Northamptonshire Archaeology

Archaeological Geophysical Survey at Cardington Airfield, Bedfordshire – Phases 1-3 April 2011 - April 2012

Northamptonshire Archaeology
2 Bolton House
Wootton Hall Park
Northampton NN4 8BE
t. 01604 700493 f. 01604 702822
e. sparry@northamptonshire.gov.uk
w. www.northantsarchaeology.co.uk

Northamptonshire County Council

John Walford

Report 12/73

April 2012

STAFF

Project Manager:	Adrian Butler MA BSc AIfA
Fieldwork:	Adrian Butler Ian Fisher BSc James Ladocha BA Lazlo Lichtenstein MA John Walford MSc Angela Warner BSc
Text and Illustrations:	John Walford Adrian Butler

QUALITY CONTROL

	Print name	Signed	Date
Checked by	Pat Chapman	*PC*	17/4/2012
Verified by	Mark Holmes	*MH*	18/4/2012
Approved by	Andy Chapman	*AC*	17/4/2012

OASIS REPORT FORM

PROJECT DETAILS		
Project name	Archaeological Geophysical Survey at Cardington Airfield, Bedfordshire: Phases 1 - 3	
Short description	Northamptonshire Archaeology was commissioned to carry out magnetometer survey prior to the construction of two ponds at Cardington Airfield, Bedfordshire. Two blocks of land, with a total area of c 11.8ha, were subject to detailed magnetometer survey. This work located two discrete Iron Age or Romano-British enclosures and a cluster of small enclosures of similar date. Two possible kilns of unknown date were more tentatively identified. Many modern features were also located, including pipelines, railway track beds and an area of disturbed ground containing much ferrous debris.	
Project type	Geophysical survey	
Site status	None	
Previous work	Unknown	
Current Land use	Airfield	
Future work	Unknown	
Monument type/ period	Iron Age or Romano-British enclosures. Possible undated kilns. Modern airfield infrastructure.	
Significant finds		
PROJECT LOCATION		
County	Bedfordshire	
Site address	Cardington Airfield	
Study area	*c* 11.8ha	
OS Easting & Northing	TL 085 467	
Height OD	*c* 30 m AOD	
PROJECT CREATORS		
Organisation	Northamptonshire Archaeology (NA)	
Project brief originator	Isabel Lisboa, ArchaeoLogica Ltd	
Project Design originator	NA	
Director/Supervisor	John Walford	
Project Manager	Adrian Butler	
Sponsor or funding body	Fosburn / Bellcross	
PROJECT DATE		
Start date	11 April 2011	
End date	16 April 2011	
ARCHIVES	Location	Content
Physical	N/A	
Paper	NA	Site survey records
Digital	NA	Geophysical survey & GIS data
BIBLIOGRAPHY	Journal/monograph, published or forthcoming, or unpublished client report	
Title	Archaeological Geophysical Survey at Cardington Airfield, Bedfordshire: Phases 1 – 3, April 2011 – April 2012	
Serial title & volume	Northamptonshire Archaeology Reports 12/73	
Author(s)	John Walford	
Page numbers	8	
Date	18 April 2012	

Contents

Figures

ARCHAEOLOGICAL GEOPHYSICAL SURVEY AT CARDINGTON AIRFIELD, BEDFORDSHIRE APRIL 2011 – APRIL 2012

ABSTRACT

Northamptonshire Archaeology was commissioned to carry out magnetometer survey prior to the construction of two ponds at Cardington Airfield, Bedfordshire. Two blocks of land, with a total area of c 11.8ha, were subject to detailed magnetometer survey. This work located two discrete Iron Age or Romano-British enclosures and a cluster of small enclosures of similar date. Two possible kilns of unknown date were more tentatively identified. Many modern features were also located, including pipelines, railway track beds and an area of disturbed ground containing much ferrous debris.

1 INTRODUCTION

Northamptonshire Archaeology (NA) was commissioned by ArchaeoLogica Ltd to conduct an archaeological geophysical survey in advance of the construction of two ponds at Cardington Airfield, Bedfordshire. One of the proposed ponds was to be constructed towards the north-eastern part of the airfield (NGR TL 088 469, Area 1), and the other to the south (NGR TL 085 464, Area 2) (Fig 1). The work was conducted in three phases, as described below and indicated in Figure 1.

