Cottam Solar Project

Environmental Statement Appendix 13.2:

Archaeological Geophysical Survey Reports (Part 10 of 13)

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Cottam
SOLAR PROJECT

WYAS Archaeological Services

Cottam Solar Project

Cottam Cable Route

Lincolnshire

Geophysical Survey

Report no. 3851
November 2022

Client: Cottam Solar Project

REGISTERED ORGANISATION CIfA

West Yorkshire Joint Services

Cottam Cable Route, Cottam Solar Project, Lincolnshire

Geophysical Survey

Summary

A geophysical (magnetometer) survey was undertaken on land consisting of approximately 160 hectares of land associated with the Cottam Cable Route linking the previously surveyed proposed solar sites of Cottam 1, 2 and 3 in Lincolnshire. The majority of the anomalies recorded are agricultural including field drains, ridge and furrow cultivation, modern ploughing and former field boundaries. Archaeological and possible archaeological responses have been recorded in one area which are likely to relate to settlement activity. Based on the geophysical survey, the archaeological potential of this site is deemed to be high in this one isolated area and low elsewhere.

WYAS Archaeological Services

Report Information

Client:	Cottam Solar Project Limited
Report Type:	Geophysical Survey
Location:	Cottam Cable Route
County:	Lincolnshire
Grid Reference:	Southwest at SK 8509 8183 / north at SK 8697 9517
Period(s) of activity:	Romano-British/medieval/post-medieval/modern
Report Number:	3851
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1 Introduction

Archaeological Services ASWYAS has been commissioned by Lanpro Services on behalf of their client, Cottam Solar Project Limited to undertake a geophysical survey in advance of the development of the Cottam Solar Scheme, Lincolnshire and Nottinghamshire. This survey relates to land associated with the Cottam Cable Route within Lincolnshire, hereafter referred to as the 'study site'. This was undertaken in line with current best practice (CIfA 2014; Schmidt *et al.* 2015). The survey was carried out between April and June, and September and October 2022 to provide additional information on the archaeological resource of the study site.

Site location, topography and land-use

The proposed cable route has been divided into four sections as below and can be seen within the WSI prepared by Lanpro in Appendix 5.

• Section 1 – areas to west of the proposed Cottam 1 Solar Project site

• Section 2 – areas adjoining land in the proposed Cottam 1 Solar Project site

• Section 3 – areas to the south of the proposed Cottam 2 Solar Project site

• Section 4 – areas to the south of the proposed Cottam 3 Solar Project site

The cable route was changed a number of times during survey, with the final route comprising *c.* 160ha over 88 areas (T1-T88). The study site is located in the southwest at SK 8509 8183 and in the north at SK 8697 9517 (See Fig. 1). The geophysical survey areas were centred along the proposed cable route with a 50m buffer on each side. The route is primarily across arable land with a mix of crop coverage, stubble, plough, silage grass and pasture.

Soils and geology

The recorded bedrock geology in the majority of the proposed route comprises mudstone and limestone of the Scunthorpe Mudstone Formation (BGS 2022). Pockets of Charmouth Mudstone Formation occur in Sections 2, 3 and 4 along water courses and rivers. No superficial deposits are recorded in the east of Section 1. Diamicton Till is present in Sections 2, 3 and 4 and in the west of Section 1. An area of Holme Pierrepont Sand and Gravel Member is located in the west of Section 1. Where Charmouth Mudstone Formation is present, superficial deposits of Alluvium comprising clay, silt, sand and gravel are present (BGS 2022).

2 Archaeological Background

The archaeological background below is taken from a Written Scheme of Investigation provided by Lanpro Services Ltd (James 2022) and is split into sections reflecting each portion of cable route.

Section 1 – areas to west of the proposed Cottam 1 Solar Project site

Various concentrations of Roman settlement and military activity lie adjacent to Stow Park Road and Till Bridge Lane, which follows the line of a Roman road between a river crossing at the Trent and Ermine Street, the Roman road running to the north of the Roman town at Lincoln '*Lindum Colonia'*. A scheduled Roman fort was recorded from cropmarks visible on aerial photographs taken in 1974 at Marton (NHLE: 1004935; HER: MLI54200). Directly to the north of the fort at Marton is a roadside settlement that lies adjacent to Till Bridge Lane (MI51369), and the site of a second possible Roman fort at Gate Burton (MLI50544). A Romano-British settlement (MLI84314) was identified during a watching brief on the Blyborough to Cottam gas pipeline to the south of Marton Road. Excavation in 1997 revealed two phases of a farmstead dating from *c*. AD 50 to at least AD 200. Geophysical survey in the Cottam 1 site, has identified several concentrations of anomalies that could represent settlements and enclosures of a late prehistoric or Roman period date based on their morphology. Romano British pottery has also been identified during fieldwalking in the 1960s in Torksey (MLI53798).

