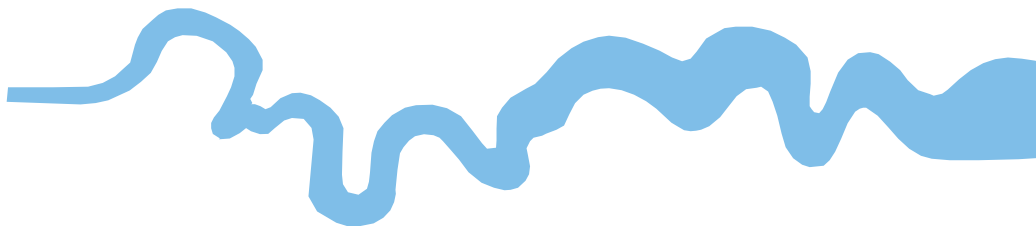


T V A S



EAST MIDLANDS

**Brascote Lane, Cadeby,
Leicestershire**

Geophysical Survey (Magnetic)

**by Tim Dawson, Camila Carvalho
and Luke O'Callaghan**

Site Code: BLC25/156

(SK 4309 0219)

Brascote Lane, Cadeby, Leicestershire

Geophysical Survey (Magnetic) Report

For Andrew Josephs Associates

by Tim Dawson, Camila Carvalho
and Luke O'Callaghan

TVAS East Midlands

Site Code BLC 25/156

August 2025

Summary

Site name: Brascote Lane, Cadeby, Leicestershire

Grid reference: SK 4309 0219

Site activity: Magnetometer survey

Date and duration of project: 26th – 27th August 2025

Project coordinator: Tim Dawson

Site supervisor: Camila Carvalho

Site code: BLC 25/156

Area of site: c.5.6ha

Summary of results: The geophysical survey investigated the field and recorded a range of magnetic anomalies. The majority of these likely represent buried land drains but there is one anomaly that may indicate the presence of a pit-type feature of potential archaeological interest.

Location of archive: The archive is presently held at Thames Valley Archaeological Services, Reading in accordance with TVAS digital archiving policies.

*This report may be copied for bona fide research or planning purposes without the explicit permission of the copyright holder. All TVAS unpublished fieldwork reports are available on our website:
www.tvas.co.uk/reports/reports.asp.*

Report edited/checked by: Steve Ford✓ 31.08.25
--

Brascote Lane, Cadeby, Leicestershire A Geophysical Survey (Magnetic)

by Tim Dawson, Camila Carvalho and Luke O’Callaghan

Report 25/156

Introduction

This report documents the results of a geophysical survey (magnetic) carried out at Brascote Lane, Cadeby, Leicestershire, (SK 4309 0219) (Fig. 1). The work was commissioned by Andrew Josephs of Andrew Josephs Associates Ltd., 16 South Terrace, Sowerby, Thirsk, YO7 1RH on behalf of FP McCann Ltd, 3 Drumard Road, Knockloughrim, Magherafelt, BT45 8QA.

Planning permission (25/00306/FUL) is currently being sought from Hinkley and Bosworth Borough Council for the erection of a pipe manufacturing facility with associated storage and biodiversity enhancements to the south of the current FP McCann concrete product facility at Brascote Lane, Cadeby, Leicestershire (Fig. 1). This is in accordance with the Ministry of Housing, Communities and Local Government’s *National Planning Policy Framework* (NPPF 2024), and the Borough’s policies on archaeology. The field investigation was carried out to a specification provided to Andrew Josephs Associates. The fieldwork was undertaken by Camila Carvalho and Luke O’Callaghan on 26th and 27th August 2025 and the site code is BLC 25/156.

The archive is presently held at TVAS East Midlands, Wellingborough in accordance with TVAS digital archiving policies.

Location, topography and geology

The site is located to the south-east of the current FP McCann concrete works, *c.*750m to the east of the centre of the village of Cadeby. The town of Market Bosworth is *c.*3.5km to the west and the city of Leicester *c.*15.5km to the east. The *c.*5.6ha survey site consists of a single grass field grazed by livestock and surrounded hedgerows and trees. A trackway with thick overgrown verges runs along the field’s north-western boundary while the north-eastern and south-eastern corners of the field are also heavily overgrown. The land slopes downhill from 125m above Ordnance Datum (aOD) in the north to 112m aOD in the south. The underlying geology is recorded as Gunthorpe Member mudstone with superficial mid-Pleistocene glaciofluvial deposits overlying the majority of the north-western half of the survey area (BGS 2010). While the magnetic response of mudstones is variable, generally, sands and gravels provide a moderate to good magnetic response and are well suited to geophysical survey (EH 2008).

Site history and archaeological background

An Archaeological Assessment undertaken in June 2025 (AJA 2025) shows that the proposal site lies landscape which has been subject to numerous archaeological investigations, particularly in advance of quarrying. These have found evidence for multiple phases and focal points of settlement from the later prehistoric, Iron Age and Roman periods. The mineral extraction that was undertaken to the south-west of and within the proposal site's western field was preceded by geophysical survey (Leicester HER ref. ELE5352), trenching (ELE4913) and archaeological excavation (ELE7951) which identified an early/middle 1st century AD Roman settlement (MLE20096) consisting of an enclosure with two structures and a number of pits. Further to the south, within the same excavation area, ditches, pits and evidence of a kiln of a similar date were also identified. Crop marks seen to the south-west of the proposed survey area suggest the presence of two ring ditches, most likely representing levelled Bronze Age barrows while another barrow was excavated c.1km north-east of the proposed survey area along with a collared urn and cremation pit (MLE27084). The same site also produced two Saxon sunken feature buildings (MLE27085) which were dated to the 5th or 6th century AD. Multiple finds ranging in date from the Mesolithic to the medieval period and including flint scatters, Roman coins and fragments of a Viking trefoil broach have been found across the study area suggesting a continuous use of the landscape across the ages.

