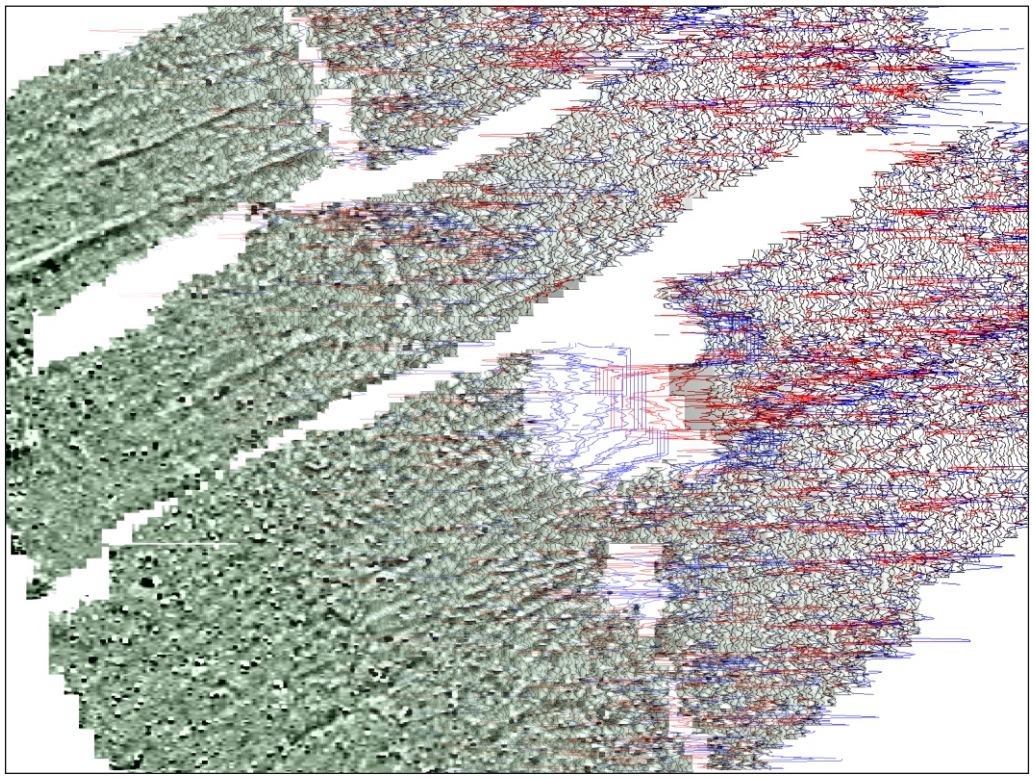
Whitehouse Farm, Belper Lane
Belper, Derbyshire

Detailed Gradiometer Survey Report



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wessexarchaeology

Whitehouse Farm, Belper Lane
Belper, Derbyshire

Detailed Gradiometer Survey Report

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	F				
File:					

* I = Internal Draft; E = External Draft; F = Final

Whitehouse Farm, Belper Lane Belper, Derbyshire

Detailed Gradiometer Survey Report

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Detailed Gradiometer Survey Report

Summary

A detailed gradiometer survey was conducted over land at Whitehouse Farm, Belper Lane, Belper (centred on NGR 433880, 348815). The project was commissioned by Wheeldon Brothers Ltd with the aim of establishing the presence, or otherwise, and nature of detectable archaeological features in advance of the development of the land and the construction of 150 new houses.

The site falls within the Buffer Zone of the Derwent Valley Mills World Heritage Site and comprises an irregular parcel of land measuring approximately 8 hectares (ha). The geophysical survey was undertaken on the 7th – 9th of November 2016. The detailed gradiometer survey has demonstrated the presence of a number of anomalies of archaeological interest in four fields.

The anomalies identified as being of archaeological interest are primarily ditch-like features, most likely associated with previous divisions of the area. They are all situated on a similar west-south-west – east-north-east alignment, which also corresponds with other features identified during a walkover survey of the area and interpreted as former field boundaries. Whilst it is possible that these features may be earlier in date, the similarity in alignment may suggest a degree of contemporaneity and it is suggested that they form part of a post-medieval agricultural landscape.

