Ratcliffe Proposed Quarry, Ratcliffe on Soar, Nottinghamshire

Detailed Gradiometer Survey Report

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Contents

Summary ..... *ii*
Acknowledgements ..... *ii*

1 INTRODUCTION 1
1.1 Project background 1
1.2 Scope of document 1
1.3 The site 1

2 ARCHAEOLOGICAL BACKGROUND 1
2.1 Introduction 1
2.2 Summary of the archaeological resource 2
2.3 Previous investigations related to the proposed development 2

3 METHODOLOGY 3
3.1 Introduction 3
3.2 Aims and objectives 3
3.3 Fieldwork methodology 3
3.4 Data processing 4

4 GEOPHYSICAL SURVEY RESULTS AND INTERPRETATION 4
4.1 Introduction 4
4.2 Gradiometer survey results and interpretation 4

5 DISCUSSION 6
5.1 Results ..... **Error! Bookmark not defined.**

REFERENCES 7

APPENDICES 8
Appendix 1 Survey equipment and data processing 8
Appendix 2 Geophysical interpretation 10
Appendix 3 OASIS form 11

List of Figures

Figure 1 Site location and boundary
Figure 2 Magnetic gradiometer survey – greyscale plots
Figure 3 Magnetic gradiometer survey – interpretation
Figure 4 Magnetic gradiometer survey 2022 and 2023 - interpretation

Summary

A detailed gradiometer survey was conducted over land at Ratcliffe on Soar, Rushcliffe, Nottinghamshire (centred on NGR 451238 330624). The project was commissioned by Saint-Gobain Interior Solutions as part of a staged approach in determining the archaeological potential of the site, prior to future development.

The site comprises one field located on Barton Lane, Ratcliffe on Soar, covering an area of 9.2 ha. The geophysical survey was undertaken on 18 – 19 September 2023. In the west, linear and curvilinear anomalies have been detected which are the continuation of likely enclosure ditches or boundary features identified during a previous geophysical survey (Wessex Archaeology 2022). Whilst there is evidence for Romano-British, medieval, and post-medieval activity in the wider area, there is not enough evidence to confidently assign a definitive period for these features.

Archaeological activity is also indicated in the north of the site, in the form of a ring ditch forming a circular enclosure. To the south of this in the centre of the site there is a possible partial ring ditch formed by pits or post holes. Ring ditches are generally Bronze-Age to Iron-Age/Romano-British in date. However, without further evidence no confident origin can be determined.

An area of possible archaeological pitting, likely caused by extraction of an unknown date has been detected across the north of the survey area. Natural pitting in the underlying geology cannot be entirely ruled out without further investigation.

A number of weaker magnetic responses may indicate further archaeological activity in the form of enclosure or boundary ditches across the survey area. However, without further context these cannot be more confidently interpreted and may be of more recent agricultural origin.

Historical cultivation is present in the west of the site. Due to the spacing and curvature they are likely to be part of a medieval to post-medieval ridge and furrow ploughing regime. Some have been subsequently reused for land drains.

A former field boundary was identified, which was present between the 1884 (Nottinghamshire XLV.SE) to 1952 (SK53) OS mapping.

In addition, anomalies interpreted as likely variations in the underlying geological deposits have been identified.

Acknowledgements

Wessex Archaeology would like to thank Saint-Gobain Construction Products UK Limited T/A British Gypsum for commissioning the geophysical survey. The assistance of Jen Saunders is gratefully acknowledged in this regard.

The fieldwork was undertaken by Amy Dunn and Matthew Lester. Lydia Jones processed the data and prepared the illustrations. Lydia Jones and Bethan Healey interpreted the data and wrote the report. The geophysical work was quality controlled by Tom Richardson. The project was managed on behalf of Wessex Archaeology by Tom Richardson.

Ratcliffe Proposed Quarry, Ratcliffe on Soar, Nottinghamshire

Detailed Gradiometer Survey Report

1 INTRODUCTION

1.1 Project background

1.1.1 Wessex Archaeology was commissioned by Saint-Gobain Interior Solutions to carry out a geophysical survey at Barton Lane, Ratcliffe on Soar, Rushcliffe, Nottinghamshire (centred on NGR 451238 330624) (**Figure 1**). The survey forms part of an ongoing programme of archaeological works being undertaken as part of staged approach in determining the archaeological potential of the site, prior to future development.