Between the winters of 872 and 873 the great Viking Army encamped on land to the north of Torksey (MLI125067). The camp was located on an easily defendable prominent buff with the Trent to the west. Between 2011 and 2015, The Universities of Sheffield and Nottingham undertook a research programme that identified the scale of the camp, along with the likely activities that occurred during the camp's lifespan, including expensive scatter of metal works (MLI25072, MLI125073 and MLI118779). Anglo-Saxon material has also been identified in the vicinity of the Viking Camp (MLI54282).

Torksey was a focus of early medieval settlement (MLI52545). Numerous kilns and vast quantities of pottery relating to the Torksey pottery industry, dated between the 9th and 12th centuries, were unearthed by excavations in 1965, 1967 and 1997 (MLI52561). Excavation in 1990, after geophysical survey in 1989, identified large amounts of early medieval pottery along with a kiln and four burials that were considered to belong to an early medieval cemetery (MLI52545). Subsequent excavation on the same site in 1994 revealed a further six burials of late 10th to early 11th-century date. An evaluation undertaken in 1996 identified bone, one fragment of early Saxon pottery, and 10th to 11th-century pottery (MLI53578). A second early medieval cemetery comprising seven burials was identified through trial excavation to the east of Main Street in 2002 (MLI54158). By the medieval period, Torksey formed a significant settlement, and evidence of medieval settlement survives in fields located between the modern village of Torksy and the Foss Dyke (MLI54207). Torksey is located on a vantage point between the Trent and the Foss dyke and so was likely to have

flourished during the medieval period as evidence by the presence of the ruins of an Elizabethan mansion are located in the centre of Torksey (MLI54206).

There may be some limited potential for the survival of previously unrecorded remains relating to Early Anglo-Saxon period in the direct hinterland of medieval villages that are suggested to have early medieval origin. The shrunken medieval village of Normanby-by-Stow (MLI52445) is located directly to the east of the proposed cable route in Section 1. Geophysical survey directly to the east of Normanby-by-Stow in the Cottam 1 site has identified a series of anomalies that are likely to relate to the medieval village. Willingham (MLI54013), to the north of the north of the proposed cable route corridor, appears to have had a relatively small population in the late 11th and 12th centuries, which rose into the 14th century. It seems to have been relatively unaffected by population decline in the 14th and 15th century, but appears to have declined in the post-medieval period. Remains of medieval plots have been recorded to the north and east of the village.

Land within Section 1 of the proposed cable route corridor has primarily remained in agricultural use throughout the medieval and post-medieval period as demonstrated by cropmarks of ridge and furrow that are recorded within the HER (MLI52493, MLI54012, MLI54020) and through the results of the geophysical surveys of adjacent proposed solar panel sites. Any potential buried archaeological features dating to the post-medieval period would likely relate to agricultural activity, such as ploughing, field boundaries and drainage.

The HER records numerous post-medieval farmsteads within the hinterland of the scheme. Parkland associated with Gate Burton Hall (MLI98360) and a post-medieval deerpark and gardens (MLI50409) are both located to the south of Knaith in the west of Section 1 of the cable route corridor.

Section 2 – areas adjoining land in the proposed Cottam 1 Solar Project site

Despite the lack or limited nature of previously recorded evidence for prehistoric and Roman period activity within the Cottam 1 site, the results of the geophysical survey within the proposed solar panel site has identified concentrations of anomalies that could represent settlements and enclosures of a late prehistoric or Roman period date based on their morphology. Several anomalies correspond with an area in which Roman period pottery and possible building stone were recovered in the 1930s (MLI51104). In the hinterland of the scheme cropmarks of a prehistoric ring ditch enclosure (MLI54007) and boundary (MLI54008) are recorded to the north of Fillingham. Roman pottery was found in the direct hinterland of the Cottam site at Cammeringham (MLI52426), and to the north of Fillingham (MLI51092).