In addition to the former land divisions, there is evidence for quarrying along the western edge of the site as well as extensive ridge and furrow ploughing across the entirety of the area. The latter are particularly prevalent within the survey results and are clearly identified. As the ridge and furrow is on the same orientation as many of the existing and extant field boundaries, it is likely that they are associated with the same agricultural landscape.

Additionally, this archaeological investigation has detected evidence for historic cultivation and a path or track which intersect the south-eastern part of the site.

Whitehouse Farm, Belper Lane
Belper, Derbyshire

Detailed Gradiometer Survey Report

Acknowledgements

Wessex Archaeology would like to thank Wheeldon Brothers Ltd, for commissioning the geophysical survey. The assistance of Sean Ingle is gratefully acknowledged in this regard.

The fieldwork was undertaken on behalf of Wessex Archaeology by staff from Contour geophysics, but was processed and reported on in-house by WA staff. Jen Smith processed and interpreted the geophysical data and Nicholas Crabb wrote the report. The geophysical work was quality controlled by Tom Richardson and Lucy Learmonth. Illustrations were prepared by Nicholas Crabb. The project was managed on behalf of Wessex Archaeology by Chris Swales.

Whitehouse Farm, Belper Lane Belper, Derbyshire

Detailed Gradiometer Survey Report

1 INTRODUCTION

1.1 Project background

1.1.1 Wessex Archaeology was commissioned by Wheeldon Brothers Ltd to carry out a geophysical survey at Whitehouse Farm, Belper, Derbyshire (hereafter "the Site", centred on NGR 433880, 348815) (**Figure 1**). The survey forms part of an ongoing programme of archaeological works being undertaken to satisfy archaeological conditions attached to planning permission by the Derby and Derbyshire Development Control Archaeologist (Planning Reference AVA/2016/1020).

1.2 Scope of the document

1.2.1 This report details a brief description of the geophysical survey methodology followed, the detailed survey results and the archaeological interpretation of the geophysical data. The results of a walkover survey of the Site have been reported upon separately (WA 2016a).

1.3 The Site

1.3.1 The Site comprises an irregular parcel of land measuring approximately 8 hectares (ha) located at the north-west edge of the Mount Pleasant area, approximately 1.6 km north-west of Belper and approximately 11 km north of Derby (**Figure 1**).

1.3.2 The Site comprises four fields covered with short grass, several small areas of hard standing and several buildings fronting onto Belper Lane and recreational grounds at Oakhurst Close. It is bounded to the north and west by agricultural land, to the south by a public park and residential development and to the east by a row of houses fronting onto Belper Lane.

1.3.3 The Site is situated on sloping ground to the south-east falling from approximately 150 m above Ordnance Datum (aOD) at its north-western edge to approximately 139 m aOD at its south-eastern edge.

1.3.4 The underlying bedrock geology throughout the Site is mapped as Chatsworth Grit sandstone. No superficial deposits are recorded (BGS 2016).

1.3.5 The soils underlying the Site are likely to consist of Cambic Stagnogley soils of the 713a (Bardsey) association (SSEW SE Sheet 3-2 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 Historic Environment Assessment (HEA) was undertaken by Wessex Archaeology (2016b) which examined the potential impact of the proposed development. This used information provided by the Derbyshire Historic Environment Record (DHER), the National Heritage List for England (NHLE) as a well as a number of other publicly accessible sources. The following background is not exhaustive, but provides a summary of the HEA and of the archaeological and historical development of the Site and the surrounding area.

2.1.2 There are no designated historical assets within the Site, however it does fall within the Buffer Zone of the Derwent Valley Mills World Heritage Site (DVMWHS). This contains a number of 18th and 19th century cotton mills which are considered to be of great historical and technological significance as they provided the blueprint for factory production methods.

2.1.3 There are a number of listed buildings within a 1 km radius of the Site, many of which are located to the south-east of the Site and are associated with the 19th century Mill complex at the DVWHS. There is one Grade 1 listed Building known as Belper North Mill (NHLE 1186846), two Grade II*, comprising an arched footbridge (NHLE 1087396) and a horseshoe weir (NHLE 1335702), and two Grade II listed buildings at Belper Bridge (NHLE 1087394) and Belper East Mill (NHLE 1335664).