1.2 Scope of document

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

1.3 The site

1.3.1 The site is located 500 m north-east of Ratcliffe-on-Soar Power Station, 2.3 km west of the village of Gotham, and 10 km south-west of central Nottingham, in the county of Nottinghamshire.

1.3.2 The survey comprises 9.2 ha of land, currently utilised for arable agriculture. The site is bounded by Barton Lane to the east, woodland and agricultural land to the north, with agricultural land to the south and west of the survey area. Ratcliffe on Soar Power Station is located 330 m to the south-west.

1.3.3 The site is on a slight incline sloping from 66 m above Ordnance Datum (aOD) at the western edge to 52 m aOD at the eastern edge.

1.3.4 The solid geology comprises Mudstone of the Branscombe Formation with a small area of overlying superficial geological deposits of Head (clay, silt, sand, and gravel) in the west of the site (BGS 2023).

1.3.5 The soils underlying the majority of the site are likely to consist of typical argillic pelosols of the 431 (Worcester) association, with a small area of stagnogleyic argillic brown earths of the 572 (Middleton) association (SSEW SE Sheet 3 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 Written Scheme of Investigation (WSI) was prepared by Wessex Archaeology (2023). An The following background is not exhaustive, but is summarised from aspects of the WSI, historical Ordnance Survey (OS) mapping, and Nottingham HER data that are considered relevant to the interpretation of the geophysical survey data.

2.2 Summary of the archaeological resource

Listed buildings

2.2.1 Thrumpton Hall represents the only Grade I listed building within the search radius of the site and is located 500 m to the north-west (NHLE 1242464).

2.2.2 There is a single Grade II* building 500 m to the north-west of the site which is the Church of All Saints in Thrumpton (NHLE 1242423). A further 18 Grade II buildings are noted within the search area. The majority of which are situated in Thrumpton, 500 m to the north-west of the site.

2.2.3 There are limited records pertaining to prehistoric activity within the immediate vicinity of the site, with the majority of evidence relating to Romano-British activity. The 'Roman site on Red Hill' is a scheduled monument and is situated 1 km west of the site (NHLE 1003667). There is also the presence of further Roman activity 3 km west south-west of the site, in the form of a scheduled monument containing a Roman Villa with enclosures (NHLE 1003567).

Archaeological and historical context

2.2.4 A Bronze-Age mace head was discovered 300 m to the north on the edge of Thrumpton.

2.2.5 A scatter of Romano-British pottery was identified by the corner of a road leading to Drypot Barn. This is 300 m south-south-west of the survey area. Drypot Barn is recorded on late 19th and early 20th century mapping, falling within the grounds of the modern-day power station, and is no longer extant.

2.2.6 Thrumpton, 500 m to the north, was a settlement recorded in the Domesday survey with a population of 15 households in 1086 (Open Domesday). A possible (now destroyed) moated manor site is recorded 300 m to the south-west of the site at the power station.

2.2.7 OS mapping and Heritage Gateway record numerous mines and quarries in the immediate surroundings. In the 1884 (Nottinghamshire XLV.SE) mapping Thrumpton Gypsum mines are recorded 420 m to the east with old shafts marked immediately to the south of these mines, and a further gypsum mine to the north-east. On the 1900 OS mapping (Nottinghamshire XLV.11) further old shafts are marked 300 m and 600 m to the west of the survey area.

2.3 Previous investigations related to the proposed development

Geophysical survey

2.3.1 A detailed gradiometer survey was undertaken over land surrounding Ratcliffe on Soar Power Station by Wessex Archaeology's in-house geophysics team in 2022 (Wessex Archaeology 2022) in fields immediately to the west and south of the survey area, as well as fields 450 m to the south. The interpretation of the northern fields of this survey is shown in **Figure 4**. This was successful in identifying anomalies of archaeological interest as well as a large number of coherent ferrous responses. It identified a number of features interpreted as evidence of archaeological settlement activity in the fields 450 m and more to the south, as well as anomalies that are suggestive of agricultural activity in the form of ridge and furrow ploughing.

