

Northamptonshire Archaeology

AWS Empingham to Hannington Pipeline

Archaeological Geophysical and Metal Detecting
Surveys, Phase 1
August-September 2006



November 2006

Report 06/189

Northamptonshire Archaeology

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QUALITY CONTROL

	Print name	Signature	Date
Checked by	P Chapman		
Verified by	A Mudd		
Approved by	A Chapman		

OASIS REPORT FORM

PROJECT DETAILS		
Project name	Empingham to Hannington pipeline route: Archaeological Geophysical and Metal Detecting Surveys Phase 1	
Short description (250 words maximum)	A total area of c 12ha, spread across 27 Fields, was surveyed by fluxgate gradiometer. One extensive archaeological site was found and there were six fields containing enclosures or partial enclosures of probable later prehistoric, Roman and medieval date. Remnant ridge and furrow and isolated lengths of ditch, where found in a further eleven. No archaeology was found in the remaining nine fields. Metal detecting in six fields yielded little.	
Project type (eg DBA, evaluation etc)	Geophysical Survey and Metal Detecting	
Site status (none, NT, SAM etc)	None	
Previous work (SMR numbers etc)		
Current Land use	Arable / Pasture	
Future work (yes, no, unknown)	Yes	
Monument type/ period	Various	
Significant finds (artefact type and period)		
PROJECT LOCATION		
County	Rutland, Northamptonshire	
Site address (including postcode)	Empingham to Hannington	
Study area (sq.m or ha)	c 12ha	
OS Easting & Northing (use grid sq. numbers)	SK 94600,08000 – SP 82500,71100	
Height OD		
PROJECT CREATORS		
Organisation	Northamptonshire Archaeology	
Project brief originator		
Project Design originator	Andy Mudd, Northamptonshire Archaeology	
Director/Supervisor	Adrian Butler, Northamptonshire Archaeology	
Project Manager	Andy Mudd, Northamptonshire Archaeology	
Sponsor or funding body	Mott MacDonald for Anglian Water Services	
PROJECT DATE		
Start date	August 2006	
End date	November 2006	
ARCHIVES		
	Location (Accession no.)	Content (eg pottery, animal bone etc)
Physical		
Paper		
Digital	Northamptonshire Archaeology	Geophysical data, GIS mapping
BIBLIOGRAPHY		
	Journal/monograph, published or forthcoming, or unpublished client report (NA report)	
Title	Empingham to Hannington pipeline route: Archaeological Geophysical Survey	
Serial title & volume	NA Reports 06/147	
Author(s)	John Walford & Adrian Butler	
Page Numbers	1-7	
Date	November 2006	

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AWS EMPINGTON TO HANNINGTON PIPELINE

ARCHAEOLOGICAL GEOPHYSICAL AND METAL DETECTING SURVEYS

PHASE 1

AUGUST-SEPTEMBER 2006

ABSTRACT

Northamptonshire Archaeology conducted geophysical prospection as part of the archaeological evaluation of the proposed AWS pipeline route from Empingham (Rutland) to Hannington (Northamptonshire). A total area of c 12 ha, spread across 27 fields, was surveyed by fluxgate gradiometer. There was one extensive site, probably representing a Romano-British settlement, and six other fields containing ditched enclosures of probable later prehistoric, Roman or medieval date. Lesser archaeological features, including remnant ridge and furrow and isolated lengths of ditch, were found in a further eleven. No archaeology was found in the remaining nine fields. A metal detecting survey in six of the fields recovered little of significance.

1 INTRODUCTION

Northamptonshire Archaeology (NA) was commissioned by Mott MacDonald, on behalf of Anglia Water Services, to conduct geophysical and metal detecting surveys in order to investigate potential archaeological sites on the proposed route of a water pipeline from Empingham in Rutland to Hannington in Northamptonshire, a distance of c 40 km (Fig 1 NGR SK 94600,08000 – SP 82500, 71100). The investigations formed part of a programme of archaeological mitigation ahead of groundworks for pipeline construction. This first phase was targeted on areas of concern where earlier Desk-Based Assessments (DBAs) had identified potential archaeological constraints (NA 2006a).

The surveys were carried out during August and September 2006. Twenty-seven fields were investigated within a corridor 30 m wide centred on the proposed route and alternatives. The total length of the surveyed area amounted to about 3.9 km, which represented about 10% of the total route.

2 ARCHAEOLOGICAL BACKGROUND

The proposed route of the pipeline has twice been the subject of DBAs, the original in 1998, and a supplementary assessment in 2006 to incorporate new information (NA 1998a & 1998b, Westgarth 2006a & 2006b). These DBAs covered a corridor about 1.5 km wide in order to assess the overall context of the cultural heritage and allow for any later variations in the route.

A review and ‘impact assessment’, drawing upon the information from these desk-based works and a walk-over survey of the whole route and alternatives (as proposed at that time), was undertaken in July 2006 in order to formulate a mitigation strategy for the Cultural Heritage aspects of the Environmental Statement (NA 2006a). This review identified 24 archaeological ‘hot-spots’ on the proposed route and on an alternative option around Rushton, Northamptonshire. The Phase 1 survey therefore targeted these fields. It is currently intended that other areas will be surveyed at a later date to identify archaeological constraints ahead of pipeline construction.

3 TOPOGRAPHY AND GEOLOGY

The survey corridor cuts across an eastward trending drainage system and is thus rather undulating. The higher ground is typically around 100-120 m OD, with the intervening valleys being lower by some tens of metres. There is an especially pronounced scarp above Rockingham, where the land drops abruptly from over 120 m towards the floor of the Welland valley at *c* 50 m.

The geology of the survey area comprises Jurassic ironstones, limestones and clays, which are largely un-faulted and tilted only slightly from the horizontal. These deposits have a capping of Quaternary Boulder Clay on the higher ground, especially in the Corby area. The Northamptonshire Sand and Ironstone deposits in Rutland are known to contain glacial frost cracking in localised areas. Narrow belts of Holocene alluvium typically occupy the river valley floors.

4 SURVEY LOCATIONS

The following table (Table 1) lists the surveys undertaken. Their locations are shown on Fig 1. Fields are numbered according to the system used for the cultural heritage input for the Environmental Statement. This uses the parish prefix and a unique number for each field.

Since the surveys were undertaken, the Proposed Route at Glaston has been changed to pass by the western side of Bisbrooke Hall. Field GLA8 and and the surveyed parts of GLA5 and BIS1 are therefore no longer relevant to the Proposed Route.

