling survey completion in one day. An overall coverage of 2.2ha was achieved.

### 2.2 Method

- 2.2.1 Individual survey grid nodes were established at 30m x 30m intervals using a Leica Viva RTK GNSS instrument, which is precise to approximately 0.02m and therefore exceeds English Heritage recommendations (2008).
- 2.2.2 The detailed gradiometer survey was conducted using a Bartington Grad601-2 fluxgate gradiometer instrument, which has a vertical separation of 1m between sensors. Data was collected at 0.25m intervals along transects spaced 1m apart with an effective sensitivity of 0.03nT, in accordance with English Heritage guidelines (2008). Data was collected in the zigzag method.
- 2.2.3 Data from the survey was subject to minimal data correction processes. These comprise a zero mean traverse function ( $\pm 5\text{nT}$  thresholds) applied to correct for any variation between the two Bartington sensors used, and a de-step function to account for variations in traverse position due to varying ground cover and topography. These two steps were applied throughout the survey area, with no interpolation applied.
- 2.2.4 Further details of the geophysical and survey equipment, methods and processing are described in **Appendix 1**.

## 3 GEOPHYSICAL SURVEY RESULTS AND INTERPRETATION

### 3.1 Introduction

- 3.1.1 The detailed gradiometer survey has identified a few anomalies of unclear origin and potential interest across the Site, along with several areas of increased magnetic response and a large amount of ferrous. Results are presented as a series of greyscale and XY plots with corresponding archaeological interpretations at a scale of 1:1500 (**Figures 2 to 4**). The data is displayed at  $-2\text{nT}$  (white) to  $+3\text{nT}$  (black) for the greyscale image and  $\pm 25\text{nT}$  at  $25\text{nT}$  per cm for the XY trace plots.
- 3.1.2 The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous/burnt or fired objects, and magnetic trends (**Figure 4**). Full definitions of the interpretation terms used in this report are provided in **Appendix 2**.
- 3.1.3 Numerous ferrous anomalies are visible throughout the detailed survey dataset. Those that are not referred to are presumed to be modern in provenance. Ferrous anomalies considered relevant to the archaeological interpretation are highlighted and discussed in the results and interpretation.



- 3.1.4 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.

## 3.2 Gradiometer survey results and interpretation

- 3.2.1 Strong positive and negative anomalies at **4000 (Figure 4)** form a linear feature, aligned north north-west to south south-east. These anomalies are typical of an infilled feature and given the linear formation, it is likely that this is a modern former field boundary. However, there is no field boundary visible on any of the Ordnance Survey maps available from 1873 to 1978.
- 3.2.2 Weak positive linear trends can be seen throughout the Site, a number of these (**4002, 4007 (Figure 4)**) are similarly aligned and follow roughly the same bearing as the field boundaries. These are likely related to previous agricultural activity on the Site. There are a number of other weak linear anomalies scattered throughout the Site and these are not thought to have any archaeological ascription.
- 3.2.3 An area of superficial geology can be seen in the south-west of the Site at **4001 (Figure 4)**. The form of the geology in the dataset is weakly defined and therefore may suggest some alluvial deposits.
- 3.2.4 North of the main bulk of the site is a small parcel of land measuring 0.36ha. One weakly defined linear trend was identified in the north-east of this area running north-east to south-west. The exact nature of this trend is not certain. No clear archaeological anomalies were discovered in the data but large amounts of ferrous **4006 (Figure 4)** can be seen around the edges of the field, which would mask any potential underlying archaeology present. Extreme positive and negative responses are due to farm machinery and various metal gates at the edges of this area.

