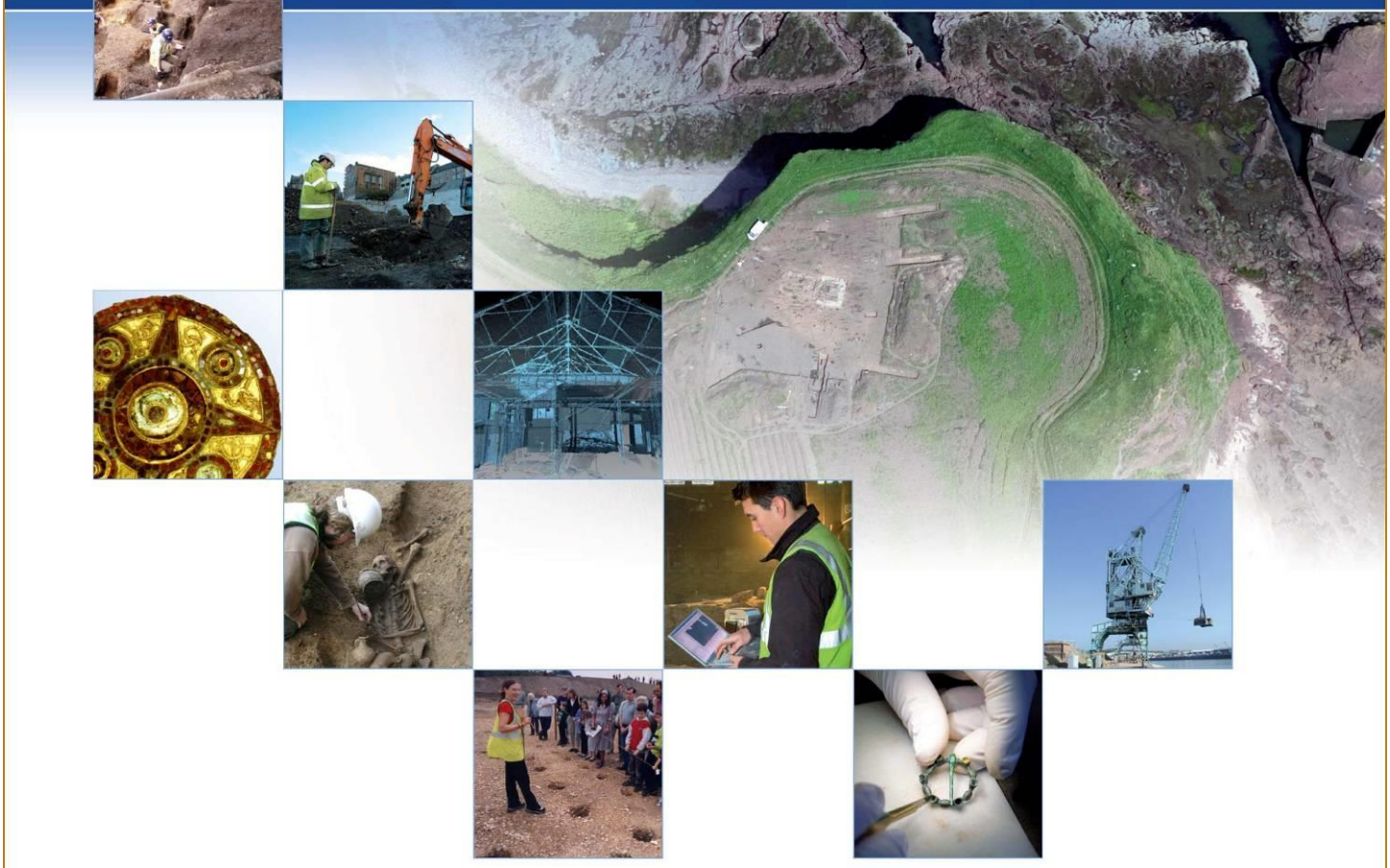
The Common, Barwell, Leicestershire

Archaeological Geophysical Survey

National Grid Reference Number: SP 4506 9646

AOC Project No: 51743

Date: May 2017



AOC Archaeology Group

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The Common, Barwell, Leicestershire

Archaeological Geophysical Survey

On Behalf of:

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National Grid Reference (NGR): **SP 4506 9646**

AOC Project No: **51743**

Prepared by: **James Lawton**

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Date of survey: **May 2017**

This document has been prepared in accordance with AOC standard operating procedures.

Author: James Lawton	**Date: 12th May 2017**
Approved by: Graeme Cavers	**Date: 12th May 2017**
Report Stage: Final Draft	**Date: 24th May 2017**

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Non-Technical Summary

AOC Archaeology Group was commissioned by WYG Environment Planning Transport Ltd to undertake an archaeological geophysical (gradiometer) survey to investigate the potential for buried archaeological remains and the location of a culvert on a proposed development area within The Common, Barwell, Leicestershire (centred at SP 4506 9646*). A total of 7 hectares were surveyed and the results of the survey have identified a number of anomalies.*

The results of the survey identified no definitive archaeological anomalies within the survey area.

A number of discrete curvilinear trends have been identified in the data in the north of the site which could be archaeological in origin. Several responses of an unclear origin were also identified.

A number of agricultural anomalies have been observed in the data including a former field boundary, as well as more modern ploughing trends.

Three linear anomalies that could represent possible modern services were recorded within the data, one of which falls along the line of the proposed culvert.

Areas of magnetic disturbance, most likely the result of modern fencing are located around the survey boundaries within the majority of the fields surveyed.

Throughout the survey area isolated dipolar or ferrous (iron spikes) anomalies were also recorded; these are most likely the result of manuring and modern detritus.

1 Introduction

1.1 AOC Archaeology Group was commissioned by WYG Environment Planning Transport Ltd to undertake an archaeological geophysical survey at a site in Barwell, Leicestershire as part of a wider scheme of archaeological assessments in advance of a proposed development of the site.

1.2 The survey was carried out to provide information on the extent and significance of potential buried archaeological remains within the proposed development site. The survey also aimed to determine the location of a known culvert, which is shown on modern mapping provided by the client.

2 Site Location and Description

2.1 The proposed development site is located on the southern corner of the village of Barwell, Leicestershire. It is located to the north of the A47, centred at SP 4506 9646 (see Figure 1).