Land Plot	Archaeology	Survey	Area (ha.)
GLA5	possible Anglo-Saxon cemetery, earlier prehistoric material	geophysics & metal detecting	200x30 (0.60)
GLA8	possible Upper Palaeolithic remains, Anglo-Saxon cemetery and earlier prehistoric material	geophysics & metal detecting	150x30 (0.45)
BIS1	possible prehistoric or later remains	geophysics	350x30 (1.05)
TBW2	?Roman road	geophysics	120x30 (0.36)
TBW4	?Roman road	geophysics	140x30 (0.42)
GTN7	medieval settlement	geophysics	170x30 (0.51)
GTN8	medieval settlement	geophysics	220x30 (0.66)
GTN9	?Roman remains	geophysics	200x30 (0.60)
ROC18	medieval / earlier settlement?	geophysics	200x30 (0.60)
MID8	possible Roman remains	geophysics	200x30 (0.60)
MID9	possible Roman remains	geophysics	200x30 (0.60)
MID10	possible Roman remains	geophysics	250x30 (0.75)
WIL5	possible Roman remains	geophysics	180x30 (0.54)
RUS10, 27, 28 alternative	possible Roman remains	geophysics	320x30 (0.96)
RUS11-14 alternative	possible medieval remains	geophysics	260x30 (0.78)
RUS28	Roman villa area	geophysics	140x30 (0.42)
RUS29	Roman villa area	geophysics	40x30 (0.12)
CRA6	possible Anglo-Saxon / Roman remains	geophysics & metal detecting	100x30 (0.30)
CRA8	possible Anglo-Saxon / Roman remains	geophysics & metal detecting	30x30 (0.09)
CRA9-10	cropmark enclosures	geophysics &	280x30 (0.84)

		metal detecting	
CRA16	cropmarks	geophysics	70x30 (0.21)
CRA17	?cropmark roads	geophysics	300x30 (0.90)
TOTAL			3860 x 30 (11.58)

Table 1: Summary of Phase 1 surveys

5 GEOPHYSICAL SURVEY METHODOLOGY

All fieldwork was carried out in accordance with the guidelines issued by English Heritage and by the Institute of Field Archaeologists and a Methods Statement issued for Richard Clark, Senior Planning Archaeologist Leicestershire County Council (EH 1995; Gaffney, Gater and Ovendon 2002; NA 2006b).

Two types of instrument were used during the detailed magnetic survey. Most fields were surveyed with a Bartington Grad601-2: when this was not possible a Geoscan FM36 or FM256 was used. Both instruments are fluxgate gradiometers, the former having a dual-sensor array and the latter a single sensor. Data from the two instruments was compatible and of comparable quality.

The survey was carried out in 27 fields along the proposed route, selected on the basis of cropmark evidence and HER data. A total area of circa 12ha was investigated. The survey blocks were 30m wide and were subdivided into 30m x 30m grid-squares. These areas were laid out by tape-measure to an internal accuracy of +/-0.1m and an accuracy of +/-1m in relation to OS National Grid. Within each square, the gradiometer was carried along 30 traverses, spaced at 1m intervals. These were walked in a zig-zag pattern at a brisk but steady pace. Data was recorded at 0.25m intervals along each traverse.

The data was analysed using Geoplot 3.00s software. Low (negative) magnetism is shown as white and high (positive) magnetism as black in the resultant greyscale plots. In accordance with NA standard practice, minimal processing was carried out on the data. The 'Zero Mean Traverse' function was applied as a standard in order to balance the data to zero. Other functions were carried out as necessary: for instance the removal of stagger caused by irregular walking.

The processed data is presented here in the form of greyscale graphics highlighting the magnetic anomalies (scale +4nT / -4nT , black ~ white, Figs 2-16). It was considered that other plotting regimes such as 'stacked trace' would be uninformative for the majority of this survey. Interpretative plots (Figs 2-16) have been generated from the greyscales to aid in the discussion.

6 GEOPHYSICAL SURVEY RESULTS

The results of the gradiometer survey are presented on a field-by-field basis, from north to south (Fig 1).

Figures 2-16 show the results from all 27 fields, together with interpretation plots. Most of the fields were found to contained features of archaeological interest and all but one of the remainder contained anomalies of recent origin.

The pre-existing water main runs close to the survey corridor and its magnetic signature is often apparent in the data. Where it lies within the corridor it appears as a strong positive magnetic anomaly with a broad negative halo or as an alternating positive to negative magnetic anomaly with an inversely alternating halo. Where it lies outside, but close to the corridor, part of the halo may intrude into the data.

Many of the blocks of data contain closely spaced parallel linear anomalies produced by ridge and furrow cultivation. These will most commonly be of medieval origin but a late Saxon or early post-medieval date cannot be excluded.

None of the fields contained obvious earthwork remains other than medieval ridge and furrow. All anomalies therefore relate to buried or ploughed out features.

Glaston 5 and 8 (Figs 2-3)

The existing pipeline dominates the data from Field GLA8 and may also be seen in western edge of the data from Field GLA5. The other noteworthy features are two lengths of ditch and an elongated pit-like anomaly in GLA5, and a patch of ridge and furrow cultivation aligned north-west to south-east, and a large ferrous anomaly in GLA8.

It is not possible to provide dating for the ditches and 'pit' but they may be archaeologically significant in view of the prehistoric and Anglo-Saxon finds from the field to the south (GLA6) and the site's hilltop position. There was a Roman coin from this site (Section 7).

Bisbrooke 1 (Figs 2-3)

The data for field BIS1 reveals a mass of overlapping archaeological anomalies, probably representing multiple phases of linear and enclosure ditches. However, these cannot be easily disentangled or related to the known cropmarks in this field, so no more detailed interpretation can be offered.

Some north-east to south-west aligned ridge and furrow cultivation is apparent in the central and southern parts of the survey block. The southern end also contains several irregular pit-like anomalies (of which only the largest are highlighted on the interpretation plot). These could perhaps indicate localised quarrying.

Thorpe-by-Water 2 and 4 (Fig 4)

The survey of TBW2 revealed several linear anomalies. One is almost certainly a ditch but the broader ones have slightly diffuse appearance and an asymmetrical trace form which suggests they may mark the edge of a palaeochannel. Field TBW4 contains two other probable ditches and a length of pipeline.

Ridge and furrow on differing north-west to south-east alignments cultivation occurs across both fields. Two of the furrows in TBW4 exhibit strong magnetic responses, such as can occur where ploughing crosses an archaeological feature, dragging soil with enhanced magnetic susceptibility along the furrows. There is thus a possibility that archaeological features may exist close to the pipeline route but outside of the area currently surveyed.

There was no indication of the projected Roman road, although the NE-SW aligned linear anomaly in TBW2 correlates with the road's expected location and alignment and could be a roadside ditch.

Gretton 7-9 (Figs 5-6)

The survey of these fields revealed a cluster of archaeological features near the eastern edge of field GTN8. This comprises part of a small ditched enclosure and other associated ditches. The recently ploughed-out boundary between fields GTN7 and GTN8 was also detected, as were two isolated lengths of ditch at the western edge of Field 9. Slight traces of north-west to south-east aligned ridge and furrow cultivation were found across all three fields.

The enclosure and ditches in GTN8 almost certainly relate to the deserted medieval hamlet of 'Cotes' the earthworks of which partly survive in the pasture north of the road.

Rockingham 18 (Fig 7)

The data from this field (ROC18) are heavily disturbed, reflecting the field's use as a sports pitch. The two large ferrous responses highlighted in the interpretation plot were produced by iron goalposts. The alternating halo along the north-western edge of the data suggests a pipeline running close to the field boundary, perhaps underneath the adjacent A6003. No anomalies of archaeological significance were detected.

Middleton 8-10 (Figs 8-9)

The data from Field MID8 revealed nothing of note. Magnetic halos from the existing pipeline occurred along the eastern edges of the data from Fields MID9 and MID10. The data from the latter field also shows a small pipe or cable, a modern farm track, and an area of slight magnetic noise probably associated with a recently demolished barn.

In all probability the nearby Roman sites identified in the HER do not extend into the pipeline corridor.

Wilbarston 5 (Fig 10)

The only anomaly identified in this field (WIL5) was a slight magnetic halo produced by the existing pipeline.

This suggests that the ditched mounds to the east are not part of a wider complex of features in this field.