## 3.3 Modern Services

- 3.3.1 Modern service **4003 (Figure 4)** aligned roughly north-south runs through the centre of the most westerly area. There is a further modern service, **4004** and **4005 (Figure 4)**, running north-west to south-east which appears in the westerly part of the Site. The disturbance caused by these can conceal any surrounding archaeology.
- 3.3.2 The dimensions of the modern services identified by the gradiometer survey are indicative of the strength of their magnetic response, based upon the materials used and backfill area of the service trenches. The physical dimensions and exact location of the services may differ from their magnetic extents in plan.
- 3.3.3 It should also be noted that 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 CONCLUSION

- 4.1.1 Comprehensive desk-based research undertaken prior to and in support of geophysical survey identified potential areas of archaeological interest within the Site. However, although the detailed gradiometer survey has been successful in detecting magnetic anomalies, none of these appear to be of archaeological interest. Weak linear trends and a possible former field boundary have been identified in conjunction with further anomalies that have been interpreted as areas of superficial geology.
- 4.1.2 The most striking features of the geophysical survey are the two modern service pipes. It should be reiterated that the exact size and location of these is unknown and responses in the dataset are merely indicative of their presence.



- 4.1.3 It should be noted that small, weakly magnetised features may produce responses that are below the detection threshold of magnetometers. It may be the case that more archaeological features may be encountered than have been identified through geophysical survey. Features across the Site have been identified as having a strong magnetic response which may obscure features of a weaker magnetic response within the vicinity.

## 5 REFERENCES

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O'Connell, M. and Bird, J.(1994). *The Roman temple at Wanborough; excavation 1985–1986*. Surrey Archaeology Collection, 82, pp 1–168.

TVAS.(2013). *Land south of Ash Lodge Drive, Ash and Tongham, Guildford, Surrey*. Site code: ALS11/106 <http://www.tvas.co.uk/reports/pdf/ALS11-106evreport.pdf>

Bird, J. and Bird, DG. (eds) (1987). *The Archaeology of Surrey to 1540*.

### 5.2 Cartographic sources

British Geological Survey <http://www.bgs.ac.uk/discoveringgeology/geologyofbritain/viewer.html> [accessed May 2015]

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



## APPENDIX 1: SURVEY EQUIPMENT AND DATA PROCESSING

### Survey methods and equipment

The magnetic data for this project was acquired using a Bartington 601-2 dual magnetic gradiometer system. This instrument has two sensor assemblies fixed horizontally 1m apart allowing two traverses to be recorded simultaneously. Each sensor contains two fluxgate magnetometers arranged vertically with a 1m 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.

The gradiometers have an effective resolution of 0.03nT over a  $\pm 100$ nT range, and measurements from each sensor are logged at intervals of 0.25m. All of the data are stored on an integrated data logger for subsequent post-processing and analysis.

Wessex Archaeology undertakes two types of magnetic surveys: scanning and detail. Both types depend upon the establishment of an accurate 20m or 30m site grid, which is achieved using a Leica Viva RTK GNSS instrument and then extended using tapes. The Leica Viva system 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 English Heritage (2008) for geophysical surveys.

Scanning surveys consist of recording data at 0.25m intervals along transects spaced 10m apart, acquiring a minimum of 80 data points per transect. Due to the relatively coarse transect interval, scanning surveys should only be expected to detect extended regions of archaeological anomalies, when there is a greater likelihood of distinguishing such responses from the background magnetic field.

The detailed surveys consist of 20m x 20m or 30m x 30m grids, and data are collected at 0.25m intervals along traverses spaced 1m apart. These strategies give 1600 or 3600 measurements per 20m or 30m grid respectively, and are the recommended methodologies for archaeological surveys of this type (EH, 2008).

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 0.125m intervals along traverses spaced up to 0.25m apart, resulting in a maximum of 28800 readings per 30m grid, exceeding that recommended by English Heritage (2008) for characterisation surveys.

### Post-processing

The magnetic data collected during the detail survey are downloaded from the Bartington system 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.

As the scanning data are not as closely distributed as with detailed survey, they are georeferenced using the GPS information and interpolated to highlight similar anomalies in adjacent transects. Directional trends may be removed before interpolation to produce more easily understood images.

Typical data and image processing steps may include:



- Destripe – Applying a zero mean traverse in order to remove differences caused by directional effects inherent in the magnetometer;
- Destagger – Shifting each traverse longitudinally by a number of readings. This corrects for operator errors and is used to enhance linear features;
- Despike – Filtering isolated data points that exceed the mean by a specified amount to reduce the appearance of dominant anomalous readings (generally only used for earth resistance data)

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.
- Greyscale – Presents the data in plan view 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 two main categories: archaeological and unidentified responses.