2.2 The survey area covers an area of approximately 7 hectares (Ha), covering six pasture fields. The survey area is situated on a slight slope ranging between approximately 98m to 113m aOD (above Ordnance Datum).

2.3 The recorded bedrock geology within the survey area consists predominantly of Mercia Mudstone Group – Mudstone, with a very small amount of Gunthorpe Member – Mudstone in the north-east corner of the site. The superficial geological deposits are made up of Thrussington Member – Diamicton (BGS 2017).

2.4 These are overlain by slowly permeable seasonally wet slightly acid but base rich loamy and clayey soils, with freely draining slightly acid loamy soils covering most of the two northernmost fields (Soilscapes 2017).

3 Archaeological Background

3.1 The archaeological background below is drawn from historic mapping (Old Maps 2017), and from a Desk Based Assessment for the Crown Imperial Works in Barwell (ULAS 2005). All SMR numbers relate to those found in this Desk Based Assessment. A Desk-based assessment is currently being written by WYG Environment Planning Transport Ltd and will be available in due course.

Prehistoric period (up to AD 70)

3.2 No prehistoric remains are recorded in the survey area.

3.3 Prehistoric activity has been recorded to the south of the village, in the form of a rectilinear enclosure which exists as a cropmark and is thought to date from the Neolithic period (MLE2800).

Roman period (AD 70 to 5th century)

3.4 There are no recorded remains of Roman activity in the survey area.

3.5 Evidence for Roman occupation, including pottery, mortaria and a possible tessellated floor surface, suggestive of a possible Villa site, has been found adjacent to High Close (MLE2812).

Medieval period (5th century to 1540)

3.6 Evidence from aerial photography would suggest field boundaries and cultivation remains are likely to be located within the survey area. These may well span in to the post-medieval period.

3.7 A late medieval mirror case, found in field to the south of Dawson's lane was discovered within the site (MLE10249)

Post-medieval period (1541 to 1899)

3.8 The 2nd edition Ordnance Survey map records no change to the proposed development site. The northernmost field is described as being part of an allotment.

Modern period (1900 to present)

3.9 The proposed development area was not subject to boundary changes in the early 20th century.

3.10 The Ordnance Survey map of 1903 shows that the field below the northernmost field was subdivided into two fields, which was removed by 1959.

3.11 The Ordnance Survey maps of 1959 and 1991 record no change within the proposed development area compared to the present layout of the site.

4 Aims

4.1 The aim of the geophysical survey was to identify any potential archaeological anomalies that would enhance the current understanding of the archaeological resource within the proposed survey area.

4.2 Specifically, the aims of the gradiometer survey were;

- To locate, record and characterise any surviving sub-surface archaeological remains within the survey area.
- To locate the possible route of a culvert across the site
- To help determine the next stage of works as per the client's instruction
- To provide an assessment of the potential significance of any identified archaeological remains in a local, regional and (if relevant) national context
- To produce a comprehensive site archive and report.

5 Methodology

5.1 All geophysical survey work was carried out in accordance with recommended good practice specified in guideline documents published by English Heritage – now Historic England (David *et al.* 2008) and the Chartered Institute for Archaeologists *Standard and Guidance for archaeological geophysical survey* (2014).

5.2 Parameters were selected that were suitable for the prospective aims of the survey and in accordance with recommended professional good practice (David *et al.* 2008, 8).

5.3 The gradiometer survey was carried out using Bartington Grad601-2 fluxgate gradiometers (see Appendices 2 and 3). Data was collected on an east-west alignment using zig-zag traverses, with a sample interval of 0.25m and a traverse interval of 1m. A total of 119 full or partial 30m by 30m grids were surveyed within the specified area, totalling an area of approximately 7ha.

5.4 Care was taken to avoid metal obstacles present within the survey area during data collection using gradiometers. Gradiometer survey is affected by 'above-ground noise' such as metal objects, and avoiding these improves the overall data quality and results obtained.

5.5 The gradiometer data were downloaded using Bartington Grad601 PC Software v313 and processed using Geoscan Geoplot v3.0 / v4.0. The details of these processes can be found in Appendices 4 and 5. Data processing, storage and documentation were carried out in accordance with the good practice specifications detailed in the guidelines issued by the Archaeology Data Service (Schmidt and Ernenwein, 2009).

5.6 Interpretations of the data were created as layers in AutoCAD LT 2009 / GIS and the technical terminology used to describe the identified features can be found in Appendix 6.

6 Results and Interpretation

6.1 The gradiometer survey results have been visualised as greyscale plots, with the minimally processed data plotted at -1nT to 2nT in Figure 3. The processed data is also plotted at -1nT to 2nT and can be seen in Figure 4. An interpretation of the data can be seen in Figure 5 and an individual characterisation of the identified anomalies follows this in Appendix 1.

Archaeology

6.2 No responses indicating definitive archaeological remains have been located in the survey area.

Discrete Archaeology

Discrete linear trends

6.3 Several discrete curvilinear trends have been identified in the data in the north of the site (**B1**). These trends consist of increased signals compared to the background values, however poor patterning of these response values and weaker strength makes interpretation difficult and more tentative. An archaeological origin could be suggested, possibly relating to ditches. Equally they could also be related to geological variations across the area or modern activity.

Unclear Origins

6.4 A number of responses of unclear origin are located throughout the site and these would all appear to have a ferrous response (**B2**). It is thought that the majority of these are related to modern areas of ferrous debris and in some cases fencing which is used to separate these fields in to smaller horse paddocks. However an archaeological origin can also not be ruled out. Several other unclear linear trends have also been noted in the data (**B3**).

Agricultural

Linear Trend (field boundary)

6.5 A linear trend of a former field boundary has been located running north/south through the centre of the survey area (**B4**). This response consists of an isolated negative linear anomaly. The signal for this kind of anomaly appears to be inconsistent, but the patterning and positioning suggests such anomalies belong to those associated with former field division systems. First Edition historic Ordnance Survey mapping of 1866-1888 of the area depicts the presence of this previous field divisions in the area (Old-Maps, 2017).