Phase 1

The initial fieldwork was conducted on 11th-12th April 2011, and comprised a detailed magnetic gradiometer survey of each pond site. Approximately 1.8ha of land was surveyed to cover the footprint of the northern pond. To the south, an area of 2.6ha was surveyed. This comprised a 1.8ha block across the footprint of the second pond, followed by a 0.8ha extension to the north to trace the full extent of an enclosure which the survey had revealed.

Phase 2

Following revisions to the construction plan, a further 3ha of gradiometer survey was undertaken on 5th August 2011. This covered two blocks of land, one of 1.8ha on the

western side of Area 1, and the other of 1.2ha extending south and east from the same area.

Phase 3

A third phase of magnetometer survey was commissioned to investigate an additional 4ha on the western side of Area 1. Fieldwork began on 8th December 2011, but much of the intended survey area proved to be inaccessible. Following scrub clearance and mowing, a return visit was made on 18th January 2012 and the survey was completed.

2 TOPOGRAPHY AND GEOLOGY

Cardington Airfield lies to the south of Bedford, in the parishes of Cardington and Eastcott. It stands at an elevation of *c* 30m aOD and is largely flat, with only a very gradual slope down towards the south and east. The land is mainly under rough grass, with tarmac tracks and hardstandings in places. A few small parts of the site are obstructed by thorns and briars, which proved to be a hindrance to the survey.

The geology of the site comprises terrace deposits of sand and gravel overlying Oxford Clay (BGS 2011).

3 ARCHAEOLOGICAL BACKGROUND

The landscape around Cardington Airfield is archaeologically rich, with many sites of prehistoric to Romano-British date having been identified by aerial survey. Within the airfield itself, although at some distance from the present survey areas, archaeological trenching has revealed ditches of Iron Age date (Dodds and Weaver 2004, Lambert 2008). Also, just outside the northern boundary of the airfield (but within *c* 50m of Area 1), excavation on the line of the Bedford Wixams watermain revealed a complex of enclosures of late prehistoric and Romano-British date (I Lisboa, pers comm).

The airfield at Cardington was opened as an airship base during the First World War and was developed further during the 1920s to provide facilities for the design and construction of the R101 (AHT 2011). It appears that the majority of the airfield buildings were located around and to the north of the two large airship sheds, and that the

remainder of the airfield (including the present survey areas) was always relatively open and undeveloped.

4 METHODOLOGY

The survey was conducted with Bartington Grad 601-2, twin sensor array, vertical component fluxgate gradiometers (Bartington and Chapman 2003). These are standard instruments for archaeological survey and can resolve magnetic variations as slight as 0.1 nanoTesla (nT).

Each survey area was manually divided into 30m grid squares by means of a tape measure and optical square. Tie in measurements were taken to field boundaries and other relevant points of detail. The gradiometers were carried at a brisk but steady pace through each grid square, collecting data along 1m spaced traverse lines. Measurements were automatically triggered every 0.25m along the traverses, giving a total of 3600 measurements per grid.

All fieldwork methods complied with the guidelines issued by English Heritage and by the Institute for Archaeologists (EH 2008; IfA 2011).

The survey data was processed using Geoplot 3.00u software. Striping, caused by slight mismatches in sensor balance, was removed using the 'Zero Mean Traverse' function and destaggering of the data was performed as necessary.

The processed data is presented in this report in the form of grey-tone plots, at scales appropriate to the dataset (+/- 4nT black/white, or otherwise as stated). The grey-tone plots have been scaled, rotated and resampled (georectified) for display against the Ordnance Survey base mapping (Figs 2 and 4). Interpretative overlays have been produced and are shown in Figures 3 and 5.

5 SURVEY RESULTS

5.1 **Area 1** (Figs 2-3)

The survey of this area has revealed several features of archaeological interest, namely an Iron Age or Romano-British rectangular ditched enclosure, a cluster of smaller enclosures of broadly similar date, and two possible kilns. Many features of more recent origin have also been detected.

The rectangular enclosure lies towards the north of Area 1 and measures 36m long by at least 28m wide. Three of its sides are represented by weakly positive linear anomalies, whilst the fourth is obscured by intense magnetic noise of recent origin (see below). It possibly represents an outlying element of the Iron Age to Romano-British site which was excavated just to the north, on the line of the Bedford Wixams watermain (Libsoa pers com).

The cluster of small enclosures occurs in the south-western part of the survey area. Six have produced clear magnetic anomalies, allowing them to be identified with reasonable confidence, and further examples are probably represented by the various weak and disjointed anomalies in the same area. A number of the enclosures intersect with each other, and so the site is clearly a multi-phased one.

