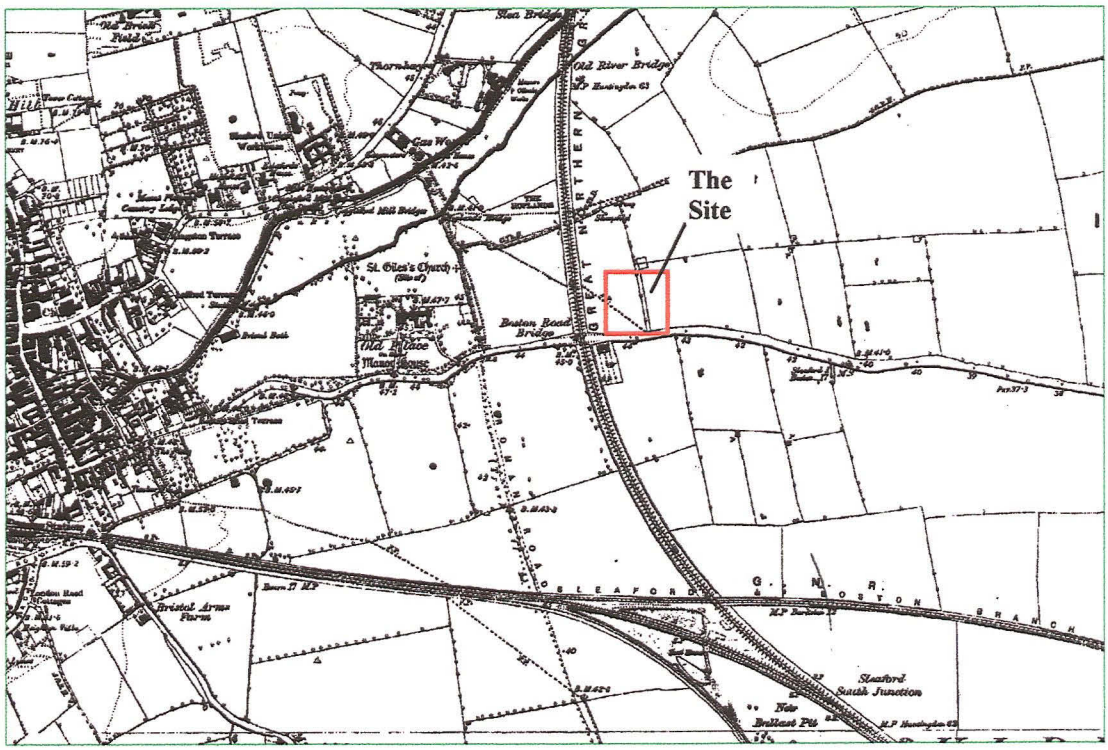
FLUXGATE GRADIOMETER SURVEY:
BOSTON ROAD, SLEAFORD
LINCOLNSHIRE



REPORT PREPARED FOR LAS

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EVENT L15661 INTERVENTION L19834 PRN 60590

Contents

Illustrations

Front cover: 1st Edition O.S map (1891).

pre-construct geophysics

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Summary

- *A fluxgate gradiometer survey was undertaken on land immediately to the north of Boston Road, Sleaford, Lincolnshire.*

- *Evidence from cropmarks, and the reported finds of metal detectorists, indicate the presence of late prehistoric/Romano-British settlement remains on the site.*

- *The gradiometer survey has identified a number of magnetic anomalies, many of which appear to indicate traces of tracks, enclosures and pits/burnt materials. These results appear to corroborate with the previously recorded cropmark evidence.*

- *Elements of the more significant anomalies detected have been masked or obliterated by a 19th century track.*