2.3.2 In the fields to the immediate west and south of the survey area ditched enclosures and boundary features were identified. Although there is evidence for Romano-British activity to the west, and medieval/post-medieval within the 2022 wider site, there was not enough evidence to confidently associate a date with these features.

2.3.3 In the south-west of the site a series of rectilinear and curvilinear enclosures were identified radiating east and west from a central throughway. It is possible that these features relate to a wider settlement, associated with a potential manorial complex. It is likely that these

features date to the medieval / post-medieval period, as early ridge and furrow intersects the features with no discernible contemporaneous association.

2.3.4 Ridge and furrow ploughing is evident in several areas of the site. Due to the curved form and wider spacing of the lines, it is likely that these are associated with pre-steam plough methods of agricultural land management.

Other archaeological investigations

2.3.5 To the south-west of the site there have been a series archaeological investigations carried out associated with the construction of the Ratcliffe-on-Soar power station. This has also revealed a variety of Romano-British features, as well as some more limited Neolithic/Bronze age and medieval activity (Greenfield 1964).

3 METHODOLOGY

3.1 Introduction

3.1.1 The geophysical survey was undertaken by Wessex Archaeology's in-house geophysics team between the 18 – 19 September 2023. Field conditions at the time of the survey were adequate throughout the period of survey. An overall coverage of 8.15 ha was achieved, with reductions attributable to unsuitable ground conditions.

3.1.2 The methods and standards employed throughout the geophysical survey conform to that set out in the Written Scheme of Investigation (WSI) (Wessex Archaeology 2023), as well as to current best practice, and guidance outlined by the Chartered Institute for Archaeologists' (CIfA 2014) and European Archaeologiae Consilium (Schmidt *et al.* 2015).

3.2 Aims and objectives

3.2.1 The aims of the survey comprise the following:

- To determine, as far as is reasonably possible, the nature of the detectable archaeological resource within a specified area using appropriate methods and practices; and
- To inform either the scope and nature of any further archaeological work that may be required; or the formation of a mitigation strategy (to offset the impact of the development on the archaeological resource); or a management strategy.

3.2.2 In order to achieve the above aims, the objectives of the geophysical survey are:

- To conduct a geophysical survey covering as much of the specified area as possible, allowing for on-site obstructions;
- To clarify the presence/absence of anomalies of archaeological potential; and
- Where possible, to determine the general nature of any anomalies of archaeological potential.

3.3 Fieldwork methodology

3.3.1 The detailed gradiometer survey was undertaken using four SenSys FGM650/3 magnetic gradiometers spaced at 1 m intervals and mounted on a non-magnetic hand-pushed cart. Data were collected at a rate of 20 Hz and interpolated to 0.1 m intervals along transects spaced 1 m apart, in accordance with European Archaeologiae Consilium recommendations (Schmidt *et al.* 2015).

3.3.2 The cart-based gradiometer system used a Carlson RTK GNSS instrument, which receives corrections from a network of reference stations operated by the Ordnance Survey (OS). Such instruments allow positions to be determined with a precision of 0.02 m in real-time and therefore exceeds European Archaeologiae Consilium recommendations (Schmidt *et al.* 2015).

3.4 Data processing

3.4.1 Data from the survey were subjected to minimal correction processes using in-house software. These comprise a remove overlap, median background, and Savgol smooth, applied to correct for any variation between the sensors and background magnetic data, as well as a gridding function for appropriate TIFF output.

3.4.2 Further details of the geophysical and survey equipment, methods and processing are described in **Appendix 1**.

4 GEOPHYSICAL SURVEY RESULTS AND INTERPRETATION

4.1 Introduction

4.1.1 The detailed gradiometer survey has identified magnetic anomalies across the site. Results are presented as a series of greyscale plots, and archaeological interpretations at a scale of 1:1500 (**Figures 2** to **3**). The interpretation of both the 2022 and current (2023) survey are presented at 1:4000 (**Figure 4**). The data are displayed at -2 nT (white) to +3 nT (black) for the greyscale image.

