Borough Council of
King's Lynn &
West Norfolk

Borough Council of King's Lynn and West Norfolk's Response to the Issues and Questions raised by Inspector David Hogger in relation to the King's Lynn and West Norfolk Local Plan: Site Allocations and Development Management Policies

Issue 22: Great Massingham (G.43)

Examination
June 2015

Table of abbreviations used with the Council's Statements

Abbreviation	Full Wording
AONB	Area of Outstanding Natural Beauty
BCKLWN	Borough Council of King's Lynn and West Norfolk
BDC	Breckland District Council
CLG	Communities and Local Government
CITB	Construction Industry Training Board
CS	Core Strategy
DM	Development Management
DPD	Development Plan Document
EA	Environment Agency
FDC	Fenland District Council
FRA	Flood Risk Assessment
GI	Green Infrastructure
GTANA	Gypsy and Traveller Accommodation Needs Assessment
ha	Hectare
HELAA	Housing and Economic Land Availability Assessment
HLF	Heritage Lottery Fund
HRA	Habitats Regulation Assessment
HSEHA	Health and Safety Executive Hazard Areas
IDB	Internal Drainage Board
KRSC	Key Rural Service Centres
KLATS	King's Lynn Area Transportation Strategy
LDS	Local Development Scheme
LLFA	Lead Local Flood Authority
LPSO	Local Plan Sustainability Objectives
NCC	Norfolk County Council
NE	Natural England
NP	Neighbourhood Plan
NPPF	National Planning Policy Framework
NORA	The Nar Ouse Regeneration Area
NWT	Norfolk Wildlife Trust
OAN	Objectively Assessed Need
PPG	Planning Practice Guidance
PPTS	Planning Policy for Traveller Sites
RV	Rural Village
RAF	Royal Air Force
RLA	Residential Land Assessment
SA	Sustainability Appraisal
SAC	Special Area of Conservation
SADMP	Site Allocation and Development Management Policies Plan
SCI	Statement of Community Involvement
SEA	Strategic Environmental Assessment
SFRA	Strategic Flood Risk Assessment
SHMA	Strategic Housing Market Assessment
SHLAA	Strategic Housing Land Availability Assessment
SMP	Shoreline Management Plan
SPA	Special Protection Area
SSF	Site Sustainability Factors
SSSI	Site of Special Scientific Interest
SuDs	Sustainable Drainage systems
SVAH	Smaller Villages and Hamlets
SWMP	Surface Water Management Plan
THI	Townscape Heritage Initiative
UPC	Un -attributable Population Change

22.1:
Is there evidence that any elements of the proposed development south of Walcups Lane (G43.1) are not justified, sustainable, viable, available or deliverable? If such evidence exists what alternatives are available and have they been satisfactorily considered by the Council?

1. Introduction

1.1. The Councils Sustainability Appraisal demonstrates that of all proposed options site G43.1 Land south of Walcup's Lane is considered the most sustainable option for development in Great Massingham out of all sites submitted for consideration. This is further explained in the supporting text accompanying the proposed policy G43.1.

1.2. The Deliverability Form prepared by the landowner dated 7/5/14 states that the land is vacant, available now and deliverable within the first 5 years of the plan period to 2026.

1.3. It is noted that there are representations about heritage and ecological issues made during the pre-submission consultation. These will be considered in turn.

2. Heritage Issues

2.1. The representation submitted by Historic England (Mr Tom Gilbert-Wooldridge ID: 56252) during the Pre- Submission consultation indicates that the site may not be deliverable due to the need to retain archaeological features in situ on the site. It also states that the site should not have been selected over alternative options based on the potential harm to the Conservation Area and adjacent Listed and historic buildings.

2.2. The landowner has since commissioned a Geophysical survey (Appendix 1) which revealed three probable wall foundations, at least one of which is thought to be of modern date, a pond backfilled in the 20th century and an area of possible ridge and furrow. The survey area was covered in modern demolition rubble that hampered identification of further features. The survey concludes that none of the structural features can be readily identified as belonging to a medieval priory. Notwithstanding this, the policy wording requires a full archaeological assessment to be submitted prior to any development. The Council has not been presented with any evidence that would undermine or contradict the findings of the geophysical survey and therefore considers the site to be deliverable on this basis.

2.3. The site is immediately adjacent to Great Massingham Conservation Area. Views from within the Conservation Area towards the site are largely shielded from view by an established copse of trees, shrubs and vegetation. The site boundary was deliberately altered following the Preferred Options consultation to exclude this copse which the landowner indicated would not be developed and is within the Conservation Area. Therefore the site will remain largely shielded from the central, more open area of the village and from the Conservation Area

2.4. Views towards the Conservation Area from Walcups Lane would be seen in conjunction with modern development on the east of Walcups Lane. The policy wording would demand a much higher quality development than the existing surrounding residential development. The Council considers that a Heritage Asset Statement accompanying the planning application, as detailed in the policy wording, would ensure that the setting of the Conservation Area would be preserved and enhanced.

2.5. In consideration of evidence submitted by Historic England, the Council considers that this is not sufficient to suggest that development cannot be delivered.

3. Ecological Issues

3.1. The representation submitted by Annie Ricketts (ID 00681) indicates the new development would lead to the fragmentation of toad migration routes between breeding ponds and terrestrial habitats and therefore lead to a reduction in the toad population contrary to clauses contained in the NPPF to protect biodiversity.

3.2. As previously stated, the Council moved the boundary of the site to remove a significant copse of trees, shrubs and vegetation adjacent to the pond which provides a habitat for species dependant on the pond. However, this would not address the issue of migratory routes between the pond and fields, which would need to be a consideration as part of the design process of any proposed development

3.3. In light of this evidence, the Council acknowledges that it is necessary to fully understand the ecological issues prior to development and proposes a modification as detailed below

4. Comparison of the alternative options

4.1. The Councils Sustainability Appraisal details the consideration of all alternative options and the reasons why these were not considered the most sustainable option for development. All sites in Great Massingham have identified constraints due to the nature of the settlement picturesque landscape, ecological and heritage sensitivity, rural highway network, isolated position) and that in the interest of delivering development in a Key Rural Service Centre the Council have chosen the least constrained and most sustainable option for development.

