

**ARCHAEOLOGICAL EVALUATION REPORT:
GEOPHYSICAL SURVEY BY MAGNETOMETRY ON LAND OFF FALKLAND WAY, BARTON UPON HUMBER,
NORTH LINCOLNSHIRE**

Planning Reference: Pre-application
NGR: TA 0394 2219
AAL Site Code: BAFW 16
OASIS Reference Number: allenarc1-263121



Report prepared for Keigar Homes Ltd

By

Allen Archaeology Ltd

Report Number AAL 2016137

September 2016



Allenarchaeology



Contents

Executive Summary	1
1.0 Introduction.....	2
2.0 Site Location and Description.....	2
3.0 Planning Background.....	2
4.0 Archaeological and Historical Background.....	2
5.0 Previous Archaeological Investigations.....	4
6.0 Methodology	5
Summary of Survey Parameters.....	5
Data Collection and Processing	5
7.0 Results (Figures 2–7)	6
8.0 Discussion and Conclusions.....	8
9.0 Effectiveness of Methodology.....	9
10.0 Acknowledgements	9
11.0 References.....	9

List of Appendices

Appendix 1: Figures	11
---------------------------	----

List of Figures

Figure 1: Site location outlined in red	11
Figure 2: Greyscale raw data and processed trace plot	12
Figure 3: Processed greyscale and interpretation.....	13
Figure 4: Processed greyscale location.....	14
Figure 5: Geophysics interpretation location.....	15
Figure 6: Combined geophysical surveys	16
Figure 7: Geophysical interpretation location and plans of earlier work.....	17

Document Control

Element:	Name:	Date:
Report prepared by:	Robert Evershed BSc (Hons)	20/09/2016
Illustrations prepared by:	Robert Evershed BSc (Hons) and Fabien Danielsson BA (Hons)	19/09/2016
Report edited by:	Natasha Powers BSc MSc MCifA MCMi	22/09/2016
Report reviewed by:	Mark Allen BSc (Hons) MCifA	26/09/2016
Version no.:	0.3	

Allen Archaeology reports are printed double sided on 100% recycled paper to reduce our carbon footprint.

Cover image: View across the southernmost field, looking southeast

Executive Summary

- Allen Archaeology Ltd was commissioned by Keigar Homes Ltd to undertake a geophysical survey using magnetometry on land off Falkland Way in Barton upon Humber, in advance of the submission of a planning application for residential development.
- The site lies in an area of archaeological interest, with limited evidence of activity dating back to the prehistoric period. Archaeological work close to the site has identified remains including Iron Age enclosures, a Roman ditch and medieval trackway with associated roadside ditches.
- The geophysical survey has revealed a large number of potential archaeological features. At the southern end of the site there are linear features which appear to align with Roman and medieval ditches uncovered in a strip, map and record exercise carried out in 2010. There are also curvilinear and linear features within this area which are suggestive of small enclosures.
- At the west end of the site there are a number of positive linear and curvilinear features. A few of these appear to be parallel ditches potentially with trackways between them, as well as further potential enclosures. There are also linear features that may represent cultivation activity such as ridge and furrow agriculture.
- Towards the north and northeast parts of the site there are further parallel, linear features likely representing trackways flanked by ditches, as well as linear anomalies that may represent either ditches or agricultural features.
- Towards the southeast end of the site there are a large number of small, linear and curvilinear features that likely represent geological variation, possibly the result of water action within these areas. As there are anthropogenic features noted elsewhere in the survey, and from previous investigations, it is possible that these geological variations may mask archaeological features.
- The survey also identified modern services, a high powered gas pipe, a water main and buried electrical cables within the site boundary.

1.0 Introduction

- 1.1 Allen Archaeology Ltd (AAL) was commissioned by Keigar Homes Ltd to undertake a geophysical survey using magnetometry on land off Falkland Way in Barton upon Humber, in advance of the submission of a planning application for residential development.
- 1.2 The site works and reporting conform to current national guidelines as set out in '*Geophysical Survey in Archaeological Field Evaluation*' (English Heritage 2008), '*The Use of Geophysical Techniques in Archaeological Evaluations*' (Gaffney *et al.* 2002), the Chartered Institute for Archaeologists '*Standard and guidance for archaeological geophysical survey*' (CIfA 2014) and a specification produced by this company (AAL 2016).

2.0 Site Location and Description

- 2.1 Barton upon Humber is located 9.1km southwest of Hull and 17.8km northeast of Scunthorpe, in the unitary authority of North Lincolnshire Council. The site is located c.0.8km to the east of the centre of the town and comprises pasture fields. The site is bounded by a watercourse and Pasture Lane South to the north, the existing Falkland Way housing development to the east, a cemetery to the south and housing to the west. The proposed development area is approximately 14.7ha in extent and is centred at TA 0394 2219 (Figure 1).
- 2.2 The bedrock geology comprises Welton Chalk Formation, with overlying superficial deposits over the majority of the site consisting of Till. The northernmost 75m of the site is recorded as changing to Tidal Flat Deposits (mapapps.bgs.ac.uk/geologyofbritain/home.html).

3.0 Planning Background

- 3.1 A planning application is to be submitted for Phase 4 of the Falkland Way residential development at Barton upon Humber, North Lincolnshire. The client has commissioned a geophysical survey in order to provide further information concerning the archaeological potential of the proposed development area.
- 3.2 The approach adopted is consistent with the recommendations of the National Planning Policy Framework (NPPF), with the particular chapter of relevance being '*Chapter 12: Conserving and enhancing the historic environment*' (Department for Communities and Local Government 2012).

