

**T H A M E S      V A L L E Y**

**ARCHAEOLOGICAL**

**S E R V I C E S**

**Coley Farm, Stoney Lane, Newbury,  
West Berkshire**

**Geophysical Survey (Magnetic)**

**by Kyle Beaverstock**

**Site Code: CFN15/284**

**(SU 4874 6850)**

**Coley Farm, Stoney Lane, Newbury,  
West Berkshire**

**Geophysical Survey (Magnetic) Report**

**For Donnington New Homes**

by Kyle Beaverstock

Thames Valley Archaeological Services Ltd

Site Code CFN 15/284

**June 2021**

## Summary

**Site name:** Coley Farm, Stoney Lane, Newbury, West Berkshire

**Grid reference:** SU 4874 6850

**Site activity:** Magnetometer survey

**Date and duration of project:** 19<sup>th</sup> May 2021

**Project coordinator:** Tim Dawson

**Site supervisor:** Kyle Beaverstock

**Site code:** CFN 15/284

**Area of site:** c. 3.5ha

**Summary of results:** No magnetic anomalies of potential archaeological interest were identified by the geophysical survey.

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

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Report edited/checked by: Steve Ford✓ 9.6.21 Tim Dawson✓ 14.6.21
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# Coley Farm, Stoney Lane, Newbury, West Berkshire A Geophysical Survey (Magnetic)

by Kyle Beaverstock

Report 21/139

## Introduction

This report documents the results of a geophysical survey (magnetic) carried out at Coley Farm, Stoney Lane, Newbury (SU 4874 6850) (Fig. 1). The work was commissioned by Nicholas Calkin on behalf of Donnington New Homes, New Warren Farm, Warren Road, Newbury, Berkshire, RG14 6NH.

A planning application (20/00604/FULEXT) has been made to West Berkshire Council for the development of a parcel of a 3.5ha parcel of land for housing at Coley Farm, Stoney Lane. A geophysical survey has been requested in order to inform the application. This is in accordance with the *National Planning Policy Framework* (NPPF 2019), and the County's policies on archaeology. The field investigation was carried out to a specification approved by Sarah Orr, Senior Archaeologist for West Berkshire Council. The fieldwork was undertaken by Kyle Beaverstock and Luciano Cicu on the 19<sup>th</sup> May 2021 and the site code is CFN 15/284.

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

## Location, topography and geology

The site is located on the northern edge of Newbury, bounded by Stoney Lane to the west, farmland to the north and east and residential properties to the south (Fig. 1). It consists of an irregular plot of land, currently in use as horse paddocks with buildings along the site's western edge and an overgrown area along the northern and southern boundaries (pl. 1-4). The topography generally slopes from c.113m above Ordinance Datum (aOD) in the west down to c.99m aOD in the east with a gully running west to east down the centre of the site. The underlying geology is stated as London Clay Formation (BGS 2006).

## Site history and archaeological background

The archaeological potential of the site has been highlighted in a desk-based assessment (Birmingham 2016). In summary, this potential stems from its location on the flanks of the archaeologically rich Kennet Valley. There are no archaeological sites already recorded on the site but several prehistoric and Roman sites are recorded to

the south and south-east (Pine 2010; Simmonds 2008) with an extensive Bronze Age/Iron Age site located on the valley margins at Harts Hill to the east (Collard et al 2006). The tertiary geological outcrops on the valley side have been used for early Iron Age iron production as at Dunstons Park (Fitzpatrick, 2011). The site may have potential for evidence relating to the Civil War (the Second Battle of Newbury), with the site of the Parliamentary camp thought to be nearby.

## **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 0.25m 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 south-west to north-east orientation across the survey area. The far west of the site was occupied by buildings and vehicles, along the north the area was overgrown as well as a small area in the north-west of the surveyed area, conditions were dry and bright.

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, 2014).

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 Geo 7x centimetre edition GPS. Readings were collected by two Bartington Grad601-2 loggers and collated using MLgrad601 software on a Linx 12x64 tablet running Windows 10 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 Geo7x 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 TerraSurveyor 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.

<b>Process</b>	<b>Effect</b>
Clip from -3.00 to 3.00 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	Cancel 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 second figure (Fig. 3), followed by a third plan to present the abstraction and interpretation of the magnetic anomalies (Fig. 4). Anomalies are shown as colour-coded lines, points and polygons.

The greyscale plot of the processed data is exported from TerraSurveyor 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 2.18.15 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.