A positive linear anomaly which passes through the middle of the clustered enclosures on a north-easterly heading is thought to represent a fairly recent field boundary. It terminates against another, more strongly magnetic, linear anomaly which runs through the entire area from north-west to south-east and correlates with a field boundary shown on early editions of the Ordnance Survey mapping. However, the strength of the latter anomaly would be remarkable for an infilled ditch on its own, and it thus seems very likely that a metal pipe lies concurrently with the former boundary.

The northernmost part of this survey area is dominated by a band of intense magnetic noise, within which four almost parallel linear trends can be discerned. The historic mapping for the site shows that three of the alignments coincide with the former locations of railway sidings. The fourth, and most southerly, of the alignments is less readily explicable, but may relate to a disused sewer which passes through the area. Generally speaking, the noisiness of the data in this area can be attributed to the

presence of much ferrous debris, clinker and other magnetic hardcore material within the soil.

Similar magnetic noise extends along the eastern edge of Area 1, indicating a further area of disturbed ground with dense scatters of magnetic debris. In this area there are several very large ferrous dipoles which probably indicate the presence of substantial pieces of buried scrap. Also, on the edge of this area, there are a pair of positive rectangular anomalies which attain a maximum intensities of 18nT and 31nT. These are likely to represent deposits of burnt soil or ceramic material – possibly kilns but possibly also concentrations of brick, or pits in which rubbish has been burnt.

Along the southern edge of Area 1 there are four evenly spaced, highly magnetic linear anomalies which appear to represent small spurs of hardstanding branching off from the adjacent track. The eastern of these is surrounded by a set of discrete ferrous anomalies, the exact significance of which is obscure. To the west of the 'spur' anomalies, there is linear anomaly of alternating magnetic polarity which represents a pipe or some other relatively modern service.

Away from the areas of intense magnetic disturbance, there are several large but magnetically subdued anomalies. Such anomalies are commonly encountered in magnetic survey data, and are generally attributed to geological or pedological variations. However, they have not been well studied, and their precise cause or causes remain obscure.

In the detached part of Area 1, to the south of the modern track, there are few anomalies of note. The former boundary and pipeline described above continues through this area, and there are concentrations of magnetic noise, indicating modern debris, adjacent to the modern concrete aprons. In the west of the area there is a particularly regular alignment of small ferrous anomalies which could represent the remains of a lighting installation or some other piece of airfield infrastructure.

Several parts of Area 1 could not be surveyed, as is indicated by the various gaps in the data. In the north there was one large area which was too wet and deeply rutted to be surveyable, and which the surveyors thought might represent a former pond or borrow pit (A Butler pers com). Other obstructions included shipping containers at the south-

western corner of the area, bushes to the south of the modern track and two parallel wire fences across the whole area.

5.2 Area 2 (Figs 4-5)

The survey of this area detected a set of positive linear and curvilinear anomalies which represent a large ditched enclosure of probable Iron Age or Romano-British date. This enclosure measures 80m north-south by 70m east-west and encompasses an area of 0.45ha. It has straight sides to the south and east and a curving side to the north and west. It appears to have a narrow entrance in its eastern side and it contains a number of internal features, including a ditch forming a D-shaped sub-enclosure within the south-eastern corner.

Weakly positive linear anomalies extend to the east and west of the enclosure, apparently representing continuations of its southern boundary ditch. To the south of this there are a few localised positive anomalies, which may indicate small pits, and also a very tenuous curvilinear anomaly which is tentatively suggested to represent a second, much smaller, ditched enclosure.

There are further anomalies of possible archaeological interest at the north-eastern corner of the survey area. Several intersecting linear anomalies may represent short lengths of ditch, and there some magnetic noise of uncertain significance.

Two intensely positive linear anomalies which cut across the south-western corner of the survey area represent a pair of pipelines. A similarly magnetic anomaly which passes across the pipes from west to east, before terminating abruptly, is of obscure significance.

6 CONCLUSION

The survey has identified many features of archaeological interest, spread widely across the areas surveyed. In Area 1, to the north, there is a rectangular ditched enclosure, a separate cluster of small irregular enclosures, and a pair of features which are of very uncertain character but may transpire to be kilns. In Area 2, to the south, there is one large ditched enclosure of irregular form, and several features of less certain significance.

Although all of the enclosures are likely to be of Iron Age or Romano-British date, they need not be contemporary elements of single, coherent site. Indeed the cluster of small enclosures in Area 1 is clearly multi-phased, as several of the enclosures intersect with each other to form a complex palimpsest of features.