2.1.4 Approximately 900 m west of the Site, Belper cemetery is a Grade II Registered Park and Garden which contains two Grade II listed identical chapels flanking the entrance arch (NHLE 1109213), Masonry piers (NHLE 1109212), and a Gothic Style Lodge (NHLE 1335294). The cemetery was consecrated in 1859 in response to urgent need for more burial space in the town.

2.1.5 The Grade II* registered park/garden at River Gardens (NHLE 1001372) is located 900 m to the south-west, and a Grade II listed bandstand of the same date is also located within this. There a 24 other Grade II listed buildings within Belper; these are predominately associated with 18th and 19th century domestic properties.

2.1.6 Other post-medieval records are predominantly occupied by buildings associated with the rural landscape, comprising numerous houses, farmsteads and barns dating from the 17th, 18th and 19th centuries. For example, 400 m to the north-west of the Site, at Dalley farm, there are six Grade II* and two Grade II listed buildings. At Crossroads Farm, there are a further five Grade II and one Grade II* listed building, which are also related to post-medieval agricultural and domestic buildings.

2.1.7 The earliest evidence of human activity within the surrounding area of the Site is the findspot of a Neolithic polished stone axe (MDR4663) found in a garden recorded approximately 250 m south of the Site, although the exact location of the findspot is unknown.

2.1.8 The surrounding area of the Site contains three separate HER entries relating to Iron Age and Romano-British quernstones. Investigations carried out approximately 600 m south-west of the Site (MDR13089) uncovered around 30 quernstones, and other fragments, from the rubble of fallen sections of drystone walls which were identified as being of Romano-British, or earlier, origin. Outcrops of Ashover Grit were uncovered immediately to the east of Starbuck House, suggesting that the availability of fallen stone from the outcrops may have made quarrying for the material unnecessary.

2.1.9 Production of the quernstones is thought to have been at the base of a now landscaped bank to the rear of Starbuck House and may have been transported along Longwalls Lane (MDR11703) which is thought to have been a Romano-British, or earlier, routeway. An excavation at Starbuck House in 2009 uncovered at least three phases of activity including a smoothed paved area, possibly for loading stone or the interior floor of an industrial building, cobbled and beaten earth floors, possible wall remnants and a circular feature which may represent the base of a domestic oven.

2.1.10 Two beehive type quern top stones (MDR13211) dating to the Iron Age were also identified at Gorses Farm approximately 880 m north-north-west of the Site. One of the pieces was almost entirely complete whilst the second had been cut in half, probably for use within a wall. A further two quernstones were found in the boundary wall of Holly House, approximately 900 m south-west of the Site.

2.1.11 There is little evidence in the surrounding area for activity during the Anglo-Saxon and medieval periods, which is limited to the extents of a medieval deer park, located approximately 900 m west of the Site. Evidence of medieval agriculture identified from LiDAR data is also located approximately 950 m south-east of the Site. It is likely the Site and the surrounding area were part of a rural landscape throughout these periods.

2.2 Recent investigations at the Site

2.2.1 A recent walkover survey (WA 2016a) of the Site identified several features, including ridge and furrow, which indicate the Site's agricultural use since at least the post-medieval period. It also noted the presence of low earthworks representing former field boundaries indicating that the Site was previously sub-divided. A possible rectangular enclosure was identified, however, this was subsequently confirmed to be a C20th horse training area which had subsequently been abandoned. The presence of an area of quarrying/extraction was also identified within the Site.

2.2.2 An examination of the fabric of the standing walls on the Site did not identify any quernstones reused in their construction. A limited amount of re used dressed stone was identified, however this dressed stone was of an unknown date.

3 METHODOLOGY

3.1 Introduction

3.1.1 The geophysical survey was undertaken on behalf of Wessex by staff from Contour geophysics between the 7th – 9th of November 2016. Field conditions at the time of the survey were good throughout the period of survey. An overall coverage of 6.7 ha was achieved, with only small areas of hardstanding and field divisions preventing data collection.