Linear Trend (Conventional ploughing)

6.6 Throughout all of the survey areas ploughing trends have been recorded (**B5**). These all run in a north-south direction except for Field 6 where they run east to west (**B6**). Anomalies of this type normally are either composed of an increased or decreased magnetic response compared to background values and run parallel to one another as well as being much more closely aligned when compared to ridge and furrow ploughing trends.

Non-archaeology

Linear Trend (possible modern service)

6.7 Three linear responses in the southern part of the survey area are likely to represent the possible locations of culverts (**B7 and B8**). In particular anomaly **B7** would appear to fall along the line of a projected route of a culvert. In contrast **B8** could also be another possible location, although is more likely that this has a natural origin, possibly agricultural or geological.

6.8 A third linear of a possible pipe or service is located in the field furthest north and along the western boundary (**B9**). Although this is not conclusive, as fencing could also give a similar response, the anomaly strength appears stronger than that of a fence and is more similar to that of a pipe.

6.9 A possible field drain is observed along a southern boundary adjacent to a headland (**B10**).

Disturbed Area (modern disturbance?)

6.10 Areas of modern disturbance have been located along the majority of field boundaries which are most likely as a result of ferrous debris used to make the boundaries, including electric fencing as well as modern fencing (**B11**). An area of disturbance that is likely to be caused by modern activity is characterised by significant increases or decreases in magnetic values compared with background readings.

Isolated Dipolar Anomalies / Ferrous (iron spikes)

6.11 Across the data set there is a large quantity of isolated dipolar anomalies (iron spikes). These are commonly caused by ferrous or high magnetically susceptible material on the surface or within the topsoil of the site, and it is likely that modern agricultural activity such as manuring has changed the magnetic properties of the top soil and created a high level of background 'noise' within the data set.

7 Conclusion

7.1 The gradiometer survey has not identified any anomalies or features of a definitive archaeological nature.

7.2 Across the survey area a number of discrete linear and curvilinear trends were identified but due to their poor strength and patterning only a tentative interpretation can be formed as to their origin, and therefore an archaeological origin cannot be dismissed.

7.3 Several unclear anomalies were detected in the data that are most likely to relate to modern disturbance due to the shape of the response in the XY trace plot used during the interpretation, however an archaeological origin cannot be ruled out.

7.4 A number of agricultural anomalies, related to a former field boundary as well as a number of more conventional modern ploughing trends and regimes have been recorded throughout the survey area.

7.5 Non-archaeological anomalies were also detected in the results: these reflect areas of likely modern disturbance. In particular, three linear responses of most likely pipes or culverts. An area of disturbance in the general surrounding the boundaries, as well as general ferrous spikes most likely as a result of manuring overtime are located throughout.

8 Statement of Indemnity

8.1 Although the results and interpretation detailed in this report have been produced as accurately as possible, it should be noted that the conclusions offered are a subjective assessment of collected data sets.

8.2 The success of a geophysical survey in identifying archaeological remains can be heavily influenced by several factors, including geology, seasonality, field conditions and the properties of the features being detected. Therefore, the geophysical interpretation may only reveal certain archaeological features and not produce a complete plan of all of the archaeological remains within a survey area.

9 Bibliography

Bartington Instruments, 2007 *Operation Manual for Grad601 Single Axis Magnetic Field Gradiometer System*

Bartington Instruments, 2016 *Operation Manual for Non-Magnetic Cart*

British Geological Survey, Geology of Britain Viewer, h*ttp://www.bgs.ac.uk/data/mapViewers/home* (last accessed 12.5.2017)

CIfA, 2014 *Standards and Guidance for Archaeological Geophysical Survey*

Clark, A., 1996 *Seeing Beneath the Soil: Prospecting Methods in Archaeology*, Second Edition. London

David, A. Linford, N. Linford, P., 2008, English Heritage (Historic England): *Geophysical Survey in Archaeological Field Evaluation*, Swindon

Gaffney, C. and Gater, J., 2003 *Revealing the Buried Past Geophysics for Archaeologists*. Stroud: Tempus Publishing Ltd.

Geoscan Research, 2005 *Geoplot – Instruction Manual,* Version 1.97

Heron, C. and Gaffney, C., 1987 'Archaeogeophysics and the site: ohm sweet ohm? in C. Gaffney and V. Gaffney (eds.) *Pragmatic Archaeology: Theory in crisis?* British Archaeological Report, British Series 167:71-81.

Old-Maps, *https://www.old-maps.co.uk/* (last accessed 12.05.2017)

Schmidt, A. and Ernenwein, E., 2009 *Archaeology Data Service: Geophysical Data in Archaeology: A Guide to Good Practice*

Sharma, P.V., 1997 *Environmental and Engineering Geophysics*

Soilscapes, *http://www.landis.org.uk/soilscapes2* (last accessed 12.05.2017)

University of Leicester Archaeological Services, 2005. *An Archaeological Desk-based Assessment And Buildings Appraisal for the Crown Imperial Works, Hill Street, Barwell, Leicestershire (SP 448 968).* On behalf of Hayward Architects, h*ttp://archaeologydataservice.ac.uk/archiveDS/archiveDownload?t=arch-416-1/dissemination/pdf/universi1-89452_1.pdf* (last accessed 12.05.2017).

Plate 1. Survey area looking south from the northern boundary of site, fields 1 and 2.

Plate 2. Survey area facing north in field 3.

Plate 3. Survey area looking south in field 4.

Plate 4. Survey area looking north from the southern entrance of field 5.

Plate 5. Survey area looking west towards the unsurveyable area in field 5.

Plate 6. Survey area looking east from western boundary of field 6.