4.1.2 The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous responses, burnt or fired objects, and magnetic trends (**Figs. 3 & 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 In the west of the survey area, strong positive linear and curvilinear anomalies have been detected at **4000**. These anomalies include a central linear anomaly 49 m long which is truncated by the survey boundary to the south. This anomaly is 1.5 m wide and is oriented north-west to south-east. At its north-western extent, a curvilinear anomaly extends to the south-east for 30 m parallel to the central linear anomaly. It is 1.5 m wide. At the south-east of the central anomaly, a strong positive linear anomaly extends at a right-angle towards the west for 7 m and is truncated by the southern field boundary. These anomalies are the continuation of those identified in a previous geophysical survey (Wessex Archaeology 2022) as enclosure ditches or boundary features of archaeological origin.

4.2.2 At the north–west of **4000** is a strong positive amorphous anomaly with a large negative halo measuring 9 x 7 m (**4001**). This anomaly may reflect an area where **4000** has been

damaged or be an area of burning. Given its strength there is the possibility it is modern in origin such as agricultural waste. Without further context a definitive interpretation cannot be made.

4.2.3 A strong curvilinear anomaly has been detected 11 m to the north of **4000** at **4002**. It is 19 m long and between 0.5 – 1.5 m wide. Given its position it may be a continuation of **4000**. It is considered likely to be a ditch, possibly a boundary feature of archaeological origin.

4.2.4 Numerous strong discrete positive anomalies between 0.5 – 3 m in diameter have been detected close to **4000** and **4002.** The clearest are at **a** and **b**. It is not clear that they are definitely archaeological however given their location they may be associated pits either for rubbish disposal or post-holes.

4.2.5 In the north of LP_001 a weak positive, fragmented sub-annular anomaly has been detected (**4003**), measuring 35 m in diameter. It does not form a complete circle as it has a large break at the eastern side. Due to the presence of other archaeological activity in the wider area, it is considered to represent a ring ditch. Given its size it is possibly a circular enclosure.

4.2.6 In the centre of the survey area are a series of discrete positive anomalies (**4004**) in a penannular arrangement, measuring 20 m long in total. The anomalies are 2 m – 2.5 m in diameter. Their size and arrangement may reflect pits or post holes. Approximately 20 m to the north, a weak positive curvilinear anomaly at **4005** has been detected. This is 15 m long and may be a ditch associated with or a continuation of **4004**. Due to the shape formed it may be the edges of a further badly preserved ring ditch. This may however be a coincidence and more investigation would be needed to accurately determine its origin.

4.2.7 In the north of the site, numerous strong positive responses, some with a magnetic negative halo, have been detected (**4006**). They are in an area covering 165 x 55 m. They consist of both circular and amorphous anomalies measuring between 0.5 – 8 m in diameter and are in no recognisable pattern. Similar anomalies were detected to the south and south-west of the survey area in the previous geophysical survey (Wessex Archaeology 2022) and were interpreted as of possible geological origin or extraction pits. As the superficial geological deposits in this location are sands and gravels, it may be that **4006** are the result of archaeological extraction. This is further supported by the archaeological anomalies detected in the immediate vicinity, as well as a number of gypsum extraction pits, quarries and mine shafts present in the surrounding area documented in previous OS mapping.

4.2.8 Several weak positive curvilinear and linear anomalies have been detected across the site. The clearest examples of these are at **4007** – **4009**. They are 11 m – 29 m long respectively and 1 m – 2 m wide. They are typical of ditch features and given their location may be the remains of enclosure or boundary ditches. They lack further contextual evidence for a more specific interpretation and so would need further investigation understand their origin.

4.2.9 Across the west of the site is an area of weak, parallel linear anomalies (**4010** and **4011**), spaced 4 m – 5 m apart and oriented north-north-east to south-south-west. The spacing and slight curvature are indicative of medieval to post-medieval ridge and furrow cultivation. At **4011**, strong dipolar linear anomalies typical of fired clay drains within the cultivation shows the later reuse of the furrows for drainage.

4.2.10 In the east of the site, a weak, positive linear anomaly has been detected (**4012**). It is 200 m long, 2 m wide, and is oriented east-south-east to west-north-west. It has been interpreted as a former field boundary, evident in OS mapping between 1884 (Nottinghamshire XLV.SE) to 1952 (SK53). The field boundary is not visible on subsequent satellite imagery Google Earth (2001 onwards) however in the 2001 imagery a difference in crop regime is visible along its western half.

4.2.11 Numerous linear and curvilinear trends have been identified across the site. The anomalies are too weak to confidently interpret. While an archaeological origin cannot be ruled out for these trends, a modern agricultural origin is more likely.