3.2 Aims and objectives

3.2.1 The aims of the survey comprise the following:

- to conduct a detailed survey covering as much of the specified area as possible, allowing for artificial obstructions;
- to clarify the presence/absence and extent of any buried archaeological remains within the site;
- to determine the general nature of the remains present.

3.3 Fieldwork methodology

3.3.1 Individual survey grid nodes were established at 30 m x 30 m intervals using a Leica Viva RTK GNSS instrument, which is precise to approximately 0.02 m and therefore exceeds Historic England recommendations (2008).

3.3.2 The detailed gradiometer survey was conducted using a Bartington Grad601-2 fluxgate gradiometer instrument, which has a vertical separation of 1 m between sensors. Data were collected at 0.25 m intervals along transects spaced 1 m apart with an effective sensitivity of 0.03 nT, in accordance with Historic England guidelines (English Heritage 2008). Data were collected in the zigzag method.

3.4 Data processing

3.4.1 Data from the survey was subject to minimal data correction processes. These comprise a zero mean traverse function (±5 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.

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 a variety of magnetic anomalies across the Site, some of which have been interpreted as possible archaeology. There are also a number of former field boundaries, along with evidence for ridge and furrow and a large amount of ferrous. Results are presented as a series of greyscale plots, XY trace plots and archaeological interpretations at a scale of 1:2000 (**Figures 2** to **4**). The data are displayed at -2 nT (white) to +3 nT (black) for the greyscale image and ±25 nT at 25 nT per cm for the XY trace plots.

4.1.2 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**.

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 There are four linear positive anomalies across the Site interpreted as possible archaeology. The clearest of these is located at **4000**, where a west-south-west – east-north-east positive and a south-south-east – north-north-west linear anomalies are visible. These are relatively weakly positive (1 nT), but are regular in shape in and size, measuring 2 m in width and 30 m and 20 m in length respectively. To the south of this, a further positive linear (1 - 3 nT) is located at **4001**. This is similarly aligned on a west-south-west – east-north-east orientation and measures 17 m in length and 2 – 3 m in width. Whilst there are other features interpreted as ridge and furrow on the same alignment, **4000** and **4001** are notably stronger in response and therefore identified as possible archaeology. These features were visible on the LiDAR data of the Site and in the walkover survey and likely represent former field boundaries.

4.2.2 At **4002**, there is a weak positive (1 nT) orthogonal linear anomaly which is located in the south-eastern part of the Site. This is poorly defined due to the presence of ridge and furrow ploughing trends, which are also visible within the area. However, it is interpreted as possible archaeology and is likely representative of a ditch, possibly forming part of an enclosure. It measures 1.5 – 2.5 m in width, extends for 40 m on a north-east – south-west alignment and turns 90 degrees in the south-west towards a north-westerly direction for a further 20 m. This corresponds with a series of low earthworks identified in the walkover survey (WA 2016a; WA 8), but is not as extensive within the results of this survey. This is likely due to extensive ploughing and widespread ferrous response encountered across the Site. The origin of these low earthworks is not clear but they are on the same alignment as the extant field system and are likely to be contemporaneous.

4.2.3 The most northern part of the Site is dominated by ploughing trends. Amongst this there are two positive (3 nT) linear anomalies, with a corresponding linear negative response adjacent. These are orientated on a west-south-west – east-north-east alignment and measure approximately 2 m in width. At **4003** the feature extends for approximately 230 m and is only divided by an existing field boundary in the centre of the feature. At **4004**, it is only clearly visible in the western extent, and extends for 106 m between the western field boundary and the intersecting division. These are interpreted as former field boundaries as they appear to respect existing boundaries and are clearly visible within the results. However, it is possible that they simply represent more prominent ridge and furrow.

4.2.4 In the north-western corner of the Site there is a short, positive (1 – 2 nT) linear anomaly at **4005**. This is aligned on an approximate north – south alignment and measures 12 x 2 m. It is situated between two former field boundaries at **4003** and **4004** and appears to terminate immediately prior to them, as opposed to being truncated by them. It is likely that this forms a further short field division in this area, however an earlier interpretation of this cannot be ruled out.