4.0 Archaeological and Historical Background

- 4.1 Prehistoric activity in the parish is attested to by scatters of worked flints and by the isolated discovery of artefacts such as stone axes (Bryant 1994, 5–12). Records show that a perforated axe head was discovered immediately to the north of the site and a circular soilmark is noted to the southeast (A Williams pers. comm.). Evidence of Iron Age activity is rare in the immediate vicinity of the site and is limited to a number of coins from South Ferriby and Winteringham, a poorly located upper part of a quern, probably from the Humber margins and an Iron Age pit at Glebe Farm, 500m to the east of the present excavations (Bryant 1994, 10–11).
- 4.2 Evidence for settlement at Barton during the Roman period comes from several sites. A concentration of these sites is located in the East Acridge area of the town to the west of this site (Bryant 1994, 15, and there seems little doubt that some form of settlement, probably of 2nd – 4th century date, existed in this area. Excavations at Glebe Farm, some 700m to the east of the site,

which took place prior to the construction of a factory revealed a small enclosed settlement of 2nd – 4th/5th century date, along with at least two trackways (*ibid*, 19–20).

- 4.3 The Anglo-Saxon core of settlement in Barton is focussed on both St. Peters Church and East Acridge. Topographic evidence indicates the presence of a sub-circular enclosure in this area, which lies to the west of the present excavation and measures approximately 250m in diameter, surrounding the later Tyrwhitt Hall. The western side of the enclosure runs under the nave and aisles of St Peter's church and the enclosure ditch was investigated at this point during excavations at the church (Rodwell 2011, 29). A middle Saxon date for the enclosure has been proposed and the enclosure ditch has been interpreted as a defensive measure around a minor royal or administrative centre (*ibid*, 30). Much of the circuit of the enclosure can be made out in the line of roads and field boundaries depicted on the 1796 enclosure map of the town, although by the time the map was drawn the earthworks themselves had most likely disappeared. A road marked 'Intack Lane' follows the route of the north-western arc of the enclosure circuit, with further lanes marking the south-western and south-eastern arcs.
- 4.4 Of particular interest is a lane or track marked on the 1796 Enclosure Map which leads from the eastern side of the possible Saxon enclosure and is formed by a combination of the routes marked Intack Lane and The Queen's Leas (Rodwell 2011, Pages 4 – 5, Figure 4). There is mention of 'Barrow Middle Way' in 'The East Field Mearfurs', a document dated 17th January 1719 and appended to the Barton Town Book (Bryant forthcoming), and this may be the same lane as that is marked on the Enclosure Map. Brown also marks Barrow Middle Way and shows it taking the same course as Intack Lane and The Queen's Leas but does not show it extending to Barrow, despite the name given to it (Brown 1908, Page 5, Figure 6). Geophysical survey, archaeological evaluation and subsequent excavation have identified the possible route of Barrow Middle Way within the site, suggesting that it may indeed have extended further towards Barrow than the early map evidence alone suggests (Bunn and Palmer-Brown 2001; Savage 2004; AAL 2013).
- 4.5 The Saxon settlement appears to have extended beyond the enclosed core and remains dating to the period have been revealed over an area between Norman Close and Barrow Road, immediately to the southwest of the site. In addition, over 200 inhumation burials dating from the late 5th to the late 7th century AD have been uncovered at Castledyke South c.700m to the west-southwest, and it is believed the cemetery may have contained as many as 600 burials in total (Bryant 1994).
- 4.6 A second, ditched enclosure, was constructed around the west, south and east sides of the town, the north edge being marked either by the wetlands along the Humber foreshore or by a forerunner of the Butts Drain. Portions of the enclosure are still visible in the modern topography of the town, having become fossilised as streets and boundaries. Castledyke West and Castledyke South are two such streets. The function and origin of this enclosure are poorly understood; Rodwell (2011, 33–35) suggests that it may have been constructed as a Viking base camp of mid or later ninth century date. This assertion is not supported by excavations at Barrow Road, the results of which suggest a mid-12th century date for the part of the enclosure encountered there (Bradley 2002). This period was one of some instability due to conflict regarding the accession, and whilst any suggestion that the enclosure was part of a 'lost' castle believed to have been constructed in Barton by Gilbert de Gant seems untenable due to the circuit of the enclosure being too large, the possibility that the enclosure was constructed around the town as a defensive measure at this time must be considered. The enclosure is likely to form the western boundary to the current site.
- 4.7 The place name Barton upon Humber is found within the Domesday Survey of 1086 AD as Baer-tun, from the Old English meaning '*the barley farm or outlying grange*' (Cameron 1998). The Domesday Record indicates there were two main landowners at the time of the survey; Earl Hugh held two bovates of land at Barton upon Humber, whilst land previously held by Ulf was given to Gilbert of

Ghent, comprising thirteen carucates of land to the geld. Gilbert had seven ploughs, and 63 villans and 16 bordars with nine ploughs, and 42 sokemen and 67 bordars with ten ploughs. There was a church and a priest and two mills, rendering 40 shillings, and a market and a ferry rendering £4 (Morgan and Thorn 1986).