THE COMMON, BARWELL, LEICESTERSHIRE
AOC PROJECT NO. 51743

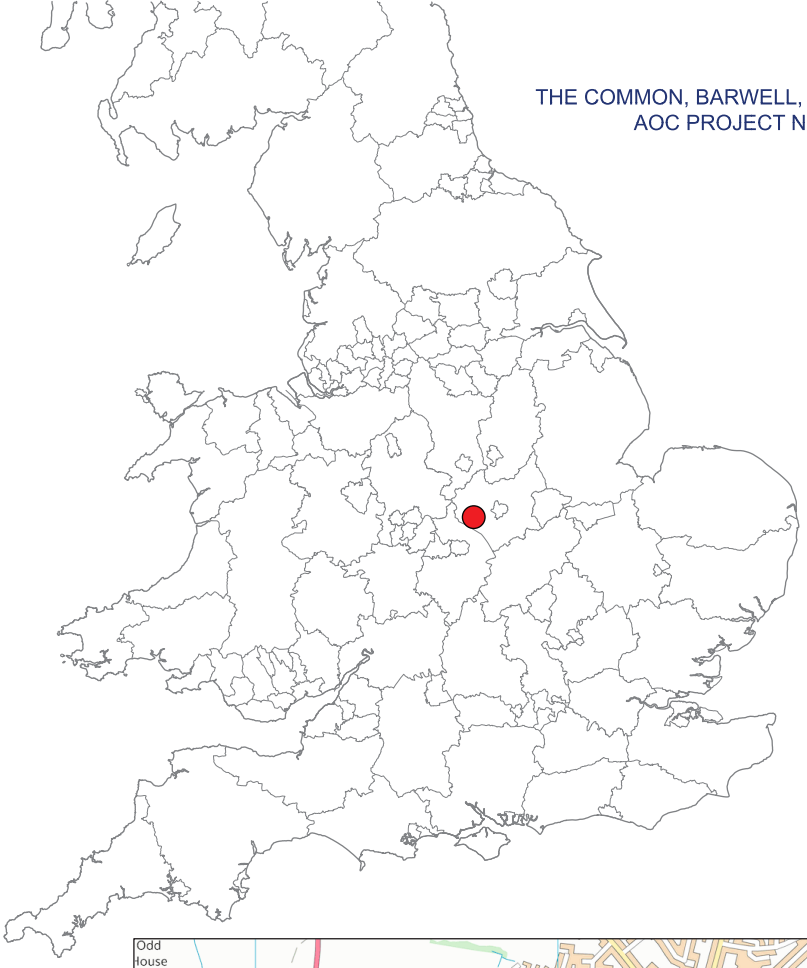

Figure
1

N

Site location

0 1000m

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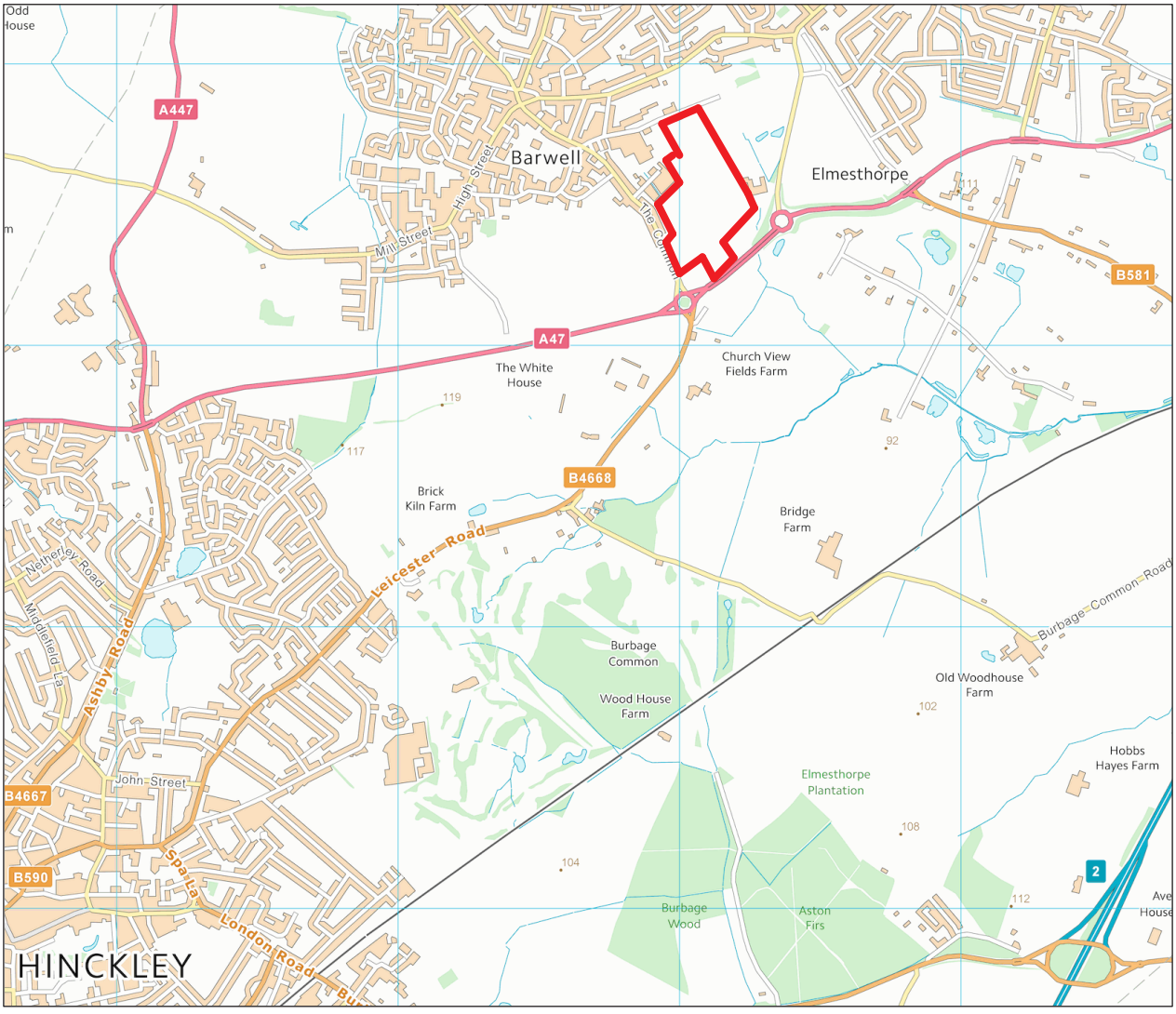