4.2.5 At **4006** a further west-north-west – east-south-east aligned linear feature is visible. This measures 2 m in width and is approximately 88 m in length. It is slightly weaker (0 - 1 nT) than the examples identified in the north of the Site at (**4003; 4004**), but a similar interpretation is applied. However, as this is located more centrally within the field, it is perhaps more feasible that this could represent a former land division. Furthermore, this feature is apparent in the LiDAR data for the area (WA 2016a: WA1)

4.2.6 Perpendicular to other former field boundaries at the site (**4003 - 4006**), there is a south-south-east – north-north west, negative anomaly at **4007**. This measures 5 m in width and extends for 48 m where it intersects with the existing field division in the north. This is visible on historic OS mapping dating to 1881, as well as being identified in the walkover survey of the Site (WA 2016a; WA3), and is therefore interpreted as a former field boundary.

4.2.7 At **4008**, there is a cluster of ferrous anomalies close to the western boundary of the Site. This is also located to the south of former field boundary where a notable dip in topography is present. There is no easily definable feature within this area, but it is likely that the concentration of dipolar anomalies is associated with former quarrying/extraction. This interpretation is supported by LiDAR data and the walkover survey (WA 2016a; WA5).

4.2.8 Across the Site there is extensive evidence for ridge and furrow ploughing. This takes the form of weak positive and negative linear trends aligned west-south-west – east-north-east. These are apparent across the whole Site, but are perhaps clearest at **4009** – **4011**. It is possible that the dominance of these anomalies has obscured earlier features which are not visible within this dataset.

4.2.9 At **4012**, there is a negative linear anomaly extending form the central area of hardstanding to a property to the west of the Site. This is associated with a path or track on an east – west alignment, which is visible on the surface and on aerial photography for the area. To the north of this, there is also a linear arrangement of ferrous anomalies which are orientated north-east – south-west (**4013**). It is likely that this is associated with a previous fence line which may have previously intersected the area.

5 DISCUSSION

5.1.1 The detailed gradiometer survey has been successful in detecting anomalies of archaeological interest. These are all considered to be ditch-like features, most likely associated with previous divisions of the area (**4000** – **4002**). These are all situated on a very similar alignment to other features identified within the survey area which are interpreted as former field boundaries (**4003** – **4007**). Many of these can be attributed to such features on historic mapping and were previously identified in the walkover survey and interpretation of LiDAR data (WA 2016a). Whilst it is possible that the possible archaeological features at **4000** – **4003** may be earlier in date, the similarity in alignment may suggest a degree of contemporaneity. However, it is impossible to confirm this on the basis of the results of this geophysical survey alone and further investigation would be required to elucidate this further.

5.1.2 In addition to the linear features, there is evidence for quarrying along the western edge of the Site (**4008**). There is also extensive ridge and furrow ploughing across the entirety of the Site. These were identified as visible earthworks in the walkover survey (WA 2016a; WA 8) and are clearly well preserved. As such, they are particularly prevalent within the survey results and can be clearly identified. As they are on the same orientation as many of the existing and extant field boundaries, it is likely that they are associated with the same agricultural landscape, most likely dating to the post-medieval period.

5.1.3 Despite the evidence in the surrounding area of the Site relating to Iron Age and Romano-British quernstone production there are no identifiable features considered likely to date to this period. However, it is possible that the extensive ridge and furrow ploughing, and propensity of modern ferrous material, may have removed or obscured any earlier features.

6 REFERENCES

6.1 Bibliography

English Heritage 2008 *Geophysical Survey in Archaeological Field Evaluation. Research and Professional Service Guideline No 1.* Swindon (2nd Edition)

Wessex Archaeology, 2016a. *Whitehouse Farm, Belper Lane, Belper, Derbyshire: Site Walkover Report.* (Unpublished Report), document ref. 114251.01

Wessex Archaeology, 2016b. *Whitehouse Farm, Belper Lane, Belper, Derbyshire: Historic Environment Assessment.* (Unpublished Report), document ref. 114250.01

6.2 Cartographic and documentary sources

Ordnance Survey 1983 *Soil Survey of England and Wales Sheet 3, Soils of Midland and Western England.* Southampton.