- 4.8 Barton began to decline in the 14th century; a direct result of the prosperity of the medieval 'new town' of Kingston upon Hull, established by King Edward I in 1293. Enclosure of the parish at the end of the 18th century allowed some growth and development in the town however (Bryant 1994).

5.0 Previous Archaeological Investigations

- 5.1 The area of investigation has been subject to a number of archaeological interventions over the last two decades. The earliest investigations comprised a geophysical survey and trial trenching at the south end of the Phase 1 Falkland Way development area in 1995 (A Williams pers. comm.). Although the work did not identify any deposits of archaeological significance, a number of fragments of prehistoric pottery and worked flints were recovered, attesting to some limited prehistoric activity in the surrounding landscape.
- 5.2 In 2001, a geophysical survey was undertaken across the middle of the previous Falkland Way development area, identifying a number of anomalies, including two parallel features believed to represent trackside ditches, and a possible penannular feature (Bunn and Palmer-Brown 2001).
- 5.3 The surveyed area was subsequently evaluated through a programme of intrusive trenching in 2004 (Savage 2004). Trenches 1 and 2 confirmed the presence of parallel ditches probably flanking a trackway, with pottery indicating this was of 11th to 12th century date. There was little evidence for metalling of the trackway, and it was suggested that a large pit in Trench 1 was dug across the trackway once it was out of use. Trench 1 also contained two shallow gullies that were believed to post-date the trackway. Other trenches revealed further linear features and a number of postholes possibly representing a timber structure or fence line. A single fragment of 12th century pottery tentatively linked the remains with the trackway. A trench across the location of the potential penannular feature did not expose any evidence for the anomaly.
- 5.4 A third geophysical survey was undertaken to the north of the 2001 survey to investigate a further area forming part of the residential development scheme (AAA and Grid 9 2009). The survey results were not particularly clear, although a number of linear, curvilinear and pit-like anomalies were identified.
- 5.5 The surveyed area was subject to evaluation trenching in April 2009, with five of the six trenches containing archaeological remains (AAA 2009). The evaluation exposed a number of undated linear features, and produced small quantities of Iron Age and Roman pottery. In addition, a pit was encountered that contained a large part of a handmade Iron Age vessel.
- 5.6 A programme of excavation and strip, map and recording was undertaken over seven areas (approximately 3ha in total) immediately to the east of the current site (AAL 2013). The investigations focussed in part on the trackway and recovered material of 12th century date, tentatively attributed to 'The Anarchy' of 1139 to 1153. Map evidence showed the trackway to have become a field boundary at the end of the 18th century. Other areas of investigation revealed middle to late Iron Age ditched enclosures and ring gullies, as well as a droveway and cremated adult human remains. A Roman ditched enclosure was also noted.

6.0 Methodology

- 6.1 The geophysical survey consisted of a detailed gradiometer survey of the site, totalling approximately 14.8ha. The survey was undertaken in a series of 30m grids across the site.
- 6.2 The fieldwork was carried out by a team of three experienced geophysicists, from Tuesday 6th to Friday 9th September 2016. The survey area was located using a Leica GS08 RTK NetRover GPS. This accurately 3D plotted the area of investigation and tied it into the National Grid.
- 6.3 The survey was carried out using a Bartington Grad601-2 Dual Fluxgate Gradiometer with an on-board automatic DL601 data logger. This instrument is a highly stable magnetometer which utilises two vertically aligned fluxgates, one positioned 1m above the other. This arrangement is then duplicated and separated by a 1m cross bar. The 1m vertical spacing of the fluxgates provides for deeper anomaly detection capabilities than 0.5m spaced fluxgates. The dual arrangement allows for rapid assessment of the archaeological potential of the site. Data storage from the two fluxgate pairs is automatically combined into one file and stored using the on-board data logger.
- 6.4 Data collection was undertaken in a zigzag traverse pattern, using a sample interval of 0.25m and a traverse interval of 1m.

Summary of Survey Parameters

6.5 Fluxgate Magnetometer

Instrument:	Bartington Grad601-2 Dual Fluxgate Gradiometer
Sample Interval:	0.25m
Traverse Interval:	1.00m
Traverse Separation:	1.00m
Traverse Method:	Zigzag
Resolution:	0.1nT
Processing Software:	3.0.29.3
Surface Conditions:	Short grass
Area Surveyed:	14.7 hectares
Date Surveyed:	Tuesday 6 th to Friday 9 th August 2016
Surveyors:	Robert Evershed BSc (Hons) and Ryan Godbold
Survey Assistant:	Fabien Danielsson BA (Hons)
Data Interpretation:	Robert Evershed BSc (Hons)

Data Collection and Processing

- 6.6 The grids were marked using pre-programmed grids on the Leica GS08 Netrover. Magnetic data was collected very close to a north-south alignment due to the alignment of the fields and the pre-programmed grids. A traverse pattern close to north-south is preferable as the fluxgate gradiometer is set up and balanced with respect to the cardinal points. Since the data is plotted as north-south traverses there is considerable merit sampling the north-south response of a magnetic anomaly with as many data points as is possible, this is accomplished as the density collected along the traverse line is greater than that between traverses (Aspinall *et al.* 2008).
- 6.7 The data collected from the survey has been analysed using Terrasurveyor 3.0.29.3. The resulting data set plots are presented with positive nT/m values and high resistance as black and negative nT/m values and low resistance as white.