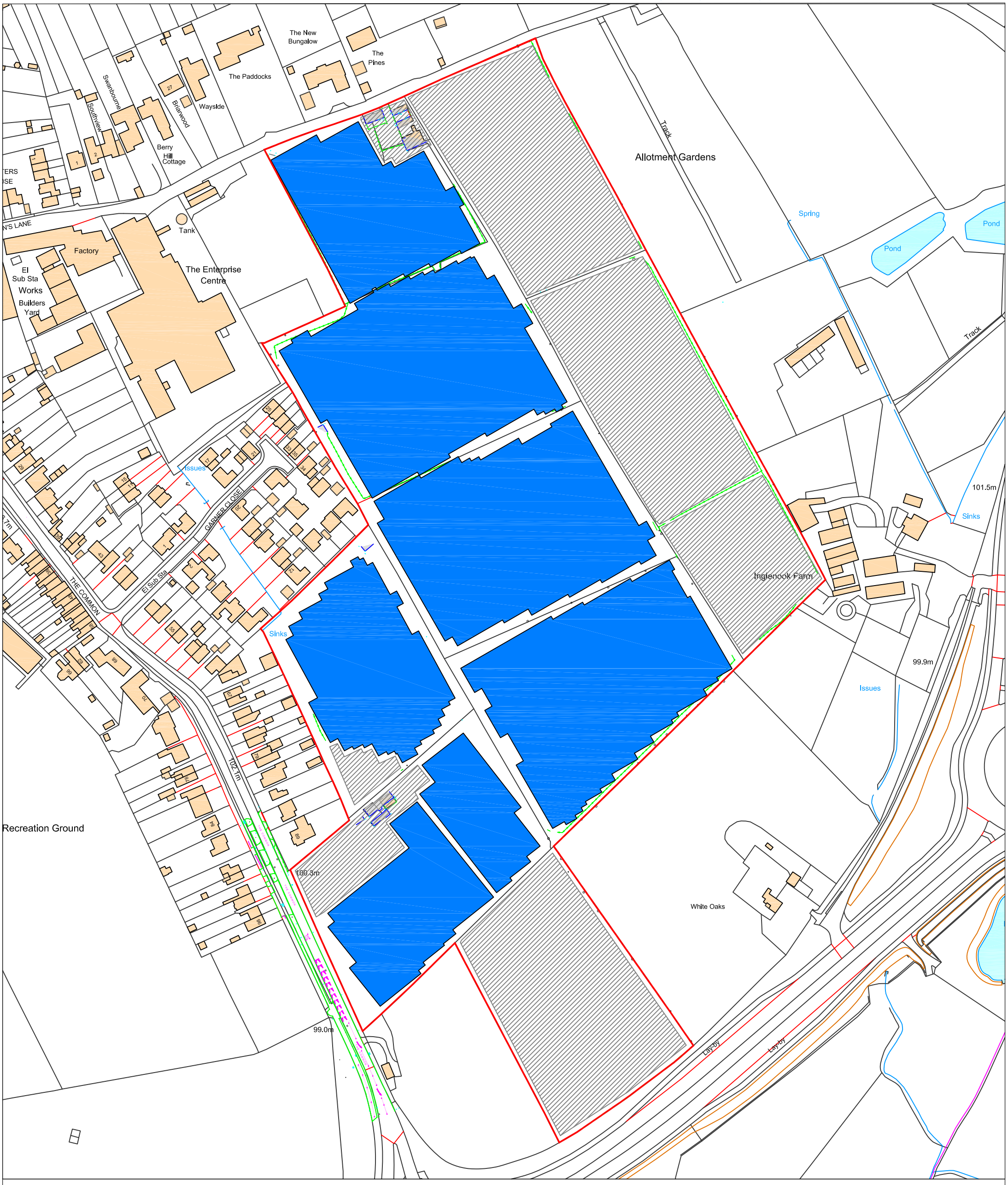

Figure 2: Location of survey areas

N

0 80m

1:2000 at A3

Area surveyed

Area not surveyed

Red line boundary

Figure 2

Project Title: The Common, Barwell, Leicestershire
Project No: 51743

Drawing Title: Figure 2
Location of Survey Areas

V1/51743/GEO/F2/24.05.17

Drawn by: KT	Checked by: JL	Approved by: JL
24/05/2017	24/05/2017	24/05/2017

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Figure 3: Minimally processed gradiometer survey results - greyscale plot

N

0 80m

1:2000 at A3

Figure 3

Scale 2nT -1nT

Project Title: The Common, Barwell, Leicestershire
Project No: 51743

Drawing Title: Figure 3
Minimally processed gradiometer survey results

V1/51743/GEO/F3/24.05.17

Drawn by: KT	Checked by: JL	Approved by: JL
24/05/2017	24/05/2017	24/05/2017

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Figure 4: Processed gradiometer survey results - greyscale plot