## **Results**

Results from the survey (Figs. 2 and 3) show a number of magnetic anomalies consisting of a few areas of magnetic disturbance, represented by bipolar positive and negative responses with a high amplitude (Fig. 4). These are from areas around the edge of the survey area and are most likely caused by ferrous material in the surrounding fencing. In the south-west of the site is an area of magnetic debris, this is represented by positive and negative responses of a high amplitude over an area. In this area anecdotal evidence pointed to the area being built up during construction of the buildings in the north of the site and the results suggest that the area is mostly made ground. This may be masking any weaker anomalies caused by possible buried archaeological features in this area. To the east of this is a smaller area of magnetic debris which was likely caused by the remains of a trough. Across the remainder of the site are a number of magnetic spikes, these are represented by points of positive and negative responses of a high amplitude and were most likely caused by buried ferrous objects. There was also a slight but indistinct shadow of a positive anomaly running east-west down the centre of the site which corresponds with the gully and shows the possible presence of colluvium in this area.

## **Conclusion**

The geophysical survey successfully recorded data from the majority of the site and although the survey showed an area of made ground in the south-west of the site no magnetic anomalies suggesting the presence of buried archaeological features were identified.

## **References**

- Birmingham, N, 2016, Coley Farm, Stoney Lane, Newbury, West Berkshire an archaeological desk-based assessment, Thames Valley Archaeological Services report 15/284, Reading
- BGS, 2006, *British Geological Survey*, 1:50,000, Sheet 267, Bedrock and Superficial Edition, Keyworth
- CI/A, 2014, 'Standard and Guidance for archaeological geophysical survey', Reading

- Collard, M, Darvill, T and Watts, M, 2006, 'Ironworking in the Bronze Age? Evidence from a 10th century BC settlement at Hartshill Copse, Upper Bucklebury, West Berkshire', *Proc Prehist Soc* **72**, 367–421
- EAC, 2015, *EAC Guidelines for the use of Geophysics in Archaeology: Questions to Ask and Points to Consider*, EAC Guidelines 2, Namur
- Fitzpatrick, A, 2011, 'Early Iron Age ironworking and the 18th century house and park at Dunston Park, Thatcham, Berkshire: archaeological observations 1993–9', *Berkshire Archaeol J* **80**, 81–112
- IFA, 2002, 'The Use of Geophysical Techniques in Archaeological Evaluation', IFA Paper No. 6, Reading
- NPPF, 2019, *National Planning Policy Framework (revised)*, Ministry for Housing, Communities and Local Government, London
- Pine, J, 2010a, 'A Late Bronze Age burnt mound and other prehistoric features, and Roman occupation at Turnpike School, Gaywood Drive, Newbury', in J Pine, *Archaeological investigations along the Line of Ermin Street, in West Berkshire, 1992–2008, Exploring Prehistoric, Roman and medieval settlement*, TVAS Monograph **12**, Reading, 1–17
- Simmonds, A, 2008, 'The excavation of a 1st century AD field system and associated cremation burials at the community hospital, Newbury, West Berkshire', *Berkshire Archaeol J* **77**, 17–33



## Appendix 1. Survey and data information

### Programme:

Name: TerraSurveyor  
Version: 3.0.25.0

### Raw data

Filename: Coley Farm RAW.xcp  
Instrument Type: MLgrad Import  
Units:  
UTM Zone: 30  
Survey corner coordinates (X/Y):  
Northwest corner: 448600.006245613, 168573.181160096 m  
Southeast corner: 448845.056245613, 168410.421160096 m  
Direction of 1st Traverse: 90 deg  
Collection Method: Parallel  
Sensors: 2 @ 1 m spacing.  
Dummy Value: 32702

### Dimensions

Survey Size (meters): 245 m x 163 m  
X&Y Interval: 0.13 m  
Source GPS Points: Active: 64383, Recorded: 64383