The interpretation of two anomalies in Area 1 as kilns is an uncertain one. Their general size and form is comparable with definite kiln anomalies found on other sites (eg Brown 2011, 12-13), but as they lie in an area of obvious modern disturbance it is not possible to exclude a more mundane cause, such as dumps of brick, or pits in which rubbish has been burnt.

Many features of obviously modern origin have also been detected by the survey. Some are insignificant, but others may have implications for the proposed development. In particular, Area 1 is crossed by a pipeline and former rail tracks, and shows evidence of extensive modern disturbance on its eastern side. The large number of intense ferrous anomalies in this area suggests the presence either of large rubbish pits or, less likely, structural remains (such as reinforced concrete foundations).

BIBLIOGRAPHY

AHT 2011, *Airship Heritage Trust website*, *http://www.aht.ndirect.co.uk/sheds/Cardington.htm*, accessed 13 April 2011

Bartington, G, and Chapman, C, 2003 A high-stability fluxgate magnetic gradiometer for shallow geophysical survey applications, *Archaeological Prospection*, **11**, 19-34

BGS 2011 *www.bgs.ac.uk/geoindex*; accessed 13th April 2011, British Geological Survey

Brown, J, 2011 *Archaeological trial trench evaluation at Highflyer Farm, Ely, Cambridgeshire: August-September 2011,* Northamptonshire Archaeology, report **11/214**

Dodds, D, and Weaver, S, 2004 *RAF Cardington, Bedfordshire: Archaeological Evaluation Report*, Oxford Archaeology, unpublished

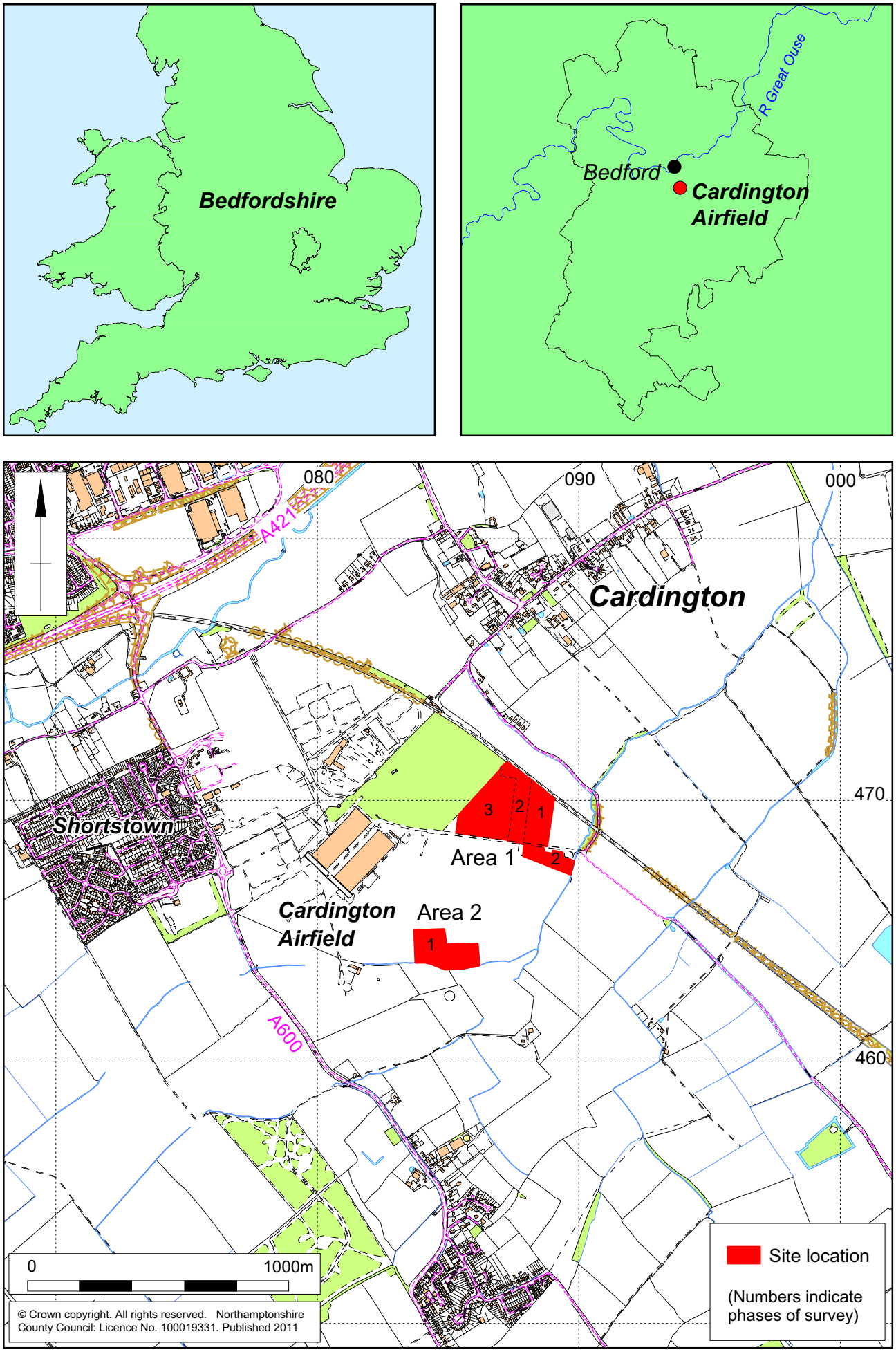
EH 2008 *Geophysical Survey in Archaeological Field Evaluation*, English Heritage