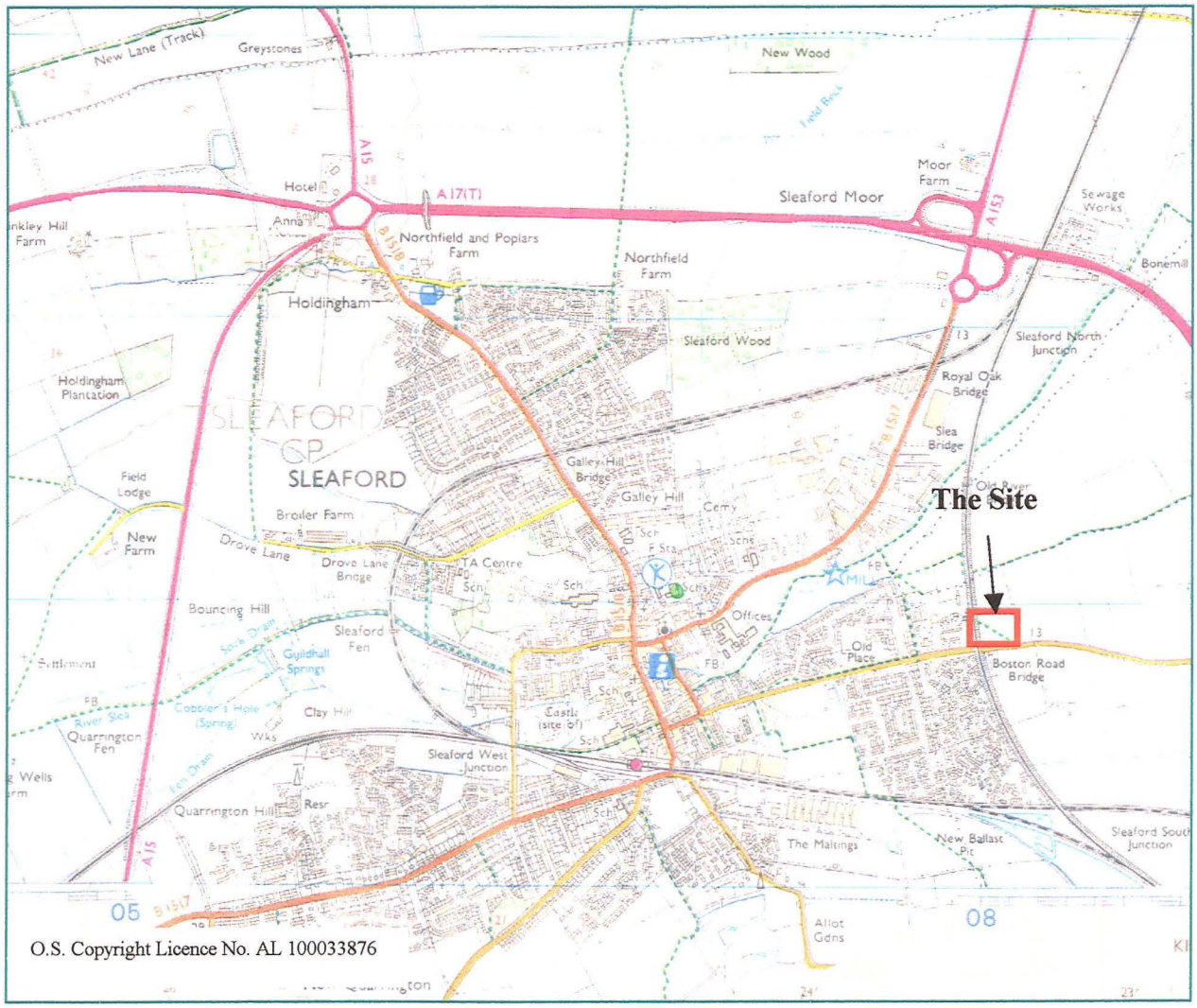


Fig.1: Location of site 1:25,0000

1.0 Introduction

Lindsey Archaeological Services (LAS), acting on behalf of Berkes Green, commissioned Pre-Construct Geophysics to undertake a fluxgate gradiometer survey on land north of Boston Road, Sleaford. This work was carried out as part of an archaeological assessment, in advance of an anticipated planning application for the development of a sports recreation ground, including football pitches, a bowling green, car parking, a pavilion, and associated infrastructure.

The survey methodology was based upon guidelines set out in the English Heritage document *'Geophysical Survey in Archaeological Field Evaluation'* (David, 1995).

2.0 Location and description (Figs 1-2)

The site is located on the eastern edge of Sleaford, north of Boston Road and east of the railway line. The application area covers a total of 6ha, and is currently under arable cultivation.

The solid geology of the area comprises carboniferous limestone, which is overlain by fen sands and gravels (BGS 1972). The magnetic response to these types of geologies is generally good to variable (Clark 1990, 92).

3.0 Archaeological and historical background

Sleaford is one of the major settlements of the late Iron Age in the East Midlands. Aerial photographs of the area to the north of Boston Road, taken in 1995, revealed extensive cropmarks which appear to represent a complex of rectangular enclosures aligned along an organised system of tracks or roads.

Intensive metal detecting over many years within the same area has resulted in the recovery of very large numbers of finds, mainly coins and brooches. The majority date to the Roman period, but rare gold staters of the Iron Age Corieltauvi tribe have also been reported. No previous systematic archaeological investigation has taken place in this area. Therefore, the extent, nature and condition of any surviving deposits are unknown.

On the east side of the town, substantial traces of Iron Age settlement activity have been identified. Excavations to the south of Boston Road in 1990 identified part of a substantial Middle Iron Age palisaded enclosure, so far paralleled only by a structure at Thetford in Norfolk (Elsdon, 1997).