5. Proposed Modifications

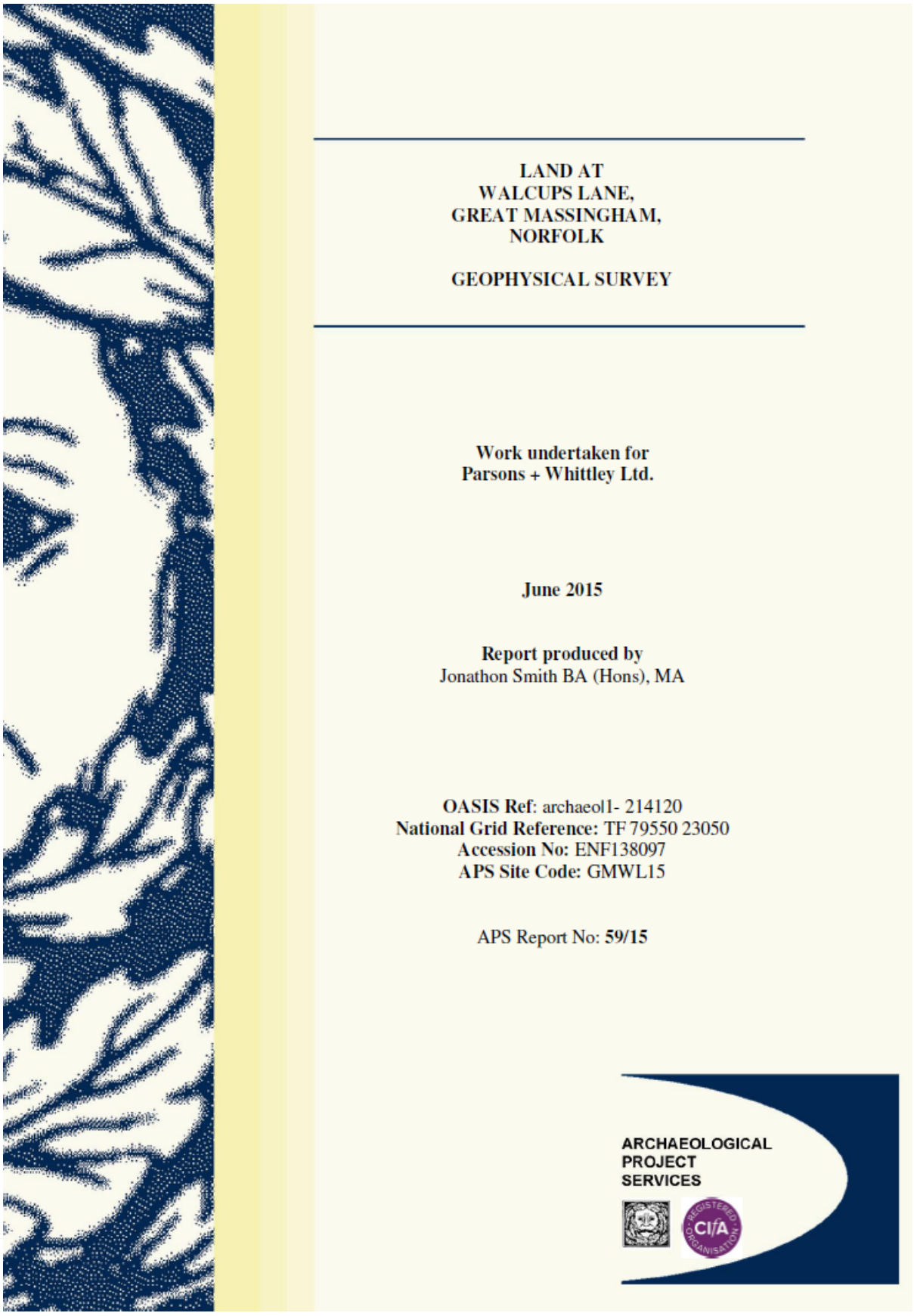
5.1. The Council proposed a further clause to Policy G.42 in order to address outstanding ecological issues and ensure the Plan is found sound

- 9. Submission of an Ecological Study that establishes that either:
  - i. There would be no negative impact on flora and fauna; Or, if any negative impacts are identified, establishes that:
  - ii. These negative impacts could be suitably mitigated against;

6. Conclusion

6.1. The Council considers that the proposed residential development site in Great Massingham is justified, sustainable, viable, and available or deliverable but that an additional point in the policy could address identified ecological issues.

Appendix 1



LAND AT
WALCUPS LANE,
GREAT MASSINGHAM,
NORFOLK

GEOPHYSICAL SURVEY

Work undertaken for
Parsons + Whittley Ltd.

June 2015

Report produced by
Jonathon Smith BA (Hons), MA

OASIS Ref: archaeol1- 214120
National Grid Reference: TF 79550 23050
Accession No: ENF138097
APS Site Code: GMWL15

APS Report No: 59/15

ARCHAEOLOGICAL
PROJECT
SERVICES

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1. SUMMARY

Detailed magnetic gradiometer surveys and a resistance survey were undertaken in connection with proposed development on land at Walcups Lane, Great Massingham. The survey totalled c. 1.1ha.

The site is thought to be in the locality of a medieval priory. The survey revealed three probable wall foundations, at least one of which is thought to be of modern date, a pond backfilled in the 20th century and an area of possible ridge and furrow. The survey area was covered in modern demolition rubble that hampered identification of further features.