6.3 Online resources

British Geological Survey Geology of Britain Viewer (accessed month year)
http://mapapps.bgs.ac.uk/geologyofbritain/home.html

7 APPENDICES

7.1 Appendix 1: Survey Equipment and Data Processing

Survey methods and equipment

The magnetic data for this project will be acquired using a non-magnetic cart fitted with 4x Bartington Grad-01-1000L 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 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 0.03 nT over a ±100 nT range, and measurements from each sensor are logged at a rate of 6 hz (intervals of sub 0.25 m). All of the data are stored on a Leica Viva CS35 tablet controller using the data acquisition program MLGrad 601. This also collects readings streamed by a Leica GS14 GNSS receiver, which is fixed to the cart at a measured distance from the sensors.

The use of the non-magnetic cart has several advantages over the use of the Bartington Grad 601-2 fluxgate gradiometer instrument. Perhaps chief amongst these is that it has a higher sample rate resulting in higher resolution dataset. The addition of the GPS receiver also negates the need to establish a survey grid prior to the survey and therefore increases efficiency. Mounting the instrument on the cart also reduces the occurrence of operator error caused by inconsistent walking speeds and variation in traverse position due to varying ground cover and topography.

Wessex Archaeology undertakes two types of magnetic surveys: scanning and detail. When not using the handheld Bartington 601-2 dual magnetic gradiometer, both types depend upon the establishment of an accurate 20 m or 30 m 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 0.02 m in real-time and therefore exceed the level of accuracy recommended by Historic England (English Heritage 2008) for geophysical surveys.

Scanning surveys consist of recording data at 0.25 m 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 20 m x 20 m or 30 m x 30 m grids, and data are collected at 0.25 m intervals along traverses spaced 1m apart. These strategies give 1600 or 3600 measurements per 20 m or 30 m 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 0.125 m intervals along traverses spaced up to 0.25 m apart, resulting in a maximum of 28800 readings per 30 m grid, exceeding that recommended by Historic England (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 for the non-magnetic cart fitted system may include:

- Smooth – Applying a smooth function removes any small scale spiking or 'fuzziness', generally caused by internal system noise. This effectively 'destripes' the data and reduces the appearance of dominant anomalous readings.
- Spline interpolation – Gridding the data with splines allows the application of minimum and maximum data values and reduces oscillations for potential fields such as gravity or magnetic.

Typical data and image processing steps for the dual magnetic gradiometer system 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.

7.2 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.