4.2.12 Several weak positive amorphous anomalies with diffuse edges have been detected in the north of the site at **4013** and **4014**. They cover areas between 5 m x 2 m and 12 m x 11 m. They are just to the south of the area of possible archaeological extraction and pits. Their magnetic signal is typical of natural variations in the underlying deposits and is considered likely to be geological in nature. However, an archaeological origin such as extraction cannot be ruled out entirely.

5 DISCUSSION

5.1.1 The detailed gradiometer survey has been successful in detecting anomalies of archaeological origin across the survey area indicating possible agricultural and extraction activity. In the west, linear and curvilinear anomalies have been detected which are the continuation of archaeological anomalies identified during a previous geophysical survey (Wessex Archaeology 2022). They are likely enclosure ditches or boundary features. Whilst there is evidence for Romano-British, medieval, and post-medieval activity in the wider area, there is not enough evidence to confidently assign a definitive period for these.

5.1.2 Archaeological activity is also indicated in the north of the site, in the form of a ring ditch forming a circular enclosure. To the south of this in the centre of the site there is a possible partial ring ditch formed by pits or post holes. Ring ditches are generally Bronze-Age to Iron-Age/Romano-British in date. However, without further evidence no confident origin can be determined.

5.1.3 An area of possible archaeological pitting, likely caused by extraction of an unknown date has been detected across the north of the survey area. Natural pitting in the underlying geology cannot be entirely ruled out without further investigation.

5.1.4 A number of weaker magnetic responses indicate further archaeological activity in the form of enclosure or boundary ditches across the survey area. However, without further context these cannot be more confidently interpreted and may be of more recent agricultural origin. The relationship between the archaeology detected is unknown. Given the location within a relatively small area some may be contemporaneous, however it may be indicative of use of the land over multiple-phases of activity.

5.1.5 Historical cultivation is present in the west of the site. Due to the spacing and curvature they are likely to be part of a medieval to post-medieval ridge and furrow ploughing regime. Some have been subsequently reused for land drains.

5.1.6 A former field boundary has been identified, which was present between the 1884 (Nottinghamshire XLV.SE) to 1952 (SK53) OS mapping.

5.1.7 In addition, anomalies interpreted as likely variations in the underlying geological deposits have been identified.

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APPENDICES

Appendix 1 Survey equipment and data processing

Survey methods and equipment

The magnetic data for this project were acquired using a non-magnetic cart fitted with four SenSys FGM650/3 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 0.6 m separation and measures the difference between the vertical components of the total magnetic field within each sensor array. This arrangement of magnetometers suppresses any diurnal or low frequency effects.

The gradiometers have an effective resolution of ±8 µT over ±1000 nT range. All of the data will be then relayed to a CS35 tablet, running the MONMX program, which is used to record the survey data from the array of FMG650/3 probes at a rate of 100 Hz. The program also receives measurements from a GPS system, which is fixed to the cart at a measured distance from the sensors, providing real time locational data for each data point.

The cart-based system relies upon accurate GPS location data which is collected using a Carlson BRX-7 RTK system. This receives corrections from a network of reference stations operated by the Ordnance Survey, allowing positions to be determined with a precision of 0.02 m in real-time and therefore exceed the level of accuracy recommended by European Archaeologiae Consilium (Schmidt *et al.* 2015).

Post-processing

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

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

Typical data and image processing steps may include:

- 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:

- Greyscale – Presents the data in plan view using a greyscale to indicate the relative strength of the signal at each measurement point. These plots can be produced in colour to highlight certain features but generally greyscale plots are used during analysis of the data.