2. INTRODUCTION

2.1 Definition of an Evaluation

Geophysical survey is a non-intrusive method of archaeological evaluation. Evaluation is defined as *'a limited programme of non-intrusive and/or intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site. If such archaeological remains are present Field Evaluation defines their character and extent, quality and preservation, and it enables an assessment of their worth in a local, regional, national or international context as appropriate'* (CIfA 2014a).

2.2 Background

Archaeological Project Services was commissioned by Parsons + Whittley Ltd. Architects to undertake a detailed geophysical survey totalling some 1.1ha on land at Walcups Lane, Great Massingham. This was in advance of proposed development of the area. The survey was carried out between 9th and 17th June 2015.

The site is in the immediate vicinity of the Augustinian Priory of St. Mary and St. Nicholas, dating to the medieval period. Fragments of this building are preserved in Abbey Farmhouse, bordering the site to the south. A map from 1884 shows the site as a sub-divided orchard with a pond. The site is known to have been re-developed in the 20th century.

2.3 Topography and Geology

Great Massingham is 14km north of Swaffham and 18km east of King's Lynn in the borough of King's Lynn and West Norfolk (Fig 1). The site (centred approximately on NGR TF 79550 23050) is located off Walcups Lane, 250m northwest of the centre of Great Massingham (Fig 2). The site is level and sits at about 80m O.D.

The local bedrock is chalk overlain by a drift geology of Lowestoft formation diamicton (BGS 2015). Local soils are of the Barrow association, typically loamy and sandy soils over chalk till (Hodge *et al* 1984).

3. GEOPHYSICAL SURVEY

3.1 Methods

The layout of the survey area is shown in Figure 3. The site was flat and was mechanically cleared of undergrowth, providing good survey conditions. However, some areas around trees could not be cleared and had to be excluded from the survey. The weather was dry and hot throughout the survey.

Survey was undertaken in accordance with English Heritage (2008) and CIfA (2014b) guidelines and codes of conduct.

Magnetometry

The magnetic survey was carried out using a dual sensor Grad601-2 Magnetic Gradiometer manufactured by Bartington

Instruments Ltd. This records subtle changes in the magnetic field resulting from differing features in the soil. Changes as small as 0.2 nanoTesla (nT) in an overall field strength of c. 49,000nT can be accurately detected using this instrumentation, although in practice instrument interference and soil noise can limit sensitivity.

The mapping of anomalies in a systematic manner allows interpretation of the type of material present beneath the surface. Strong magnetic anomalies are generated by buried iron-based objects or by kilns or hearths, usually resulting in a bipolar (positive/negative) response. More subtle positive anomalies representing pits and ditches can be seen where these contain more topsoil which is normally richer in magnetic iron oxides and provides a contrast with the natural subsoil (but this can vary depending on the nature of the underlying deposits). A negative anomaly may result from upcast bank material. Wall foundations can also show as negative anomalies where the stone is less magnetic than the surrounding soil, or as stronger positive and negative anomalies if of brick, but are not always responsive to the technique. It should be noted that not all features will be responsive and absence of anomalies does not necessarily indicate absence of archaeological features (Clark 1996).

Magnetometers measure changes in the Earth's magnetic field. With two sensors configured as a gradiometer the recorded values indicate the difference between two magnetic measurements separated by a fixed distance. The Grad601-2 consists of two high stability fluxgate gradiometers suspended on a single frame with a 1m separation between the sensing elements giving a strong response to deep anomalies.

Sampling interval and data capture
Readings were taken at 0.25m intervals along traverses 1m apart. This equates to 3600 sampling points in a full 30m x 30m grid. The Grad 601 has a typical depth of penetration of 0.5m to 1.0m although a greater range is possible where strongly magnetic objects have been buried in the site.

Readings are logged consecutively into the data logger which is downloaded daily either into a portable computer whilst on site or directly to the office computer. At the end of each job, data is transferred to the office for processing and presentation.

Processing and presentation of results
Processing is performed using specialist TerraSurveyor software. This can emphasise various aspects contained within the data but which are often not easily seen in the raw data. Basic processing of the magnetic data involves flattening the background levels with respect to adjacent traverses and adjacent grids (Destripe or zero median traverse). Despiking is also performed to reduce the effect of the anomalies resulting from small iron objects often found on agricultural land. Further processing can then be carried out which may include low pass filtering to reduce 'noise' in the data and hence emphasise the archaeological or man-made anomalies.

The following are the processing techniques carried out on the processed gradiometer data used in this report:

1. DeStripe (sets the background median of each traverse within a grid to zero and is useful for removing striping effects)

2. Despike (useful for display and allows further processing functions to be carried out more effectively by removing extreme data values)
Parameters: X radius = 2; Y radius = 2; Threshold = 3SD; Spike replacement = medium

3. Clip (excludes extreme values allowing better representation of detail in the mid range): -5 to 5nT.

In order to minimize the risk of features being missed or obscured, the survey was carried out twice, walking first in a NNW-SSE orientation and then in a ENE-WSW orientation.

Resistance Survey

This method relies on the relative ability of soils (and objects within the soil) to conduct an electrical current, which is passed through them. As resistivity is linked to moisture content, and therefore porosity, dense features such as rock will give a relatively high resistivity response, while features such as a ditch which retains moisture give a relatively low response.

The resistance meter used was an RM15 manufactured by Geoscan Research incorporating a multiplexer with a mobile Twin Probe Array. The Twin Probes are separated by 0.5m and the associated remote probes were positioned approximately 15m outside the grid. The instrument uses an automatic data logger, which permits the data to be recorded as the survey progresses for later downloading to a computer for processing and presentation.

Readings were taken at 1m intervals along traverses 1m apart. This equates to 900 sampling points in a full 30m x 30m grid.

The month of June, when the survey was carried out, is usually particularly dry and has a tendency to de-emphasize 'dry features' like stonework and particularly highlight 'wet features' such as ditches and pits.