The data sets have been subjected to processing using the following filters:

- De-stripping
- Clipping
- De-staggering

- 6.8 The de-stripe process is used to equalise underlying differences between grids or traverses. Differences are most often caused by directional effects inherent to magnetic surveying instruments, instrument drift, instrument orientation (for example off-axis surveying or heading errors) and delays between surveying adjacent grids. The de-stripe process is used with care as it can sometimes have an adverse effect on linear features that run parallel to the orientation of the process.
- 6.9 The clipping process is used to remove extreme data point values which can mask fine detail in the data set. Excluding these values allows the details to show through.
- 6.10 The de-staggering process compensates for data correction errors caused by the operator commencing the recording of each traverse too soon or too late. It shifts each traverse either forward or backwards by a specified number of intervals.
- 6.11 Plots of the data are presented in processed linear greyscale (smoothed) with any corrections to the measured values or filtering processes noted, and as separate simplified graphical interpretations of the main anomalies detected.

7.0 Results (Figures 2–7)

- 7.1 For the purposes of interpreting the anomalies, the survey data has been processed to the values of -3 to 3 nT/m (Figure 3). This enhances faint anomalies that may otherwise not be noted in the data, with a number of anomalies identified across the data set, and these are discussed in turn and noted as single or double digit numbers in square brackets.
- 7.2 Immediately noticeable is the long, linear dipolar anomaly [1], producing a magnetic reading of -100 to 100 nT/m, and running along the western border of the easternmost field and through the centre of the northernmost field. This represents a modern service, a high pressure gas pipe. Within the northern field it is noted a parallel linear dipolar feature exists immediately to the west of [1], this likely represents a water main, and whilst the gas main runs within the easternmost field, it appears the water main passes along the field boundary to the west of this field.
- 7.3 In the northeast corner of the site there is another linear dipolar feature [2], -100 to 100 nT/m. This represents an underground electric cable. At the southern end of the dipolar feature is a telegraph pole where the electricity cable transfers from over ground to underground.
- 7.4 Immediately to the east and the west of the linear dipolar features [1] are large areas of magnetic noise [3] related to the dipolar features, up to -100 to 100 nT/m but decreasing further away from the services.
- 7.5 Along the eastern border of the site there is an area of magnetic noise [4], -20 to 20 nT/m, which represents a metal fence along the edge of the field.
- 7.6 Along the southern edge of the eastern field is an area of magnetic noise [5], -5 to 20 nT/m. This is likely to relate to the modern houses present immediately to the south and to possible modern waste build-up along the field boundary.

- 7.7 Along the eastern border of the southernmost field is an area of magnetic noise [6], -100 to 100 nT/m, which represents a metal fence.
- 7.8 The area of magnetic noise [7], -20 to 20 nT/m with some areas as low and high as -100 to 100 nT/m, within the southern part of the westernmost field and the northeast corner of the southernmost field, is likely to result from a combination of underground electrical cables, and a build-up or dump of modern waste within this area.
- 7.9 The magnetic noise [8], -10 to 10 nT/m, along the northern edge of the westernmost field is likely a combination of the accumulation of modern waste within this area and a metal fence within the field boundary.
- 7.10 The area of magnetic noise [9], -100 to 100 nT/m, represents a modern, metal gate.
- 7.11 The area of magnetic noise [10], -4 to 10 nT/m, likely represents a dump of modern waste.
- 7.12 The linear area of magnetic noise within the middle field [11], -10 to 10 nT/m, likely represents a dump of modern waste. However, the linear nature of this feature may suggest that the material has been spread out slightly by the action of ploughing in the past.
- 7.13 Aligned roughly west-southwest to east-northeast across the southernmost part of the easternmost field and through the middle of the southernmost field is a linear positive anomaly [12]. This has produced magnetic readings of 1 to 3 nT/m and likely represents a former ditch, path or trackway. In this case it is most likely a continuation of the Roman ditch uncovered in the 2010 strip map and record (AAL 2013) (Figures 6 and 7). There is also a linear, positive anomaly that cuts through [12] at a right angle towards the western end of the southernmost field, 2 to 3 nT/m, which may well be contemporary.
- 7.14 The collection of linear and amorphous positive features [13], 5 to 8 nT/m, aligned roughly east to west through the southernmost field form part of a medieval track with roadside ditches noted and investigated previously (Figure 7).
- 7.15 The parallel, linear positive features [14], 2 to 5 nT/m, aligned roughly east to west within the westernmost field, likely represent ditches either side of a trackway.
- 7.16 The parallel linear or curvilinear features [15], 2 to 8 nT/m, aligned roughly east to west at the north end of the easternmost field likely represent ditches either side of a trackway.
- 7.17 Within the centre of the westernmost field there are a large number of potentially interconnecting linear, curvilinear and amorphous features [16], 2 to 6 nT/m. The slightly curvilinear features aligned roughly north to south may represent cultivation activity such as ridge and furrow agriculture. The other features may well represent ditches, pits, paths or tracks, possibly including boundary or enclosure features. These features continue into the middle field [17], 2 to 8 nT/m, and likely indicate a continuation of enclosure features and other anthropogenic activity. Not all of these features appear on the same alignment, suggesting several phases of activity.
- 7.18 The parallel positive linear features towards the south end of the westernmost field [19], 2 to 4 nT/m, likely represent ditches either side of a trackway.
- 7.19 The short parallel positive linear features [19], 1 to 2 nT/m, at the northeast corner of the middle field, likely represent ditches either side of a trackway, possible with an enclosure or boundary ditch running off them to the north.