N

0 80m

1:2000 at A3

Figure 4

Scale 2nT -1nT

Project Title: The Common, Barwell, Leicestershire
Project No: 51743

Drawing Title: Figure 4
Processed gradiometer survey results

V1/51743/GEO/F4/24.05.17

Drawn by: KT	Checked by: JL	Approved by: JL
24/05/2017	24/05/2017	24/05/2017

AOC Archaeology Group

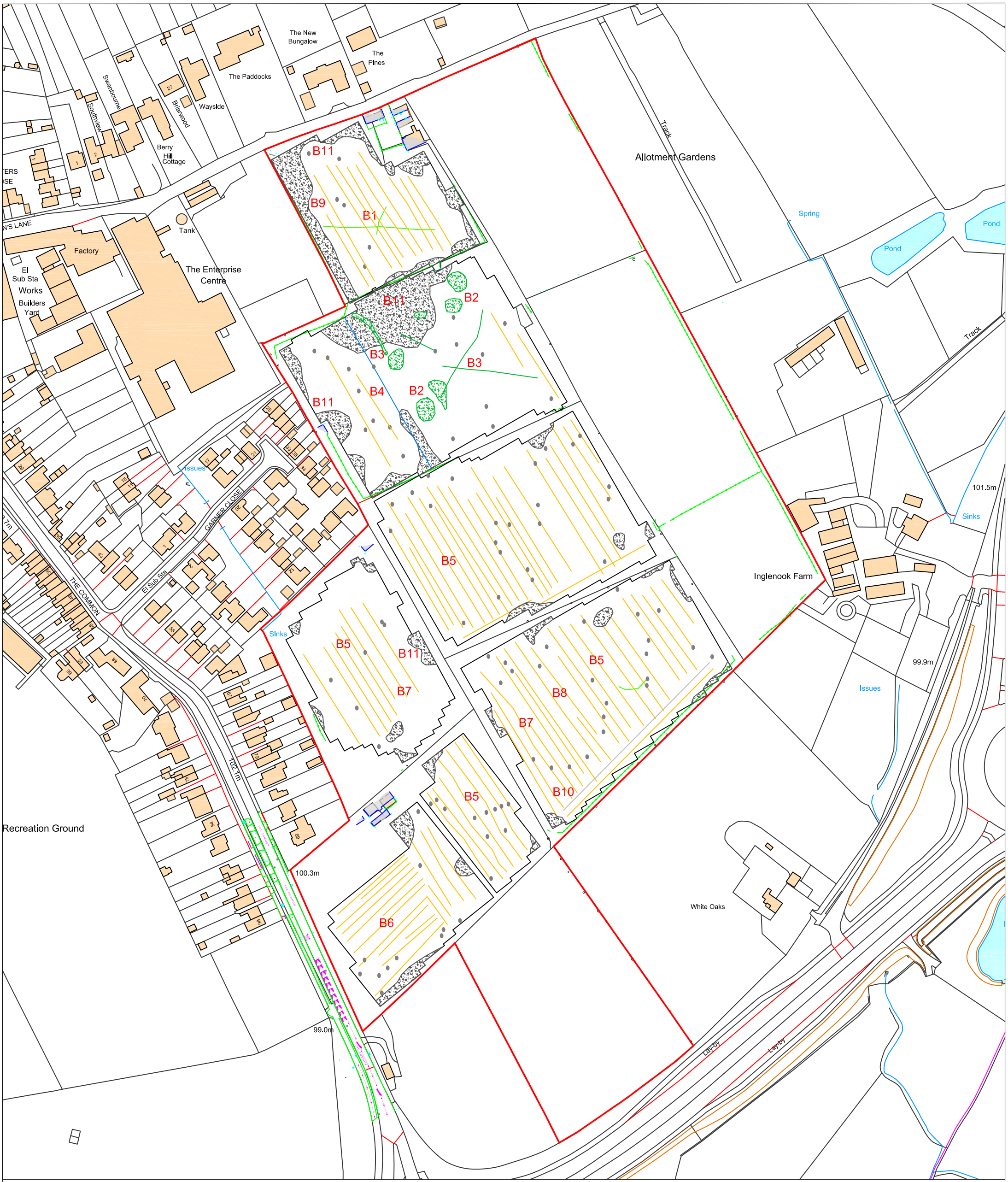

Figure 5: Interpretation of gradiometer survey results

N

0 80m

1:2000 at A3

Figure 5

- Discrete Trend (Archaeology?)
- Old Field Boundary
- Linear Trend (Ploughing)
- Linear Trend (Field Drains)
- Ferrous / Iron Spikes
- Trend (Unclear Origin)
- Area of Disturbance (Unclear Origin)
- Linear Trend (Modern Service)
- Area of Disturbance (Modern)
- Red line boundary

Project Title: The Common, Barwell, Leicestershire Project No: 51743		
Drawing Title: Figure 5 Interpretation of gradiometer survey results		
V1/51743/GEO/F5/24.05.17		
Drawn by: KT	Checked by: JL	Approved by: JL
24/05/2017	24/05/2017	24/05/2017

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Appendix 1: Characterisation of Identified Anomalies

Gradiometer survey

Site Specific Anomaly Code: **B**

Anomaly	Type of Archaeology
B1	Discrete linear trends
B2	Unclear Origins
B3	Unclear Origins
B4	Linear Trend (field boundary)
B5	Linear Trend (Conventional ploughing)
B6	Linear Trend (Conventional ploughing)
B7	Linear Trend (possible modern service)
B8	Linear Trend (possible modern service)
B9	Linear Trend (possible modern service)
B10	Linear Trend (possible field drain)
B11	Disturbed Area (modern disturbance?)

Appendix 2: Survey Metadata

Field	Description
Surveying Company	AOC Archaeology
Data collection staff	Alistair Galt, Dan Shiel
Client	WYG Environment Planning Transport Ltd
Site name	The Common, Barwell
County	Leicestershire
NGR	SP 4506 9646
Land use/ field condition	Pasture
Duration	3/5/17 - 5/5/17
Weather	Overcast/Sunny
Survey type	Gradiometer Survey
Instrumentation	Trimble GXOR system Bartington Grad 601-2
Area covered	Approx 7 ha (119 full and partial grids)
Download software	Grad601 PC Software v313
Processing software	Geoplot v3.0 and v4.0
Visualisation software	AutoCAD LT 2009
Geology	The recorded bedrock geology within the survey area consists predominantly of Mercia Mudstone Group – Mudstone, with a very small amount of Gunthorpe Member – Mudstone in the northern corner of the site. The superficial geological deposits are made up of Thrussington Member – Diamicton (BGS 2017).
Soils	These are overlain by slowly permeable seasonally wet slightly acid but base rich loamy and clayey soils, with freely draining slightly acid loamy soils covering most of the two northernmost fields (Soilscapes 2017)
Scheduled Ancient Monument	No
Known archaeology on site	None
Historical documentation/ mapping on site	None
Report title	The Common, Barwell, Leicestershire
Project number	51743
Report Author	James Lawton
Report approved by	Graeme Cavers

Appendix 3: Archaeological Prospection Techniques, Instrumentation and Software Utilised

Gradiometer survey

Gradiometer surveys measure small changes in the earth's magnetic field. Archaeological materials and activity can be detected by identifying changes to the magnetic values caused by the presence of weakly magnetised iron oxides in the soil (Aspinall *et al.*, 2008, 23; Sharma, 1997, 105). Human inhabitation often causes alterations to the magnetic properties of the ground (Aspinall et al, 2008, 21). There are two physical transformations that produce a significant contrast between the magnetic properties of archaeological features and the surrounding soil: the enhancement of magnetic susceptibility and thermoremnant magnetization (Aspinall *et al.*, 2008, 21; Heron and Gaffney 1987, 72).