3.2 Results

The presentation of the data for the site involves a print-out of the magnetic surveys as greyscale plots showing raw and processed data side by side (Fig 4). The unprocessed data most clearly shows the strong magnetic anomalies identified on site at a range of +/-100nT. The processed data has been reduced in range to +/-5nT where more subtle ditch and pit features should be visible (if present), at the expense of increasing visual interference from stronger magnetic features.

The resistance survey is displayed as a greyscale plot showing raw and processed data side by side (Fig. 5). The raw data has been clipped to between 51ohms and 187ohms. The processed data has been clipped to between 92ohms and 145ohms and has been 'despiked' to remove the speckles caused by anomalous results.

All six survey images have been carefully examined and identified features plotted onto an interpretative drawing (Fig 6).

Known weaknesses in the data

The resistance survey has an anomalous black stripe in one of the grids. This has been caused by an operator failing to spot a loose wire as the data was automatically logged. However this error has not been thought to negatively impact on the interpretation of the results.

Magnetic anomalies greater than 5nT are apparent throughout much of the survey area. The field staff noticed many 20th century frogged bricks and older un-frogged bricks protruding from the topsoil, which would account for these broad areas of disturbance.

Bipolar Magnetic Linear Anomalies

The survey revealed three very strong (greater than 100nT) bipolar linear features (highlighted with blue lines). These are also visible in the resistance plot as diffuse pale lines. Field staff noted that one of these, the long NNW-SSE orientated linear, was caused by a superficially buried

concrete wall foundation.

A further, slightly more fragmented bipolar magnetic linear is visible running NE-SW (highlighted with a broken blue line). This is possibly another wall foundation.

Bipolar Magnetic Disturbances
There is a very strong area of bipolar disturbance (greater than 100nT) in the middle of the survey area (highlighted with blue cross hatching). An Ordnance Survey map dating to 1884 (Fig 7) shows a pond in this location.

Along the eastern edge of the site is another area of relatively high disturbance (80-100nT) which is most likely caused by the metalled surface of the public foot path (highlighted with green single hatches).

Positive Magnetic Linear Anomalies
The processed version of the second magnetic survey shows three quite diffuse positive linears. These are NNE-SSW orientated, parallel and between 6-7m apart. These are the only features that appear on one of the magnetic surveys and not the other. The discrepancy is probably due to the orientation used in Survey 1, which has a tendency to de-emphasis features in the same orientation as the survey was walked. These features are also weakly visible in the resistance survey. The linears may represent a fragment of surviving ridge and furrow.

4. DISCUSSION

Three strong bipolar magnetic linears are apparent. One is due to concrete foundations and it seems likely the other two have a similar origin. A fourth linear of a similar nature may also be present, although it is considerably more fragmented. Bricks from modern demolition are visible throughout the site and have caused severe disturbance to magnetic survey. None of the structural features can be readily identified as belonging to a medieval priory. In the light of evidence of modern developments on the site (the presence of partially buried concrete and bricks of two different ages), it seems probable that all the wall features identified have a modern origin.

The pond feature may have medieval origins (although maps clearly show it was filled in at some point in the 20th century). Taken together with the ridge and furrow, these two features may represent fields and fish ponds related to the upkeep of the priory.

5. ACKNOWLEDGEMENTS

Archaeological Project Services wishes to acknowledge Parsons + Whittley Ltd. who commissioned the project. Gary Taylor and Denise Drury (APS) edited the report.

6. PERSONNEL

Project coordinator: Neil Jefferson
Geophysical Survey: Neil Jefferson and Jonathon Smith
Survey processing and reporting: Jonathon Smith.

7. BIBLIOGRAPHY

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CIfAb, 2014 *Standard and Guidance for Geophysical Survey.*

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Hodge, C.A.H., Burton, R.G.O., Corbett, W.M., Evans, R. and Seale, R.S., 1984 *Soils and their use in Eastern England,* Soil Survey of England and Wales **13**