- 7.20 The potentially parallel, positive, linear features [20], 2 to 5 nT/m, possibly represent boundary ditches or ditches either side of a trackway.
- 7.21 The curvilinear and linear, positive features [21], 2 to 4 nT/m, at the southeast corner of the southernmost field, likely represent small enclosures, along with some amorphous positive anomalies, up to 10 nT/m, which could represent pits, soil-filled hollows or former ponds.
- 7.22 At the north edge of the northernmost field is a positive linear feature [22], 5 to 8 nT/m, aligned roughly east- northeast to west- southwest. This may represent a former ditch or track, possibly a boundary feature.
- 7.23 Within the easternmost field there are a large number of small curvilinear and linear positive features [23], 2 to 5 nT/m with some as high as 8 nT/m, that likely represent geological variation and are potentially the result of water action within this area of the site. This continues through into the southwest corner of the central field [24] and could mask archaeological features within these areas.
- 7.24 The parallel, linear, positive features [25], 1 to 3 nT/m, within the northernmost field, could represent former ditches or cultivation activity such as ploughing.
- 7.25 The negative, linear feature [26], -2 to -5 nT/m, within the westernmost field, is likely to represent a former field boundary, seen on historic mapping.
- 7.26 The negative linear feature [27], -2 to -3 nT/m, just to the north of [26], is likely to represent a former ditch, path or track.
- 7.27 The linear negative feature [28], -1 to -2 nT/m, within the northernmost field, probably represents a former ditch, path or track, probably related to the positive linear features [20] immediately to the south.
- 7.28 Scattered randomly throughout the site are a large number of strong and weak dipolar responses, examples of which are highlighted as [29]. The characteristic dipolar response of pairs of positive and negative 'spikes' suggest near-surface ferrous metal or other highly fired material in the ploughsoil.

8.0 Discussion and Conclusions

- 8.1 The geophysical survey has revealed a large number of potential archaeological features across the entire site. At the southern end of the site there are linear features which align with Roman and medieval ditches uncovered in the 2010 strip, map and record (AAL 2013). There are also curvilinear and linear features within this area which are suggestive of small enclosures.
- 8.2 Within the western part of the site there are a large number of positive linear and curvilinear features. A few of these appear to be parallel ditches potentially with trackways between them, as well as more potential enclosures. There are also linear features that may represent cultivation activity such as ridge and furrow agriculture.
- 8.3 Towards the northern and north-eastern parts of the site there are more parallel linear features likely to represent trackways flanked by ditches, as well as linear features that could represent either further ditches or agricultural features.
- 8.4 Towards the southeast part of the site there are a large number of small, linear and curvilinear features that are likely to represent geological variation, possibly the result of water action within

the these areas. Due to the large number of anthropogenic features across the entire site it is possible that these geological variations may mask archaeological features within these areas.

- 8.5 The survey also identified modern services, a high powered gas pipe, a water main and buried electrical cables within the site boundary.

9.0 Effectiveness of Methodology

- 9.1 The non-intrusive evaluation methodology employed was particularly appropriate to the scale and nature of the site to be surveyed. Magnetometry was the prospection technique best suited to the non-intrusive identification of archaeological remains on the site.

10.0 Acknowledgements

- 10.1 Allen Archaeology Ltd would like to thank Keigar Homes Ltd for this commission.

11.0 References

AAA, 2009, *Trial Trenching on land off Falkland Way, Barton-upon-Humber, North Lincolnshire*. Allen Archaeological Associates Report Number 2009018, unpublished project document

AAA and Grid Nine Geophysics, 2009, *Archaeological Evaluation Report: Fluxgate Gradiometer Survey on Land off Falkland Way, Barton upon Humber, North Lincolnshire*. Allen Archaeological Associates Report Number 2009013, unpublished project document

AAL, 2013, *Archaeological excavation and strip, map and record analysis report: Land off Falkland Way, Barton upon Humber, North Lincolnshire*. Unpublished client report

AAL, 2016, *Specification for a Fluxgate Magnetometer Geophysical Survey: Falkland Way, Barton upon Humber, North Lincolnshire*. Allen Archaeology Ltd

Aspinall, A, Gaffney, C, and Schmidt, A, 2008, *Magnetometry for Archaeologists*, Plymouth: Altamira Press

Bradley, J, 2002, Excavations at Barrow Road, Barton-on-Humber, 1999-2000, in *Lincolnshire History and Archaeology* 37, 5–20

Brown, R, 1908, *Notes on the Earlier History of Barton upon Humber Vol. 2 p. 5 fig. 6*

Bryant, G, 1994, *Early History of Barton-upon-Humber*, Workers' Educational Association

Bunn, D, and Palmer-Brown, C, 2001, *Fluxgate Gradiometer Survey: Land off Falkland Way, Barton upon Humber, North Lincolnshire*, Pre-Construct Geophysics, Unpublished client report

Cameron, K, 1998, *A dictionary of Lincolnshire place-names*, English Place-Name Society, Nottingham: University of Nottingham

CIfA, 2014, *Standard and guidance for archaeological geophysical survey*, Reading: Chartered Institute for Archaeologists

English Heritage, 2008, *Geophysical Survey in Archaeological Field Evaluation*, English Heritage