The Site

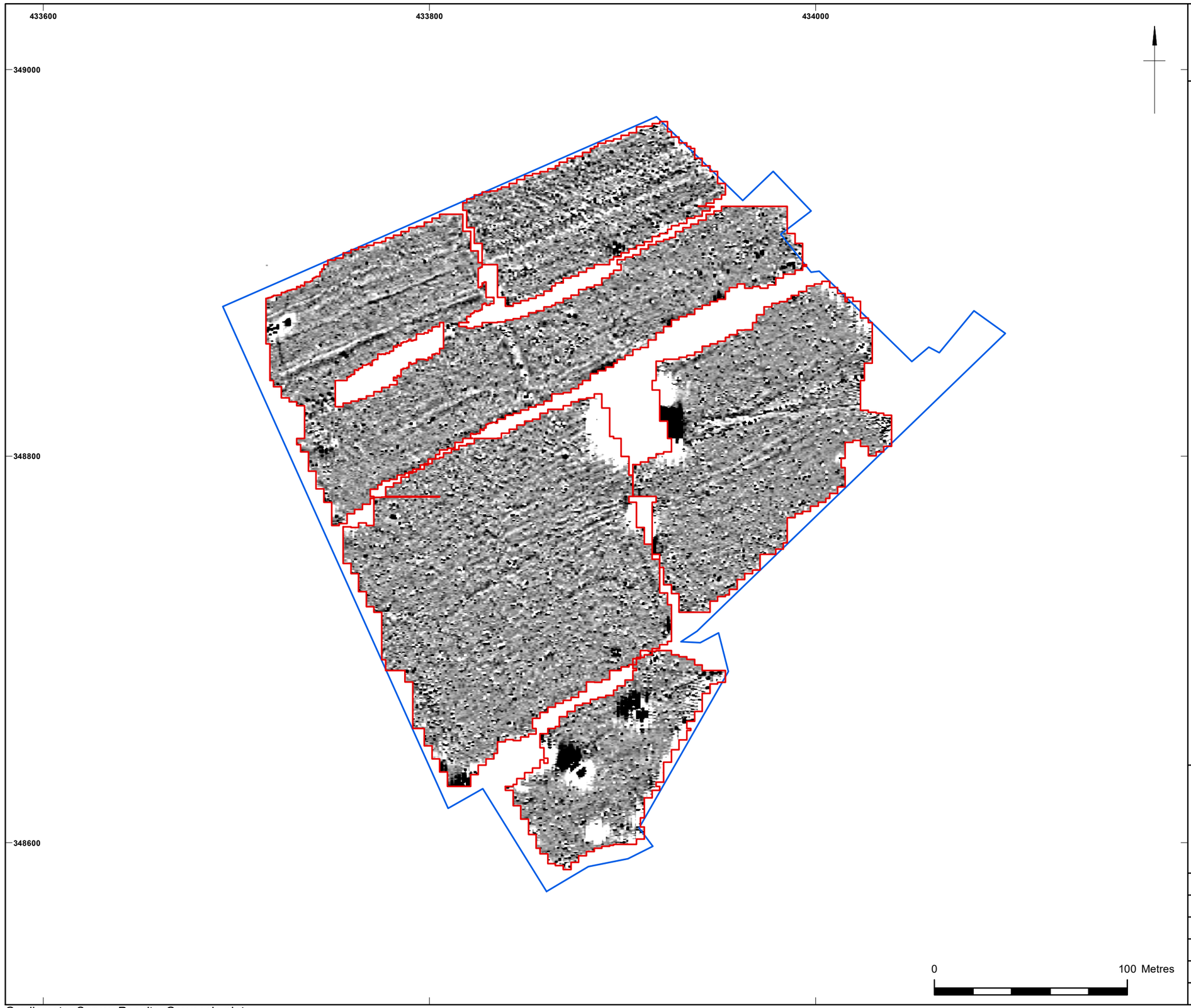
Detailed survey extent

Coordinate system:
OSGB36 (OSTN15/OSGM15)

Date:	24/11/2016
Revision Number:	0
Scale:	1:12,500 at A3
Illustrator:	NLC
Path:	S:\PROJECTS\114251\GIS\FigsMXD\2016_11_23_Geophysics