Ditches and pits can be easily detected through gradiometer survey as the top soil is generally suggested to have a greater magnetisation than the subsoil caused by human habitation. Also areas of burning or materials which have been subjected to heat commonly have high magnetic signatures, examples include: hearths, kilns, fired clay and mudbricks (Clark 1996, 65; Lowe and Fogel 2010, 24). It should be noted that negative anomalies can also be useful for characterising archaeological features. If the buried remains are composed of a material with a lower magnetisation compared with the surrounding soil, the surrounding soil will consequently have a greater magnetisation resulting in the feature displaying a negative signature. For example stone materials of a structural nature that are composed of sedimentary rocks are considered non-magnetic and so will appear a negative features within the data set.

Ferrous objects- i.e. iron and its alloys- are strongly magnetic and are typically detected as high-value peaks in gradiometer survey data, though it is not usually possible to determine whether these relate to archaeological or modern objects.

Although gradiometer surveys have been successfully carried out in all areas of the United Kingdom, the effectiveness of the technique is lessened in areas with complex geology, particularly where igneous and metamorphic bedrock is present. All magnetic geophysical surveys must therefore take the effects of background geological and geomorphological conditions into account.

Gradiometer survey instrumentation

AOC Archaeology's gradiometer surveys are carried out using Bartington Grad601-2 magnetic gradiometers. The Grad601-2 is a high-stability fluxgate magnetic gradient sensor, which uses a 1m sensor separation. The detection resolution is from 0.03 nT/m to 0.1nT/m, depending on the sensor parameters selected, making the Grad601-2 an ideal instrument for prospective survey of large areas as well as detailed surveys of known archaeology. The instrument stores the data collected on an on-board data-logger, which is then downloaded as a series of survey grids for processing.

Gradiometer survey software

Following the survey, gradiometer data is downloaded from the instrument using Grad601 PC Software v313. Survey grids are then assembled into composites and enhanced using a range of processing techniques using Geoscan Geoplot v3.0 / v4.0 (see Appendix 4 for a summary of the processes used in Geoplot and Appendix 5 for a list of processes used to create final data plots).

Appendix 4: Summary of Processes used in Geoplot

Process	Effect
Clip	Limits data values to within a specified range
De-spike	Removes exceptionally high readings in the data that can obscure the visibility of archaeological features. In resistivity survey, these can be caused by poor contact of the mobile probes with the ground. In gradiometer survey, these can be caused by highly magnetic items such as buried ferrous objects.
De-stagger	Corrects a misalignment of data when the survey is conducted in a zig-zag traverse pattern.
Edge Match	Counteracts edge effects in grid composites by subtracting the difference between mean values in the two lines either side of the grid edge.
High pass filter	Removes low-frequency, large scale detail in order to remove background trends in the data, such as variations in geology.
Interpolate	Increases the resolution of a survey by interpolating new values between surveyed data points, creating a smoother overall effect.
Low Pass filter	Uses a Gaussian filter to remove high-frequency, small scale detail, typically for smoothing the data.
Periodic Filter	Used to either remove or reduce the appearance of constant and reoccurring features that distort other anomalies, such as plough lines.
Wallis filter	Applies a locally adaptive contrast enhancement filter.
Zero Mean Grid	Resets the mean value of each grid to zero, in order to counteract grid edge discontinuities in composite assemblies.
Zero Mean Traverse	Resets the mean value of each traverse to zero, in order to address the effect of striping in the data and counteract edge effects.