Gaffney, C, and Gater, J, 2003 *Revealing the Buried Past: Geophysics for Archaeologists*, Tempus Publishing

IfA 2011 *The Use of Geophysical Techniques in Archaeological Evaluations*, Institute for Archaeologists Technical Paper

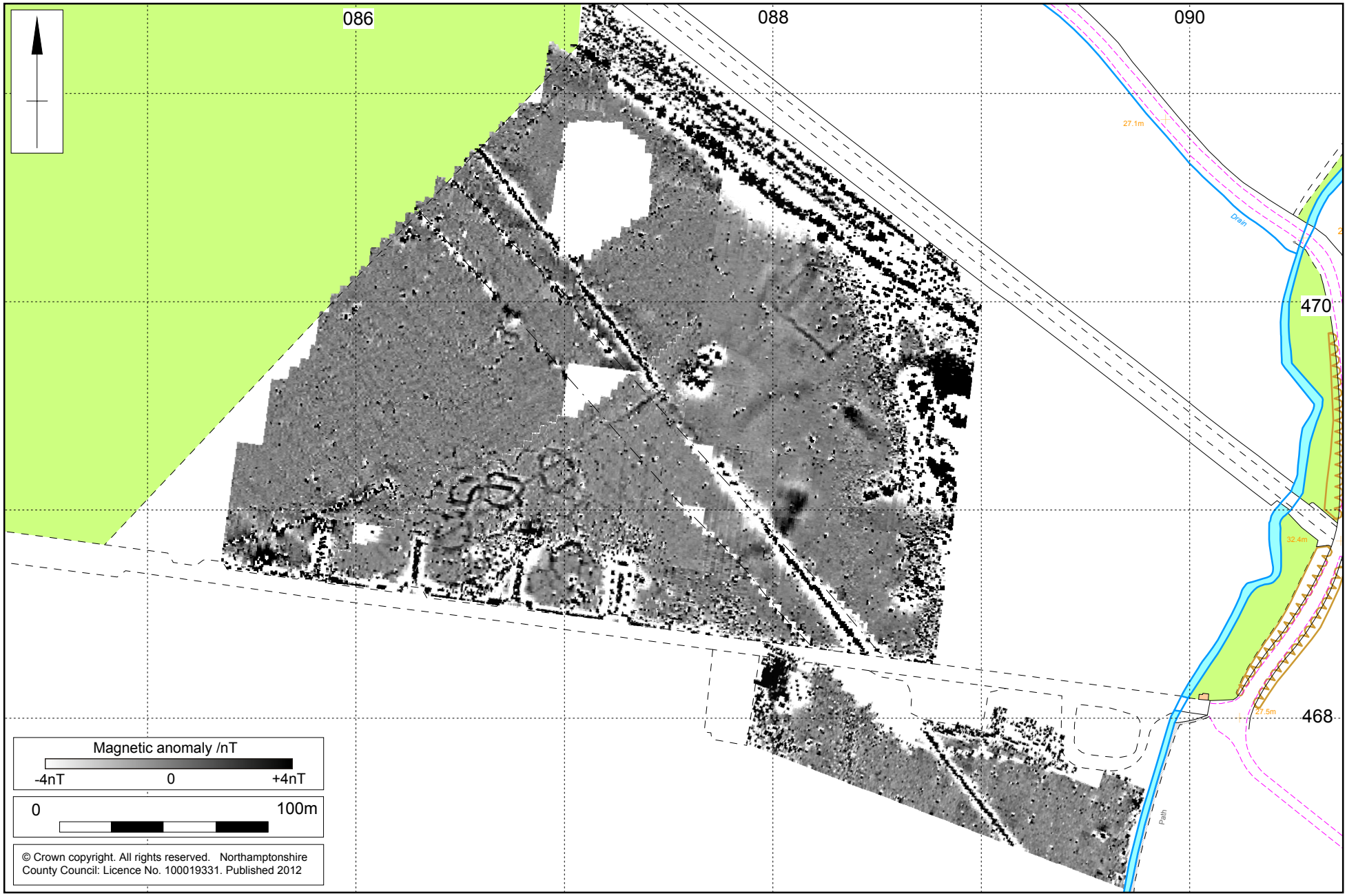
Lambert, N, 2008 *RAF Cardington, Bedfordshire: Phase II Archaeological Evaluation Report*, Oxford Archaeology, unpublished