Methodology

Sample interval

Data collection involved the traversing of the survey area along straight and parallel lines using two cart-mounted Bartington Grad601-2 fluxgate gradiometers. Even coverage was achieved with the use of regularly spaced markers at the ends of traverses and the real-time positional trace plot. Readings were taken at 0.13m intervals along traverses 1m apart, providing an appropriate methodology balancing cost and time with resolution. Traverses were walked at an alternating zig-zag pattern along a north-west to south-east orientation across the survey area. Very few obstacles were encountered during the survey with only thick vegetation around parts of the site boundary preventing survey coverage.

The Grad 601-2 has a typical depth of penetration of 0.5m to 1.0m. This would be increased if strongly magnetic objects have been buried in the site. Under normal operating conditions it can be expected to identify buried features >0.5m in diameter. Features which can be detected include disturbed soil, such as the fill of a ditch, structures that have been heated to high temperatures (magnetic thermoremnance) and objects made from

ferro-magnetic materials. The strength of the magnetic field is measured in nano Tesla (nT), equivalent to 10^{-9} Tesla, the SI unit of magnetic flux density.

Equipment

The purpose of the survey was to identify geophysical anomalies that may be archaeological in origin in order to inform a targeted archaeological investigation of the site prior to development. The survey and report generally follow the recommendations and standards set out by both European Archaeological Council (EAC 2015) and the Chartered Institute for Archaeologists (2002, 2020).

Magnetometry was chosen as a survey method as it offers the most rapid ground coverage and responds to a wide range of anomalies caused by past human activity. These properties make it ideal for the fast yet detailed surveying of an area.

The detailed magnetometry survey was carried out using two dual sensor Bartington Instruments Grad 601-2 fluxgate gradiometers mounted upon a Bartington non-magnetic cart. A two-wheeled lightweight structure pushed by hand, the cart consisted a bank of four vertically-mounted Bartington Grad601-2 magnetic sensor tubes at 1m apart and a Trimble R2 Receiver, centimetre edition GPS. Readings were collected by two Bartington Grad601-2 loggers and collated using MLgrad601 software on a Fusion 5 10" FWIN232 PRO N5 Tablet PC running Windows 11 mounted at the rear of the cart. This enables readings to be taken of both the general background magnetic field and any localised anomalies with the difference being plotted as either positive or negative buried features. All sensors are calibrated to cancel out the local magnetic field and react only to anomalies above or below this base line. On this basis, strong magnetic anomalies such as burnt features (kilns and hearths) will give a high response as will buried ferrous objects. More subtle anomalies such as pits and ditches can be seen from their infilling soils containing higher proportions of humic material, rich in ferrous oxides, compared to the undisturbed subsoil. This will stand out in relation to the background magnetic readings and appear in plan following the course of a linear feature or within a discrete area.

The Trimble R2 Receiver, centimetre edition GPS system with centimetre real-time accuracy was used to tie the cart traverses into the Ordnance Survey national grid. This unit offers both real-time correction and post-survey processing; enabling a high level of accuracy to be obtained both in the field and in the final post-processed data.

Data gathered in the field was processed using the TerraSurveyor64 software package. This allows the survey data to be collated and manipulated to enhance the visibility of anomalies, particularly those likely to be

of archaeological origin. The table below lists the processes applied to this survey, full survey and data information is recorded in Appendix 1.

Process	Effect
Clip from -1.8 to 2.2 nT	Enhance the contrast of the image to improve the appearance of possible archaeological anomalies.
De-stripe: median, all sensors	Removes the striping effect caused by differences in sensor calibration, enhancing the visibility of potential archaeological anomalies.
De-spike: threshold 1, window size 3×3	Compresses outlying magnetic points caused by interference of metal objects within the survey area.
De-stagger: all grids, both by -1 intervals	Cancels out effects of site's topography on irregularities in the traverse speed.

The raw data plot is presented as a greyscale plot shown in relation to the site (Fig. 2) with the processed data then presented as a two following figures (Figs. 3 and 4), followed by a fifth plan to present the abstraction and interpretation of the magnetic anomalies (Fig. 5). Anomalies are shown as colour-coded lines, points and polygons.

The greyscale plot of the processed data is exported from TerraSurveyor64 in a georeferenced portable network graphics (.PNG) format, a raster image format chosen for its lossless data compression and support for transparent pixels, enabling it to easily be overlaid onto an existing site plan. The data plot is combined with grid and site plans in QGIS and exported again in .PNG format in order to present them in figure templates in Adobe InDesign CS5.5, creating .INDD file formats. Once the figures are finalised they are exported in .PDF format for inclusion within the finished report. Mean nano Tesla (nT) readings will be represented by $\bar{x}$.