To the north of Boston Road, a later Iron Age site of international significance has been investigated. The site at Old Place, to the west of the railway line, has been subject to a number of archaeological excavations, commencing in the 1960's. These various phases of work have exposed a major settlement and associated agricultural enclosures, lying at the point where the prehistoric route of Mareham Lane crosses the River Slea. Most importantly, this site yielded large numbers of coin pellet moulds and crucible fragments, suggesting the presence of a late Iron Age mint. The material

from this site represents the largest such collection from Iron Age Europe and, combined with the abundance of high quality local pottery and imported fine wares, suggests that the site was on a par with the major Corieltauvi settlements at Lincoln and Leicester (Elsdon, 1997).

Settlement evidence at Old Place continued into the Romano-British period, with the construction of corn driers, agricultural buildings and a well-appointed two storey stone built residence, possibly that of a wealthy landowner with commercial interests in the nearby fenland. Several infants had been buried in the area of this building, perhaps as foundation burials, and a number of adult burials were found in farmland to the west of the building, close to boundary ditches dividing the landscape into a series of agricultural enclosures, and representing a population of lower social standing than the inhabitant of the stone structure. The former prehistoric route of Mareham Lane was metalled for several hundred metres where it passed through the settlement, and was connected to the outlying farmland by a number of small trackways (Clay, 1998).

4.0 Methodology

Gradiometry is a non-intrusive scientific prospecting technique that is used to determine the presence/absence of some classes of sub-surface archaeological features (eg pits, ditches, kilns, and occasionally stone walls). By scanning the soil surface, geophysicists identify areas of varying magnetic susceptibility and can interpret such variation by presenting data in various graphical formats and identifying images that share morphological affinities with diagnostic archaeological remains.

The use of gradiometry is used to establish the presence/absence of buried magnetic anomalies, which may reflect sub-surface archaeological features.

The area survey was conducted using a Bartington Grad 601 dual fluxgate gradiometer with DL601 data logger set to take 4 readings per metre (a sample interval of 0.25m). The zigzag traverse method of survey was used, with 1m wide traverses across 30m x 30m grids. The sensitivity of the machine was set to detect magnetic variation in the order of 0.1 nanoTesla.

The data was processed using *ArcheoSurveyor 28.4.0*. It was clipped to reduce the distorting effect of extremely high or low readings caused by discrete pieces of ferrous metal on the site. The results are plotted as greyscale and trace images.

Fig.2: Location of survey superimposed over proposed development with known cropmarks, shown as green.

1:1000

Instrument	Bartington Grad-601
Grid size	30m x30m
Sample interval	0.25
Traverse interval	1.0m
Traverse method	Zigzag
Sensitivity	0.1nT
Processing software	ArcheoSurveyor 28.4.0
Weather conditions	Fair
Area surveyed	c.1ha
Date of survey	15/07/04
Survey personnel	Peter Masters
Central National Grid Reference	TF 082 460

Table 1: Summary of survey parameters

5.0 Analysis and Interpretation of Results (Figs. 2-3)

The survey results indicate the presence of a series of linear and curvilinear anomalies that appear to reflect a complex of tracks and enclosures associated with Late Iron Age and/or Romano-British settlement remains. Other zones of magnetic variation probably reflect natural and modern features: a zone of strong magnetic variation in the southwest corner of the survey area reflects the close proximity of a wire mesh fence (circled in pink).

The survey recorded a broad dipolar linear anomaly (boxed in pink) that extends across the mid point of the survey from north to south. This almost certainly represents the ploughed out and scattered remains of a former track, as depicted on the First Edition Ordnance Survey Map (dated 1891, see cover); brick rubble, limestone blocks and tile were observed during the survey. This feature is probably masking underlying earlier archaeological remains.

A series of diffuse and north to south-aligned parallel linear anomalies (shown as orange) may indicate modern plough marks.

A broad zone of anomalous readings (outlined in yellow) does not clearly resolve as archaeological activity, and it is possible that it represents a natural feature, such as an extensive deposit of silt/sand.

The survey results complement the cropmark evidence, confirming that former tracks and related enclosed features lie within the site. These anomalies (shown as red) probably indicate flanking ditches of tracks, some of which also form enclosure boundaries. Towards the west of the survey area, at least one junction may have been detected: others may indicate sub-enclosure ditches (shown as red dashed lines).

A number of discrete and predominately positive anomalies were detected (examples circled in red). These could indicate pits and/or areas of burning.

6.0 Conclusions

The survey has undoubtedly detected archaeological remains associated with a larger Late Iron Age/ Roman-British settlement. The results, which largely complement cropmark evidence, indicate traces of former tracks, enclosures and related discrete features, such as pits and burnt materials.

A 19th century trackway was detected, the rubble remains of which have diminished the magnetic resolution of underlying archaeological features.

7.0 Acknowledgements

Pre-Construct Geophysics would like to thank Lindsey Archaeological Services for this commission.