Northamptonshire Archaeology
a Service of Northamptonshire County Council 18 April 2012



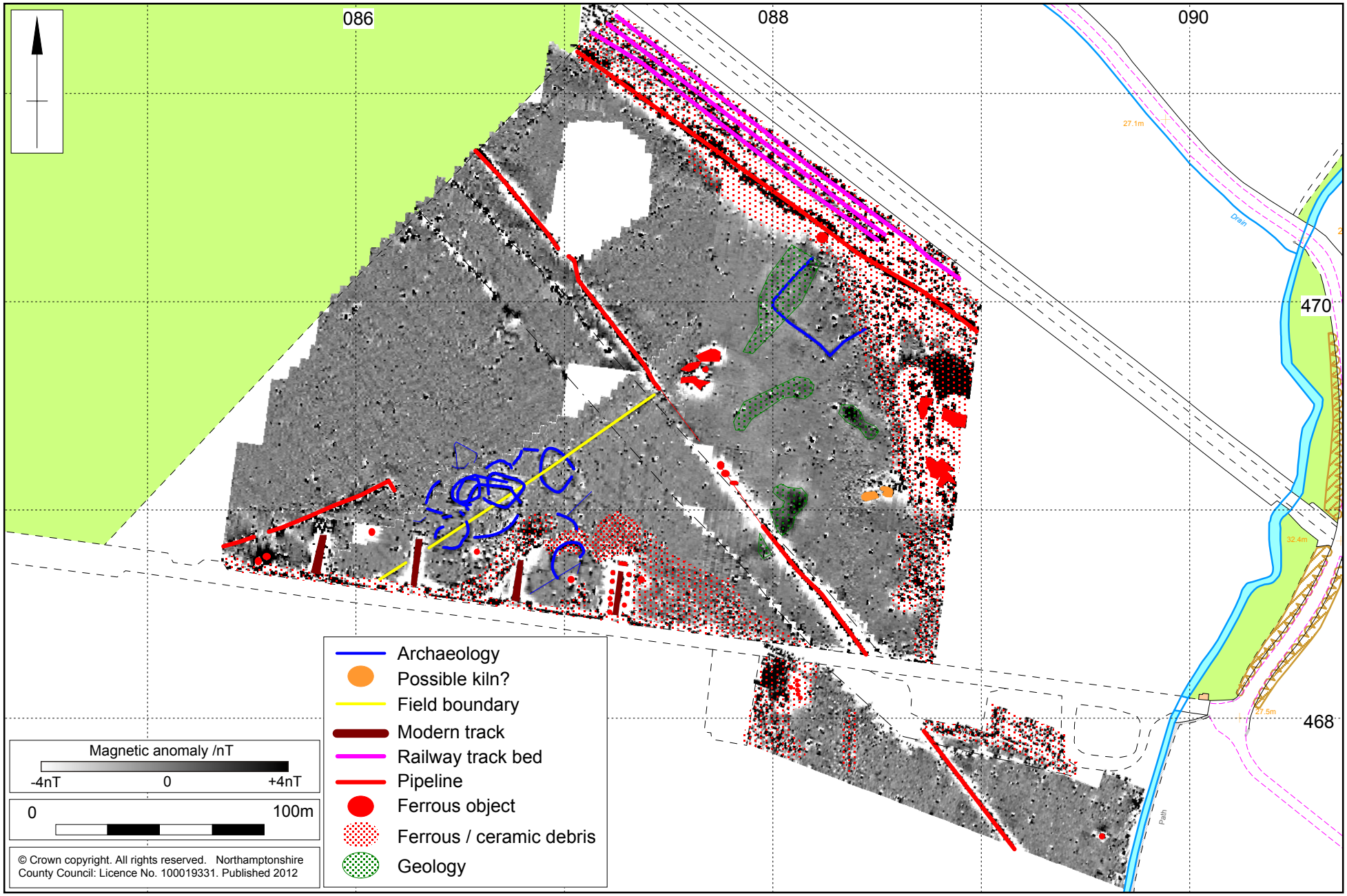
Scale 1:20,000