Rushton 11-14 (Figs 11-12)

The response from the existing water pipeline dominates the western half of these two blocks of data. To the east, areas of east – west aligned medieval ridge and furrow ploughing can be seen in Fields RUS13 and RUS14. In the latter field, two negative linear anomalies, meeting at a right angle, appear to overlie the ploughing. Their origin is uncertain, but they are unlikely to be archaeologically significant.

Rushton 10, 27-29 (Figs 11-12)

The principal archaeological features in these blocks of data occur in Field RUS28, where a group of linear anomalies appear to represent parts of ditched enclosures. A sinuous negative anomaly in Field RUS10 may be of either archaeological or natural origin.

Areas of north-west to south-east aligned ridge and furrow ploughing occur in RUS10, RUS27 and RUS28.

The patches of magnetic noise which occur in RUS10 and RUS29 suggest dumps of rubble containing ceramic and ferrous debris. This interpretation is supported by information from the landowner that the western end of RUS29 is made ground.

Fields RUS28 and RUS29 were considered to contain potential archaeological constraints due to the presence of a Roman villa complex here whose extent remains undefined. A bath-house is under excavation 200 m to the east, in Field 29 and another building is thought to lie in the northern part of Field 28. The linear anomalies identified in Field 28 appear likely to be Roman, but they do not seem to be associated with buildings or dense or complex archaeology.

Cransley 6 (Figs 13-14)

This block of data contains several linear anomalies, the three strongest of which form an 'F'-shaped pattern and may represent part of a ditched enclosure. Some of the other anomalies may also have archaeological significance but their weakness and tendency to run parallel with the present field boundaries means that an agricultural origin cannot be excluded.

The field lies on the edge of a former quarry where an Anglo-Saxon cemetery and Roman remains were discovered. The possible ditches may relate to a Roman settlement here. The

field to the south (CRA7) appeared to have been quarried.

Cransley 8-10 (Figs 13-14)

The block of data from Field CRA10 exhibits extensive archaeological remains, likely to represent a ditched enclosure complex of later prehistoric or Romano-British date. The presence of this site was already known from cropmarks but this survey shows it to be more extensive than was previously recognised.

Evidence of north-west to south-east aligned ridge and furrow cultivation occurs across much of CRA10. At the southern end this is interrupted by a large isolated pit-like anomaly, possibly representing a small back-filled quarry.

Nothing of note was detected in Fields CRA8 or CRA9. Field 8 seems likely to a former quarry

Cransley 16 (Figs 15-16)

This block of data is dominated by the response from the existing water pipeline and that of a second pipeline or cable running perpendicular to it (CRA16). The only other noteworthy features are two slight parallel linear ones, which are of uncertain archaeological significance.

The interpretation of the cropmarks in this field and the extent of any archaeological constraint remain unresolved.

Cransley 17 (Figs 15-16)

The principal archaeological feature in this block of data is a rectangular ditched enclosure, three sides of which lie within the survey corridor (CRA17). This enclosure intersects with an area of north-west to south-east aligned ridge and furrow cultivation. South of the enclosure are two parallel linear features which run at a slight angle to the plough furrows. These are tentatively identified as the side ditches of a former trackway.

There are two areas of rounded magnetic anomalies. The cause of these is uncertain although, given their strength (up to *c* 70nT), the possibility that they represent furnaces or other industrial features should be considered.

The two large rectangular ferrous anomalies in the northern half of the data probably represent underground storage tanks. The negative magnetic halo along the south-eastern edge of the data was produced by the existing water pipeline. A former mineral railway crosses the southern end of the plot.

There is no indication of the former road to Great Cransley. The ridge and furrow aligns closely with the projected road and it is possible that ploughing ridges extended up to, and perhaps over, the road (which need have been no more than a hollow-way).

The date of the rectangular enclosure is uncertain, but a later prehistoric or Roman date would not be out of place on morphological grounds.

7 METAL DETECTING

Metal detecting undertaken in areas of potential near Glaston (Rutland) and north of Cransley (Northamptonshire) in Fields GLA5, GLA8, BIS1, CRA6, CRA8 and CRA9/10. All fields had been ploughed and were without crops except GLA8 and CRA8 which were under grass.

There were no finds from CRA6 or CRA8 (the latter field probably having been quarry). Finds from the other fields, located in relation to the geophysical survey grid, are itemised in Appendix 1.

There were no finds of particular significance. The only object possibly indicative of an archaeological constraint was a Roman sestertius of the 1st/2nd century AD from GLA5. This may suggest a Roman site of this date in the field, but as an isolated find it may just be a casual loss.

Where datable, the other finds were overwhelmingly post-medieval and represent a background scatter of casual losses.

8 CONCLUSIONS

The geophysical survey successfully identified some areas of significant archaeological potential, others where minor archaeological features occur and others again which appear to be archaeologically barren. In a small number of cases the potential for archaeological remains could not be gauged because of the 'bleaching' effect of the present pipe and other modern metallic intrusions. Overall, 18 of the 27 fields investigated contained some archaeological remains, although this falls to 13 out of 27 if fields containing only ridge and furrow are excluded.

There were extensive archaeological remains in Great Cransley Field CRA10, whose presence, but not overall extent, were indicated by cropmarks. Roman pottery was noted on the surface of this field and the features are likely to relate to Roman-British settlement enclosures. The site lies on a free-draining (sandy), south-facing hill slope, which would probably have been a favoured location for settlement in prehistoric and early historic times.

There were less extensive indications of enclosures in CRA6, CRA17, RUS28, GTN8, BIS1 and GLA5. Fields CRA6, BIS1 and GLA5 are on hilltop/south-facing slope sites. Field RUS28 lies in the Ise Valley east of Rushton near a known Roman villa complex. The features at Gretton (GTN8) are likely to be medieval and the others may be later prehistoric or Roman. It is unclear whether settlement remains are associated with these ditches, or whether the ditches were peripheral agricultural features.

It is striking that, although there was a general correlation between the presence of cropmarks and the discovery of archaeology, the two were never in complete agreement. The geophysical survey revealed a previously unknown enclosure in field CRA17 at Great Cransley, and demonstrated the sites at Great Cransley CRA10 and Bisbrooke BIS1 to be more extensive than the cropmarks alone had suggested.

There seems to be a correlation between the areas where the survey identified least archaeology (notably the fields at Wilbarston, Middleton and Rockingham) and the presence of Boulder Clay. There is, however, insufficient evidence to say how far this reflects a genuine absence of detectable features and how far it might be down to geological constraints on the effectiveness of magnetic survey. The technique is generally also acknowledged to be unsatisfactory for detecting small, discrete and scattered features such as postholes, pits and graves.