8.0 References

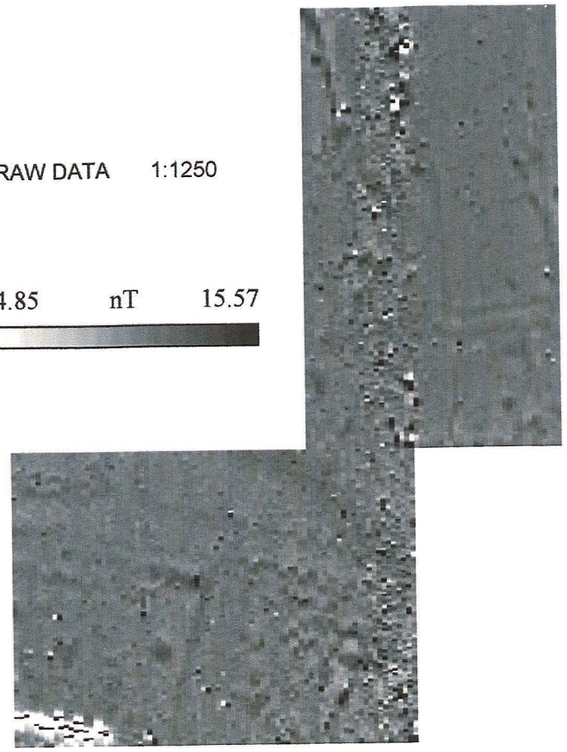
BGS 1972 *Sheet 127*, Grantham Solid and Drift edition 1:50,000 series.

Clark, A. J. 1990 *Seeing beneath the soil.* London, Batsford.

David, A. 1995 Research & Professional Services Guidelines No 1: *Geophysical Survey in Archaeological Field Evaluation. London*

Clay C., 1998, *Roman Sleaford: A reassessment of the settlement and its environs based on the 1997 Sleaford Police Station excavations*, MA dissertation, School of Archaeological Studies, University of Leicester, Leicester.

Elsdon S.M, 1997, *Old Sleaford Revealed. A Lincolnshire settlement in Iron Age, Roman, Saxon and medieval times: excavations 1882-1995*, Oxbow Monograph 91, Nottingham Studies in Archaeology 2, Oxbow Books, Oxford



RAW DATA 1:1250

- 204.85 nT 15.57

60m

N

TRACE PLOT
OF UNCLIPPED DATA

1:1250

100nT

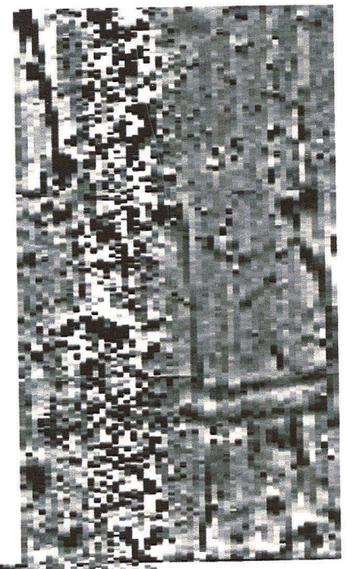
?NATURAL

MODERN FERROUS
(OVER ARCHAEOLOGICAL
FEATURES)

?MODERN CULTIVATION

DITCH

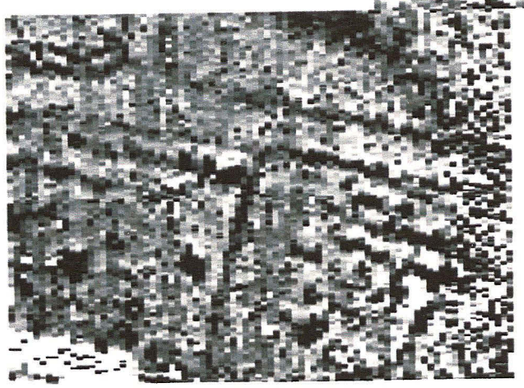
PIT/BURNT MATERIAL



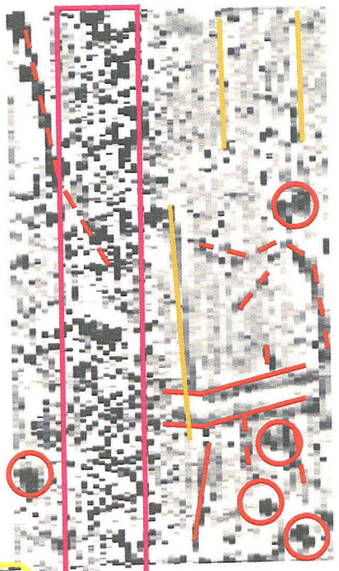
GREYSCALE IMAGE
OF ENHANCED
DATA

1:1000

- 5 nT 5



60m



INTERPRETIVE
IMAGE

1:1000

Fig 3: Greyscale and trace plots of raw and enhanced data with interpretive plan , scale - 1:1000/1250