8. ABBREVIATIONS

BGS British Geological Survey

CIfA Chartered Institute for Archaeologists

Figure 1 - General location plan

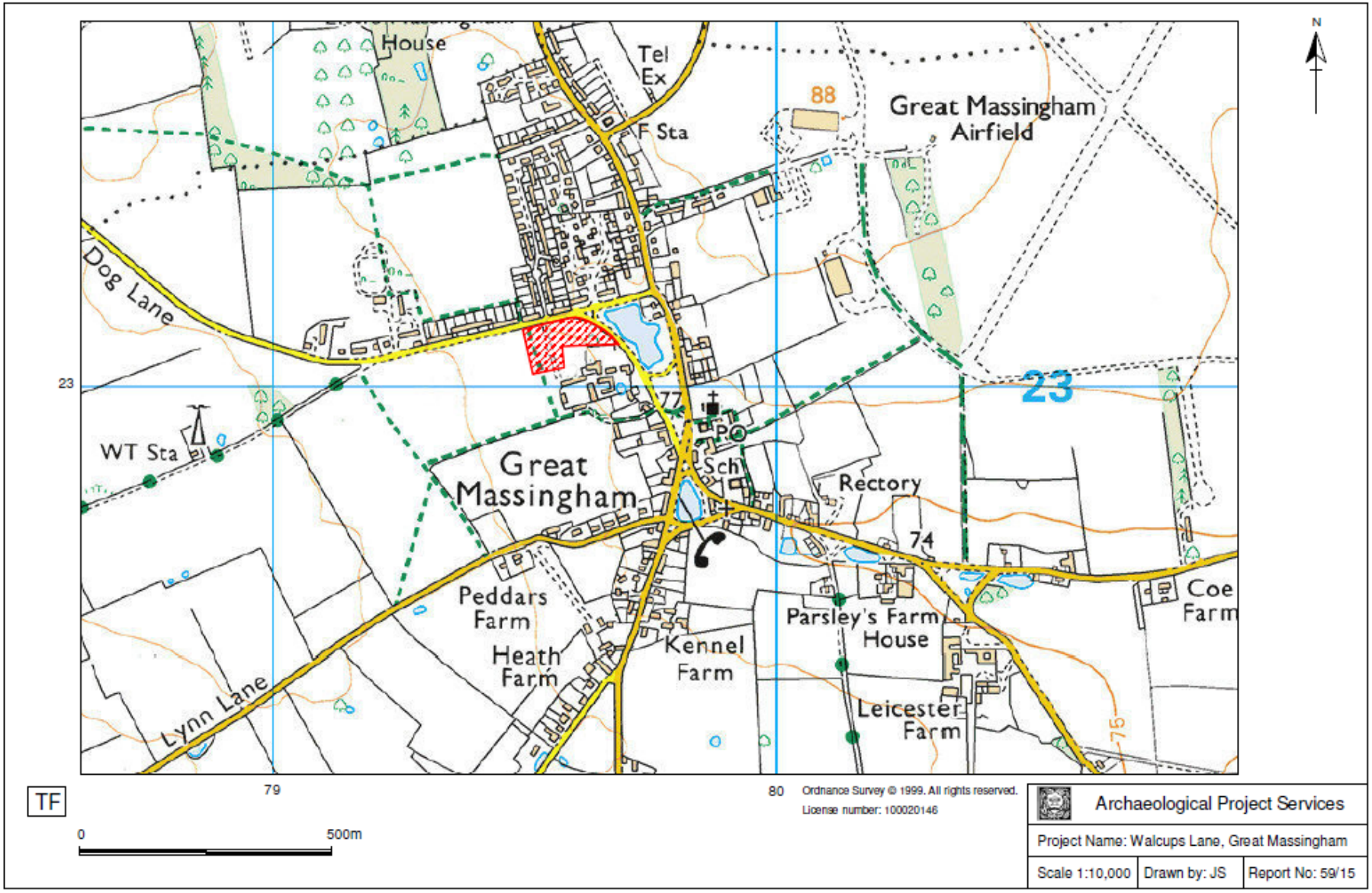

Figure 2 - Site Location

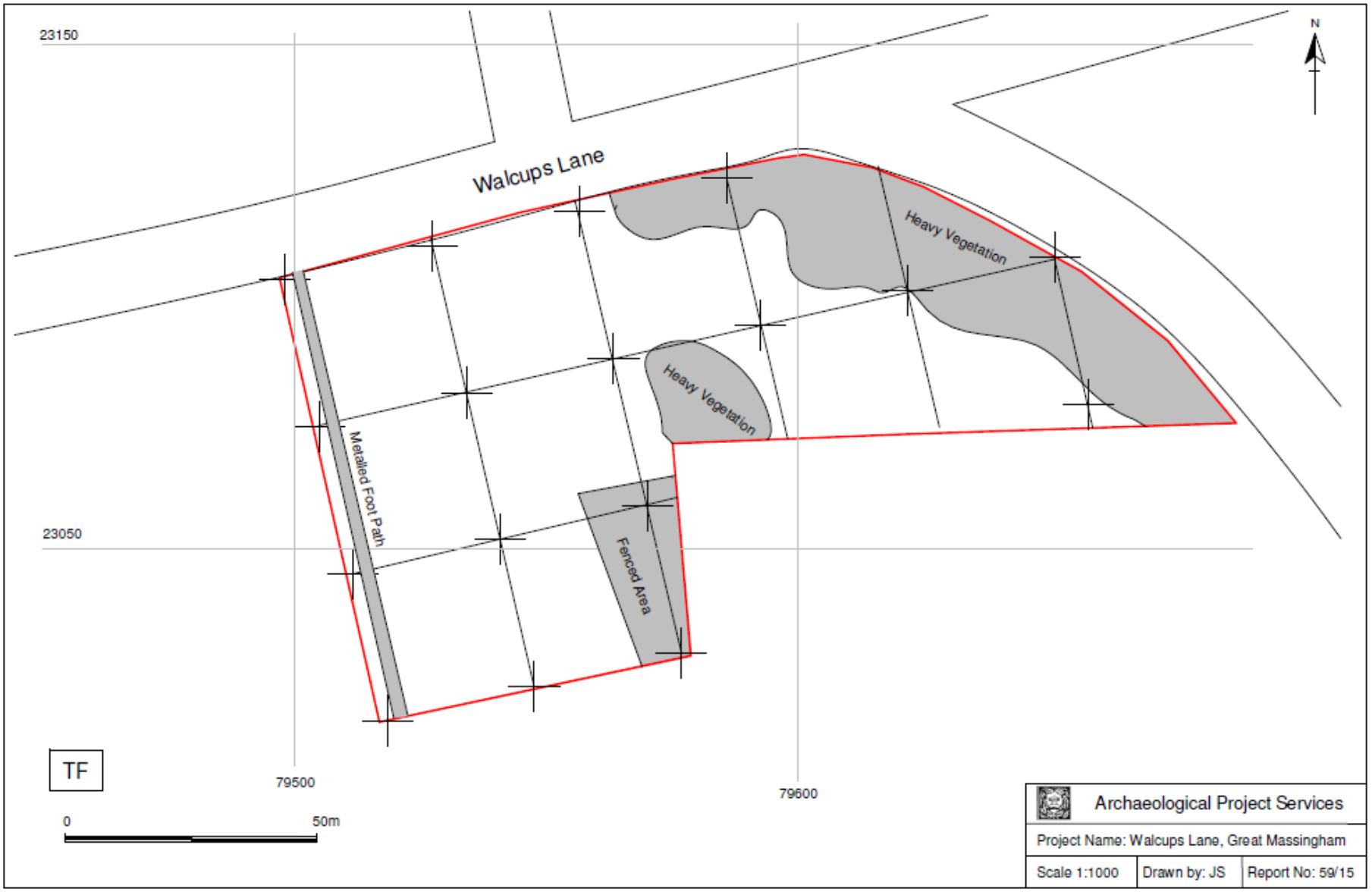

Figure 3 - Layout of Survey Area

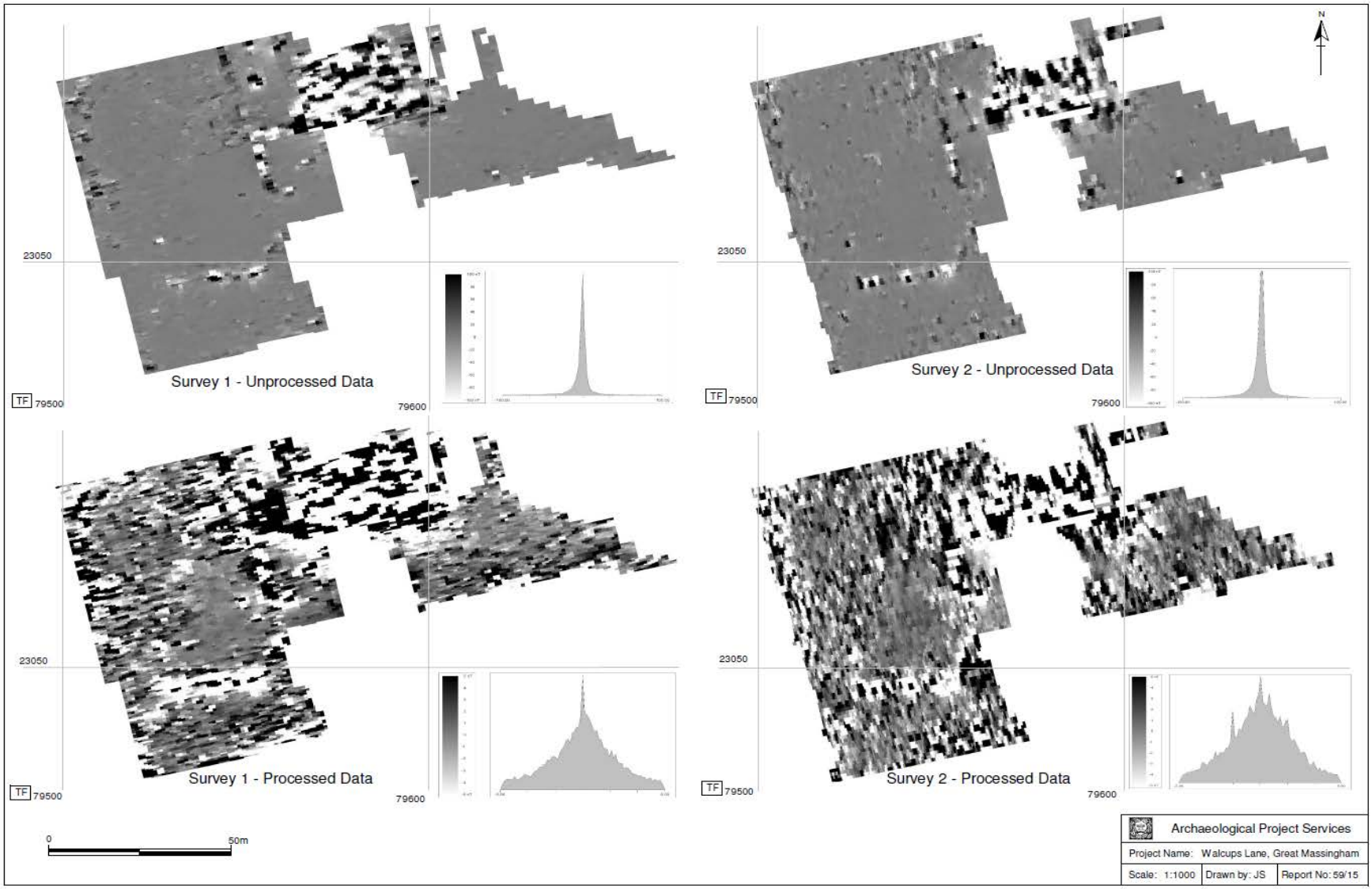

Figure 4 - Magnetometry Survey Results

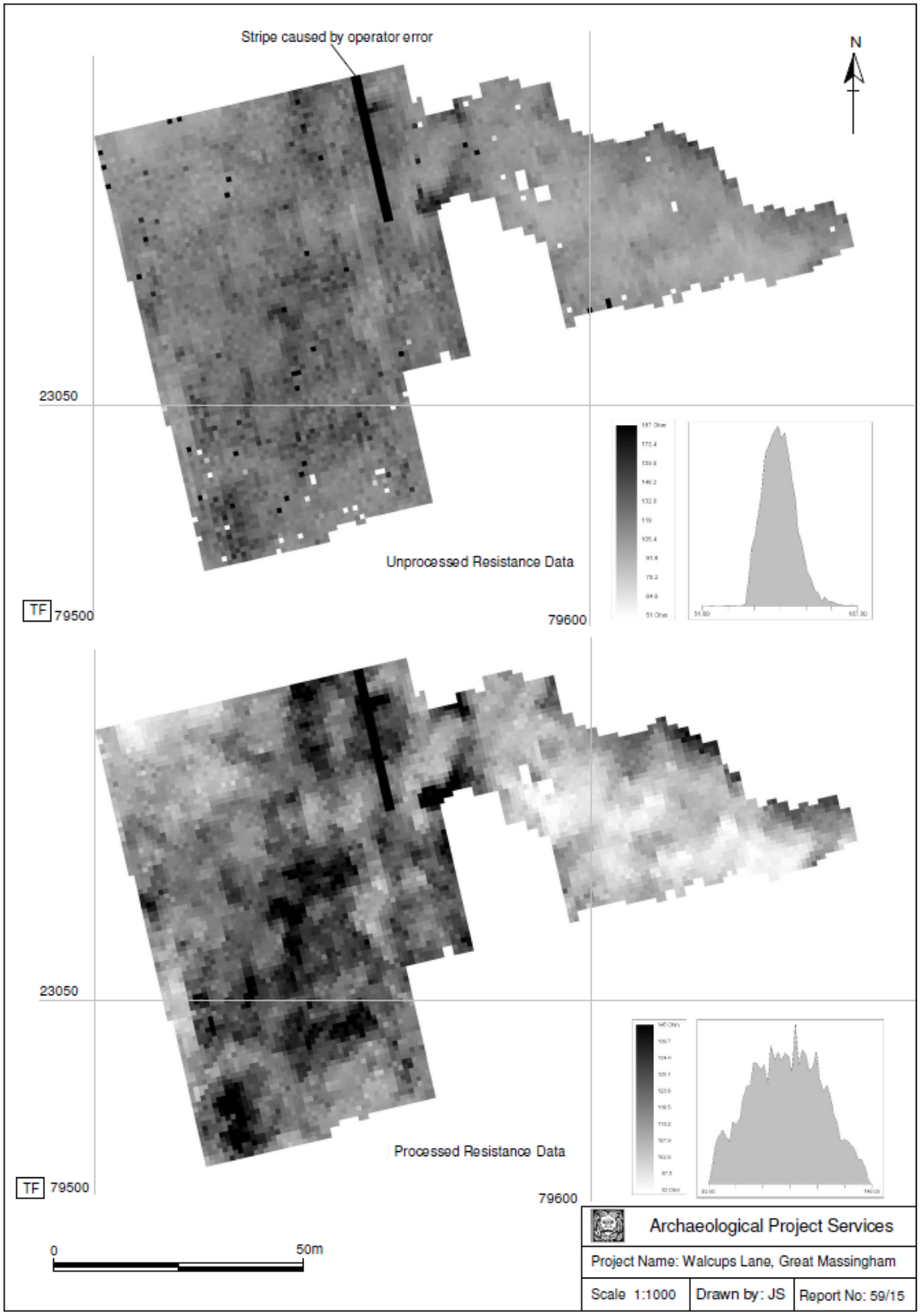

Figure 5 - Resistance Survey Results

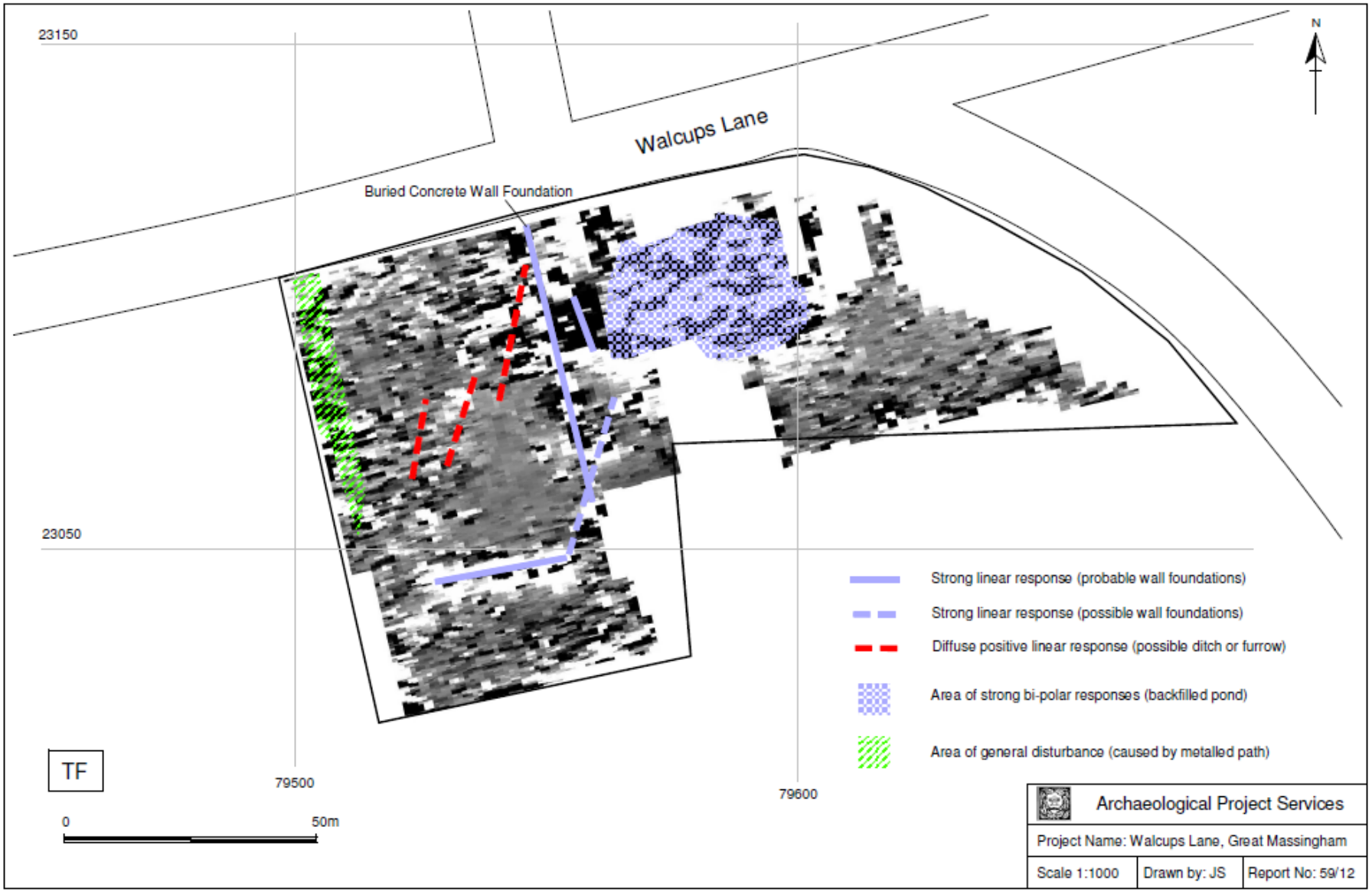

Figure 6 - Interpreted Results

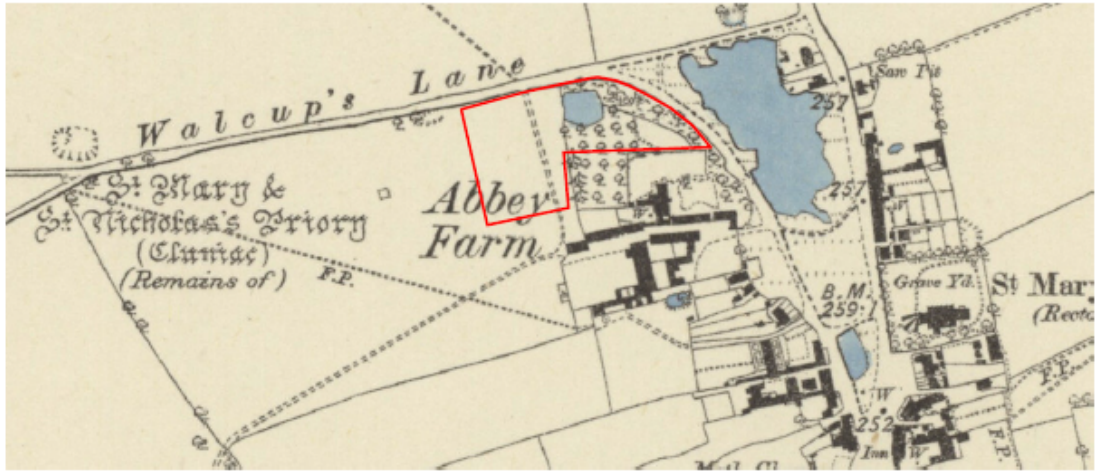

Figure 7 - 1884 OS map

Appendix 1
THE ARCHIVE

The archive consists of:

4 Daily record sheets
1 Report text and illustrations
Digital data

File names	*Magnetometry Data* GMWL15 EW01.xgd to GMWL15 EW12.xgd GMWL15 NS01.xgd to GMWL15 NS12.xgd GMWL15_ES.xcp GMWL15_NS.xcp *Resistance Data* GR Mass 01.xgd to GR Mass 11.xgd GR Mass.xcp
Explanation of codes used in file names	xgd files are magnetometer grids, named with site code and number in the order surveyed. Grids suffixed with '-a' are re-orientated copies. xcp files are composites containing record of all the data and processes used to produce the end product