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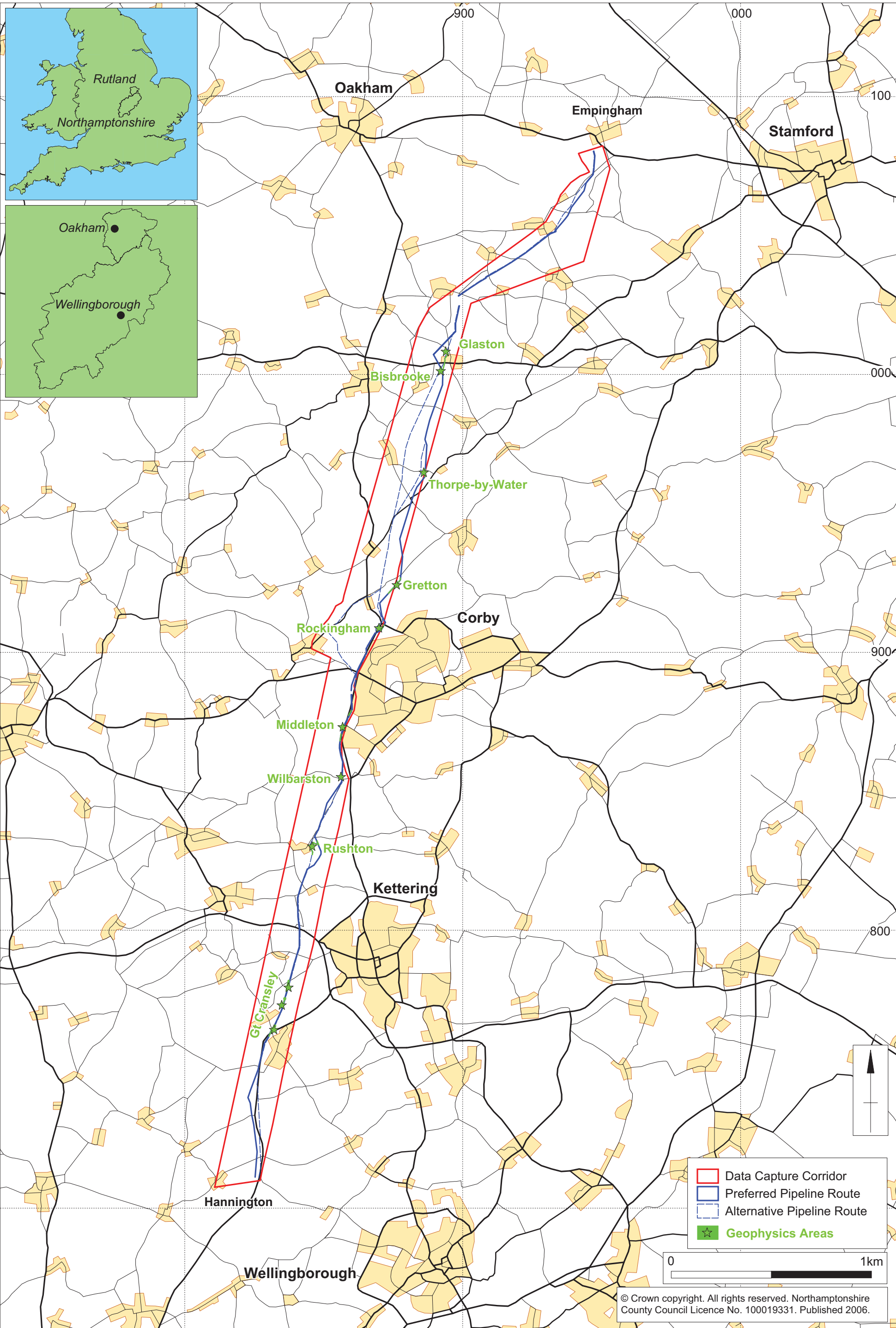
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Appendix 1: Phase 1 metal detecting finds*Steve Critchley and Tora Hylton*

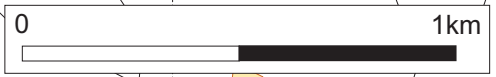
Parish	Field	Ref	Date	Description
Glaston	GLA5	SF1	post medieval	copper alloy ring
		SF2	post medieval	copper alloy perforated cap with scallop motif
		SF3	post medieval	copper alloy ring
		SF4	1 st -2 nd century	Roman copper alloy coin (sestertius)
		SF5	post medieval	metal alloy button
		SF6	post medieval	metal alloy terminal
		SF7	?medieval	copper alloy buckle plate
		SF8		copper alloy circular plate with vestige of centrally placed loop, possibly part of button
		SF9	post medieval	copper alloy keyhole escutcheon
		SF10	post medieval	copper alloy penny dated 1870 (Victoria)
		SF11	post medieval	copper alloy sheet/plate fragment
	GLA8	SF1	post medieval	iron ring
		SF2	post medieval	metal alloy sheet fragment
		SF3	post medieval	copper ally gun cartridge (retained by landowner)
		SF4	?	copper alloy sheet fragment with rivet at one end
		SF5	post medieval	metal alloy disc
		SF6	post medieval	copper alloy penny dated 1930 (George V)
		SF7	post medieval	lead molten fragment
Cransley	CRA10	SF1		lead perforated disc, incomplete, weight or spindle whorl
		SF2	?	slag fragment
		SF3	medieval	copper alloy buckle plate
		SF4	post medieval	copper alloy farthing 1875 (Victoria)
		SF5	post medieval	copper alloy button