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:

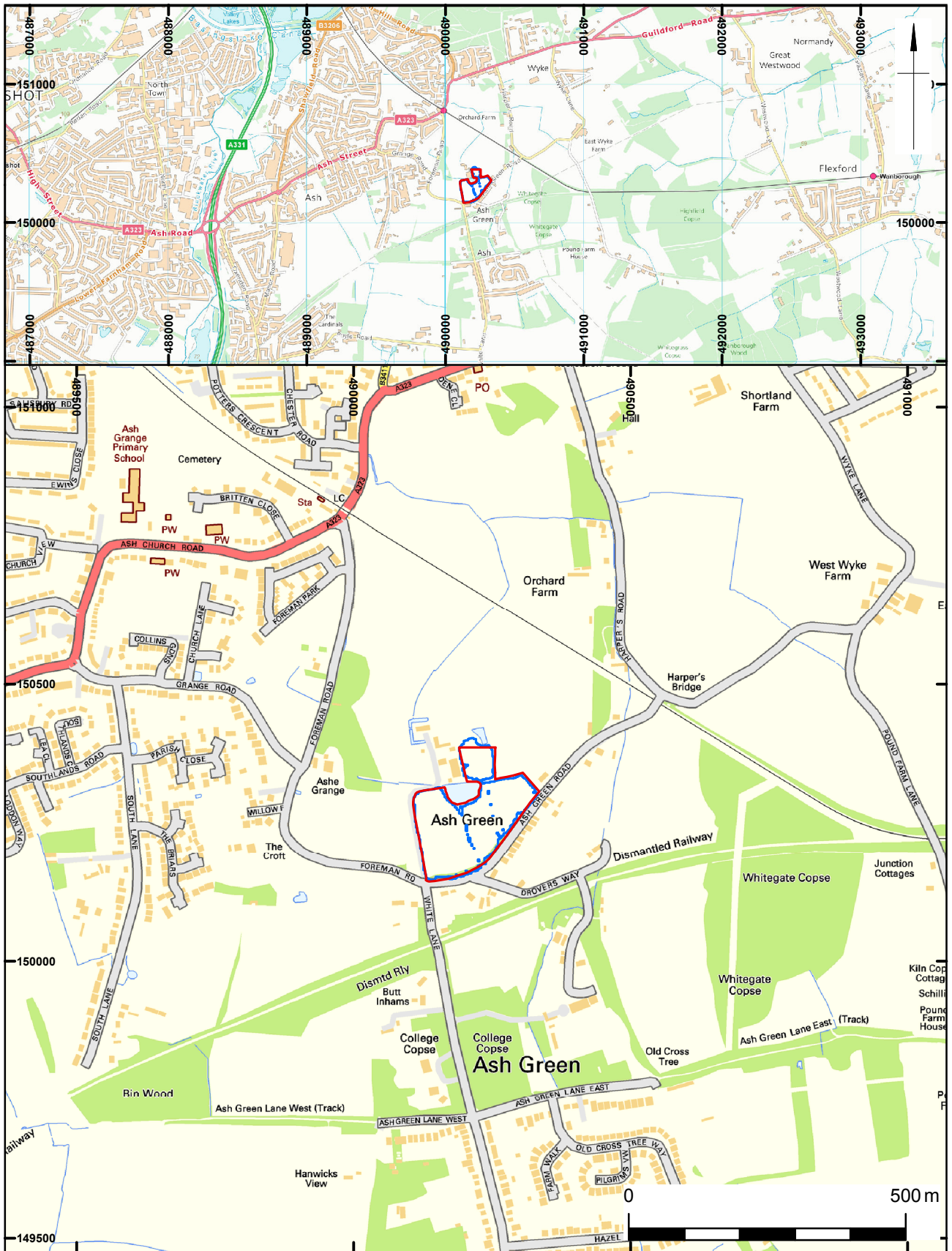
- Archaeology – used when there is a clear geophysical response and anthropogenic pattern.
- Probable archaeology – used for features which give a clear response but which form incomplete patterns.
- Possible archaeology – used for features which give a response but which form no discernible pattern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




The unidentified 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.
- Ferrous – used for responses caused by ferrous material. These anomalies are likely to be of modern origin.