Description of file formats	All files are in plain text xml format with header data defining survey and processing parameters
List of codes used in files	D indicates a "dummy" value within the composite data
Hardware, software and operating systems	TerraSurveyor 3.0.25.1 running under Windows 7
Date of last modification	18/06/2015
Indications of known areas of weakness in data	

All primary records are currently kept at:

Archaeological Project Services, The Old School, Cameron Street, Heckington, Sleaford, Lincolnshire NG34 9RW

Expected Final Repository (currently not taking archives):
Norwich Castle Museum
Castle Meadow
Norwich
Norfolk
NR1 3JU

Accession Number: ENF 138097

OASIS code: archaeol1-214120

APS Site Code: GMWL15

OASIS DATA COLLECTION FORM: England

Printable version

OASIS ID: archaeol1-214120

Project details

Project name	Geophysical Survey at Walcups Lane, Great Massingham
Short description of the project	A 1.1ha magnetometry and resistance survey on the site of a medieval priory, off Walcups lane, Great Massingham. The survey revealed modern foundations, a pond and possible ridge and furrow.
Project dates	Start: 09-06-2015 End: 18-06-2015
Previous/future work	No / Not known
Any associated project reference codes	ENF138097 - Sitecode
Type of project	Field evaluation
Site status	None
Current Land use	Grassland Heathland 3 - Disturbed
Monument type	WALL Modern
Monument type	RIDGE AND FURROW Medieval
Monument type	POND Uncertain
Significant Finds	NONE None
Methods & techniques	"Geophysical Survey"
Development type	Not recorded
Prompt	Voluntary/self-interest
Position in the planning process	Pre-application
Solid geology	CHALK (INCLUDING RED CHALK)
Drift geology (other)	Lowestoft diamicton
Techniques	Magnetometry
Techniques	Resistivity - area

Project location

Country	England
Site location	NORFOLK KINGS LYNN AND WEST NORFOLK GREAT MASSINGHAM Walcups Lane
Postcode	PE32 2JG
Study area	1.10 Hectares
Site coordinates	TF 79550 23050 52.7747405524 0.662129254175 52 46 29 N 000 39 43 E Point

Project creators

Name of Organisation	Archaeological Project Services
Project brief originator	Archaeological Project Services
Project design originator	Neil Jefferson
Project director/manager	Neil Jefferson
Project supervisor	Neil Jefferson
Type of sponsor/funding body	Developer

Project archives

Physical Archive Exists?	No
Digital Archive recipient	Norfolk Museums Service
Digital Archive ID	ENF138097
Digital Media available	"Geophysics","Images vector","Survey","Text"
Paper Archive ID	ENF138097
Paper Media available	"Diary","Map","Survey ","Unpublished Text"

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	LAND AT WALCUPS LANE, GREAT MASSINGHAM, NORFOLK: GEOPHYSICAL SURVEY
Author(s)/Editor(s)	Smith, J.
Other bibliographic details	APS Report 59/15
Date	2015
Issuer or publisher	Archaeological Project Services
Place of issue or publication	Heckington
Description	A4 ring bound booklet

Entered by	Jonathon Smith (info@apsarchaeology.co.uk)
Entered on	18 June 2015

OASIS:

Please e-mail Historic England for OASIS help and advice