Department for Communities and Local Government, 2012, *National Planning Policy Framework*. London: Department for Communities and Local Government

Gaffney, C, Gater, J, and Ovenden, S, 2002, *The Use of Geophysical Techniques in Archaeological Evaluations*, IFA Paper No. 6, Reading: The Institute for Archaeologists

Morgan, P, and Thorn, C, (eds), 1986, *Domesday Book: vol.31: Lincolnshire*, Chichester: Phillimore & Co. Ltd

Rodwell, W, 2011, *St Peter's, Barton-upon-Humber, Lincolnshire: A Parish Church and its Community*, Oxford: Oxbow Books

Savage, S, 2004, *Land off Falkland Way, Barton upon Humber, North Lincolnshire: Archaeological Trial Excavation Interim Report*. Pre-Construct Archaeology (Lincoln), unpublished client report

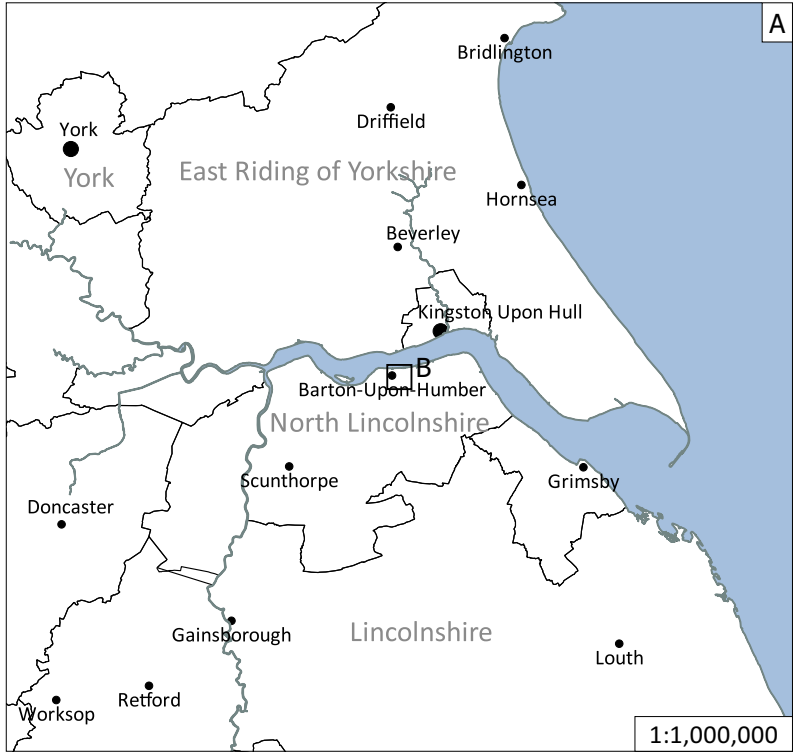
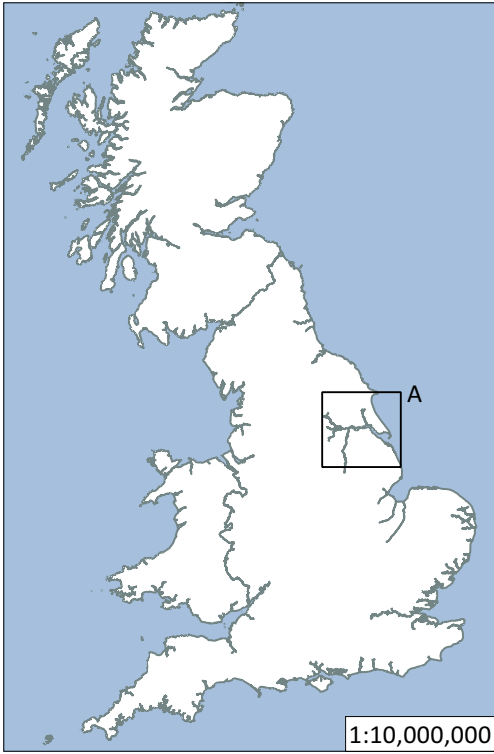


Figure 1: Site location outlined in red

© Crown copyright 2000. All rights reserved. Licence Number 100047330

Site Code	BAFW 16
Scale	1:10,000,000 1:1,000,000 1:25,000 @ A4
Drawn by	F Danielsson
Date	19/09/15