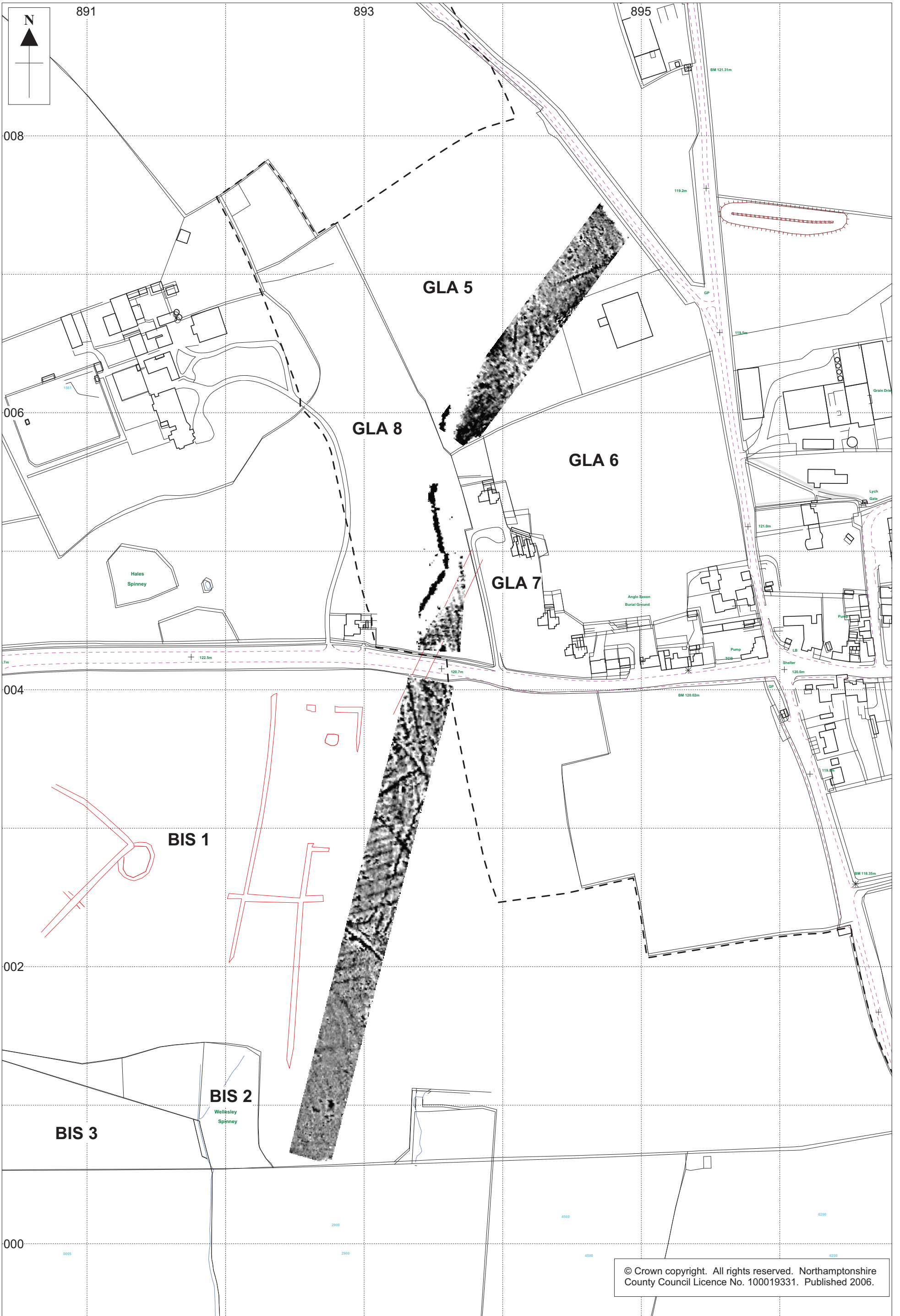
Scale 1:12,500

Site Location Fig 1

- ▭ Data Capture Corridor
- ▭ Preferred Pipeline Route
- ▭ Alternative Pipeline Route
- ★ Geophysics Areas



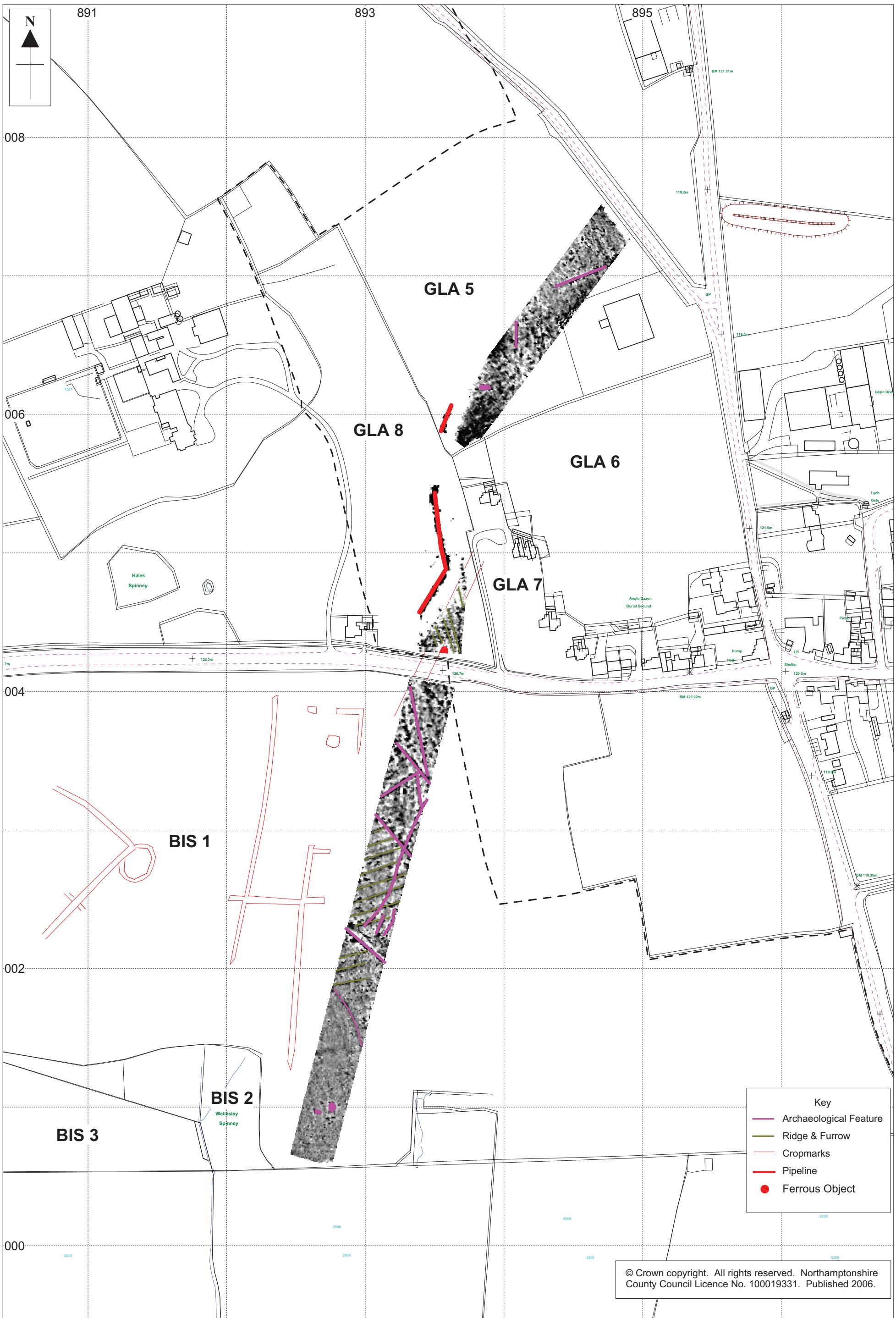
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Scale 1:2500 at A3

Survey Results GLA 5, 8 & BIS 1 (+4nT/-4nT black/white) Fig 2

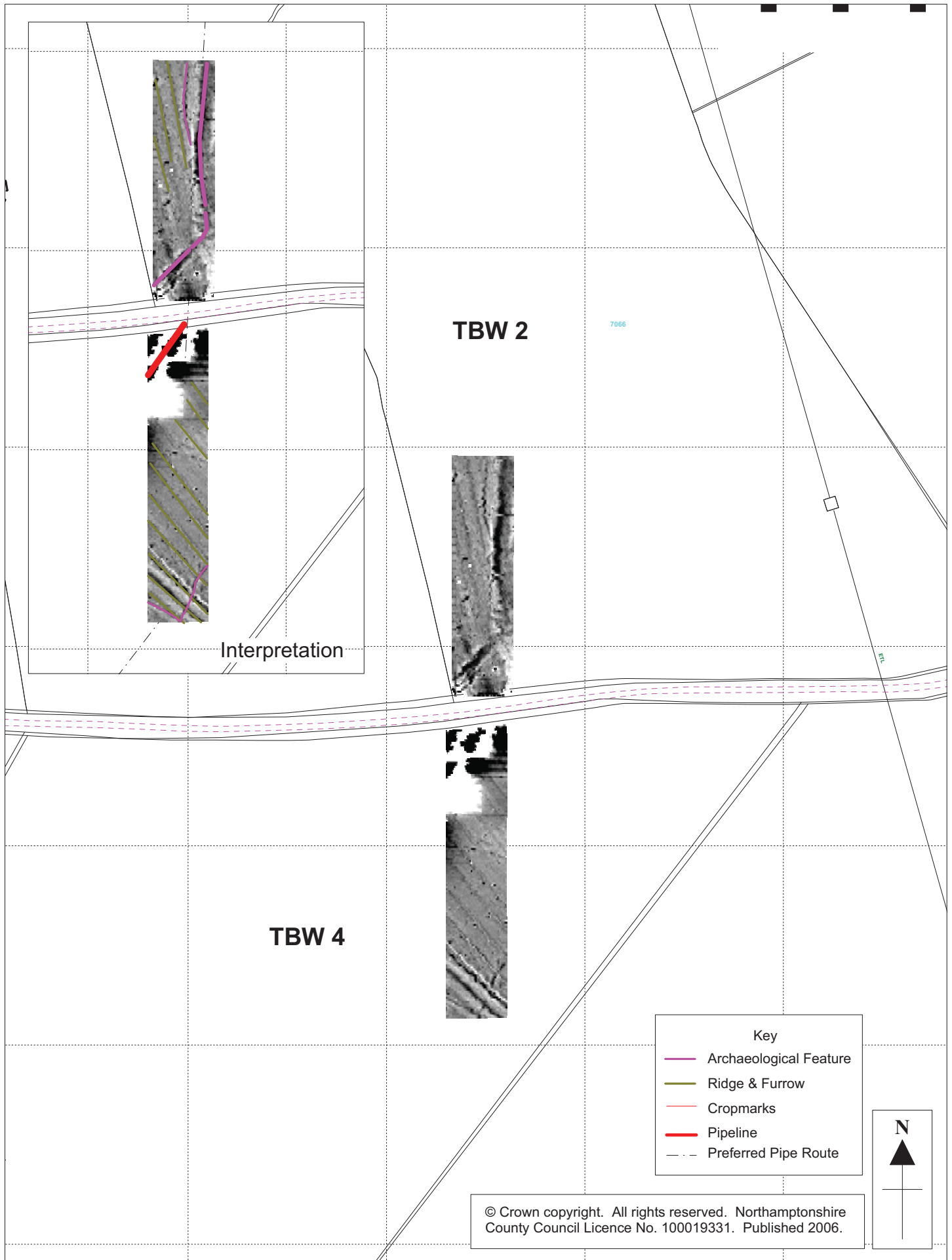
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Scale 1:2500 at A3