Results

The geophysical survey recorded a range of archaeological anomalies across the entire site area (Figs. 2-4). Only one of these anomalies, a discrete positive subcircular patch *c.*8m in diameter located in the south-eastern part of the site [Fig. 5: 1], is likely to represent a buried feature of potential archaeological interest. The majority of the magnetic anomalies recorded by the survey are linear positive anomalies which broadly cross the field from the north to the south. The sharply-defined nature of the anomalies and their regular layout suggest that they represent buried land drain pipes although the slight “S”-shaped appearance of some of the lines are somewhat suggestive of ridge and furrow earthworks. The linear anomalies appear to be in three groups, all of slightly different orientation [2, 3, 4] while towards the southern edge of the site are a series of similar anomalies on a more north-west to south-east orientation [5] which may represent further drainage pipes. Several areas of magnetic disturbance or scattered magnetic debris were recorded around the boundaries of the survey area.

These more extreme positive and negative readings are usually caused by nearby ferromagnetic objects, such as boundary fencing, or buried magnetically enhanced material such as rubble or made ground. Similarly, magnetic spikes of high and low readings recorded across the survey area are likely caused by ferrous objects, such as fragments of farm equipment, buried in the topsoil.

Conclusion

The magnetometer survey was successfully completed across the site with only a small number of obstructions encountered in the form of dense vegetation along some sections of boundary. The results of the survey showed a variety of magnetic anomalies but only one has been interpreted as being of possible archaeological interest. This discrete positive anomaly in the south-eastern area of the site may represent a buried pit-type feature. The majority of the magnetic anomalies identified likely indicate the presence of a series of land drains which are orientated north-south following the slope of the site. These may have been installed following an older pattern of field boundaries or in multiple phases as there appears to be three distinct sets of alignment. The eastern-most set has a slight “S”-shape to the anomalies raising the possibility that they may instead represent the remains of ridge and furrow cultivation.

References

- AJA, 2025, ‘Erection of a Pipe Manufacturing Facility with Associated Storage, Brascote Lane, Cadeby: Archaeological Assessment’, Andrew Josephs Associates unpublished report, Leamington Spa
- BGS, 2010, *British Geological Survey*, Sheet 155, 1:50,000 series, Bedrock and Superficial Deposits, Keyworth
- CIFA, 2020, ‘Standard and Guidance for archaeological geophysical survey’, Reading
- EAC, 2015, *EAC Guidelines for the use of Geophysics in Archaeology: Questions to Ask and Points to Consider*, EAC Guidelines 2, Namur
- EH, 2008, *Geophysical Survey in Archaeological Field Evaluation*, English Heritage, Swindon
- IFA, 2002, ‘The Use of Geophysical Techniques in Archaeological Evaluation’, IFA Paper No. 6, Reading
- NPPF, 2024, *National Planning Policy Framework* (revised), Ministry of Housing, Communities and Local Government, London

Appendix 1. Survey and data information

Programme:

Name: TerraSurveyor64
Version: 4.1.14.7

Raw data

Name: BLC25-156_01_raw
Path: S:\Geophysics\ArcheoSurveyor projects\Brascote Lane,
Cadeby (BLC25-156)\Comps\

SURVEY

Desc: Imported as Composite from: BLC25-156_01.xyz
InstDesig: MLGrad601
InstType: Magnetometer
SurveyDate: 28/08/2025
AssembleDate: Not set
ProcessDate: Not set
Surveyors:
Assemblers:
Comments:
Units: nT
UTM Zone: 30U
SouthWest corner: -1.2316146639753826E25 -
3.5927974861839974E28
NorthWest corner: -9.659013550721801E24
3.7062022868242829E28
NorthEast corner: -9.6800070179795853E24
3.7158707199729472E28
SouthEast corner: -1.2342915276225186E25 -
3.6021700783526989E28
Surveyed Area: 3.1195 ha
Survey Extent: 6.5523 ha
GPS Datum: WGS-84
Map Coordinate System: DDD
Survey Type: GPS
Average point interval : 0.18m
Interval & Radius : 0.15m 1m
Source GPS totals: Trackgroups:1 Tracks:1056, Points:745688

Base layer Stats

Max: 99.20
Min: -99.90
Std Dev: 8.04
Mean: 0.88
Median: 1.60

Name: BLC25-156_02_raw
Path: S:\Geophysics\ArcheoSurveyor projects\Brascote Lane,
Cadeby (BLC25-156)\Comps\

SURVEY

Desc: Imported as Composite from: BLC25-156_02.xyz
InstDesig: MLGrad601
InstType: Magnetometer
SurveyDate: 28/08/2025
AssembleDate: Not set
ProcessDate: Not set
Surveyors:
Assemblers:
Comments:
Units:
UTM Zone: 30U
SouthWest corner: 0.00 0.00
NorthWest corner: 0.00 201.10
NorthEast corner: 283.15 201.10
SouthEast corner: 283.15 0.00
Surveyed Area: 2.3809 ha
Survey Extent: 5.7427 ha
GPS Datum: WGS-84
Map Coordinate System: DDD

Survey Type: GPS
Average point interval : 0.18m
Interval & Radius : 0.15m 1m
Source GPS totals: Trackgroups:1 Tracks:992, Points:541984

Base layer Stats

Max: 98.50
Min: -99.90
Std Dev: 3.77
Mean: 2.48
Median: 2.30

Minimally processed data

Name: BLC25-156_01_min

Top layer Stats

Max: 10.00
Min: -10.00
Std Dev: 1.94
Mean: -0.15
Median: 0.00

Processes:

DeStripe	
Mode	Track
Method	Median
Orientation	Along
MaintainMean	✗
ThresholdType	None
ThresholdMin	2.00
ThresholdMax	2.00
Sectors	5
WindowLength	0
WindowWidth	0