### Stats

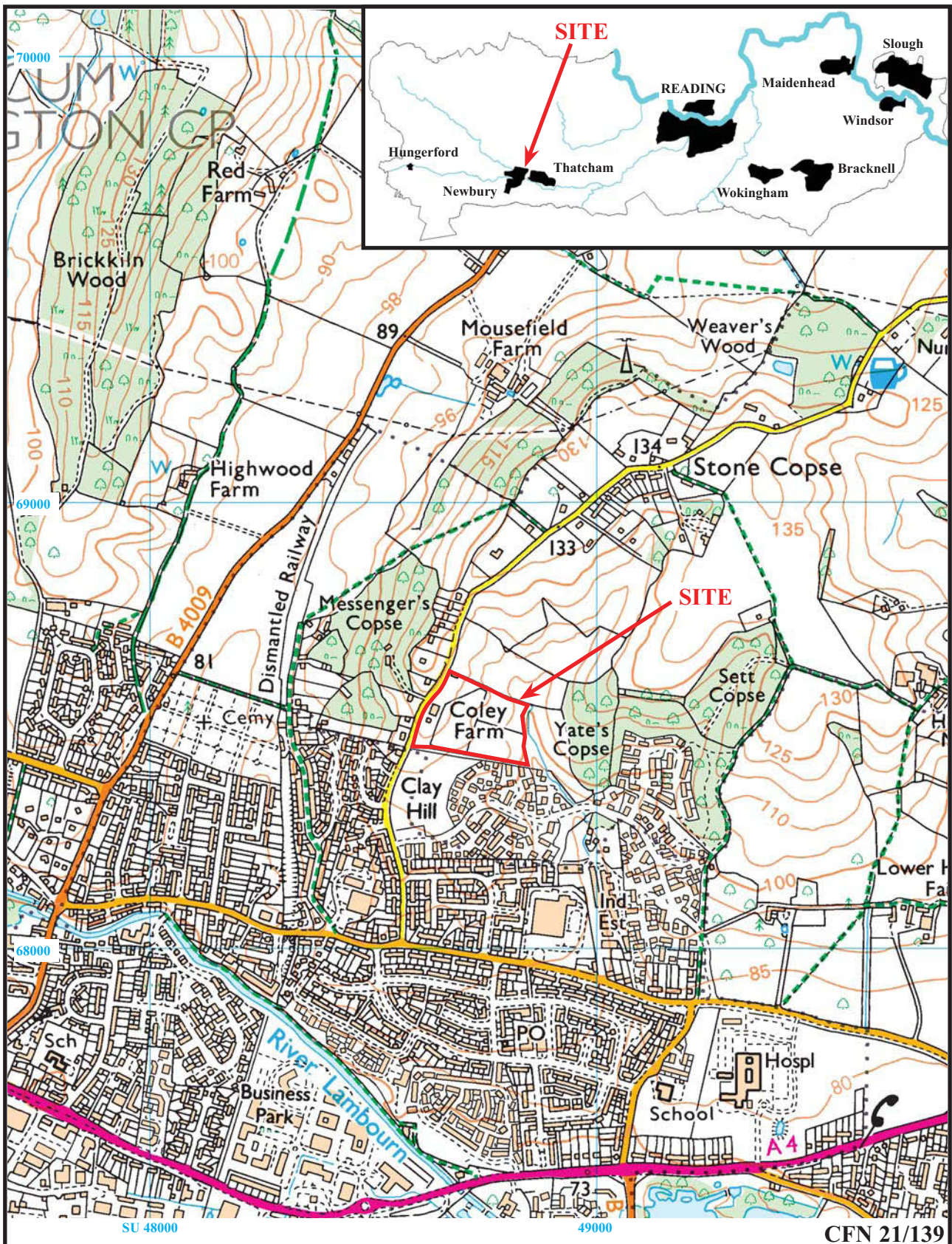
Max: 96.50  
Min: -99.90  
Std Dev: 9.58  
Mean: -0.52  
Median: 0.38  
Composite Area: 3.9884 ha  
Surveyed Area: 2.1508 ha

### Processed data

Filename: Coley Farm.xcp  
Stats  
Max: 3.00  
Min: -3.00  
Std Dev: 1.05  
Mean: 0.03  
Median: 0.00  
Composite Area: 3.9884 ha  
Surveyed Area: 2.1508 ha

### GPS based Process

- 1 Base Layer.
- 2 Unit Conversion Layer (Lat/Long to UTM).
- 3 DeStripe Median Traverse:
- 4 Clip at 1.00 SD
- 5 Clip from -3.00 to 3.00



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West Berkshire, 2021  
Geophysical Survey (Magnetic)**

Figure 1. Location of site within Newbury and Berkshire.

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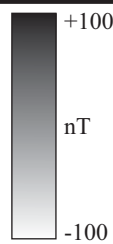
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Figure 2. Plot of raw gradiometer data.





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Figure 3. Plot of processed gradiometer data.

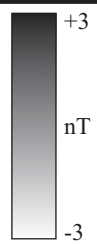






Plate 1. North west corner of survey area showing built up area around garden looking west



Plate 2. Northern edge of site showing built up area and buildings looking east



Plate 3. Eastern edge of site showing overgrown area on eastern edge looking south



Plate 4. Southern and western part of survey area looking north east

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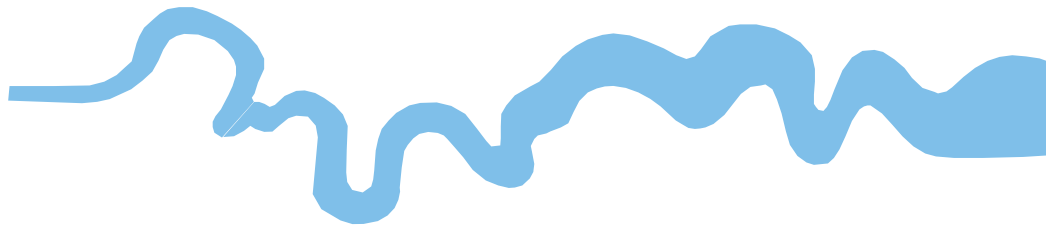
**Coley Farm, Stoney Lane, Newbury,  
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Plates 1 to 4.**

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## 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





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