Survey Results with Interpretation GLA 5, 8 & BIS 1 Fig 3

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Scale 1:2500 at A3

Survey Results GTN 7, 8 & 9 (+4nT/-4nT black/white) Fig 5

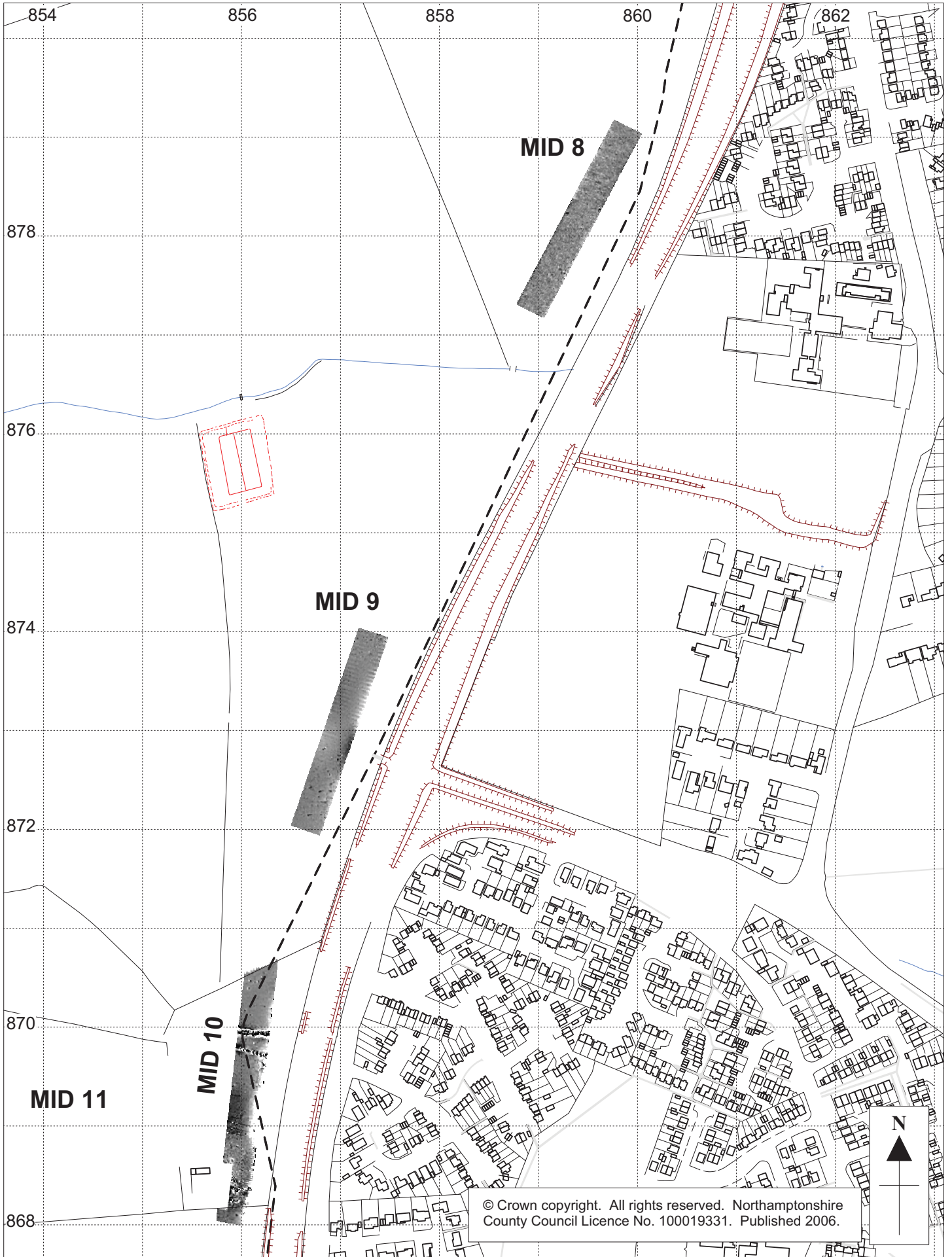
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Scale 1:2500 at A3