Clip
Min -10.00
Max 10.00
SelectSD 0.00

Name: BLC25-156_02_min

Top layer Stats

Max: 10.00
Min: -10.00
Std Dev: 1.22
Mean: -0.01
Median: 0.00

Processes:

DeStripe	
Mode	Track
Method	Median
Orientation	Along
MaintainMean	✗
ThresholdType	None
ThresholdMin	2.00
ThresholdMax	2.00
Sectors	5
WindowLength	0
WindowWidth	0

Clip
Min -10.00
Max 10.00
SelectSD 0.00

Processed data

Name: BLC25-156_01

Top layer Stats

Max:2.20

Min:-1.80

Std Dev:0.70

Mean:-0.02

Median:0.00

Processes:

DeStripe

Mode	Track
Method	Median

Orientation Along

MaintainMean **X**

ThresholdType None

ThresholdMin 2.00

ThresholdMax 2.00

Sectors 5

WindowLength 0

WindowWidth 0

Hi/Lo

FilterModeDeSpike

WindowLength 9

WindowWidth 1

WeightingMode Median

Threshold 1.00

ReplaceCenterWith Average

Clip

Min -1.80

Max 2.20

SelectSD 0.00

Name: BLC25-156_02

Top layer Stats

Max: 2.20

Min: -1.80

Std Dev: 0.59

Mean: 0.02

Median: 0.00

Processes:

DeStripe

Mode	Track
Method	Median

Orientation Along

MaintainMean **X**

ThresholdType None

ThresholdMin 2.00

ThresholdMax 2.00

Sectors 5

WindowLength 0

WindowWidth 0

Hi/Lo

FilterModeDeSpike

WindowLength 9

WindowWidth 1

WeightingMode Median

Threshold 1.00

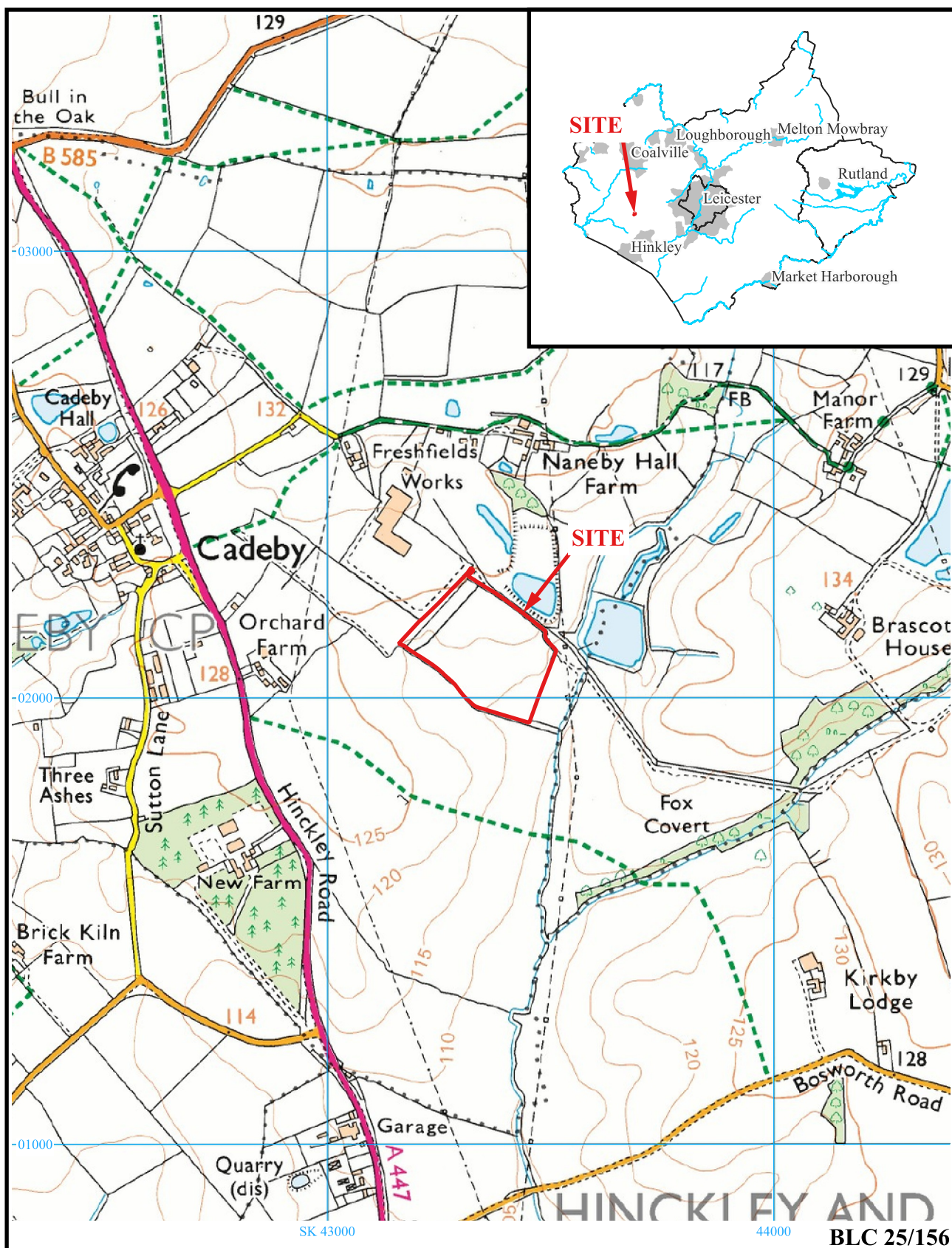