Appendix 2 Geophysical interpretation

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

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

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

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

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

The agricultural category is used for the following:

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

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

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

Appendix 3 OASIS form

OASIS Summary for wessexar1-519870

OASIS ID (UID)	wessexar1-519870
Project Name	Geophysical Survey at Ratcliffe Proposed Quarry
Sitename	Ratcliffe Proposed Quarry
Sitecode	285410
Project Identifier(s)	285410
Activity type	Geophysical Survey, MAGNETOMETRY SURVEY
Planning Id	
Reason For Investigation	Planning: Pre application
Organisation Responsible for work	Wessex Archaeology
Project Dates	18-Sep-2023 - 19-Sep-2023
Location	Ratcliffe Proposed Quarry NGR : SK 51200 30623 LL : 52.870655108764666, -1.240809152224566 12 Fig : 451200,330623
Administrative Areas	Country : England County/Local Authority : Nottinghamshire Local Authority District : Rushcliffe Parish : Thrumpton
Project Methodology	The detailed gradiometer survey was undertaken using four SenSys FGM650/3 magnetic gradiometers spaced at 1 m intervals and mounted on a non-magnetic hand-pushed cart. Data were collected at a rate of 20 Hz and interpolated to 0.1 m intervals along transects spaced 1 m apart, in accordance with European Archaeologiae Consilium recommendations (Schmidt et al. 2015). The cart-based gradiometer system used a Carlson RTK GNSS instrument, which receives corrections from a network of reference stations operated by the Ordnance Survey (OS). Such instruments allow positions to be determined with a precision of 0.02 m in real-time and therefore exceeds European Archaeologiae Consilium recommendations (Schmidt et al. 2015).

Project Results	In the west, linear and curvilinear anomalies have been detected which are the continuation of likely enclosure ditches or boundary features identified during a previous geophysical survey (Wessex Archaeology 2022). Whilst there is evidence for Romano-British, medieval, and post-medieval activity in the wider area, there is not enough evidence to confidently assign a definitive period for these features. Archaeological activity is also indicated in the north of the site, in the form of a ring ditch forming a circular enclosure. To the south of this in the centre of the site there is a possible partial ring ditch formed by pits or post holes. Ring ditches are generally Bronze-Age to Iron-Age/Romano-British in date. However, without further evidence no confident origin can be determined. An area of possible archaeological pitting, likely caused by extraction of an unknown date has been detected across the north of the survey area. Natural pitting in the underlying geology cannot be entirely ruled out without further investigation. A number of weaker magnetic responses may indicate further archaeological activity in the form of enclosure or boundary ditches across the survey area. However, without further context these cannot be more confidently interpreted and may be of more recent agricultural origin. Historical cultivation is present in the west of the site. Due to the spacing and curvature they are likely to be part of a medieval to post-medieval ridge and furrow ploughing regime. Some have been subsequently reused for land drains. A former field boundary was identified, which was present between the 1884 (Nottinghamshire XLV.SE) to 1952 (SK53) OS mapping. In addition, anomalies interpreted as likely variations in the underlying geological deposits have been identified.
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Archives	