Finally, services such as water pipes are marked where they have been identified



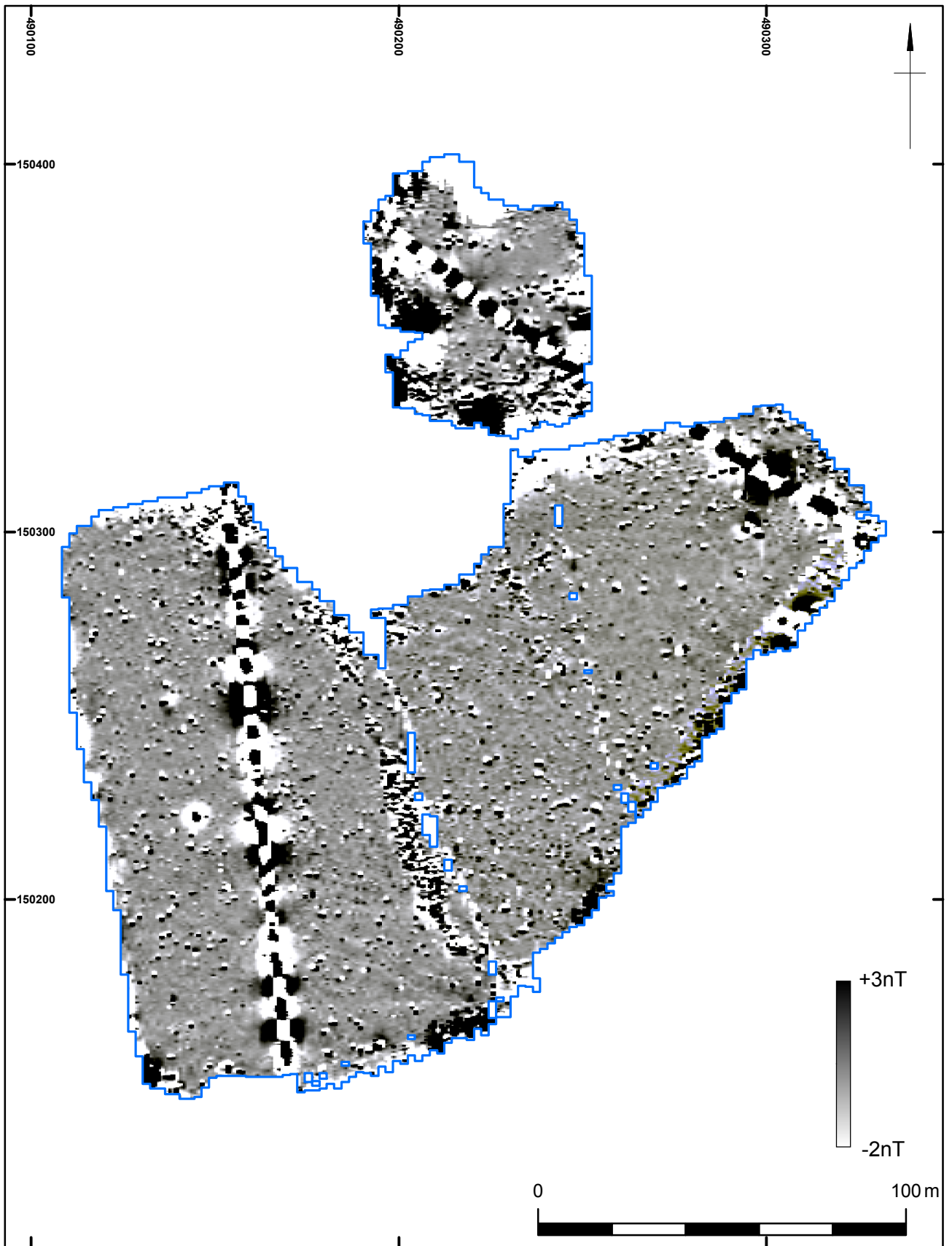




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Site location and survey extents