ReplaceCenterWith Average

Clip

Min -1.80

Max 2.20

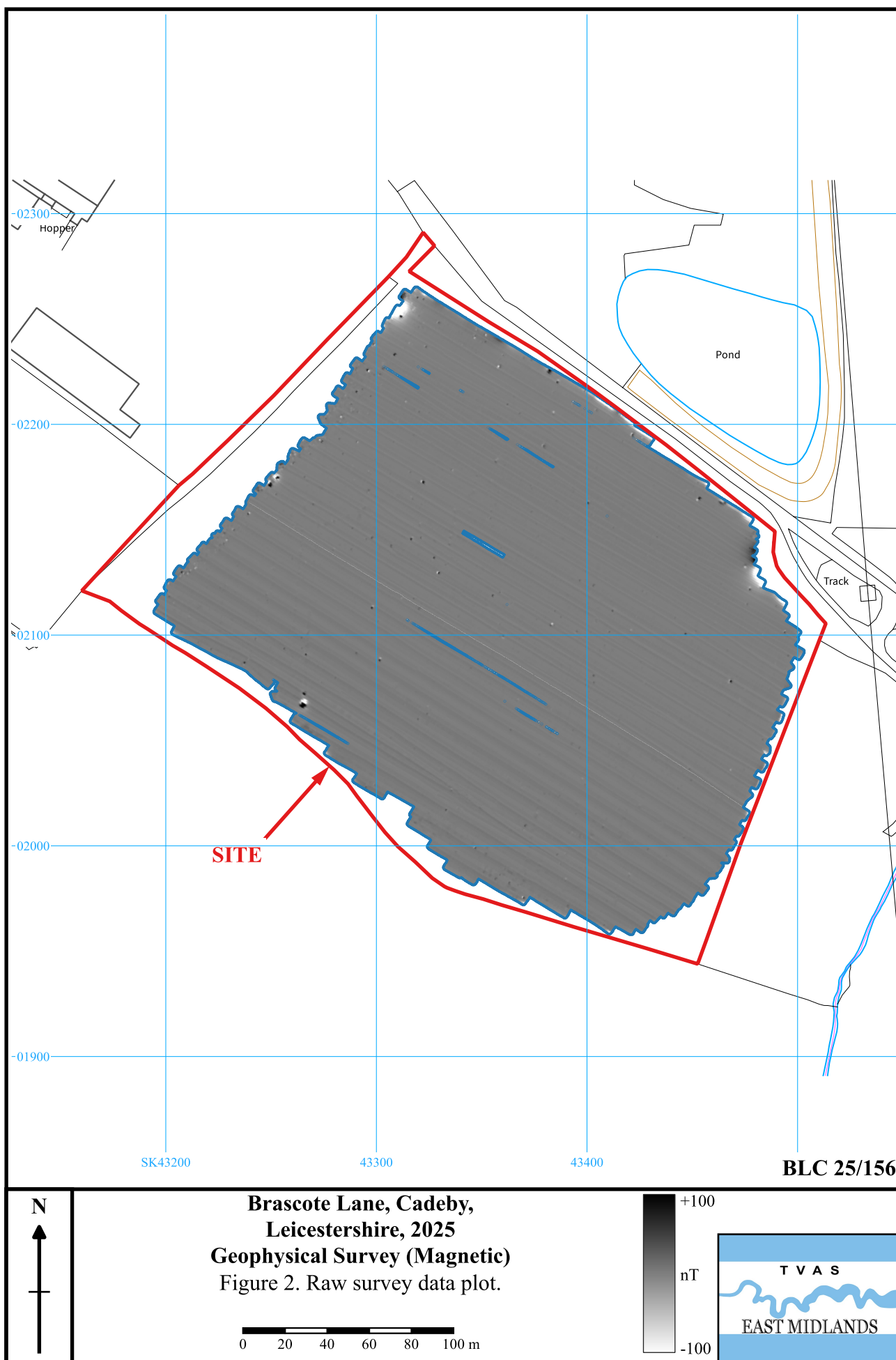
SelectSD 0.00

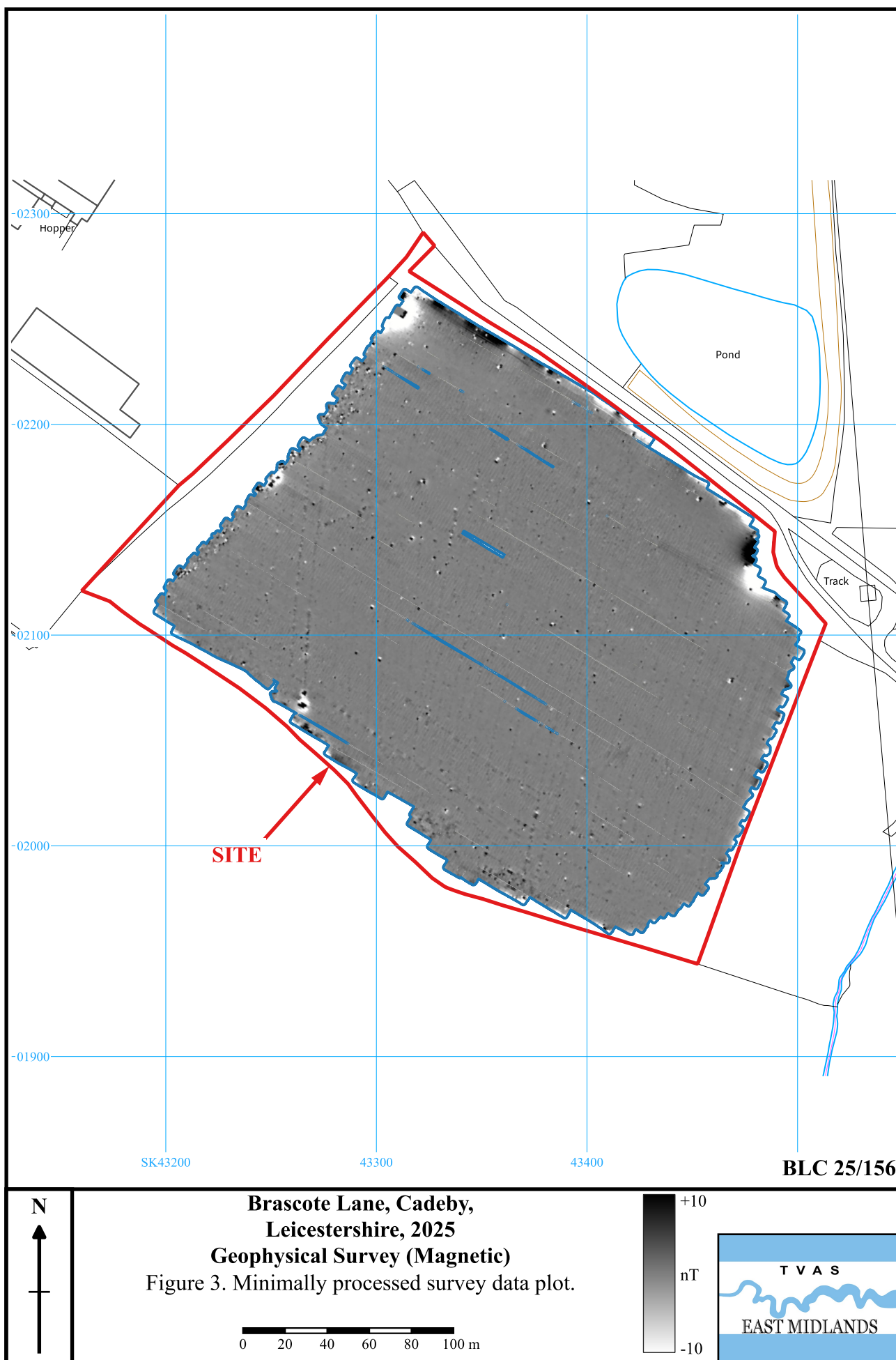


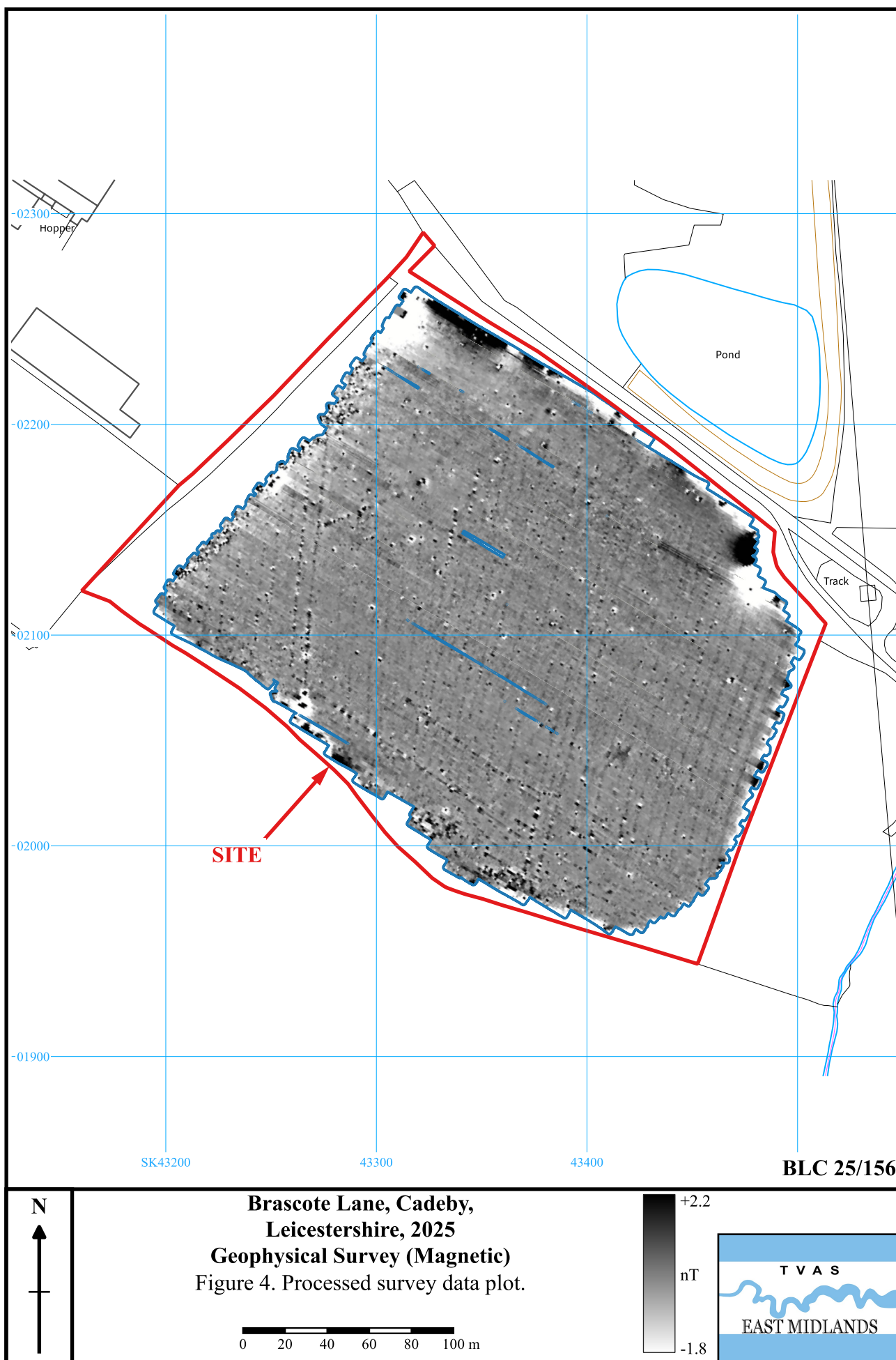
**Brascote Lane, Cadeby,
Leicestershire, 2025
Geophysical Survey (Magnetic)**
Figure 1. Location of site within Cadeby and Leicestershire.