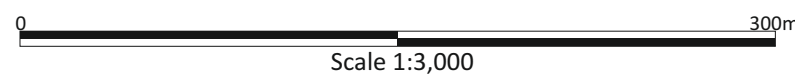
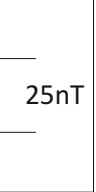
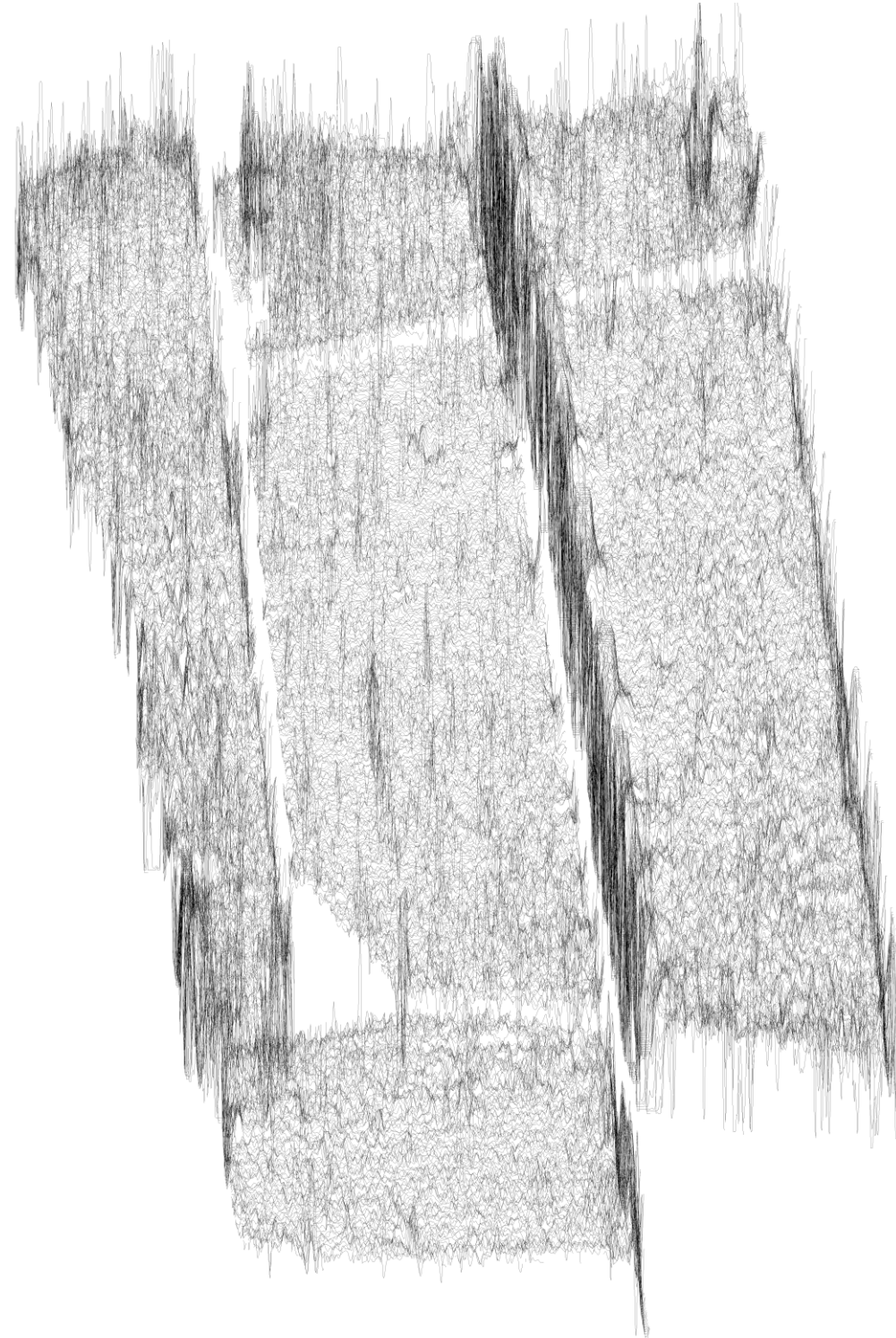
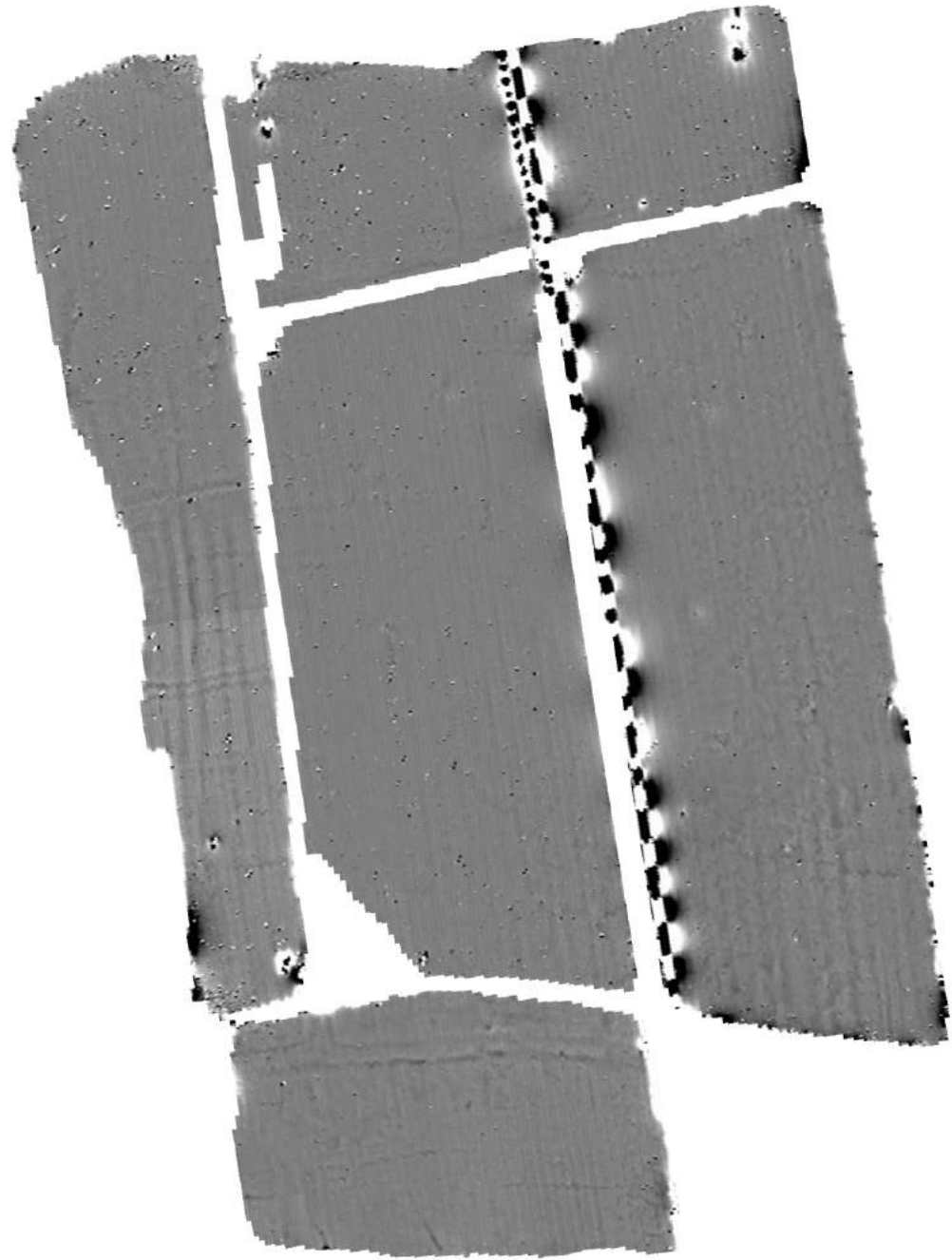
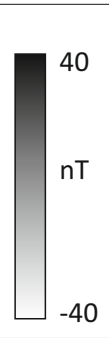
Allenarchaeology