Site Location Fig 1



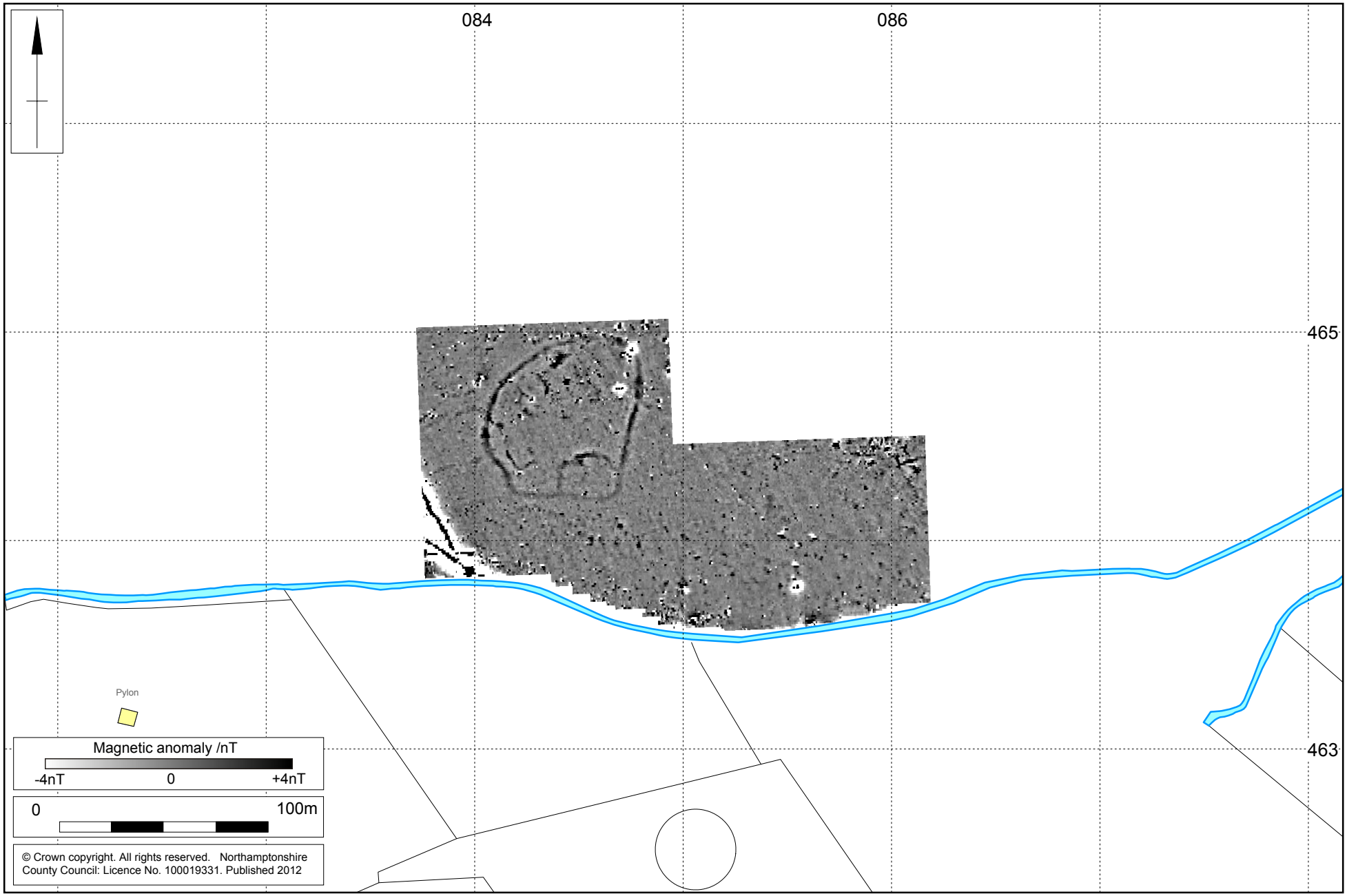
1:2500

Magnetometer Survey Results, Area 1 Fig 2



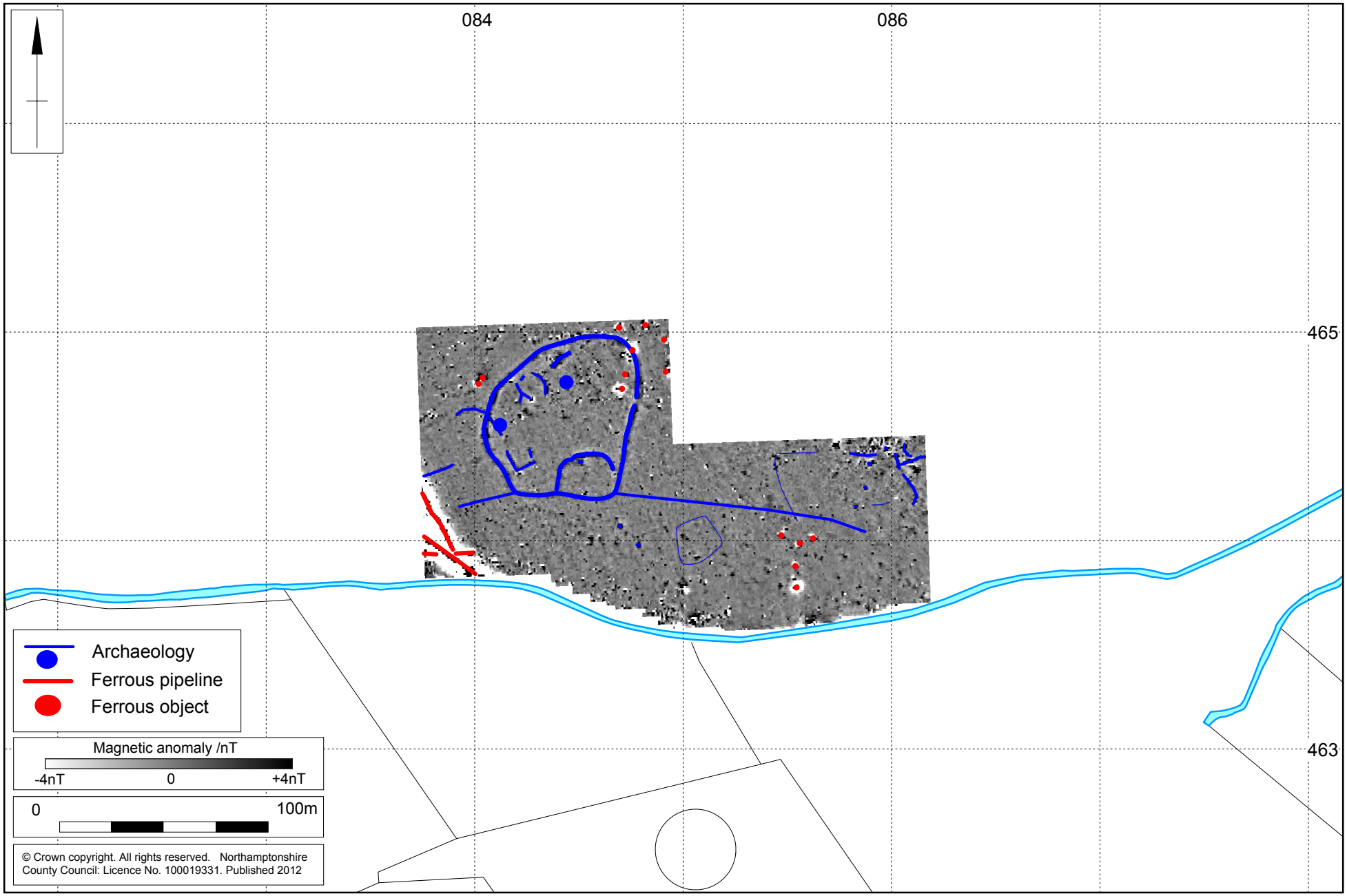
1:2500

Magnetometer Survey Interpretation, Area 1 Fig 3



1:2500

Magnetometer Survey Results, Area 2 Fig 4



1:2500

Magnetometer Survey Interpretation, Area 2 Fig 5