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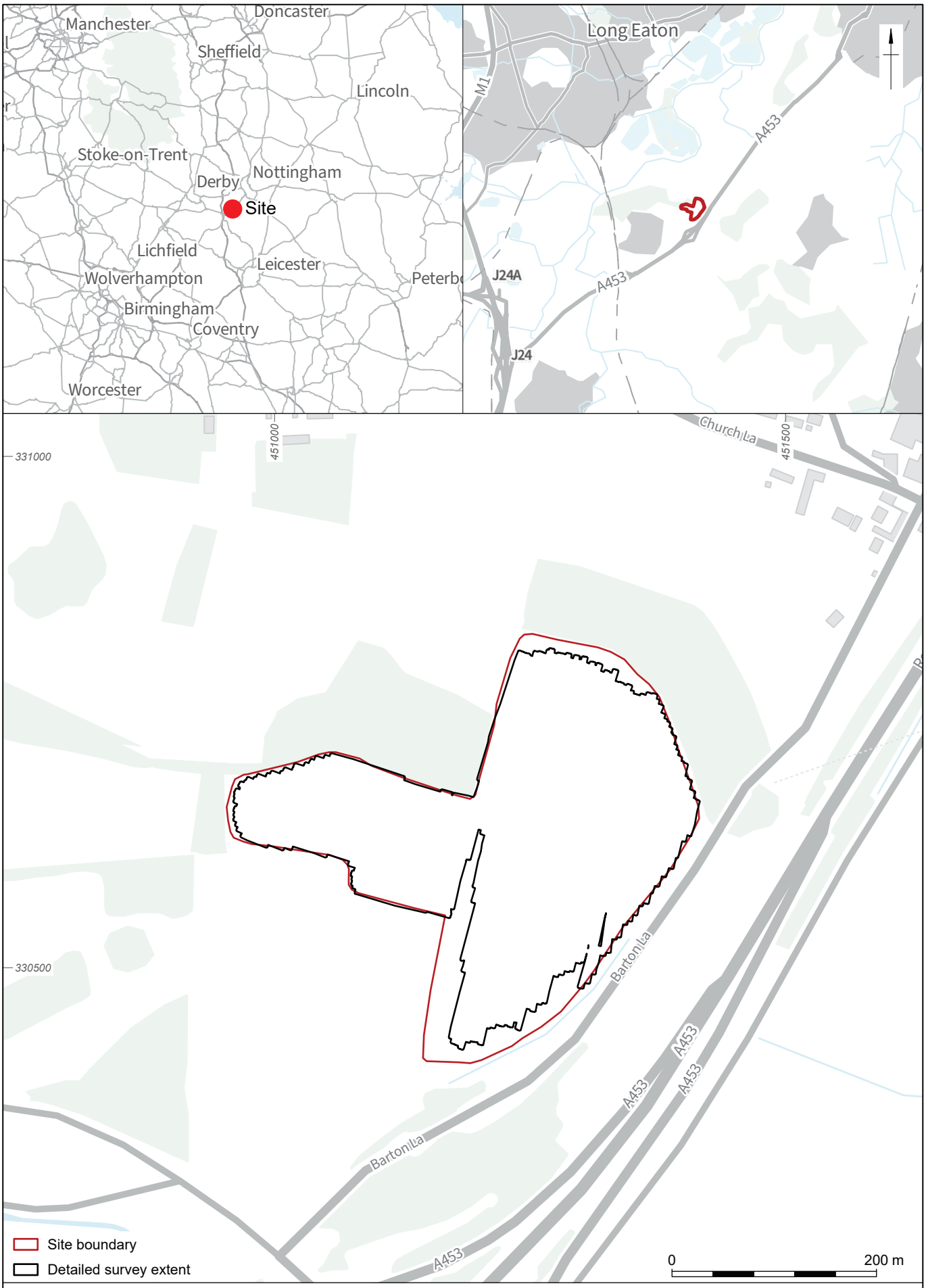

Coordinate system: OSGB 1936 British National Grid

Date: 17/10/2023	Created by: LJ	Revision: 0	Scale: 1:5,000 at A4

Figure 1: Site location and boundary

X:\Projects\285410\GIS_ArcPro\285410\285410.aprx

451000

451250

330750

330500

Bartonl La

Remembrance Way

Site boundary

Detailed survey extent

-2 nT

3 nT

0

50 m

Date: 17/10/2023 | Created by: LJ

Scale: 1:1500 | Revision: 0

Figure 2: Magnetic gradiometer survey - greyscale plots

X:\Projects\285410\GIS_ArcPro\285410\285410.aprx

451000

451250

330750

330500

4006

4003

4013

4014

4005

4004

4012

4008

4009

4011

4007

4010

4001

4002

4000

a

b

Bartonlla

Remembrance Way

Site boundary
Detailed survey extent
Archaeology
Possible archaeology
Former field boundary
Historic cultivation
Trend
Ferrous
Geology

0 50 m

Date: 17/10/2023 | Created by: LJ

Scale: 1:1500 | Revision: 1

Figure 3: Magnetic gradiometer survey - interpretation

X:\Projects\285410\GIS_ArcPro\285410\285410.aprx

331000

450500

451000

Church La

Church La

330500

Bartonlla

Bartonlla

A453

A453

A453

A453

A453

Remembrance Way

Remembrance Way

Thrumpton

WA Gradiometer Survey 2023
- Site boundary
- Detailed survey extent
- Archaeology
- Possible archaeology
- Former field boundary
- Historic cultivation
- Trend
- Ferrous
- Geology

WA Gradiometer Survey 2022
- Site boundary
- Detailed survey extents
- Archaeology
- Possible archaeology
- Former field boundary
- Former Path
- Historic cultivation
- Trend
- Ferrous
- Geology

0 200 m

Date: 17/10/2023 | Created by: LJ

Scale: 1:4000 | Revision: 1

Figure 4: Magnetic gradiometer survey 2022 and 2023 - interpretation