Reproduced under licence from Ordnance Survey Explorer Digital mapping at 1:12500
Crown Copyright reserved









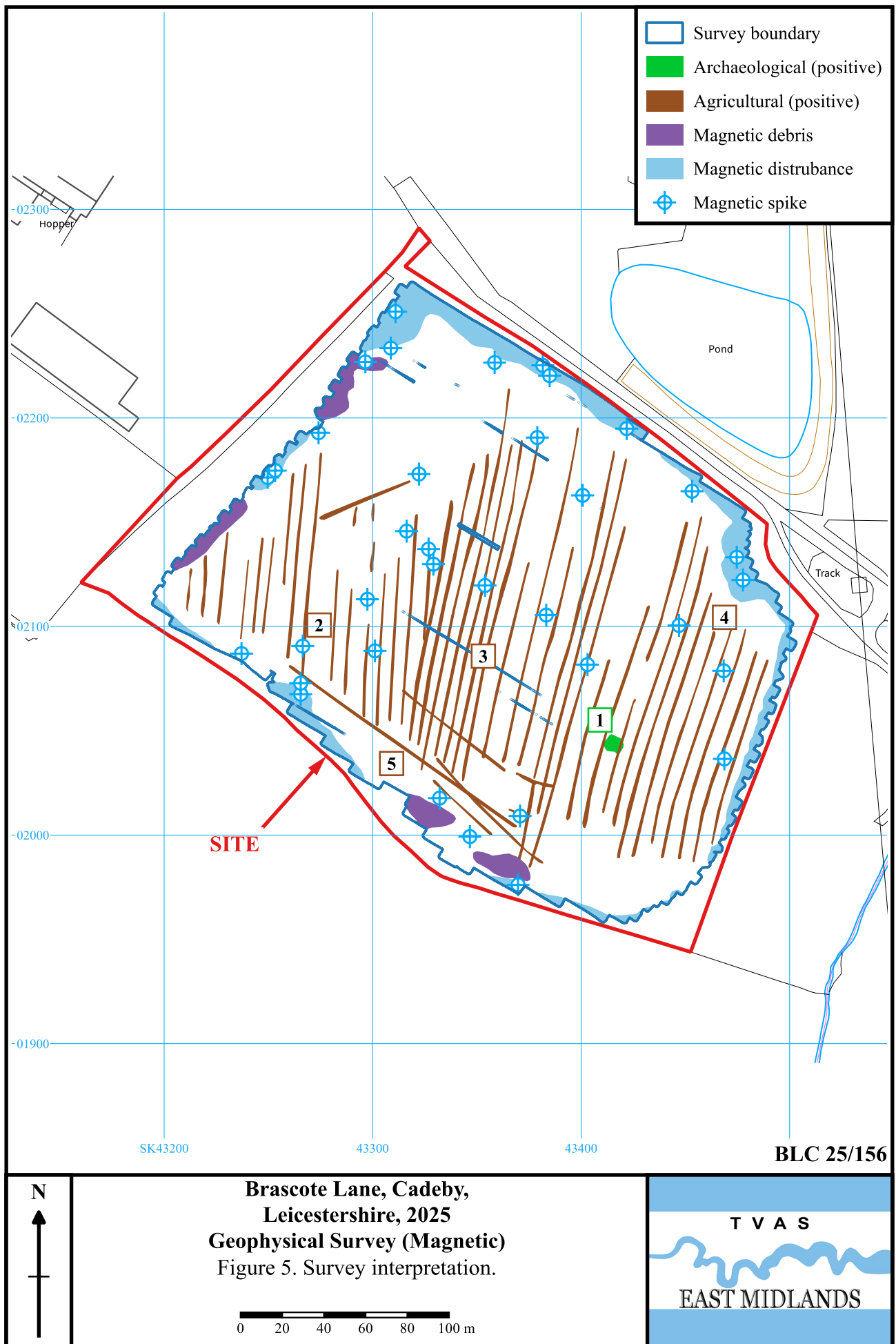




Plate 1. East of the survey area looking north-west from the north-east.



Plate 2. Centre of the survey area looking west from the north-east.