Survey Results GTN 7, 8 & 9 with Interpretation Fig 6

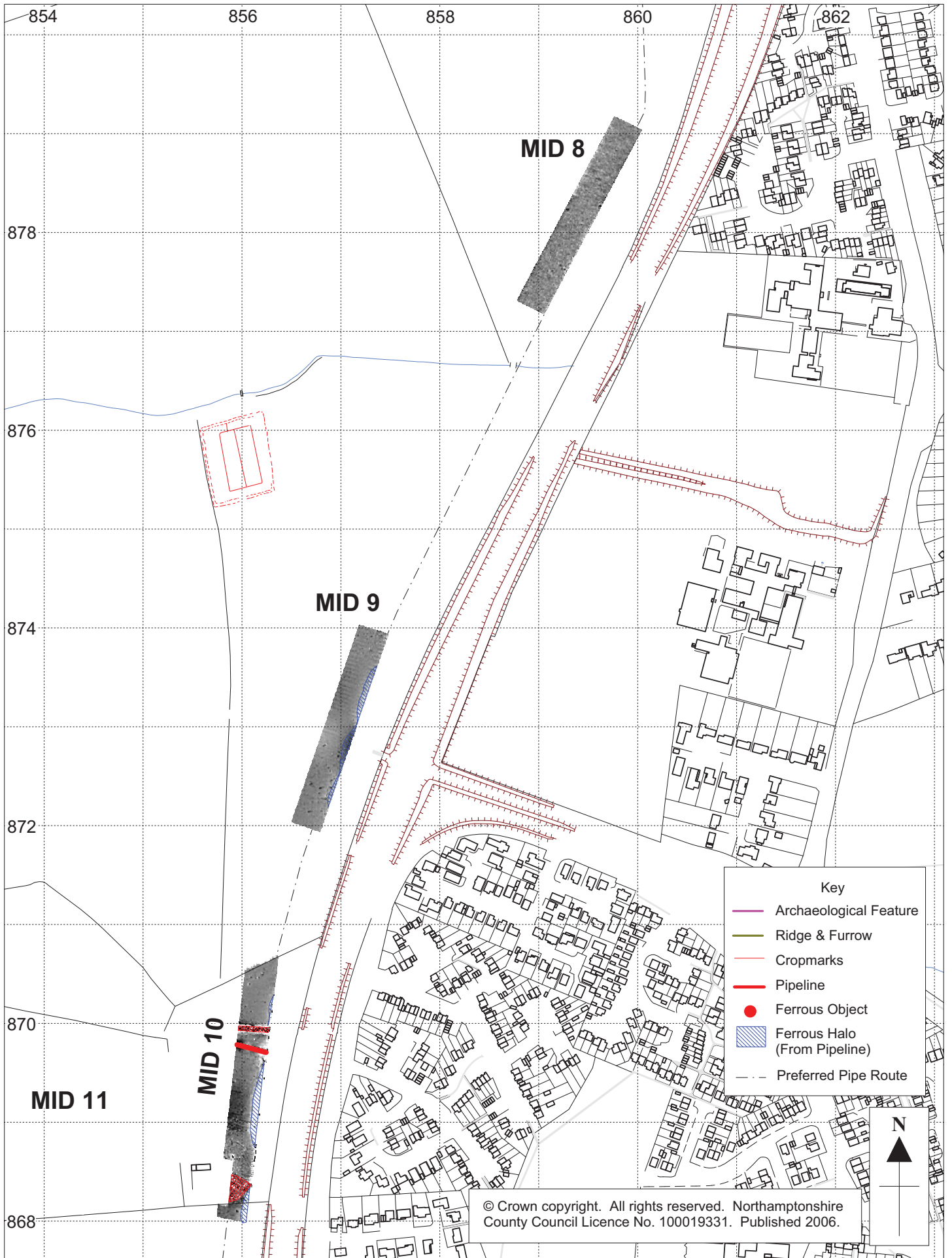






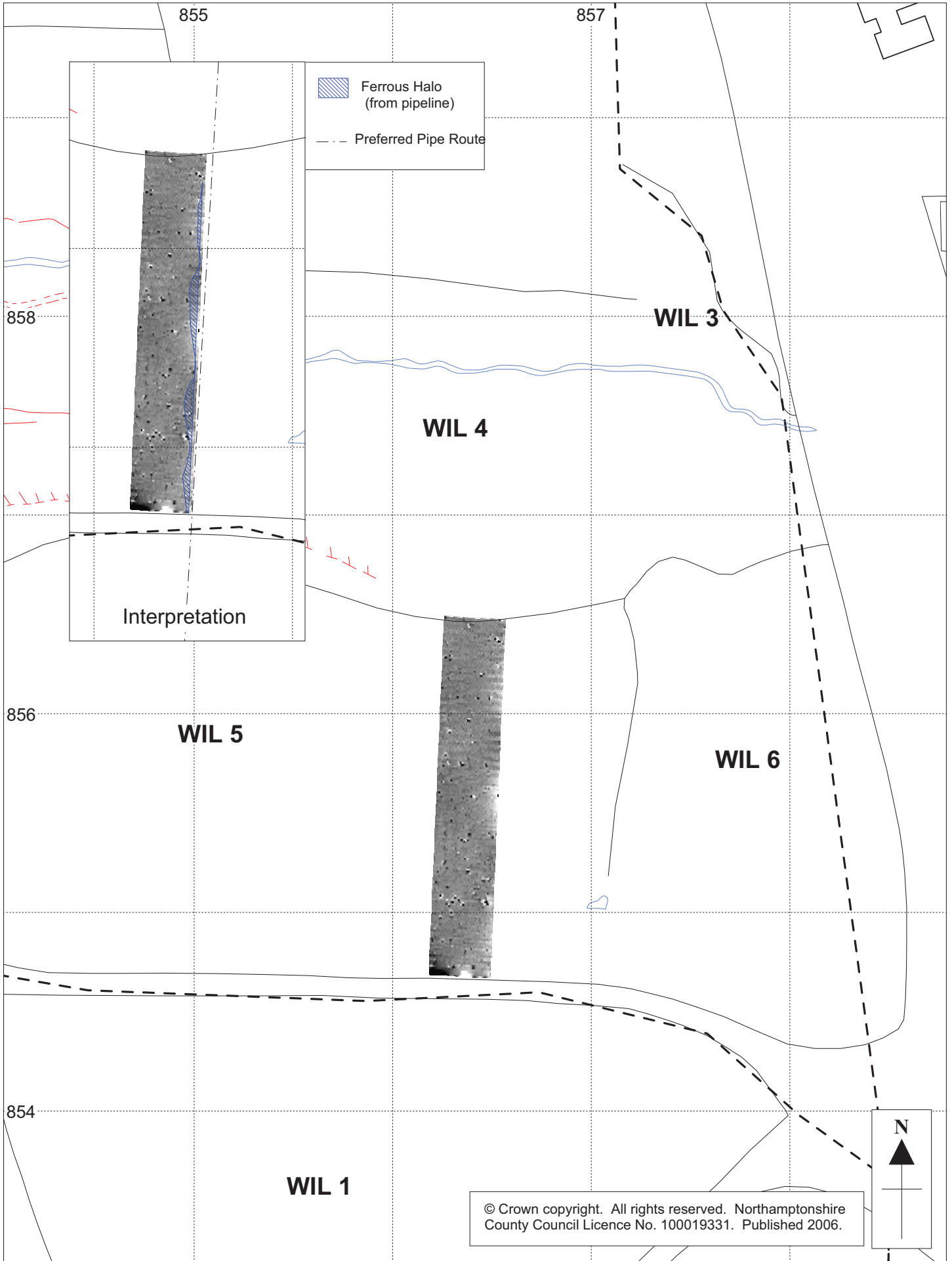
Scale 1:5000 at A4

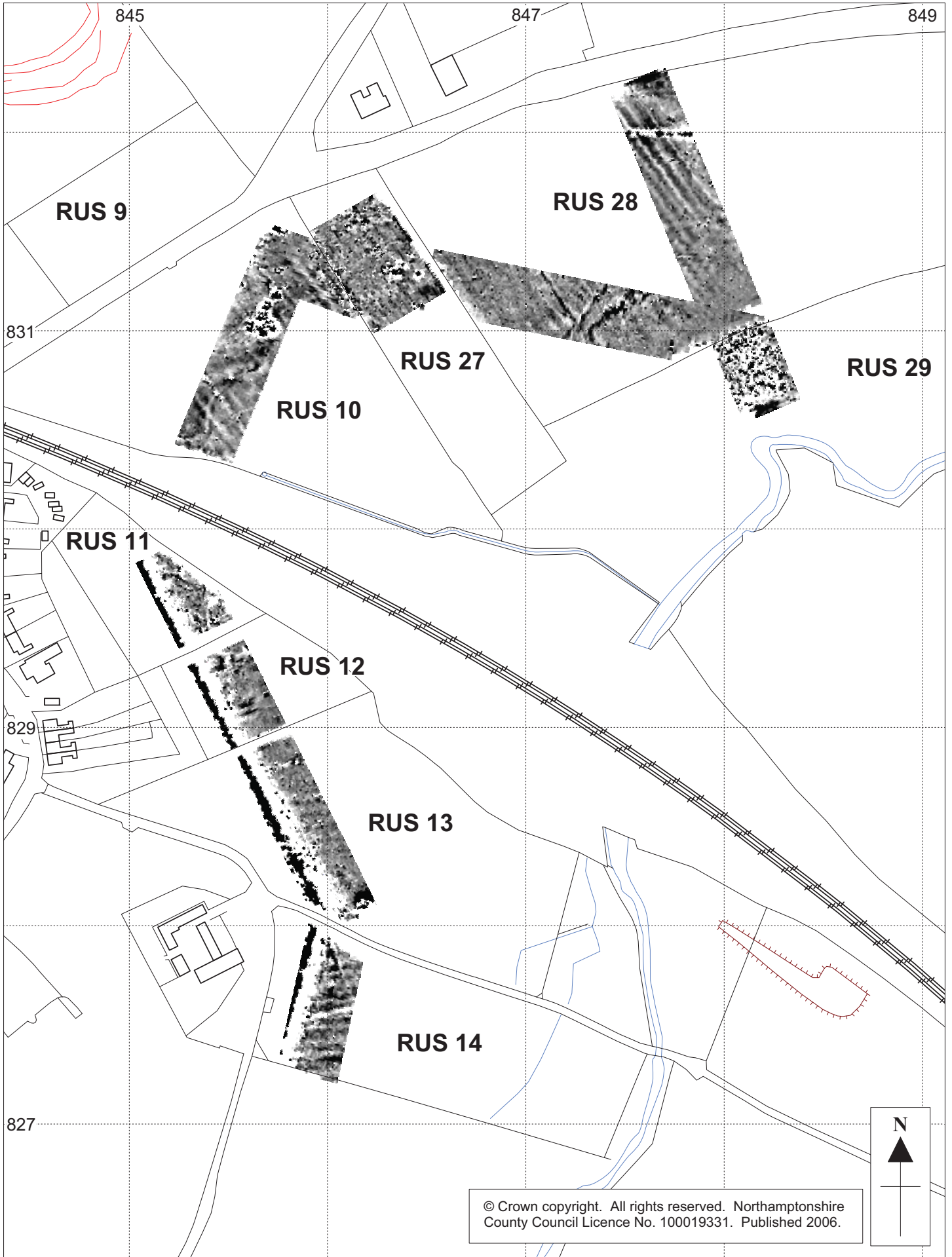
Survey Results Middleton 8, 9 & 10 (+4nT/-4nT black/white) Fig 8

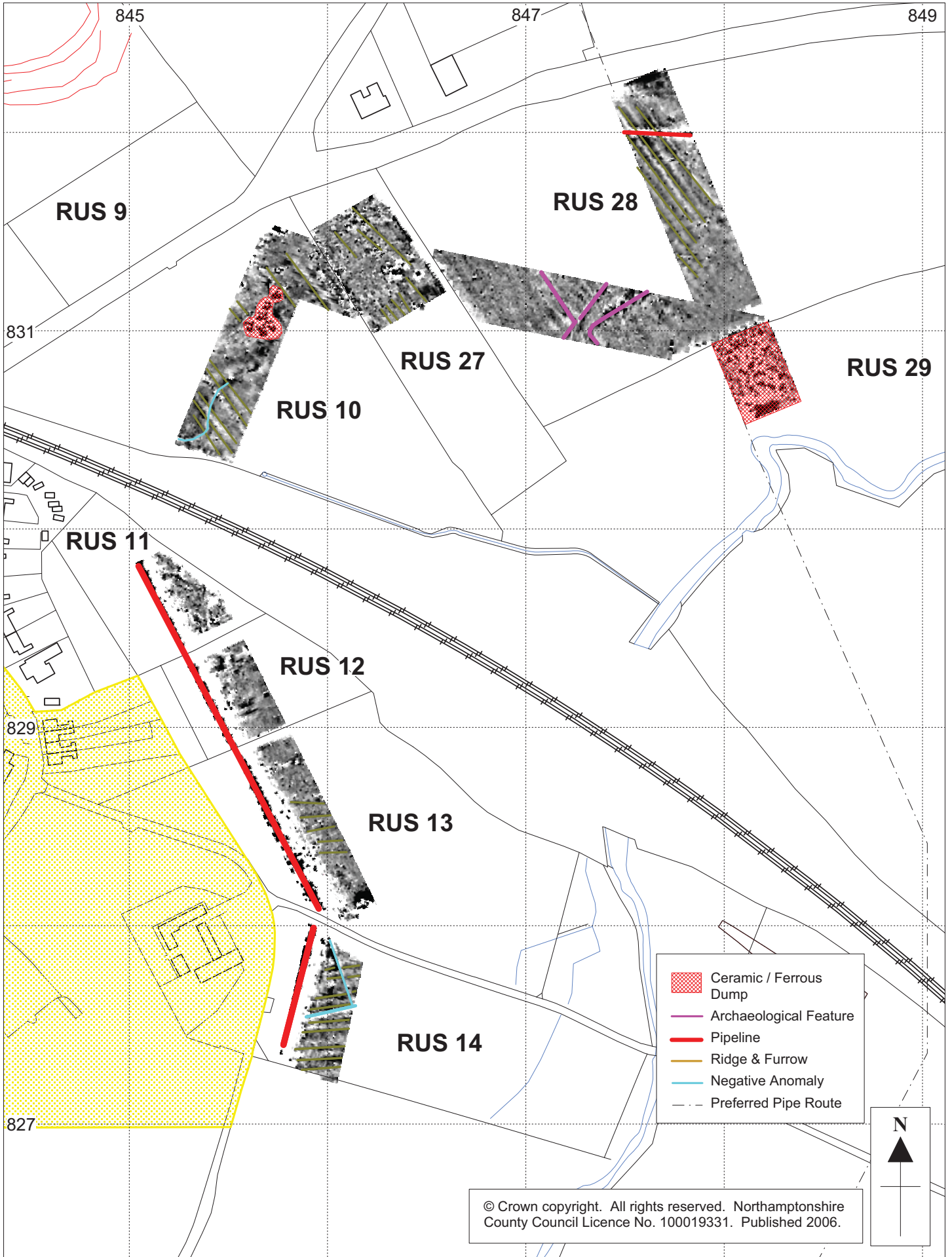


Scale 1:5000 at A4

Survey Results Middleton 8, 9 & 10 with Interpretation Fig 9







Scale 1:2500 at A4

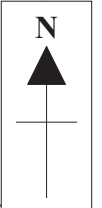
Survey Results Rushton 10-14 & 27-29 with Interpretation Fig 12



Scale 1:2500 at A3

Survey Results Cransley 6, 8-10 (+4nT/-4nT black/white) Fig 13

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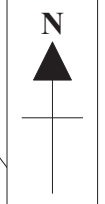
Scale 1:2500 at A3

Survey Results Cransley 6, 8-10 with Interpretation Fig 14



Key

- Ridge & Furrow
- Archaeological Anomaly
- Cropmarks
- Preferred Pipe Route



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