- Lincoln
- Birmingham
- Cambridge
- Southampton

www.allenarchaeology.co.uk

Raw data (clipped to +/- 40 nT)

Trace Plot (ZMT and clipped to +/- 25nT)



Site Code	BAFW 16
Scale	1:3,000 @ A3
Drawn by	R Evershed
Date	19/09/16

Allenarchaeology
 Lincoln
 Birmingham
 Cambridge
 Southampton
www.allenarchaeology.co.uk

Figure 2: Greyscale raw data and processed trace plot



Key

- Positive anomaly
- Negative anomaly
- Magnetic noise
- Dipolar anomaly
- Linear dipolar anomaly
- Survey Boundary



Site Code	BAFW 16
Scale	1:3,000 @A3
Drawn	Robert Evershed
	19/09/16



Figure 4: Processed greyscale plot and interpretation



Key

Site Boundary

3
 nT
 -3

Site Code	BAFW 16
Scale	1:3,000 @ A4
Drawn By	R Evershed
Date	19/09/2016

Figure 4: Processed greyscale location



Allenarchaeology

Lincoln
Birmingham
Cambridge
Southampton

www.allenarchaeology.co.uk



Key

- Positive anomaly
- Negative anomaly
- Magnetic noise
- Dipolar anomaly
- Linear dipolar anomaly
- Survey Boundary
- Site Boundary

Site Code	BAFW 16
Scale	1:3,000 @ A4
Drawn By	R Evershed
Date	19/09/2016

Allenarchaeology

- Lincoln
- Birmingham
- Cambridge
- Southampton

www.allenarchaeology.co.uk

Figure 5: Geophysical interpretation location





Key

Site Boundary



Site Code
Scale
Drawn By
Date

BAFW 16
1:2,500 @ A3
R Evershed
19/09/2016

Allenarchaeology

- Lincoln
- Birmingham
- Cambridge
- Southampton

www.allenarchaeology.co.uk

Figure 6: Combined geophysical surveys





- Key**
- Positive anomaly
 - Negative anomaly
 - Magnetic noise
 - Dipolar anomaly
 - Linear dipolar anomaly
 - Survey Boundary
 - Site Boundary
- Key to earlier work**
- Undated features
 - Iron Age enclosures
 - Iron Age droveway
 - Roman boundaries
 - Medieval ditches
 - Post-medieval and modern features

Site Code BAFW 16
 Scale 1:2,500 @ A3
 Drawn By R Evershed
 Date 19/09/2016

Allenarchaeology

Lincoln
 Birmingham
 Cambridge
 Southampton

www.allenarchaeology.co.uk



Figure 7: Geophysical interpretation location and plans of earlier work



Allen Archaeology Limited
Website: www.allenarchaeology.co.uk

Company Registered in England and Wales No: 6935529

Lincoln
Whisby Lodge
Hillcroft Business Park
Whisby Road
Lincoln
LN6 3QL

Birmingham
Arion Business Centre
Harriet House
118 High Street
Birmingham
B23 6BG

Cambridge
Wellington House
East Road
Cambridge
CB1 1BH

Southampton
International House
Southampton International Business Park
George Curl Way
Southampton
SO18 2RZ

Tel/Fax: +44 (0) 1522 685356
Email: info@allenarchaeology.co.uk

Tel/Fax: +44 (0) 800 610 2545
Email: birmingham@allenarchaeology.co.uk

Tel/Fax: +44 (0) 800 610 2550
Email: cambridge@allenarchaeology.co.uk

Tel: +44 (0) 800 610 2555
Email: southampton@allenarchaeology.co.uk