Plate 3. South-west of the survey area looking south from the north.



Plate 4. West of the survey area looking north-west from the south-east.

BLC 25/156

**Brascote Lane, Cadeby,
Leicestershire, 2025
Geophysical Survey (magnetic)
Plates 1 - 4.**

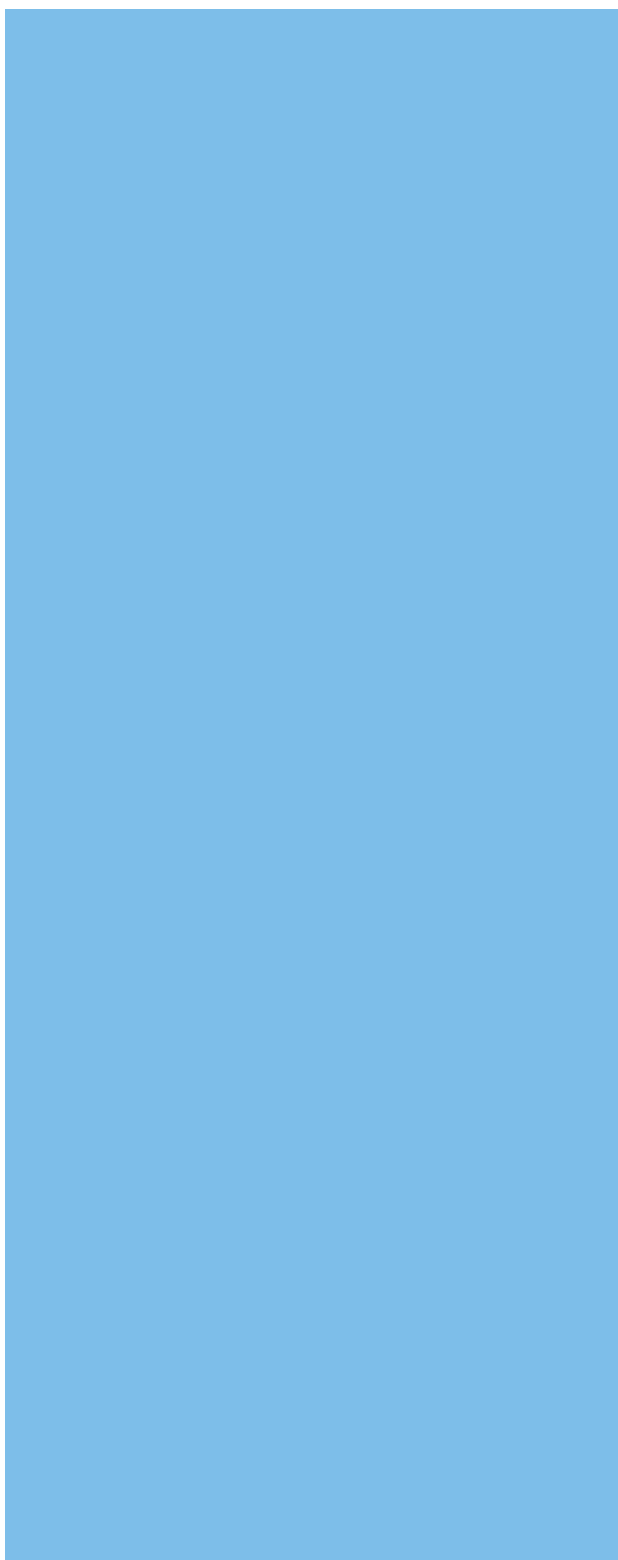
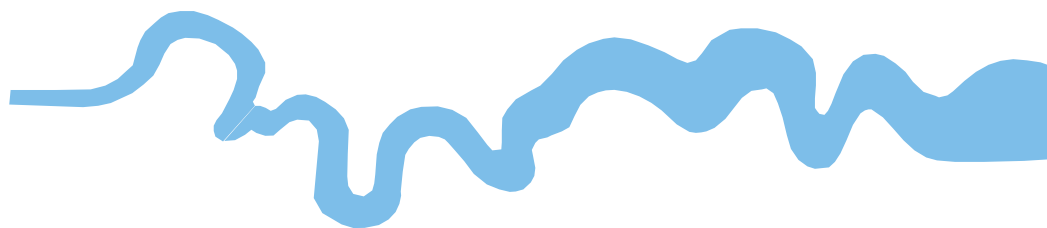


TIME CHART

Calendar Years

Modern _____	AD 1901
Victorian _____	AD 1837
Post Medieval _____	AD 1500
Medieval _____	AD 1066
Saxon _____	AD 410
Roman _____	AD 43
	AD 0 BC
Iron Age _____	750 BC
Bronze Age: Late _____	1300 BC
Bronze Age: Middle _____	1700 BC
Bronze Age: Early _____	2100 BC
Neolithic: Late	3300 BC
Neolithic: Early	4300 BC
Mesolithic: Late	6000 BC
Mesolithic: Early	10000 BC
Palaeolithic: Upper	30000 BC
Palaeolithic: Middle	70000 BC
Palaeolithic: Lower	2,000,000 BC





**TVAS (East Midlands),
4 Bentley Court, Wellingborough
Northamptonshire, NN8 4BQ**

**Tel: 01933 277 377
Email: eastmidlands@tvas.co.uk
Web: www.tvas.co.uk/eastmidlands**

***Offices in:
Reading, Brighton, Taunton and Stoke-on-Trent***