Figure 1

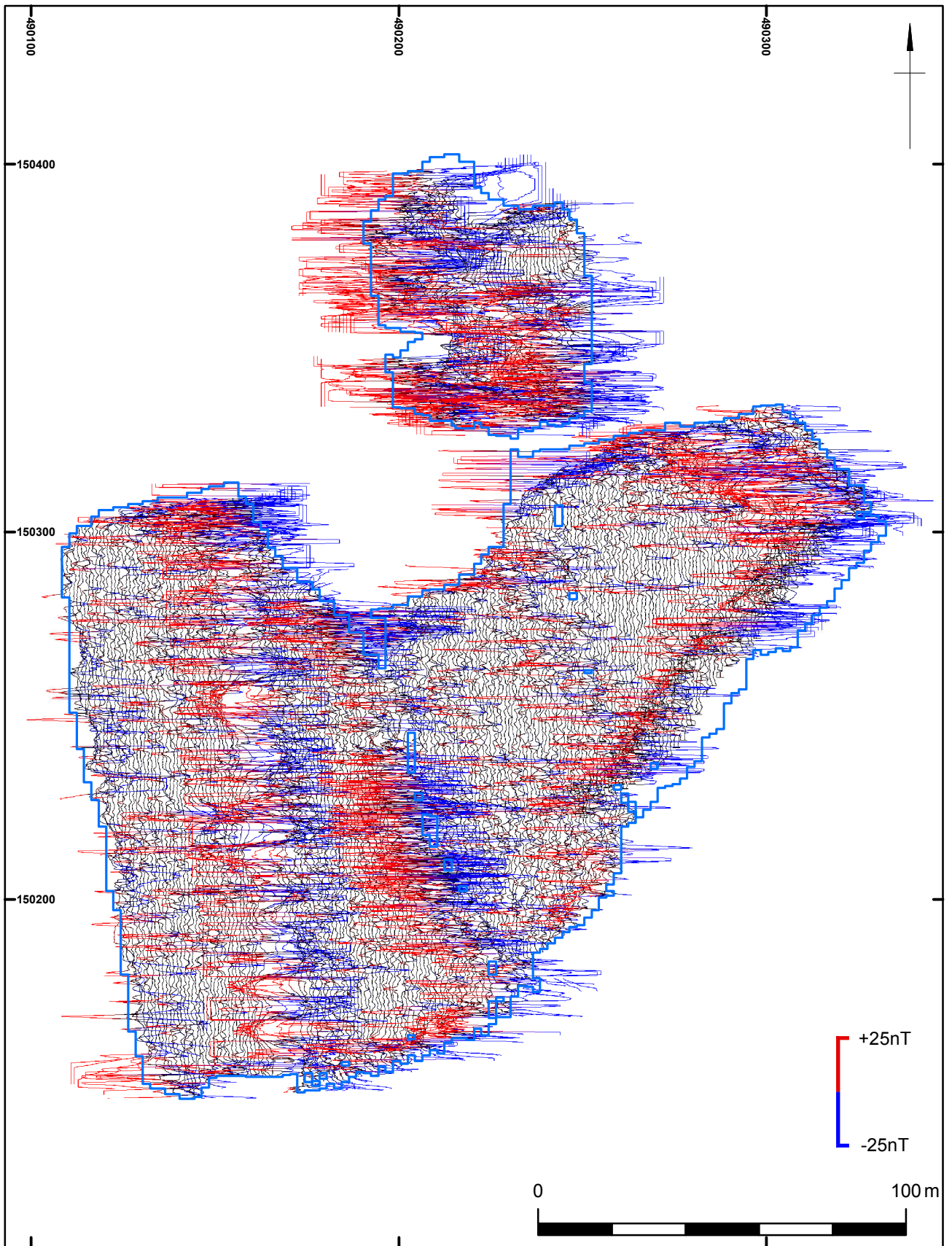






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Greyscale plot

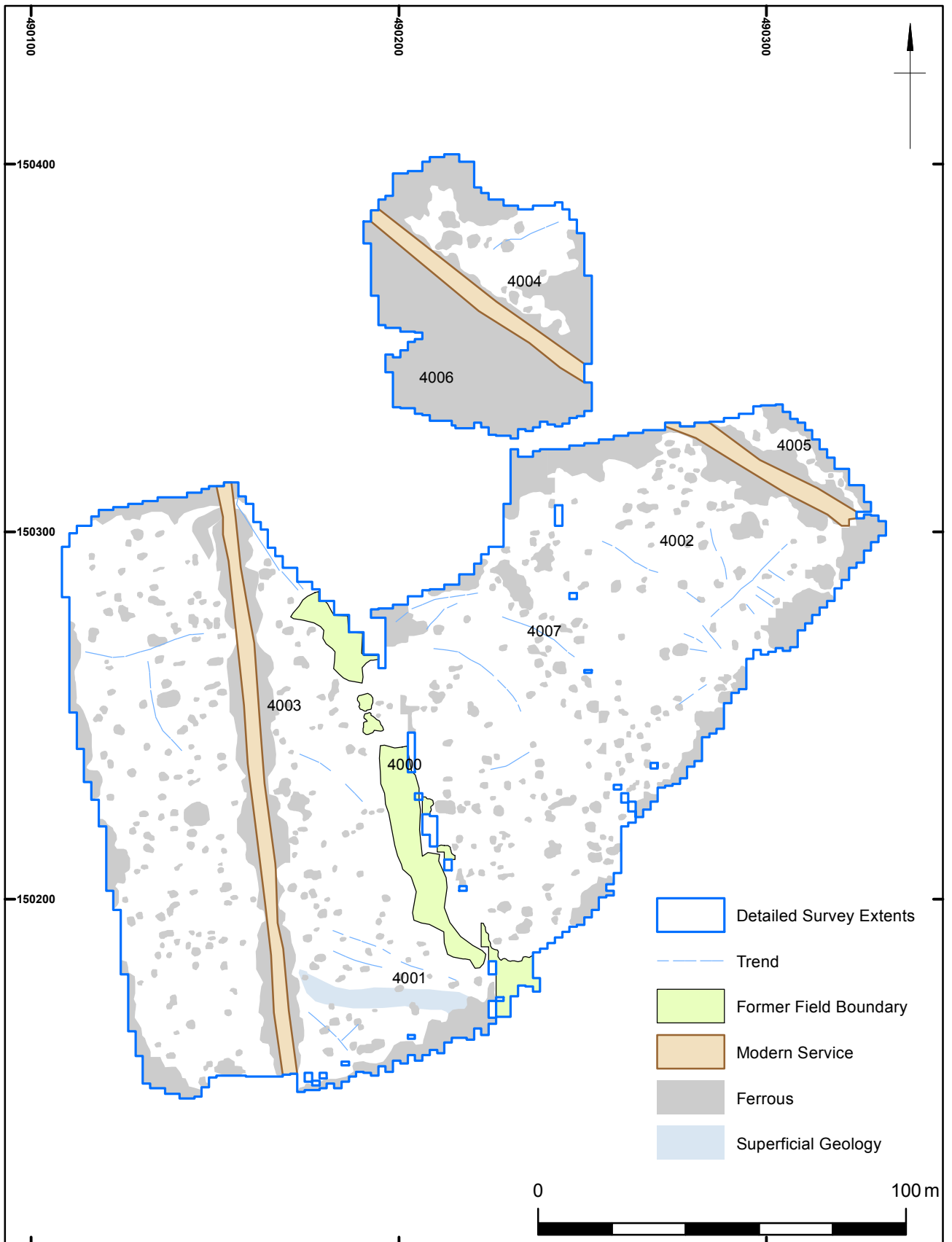
Figure 2









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XY Trace plot

Figure 3



-  Detailed Survey Extents
-  Trend
-  Former Field Boundary
-  Modern Service
-  Ferrous
-  Superficial Geology

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