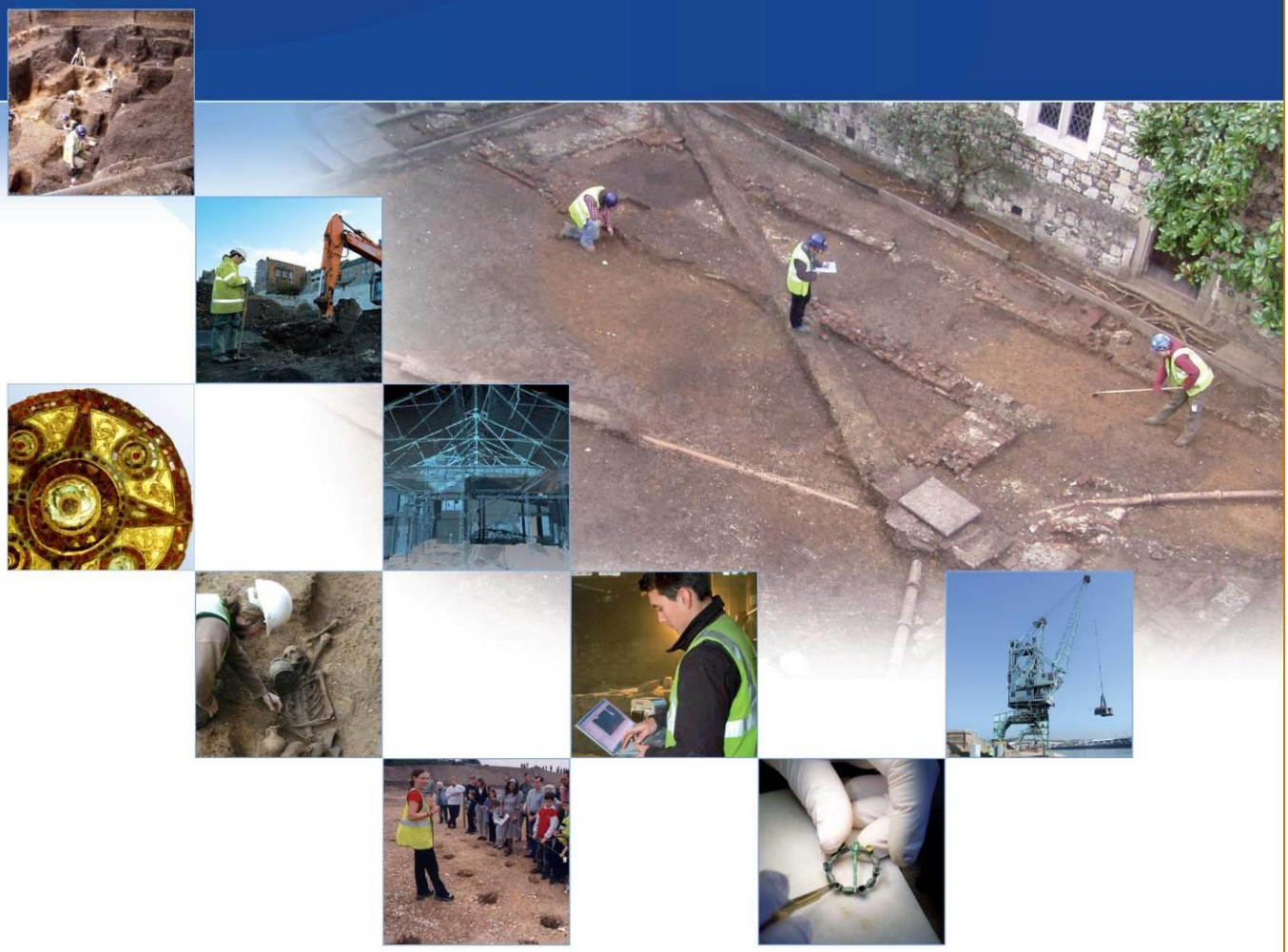
Appendix 5: Survey Processing Steps

Gradiometer survey	
Process	**Extent**
Zero Mean Traverse	All LMS =on, threshold -5 to 5
Despike	X=1 Y=1 Thr = 3 Repl = Mean
Clip	Min =-5 Max = 5
Destagger	All grids dir Shift = 2 Line Pattern 34-78 Dual-DS
Low Pass filter	X=1 Y=1 Wt=G
Interpolate	Y, Expand – Expand –SinX/X x2
Raw Palette Scale	Grey55 – Grey08 Min= -1nT Max= 2nT
Palette Scale	Grey55 – Grey08 Min= -1nT Max= 2nT

Appendix 6: Technical Terminology

Type of Anomaly	Description
Archaeology	
Archaeology - Trend	These are made up of linear / curvilinear / rectilinear anomalies and are either characterised by an increase or decrease in values compared to the magnetic background. This evidence is normally supported by the presence of archaeological remains and is confirmed by other forms of evidence such as HER records and aerial photography.
Archaeology - Area of Disturbance	This is characterised by a general increase and decrease of magnetic responses over a localised area and does not appear as having a linear form. These anomalies do not have the high dipolar response which are manifested in an 'iron spike' anomaly. This anomaly may be supported by the known location of a former building, or other forms of evidence such as HER records and aerial photography.
Archaeology - Pit	An anomaly composed of an increase in magnetic values with a patterning on the XY trace plot that is suggestive of buried remains, such as the infill of a pit. This evidence is normally supported by the presence of archaeological remains and is confirmed by other forms of evidence such as HER records and aerial photography.
Discrete Archaeology	
Archaeology? – Trend	Anomalies of a linear / curvilinear / rectilinear form either composed of an increased or decreased signal compared to magnetic background values. It is possible these anomalies belong to archaeological remains, but poor patterning or weaker response values makes interpretation difficult. Where historical records are present, the anomalies would appear to be weak or inconclusive.
Archaeology? - Area of Disturbance	Anomalies with an increase or decrease in magnetic values compared with the magnetic background over a localised area. Poor patterning or weak signal changes creates difficulty in defining the origin of the anomaly and so interpretation is only tentative. The anomaly lacks definitive records to confirm its origin as being archaeological. Disturbed areas could indicate the presence of buried rubble relating to fallen structures, or instead denote modern material from either quarrying or agricultural activity. On certain geologies these anomalies could be caused by in-filled natural features.
Archaeology? – Pit	An anomaly composed of an increase in magnetic values with a patterning on the XY trace plot that is suggestive of buried remains, such as the infill of a pit, but is isolated in its location and association with other features.
Unclear Origin	
Linear Trend	Anomalies of a linear / curvilinear form which are composed of a weak or different change in magnetic values. Coupled with poor patterning, the anomaly is difficult to interpret and it is unclear whether it has an archaeological origin.
Area of Disturbance	An area of magnetic disturbance which consists of a variety of increased and decreased magnetic values compared with background readings, but lacks sufficient patterning or context for a conclusive interpretation. It is likely that these readings are caused by modern disturbances, but interpretation is tentative.

Agricultural	
Linear Trend (Old Field Boundary)	These isolated long linear anomalies, most often represented as a negative magnetic trend, are likely to relate to former field boundaries. The magnetic signal may appear inconsistent but when the positioning is cross referenced with historic mapping, it is confirmed as a former field boundary.
Linear Trend (Old Field Boundary?)	These isolated long linear anomalies, most often represented as a negative magnetic trend, are likely to relate to former field boundaries. The positioning is not supported by historic mapping, but is often confirmed with adjacent ploughing patterns.
Linear Trend (Ridge and Furrow / Rig and Furrow)	A series of regular linear anomalies either composed of an increased or decreased magnetic response compared to background values. The width between the anomalies is consistent with that of a Ridge and Furrow ploughing regime, which is normally wider than conventional ploughing methods.
Linear Trend (Conventional ploughing)	A series of regular linear anomalies either composed of an increased or decreased magnetic response compared to background values. The regular patterning is likely to denote the presence of ploughing, however isolated trends can occasionally be observed that follow the orientation of ploughing trends seen elsewhere in the area. Anomalies seen adjacent to field edges are representative of headlands caused by ploughing.
Linear Trend (field drainage)	A series of linear anomalies of an indeterminate date, usually with a regular or herringbone patterning and regular spacing. These are likely to represent agricultural activity such as land drainage.
Non- Archaeology	
Geology / Natural	An area of disturbance that is composed of irregular significant increases or decreases in magnetic values compared with background readings and is likely to indicate natural variations in soil composition or geology.
Linear Trend (possible modern service)	Anomalies of a linear form often composed of contrasting high positive and negative values. Such anomalies usually signify a feature with a high level of magnetisation and are likely to belong to modern activity such as pipe lines or modern services.
Disturbed Area (modern disturbance?)	An area of disturbance that is likely to be caused by modern activity and is characterised by significant increases or decreases in magnetic values compared with background readings.
Isolated Dipolar Anomalies / Ferrous (iron spikes)	A response normally caused by ferrous materials on the ground surface or within the top soil, which causes a 'spike' representing a rapid variation in the magnetic response. These are generally not assessed to be archaeological when surveying on rural sites, and generally represent modern material often re-deposited during manuring.



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