Site location and survey extents

Figure 1



Detailed Survey Extents

Site boundary

+25 nT

-25 nT

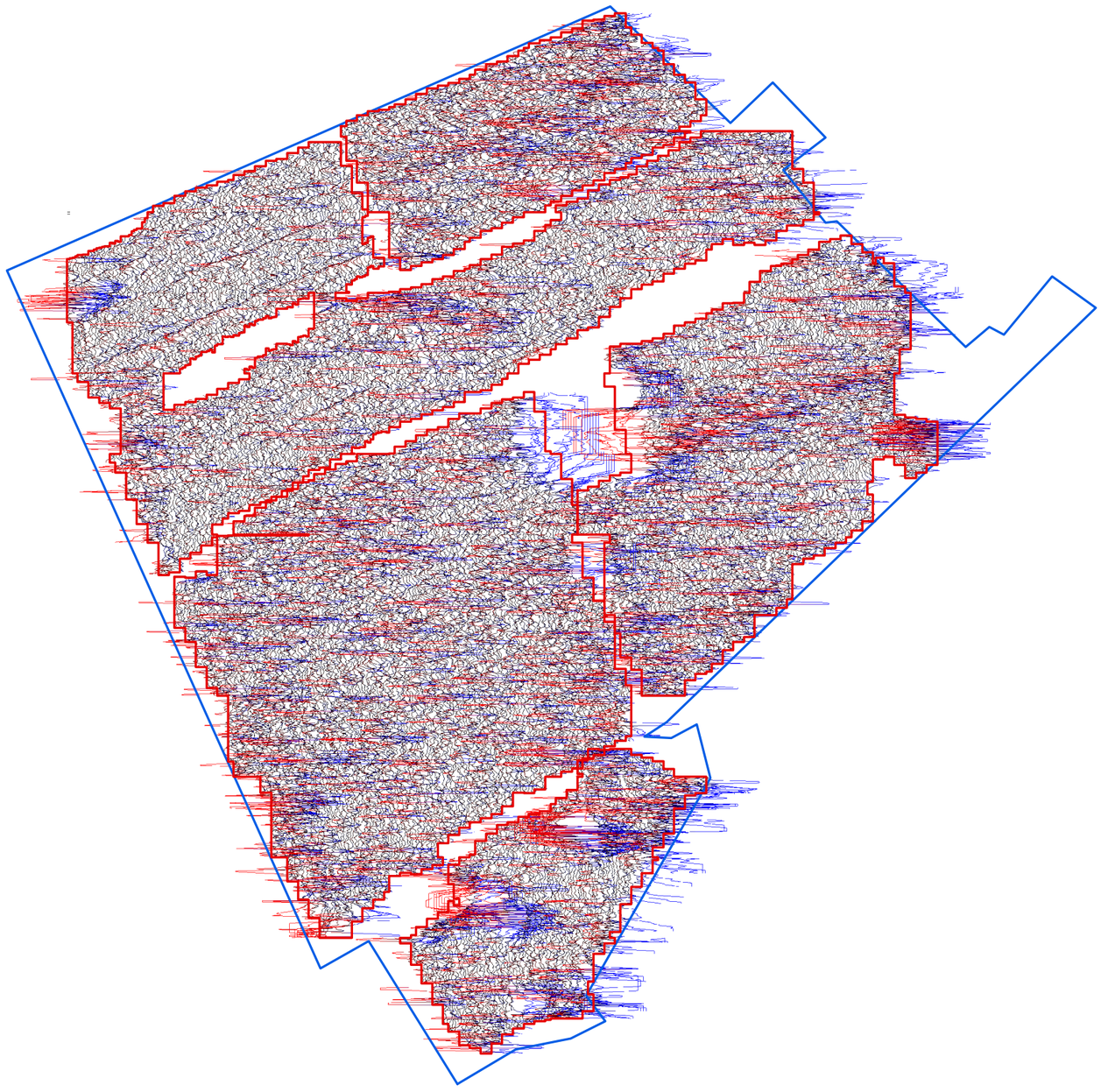
Coordinate system:
OSGB36 (OSTN15/OSGM15)

Date:	23/11/2016
Revision Number:	0
Scale:	1:2000
Illustrator:	NLC
Path:	S:\PROJECTS\114251\GIS\FigsMXD\2016_11_23_Geophysics

Gradiometer Survey Results: Greyscale plot

Figure 2

433600
433800
434000
349000
348800
348600



Detailed Survey Extents
Site boundary

+25 nT
-25 nT

0
100 Metres

Coordinate system:
OSGB36 (OSTN15/OSGM15)

Date:	23/11/2016
Revision Number:	0
Scale:	1:2000
Illustrator:	NLC
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Gradiometer Survey Results: XY trace plot

Figure 3

433800

434000

434200

349000

348800

348600

4003

4004

4011

4005

4007

4013

4002

4012

4008

4010

4009

4006

4000

4001

0

100 Metres

Detailed Survey Extents

Site boundary

Possible archaeology

Former field boundary

Path/Track

Ferrous

Ridge and furrow

Ploughing

Trend

Coordinate system:
OSGB36 (OSTN15/OSGM15)

Date:	23/11/2016
Revision Number:	0
Scale:	1:2000
Illustrator:	NLC
Path:	S:\PROJECTS\114251\GIS\FigsMXD\2016_11_23_Geophysics

Gradiometer Survey Results: Interpretation

Figure 4

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