There may be some limited potential for the survival of previously unrecorded remains relating to Early Anglo-Saxon period in the vicinity of the known area of former medieval villages. Normanby-by-Stow (MLI52445) is located to the west of the Cottam 1 site, and geophysical survey has identified a series of anomalies that are likely to relate to the

shrunken medieval village. Coates (MLI50538), which is located in the centre of the Cottam 1 site, had a relatively small population at the time of the Domesday Book, which grew during the 13th and 14th centuries but was depleted by the Black Death and eventually abandoned by the late 14th or early 15th century. Analysis of earthworks suggests a manorial complex (MLI50313) was located at the west end of the village. The village of Fillingham (MLI51121) appears to have had a large population by the end of the 11th century. Ploughed earthworks have been recorded at the east end of the village and an extensive area of medieval features, containing 12th-century pottery, were revealed during archaeological evaluation works at Church Farm. Closer to the scheme, is the site of a possible medieval grange at Fillingham Grange farm (MLI51120), which is suggested to have been associated with Ravesby Abbey. Thorpe (MLI50540) is documented in the Domesday Book as being a relatively small settlement at the end of the 11th century. Although the village grew during the later medieval period, medieval village plots were replaced by post-medieval farmsteads and now survive as earthworks to the north and south of Thorpe Lane.

It is considered that the majority of the Section 2 survey area has remained in primarily agricultural use throughout the medieval and post-medieval periods. This is supported by the vast number of HER records relating to ridge and furrow cropmarks (MLI50925, MLI52107, MLI52108, MLI52520, MLI52526, MLI52527, MLI52430), and the results of the geophysical survey. Therefore, it is considered likely that the majority of any potential buried archaeological features dating to the medieval and post-medieval periods are likely to relate to agricultural activity, such as ploughing, field boundaries and drainage.

Section 3 – areas to the south of the proposed Cottam 2 Solar Project site

The HER records several finds of a prehistoric and Roman date in the northern part of Section 3. These include a stone axehead (MLI51358) and stone axe and flint scrapper (MLI51349) found near Springthorpe; Mesolithic flints near School Lane (MLI51357); part of a polished stone axe fragment found to the south-west of Magin Moor Cottage (MLI51291); Roman pottery and part of a quern found to the north-west of Magin Moor Cottages (MLI51340); and Roman British pottery and stone found to the north of School Lane (MLI51356). Several concentrations of anomalies have also been identified through geophysical survey in the Cottam 1 and 2 sites that could be indicative of settlements and enclosures of a late prehistoric or Roman date.

Several villages adjacent to the proposed cable route in Section 3 are recorded in the Domesday Book of 1086. The settlement at Yawthorpe (MLI51344) had a chapel by 1277, and the earthwork remains surrounding the present settlement attest to its larger size during the medieval period. Corringham (MLI51346) and Springthorpe (MLI51360) are recorded as having a sizeable population at the time of the Domesday survey; vestiges of their medieval layout are retained in the plan of the modern village. A shrunken medieval village is located at Heapham (MLI50515), and earthworks of a moated site are located to the north of the modern village.

The majority of Section 3 of the proposed cable route corridor is likely to have retained a rural character since at least the early medieval period. The documentary and archaeological evidence for the area around the proposed cable route suggests that the present pattern of villages, hamlets and post-medieval farmsteads broadly represents the pattern of Late Anglo-Saxon, medieval and post-medieval settlement. An abundance of ridge and furrow is recorded on the HER (records MLI5091, MLI50925, MLI54142, MLI54253, MLI54272 and MLI98190 relating to recorded ridge an furrow are located within or next to Section 3 of the proposed cable route corridor) and the results of the geophysical survey in the solar panel sites at Cottam 1 and 2. Any potential buried archaeological features dating to the medieval and postmedieval period that may be present within the proposed cable route area are likely to primarily relate to agricultural activity, such as ridge and furrow, field boundaries and drainage.

A section of the former Second World War Sturgate Airfield extends into the Section 3 cable route corridor near Heapham. Sturgate Airfield was opened in 1944 and closed in 1946. It was later used by the US Air Force between 1952 and 1964 and survives in the modern landscape as cropmarks and remains of stonework. The portion of the airbase that lies within the scheme's corridor is currently used as a depot and so unlikely to accessible for survey works.

Section 4 – areas to the south of the proposed Cottam 3 Solar Project site

The HER records limited evidence of prehistoric and Roman activity within the direct vicinity of Section 4 of the proposed cable route. A stone axe fragment was found in Northorpe Beck (MLI51291) and a fragment of Roman pottery was found to the south of Hall Farm (MLI51312). Geophysical survey in the Cottam 3 site has also identified several concentrations of anomalies that could be indicative of settlements and enclosures of a late prehistoric or Roman date.

Evidence of early medieval activity comprises a single find of a sherd of Anglo-Saxon pottery at the White Hart, in Blyton (MLI87837).

Several villages adjacent to the proposed cable route in Section 4 are recorded in the Domesday Book of 1086. The village of Blyton (MLI51317) appears to have been an average sized settlement in the early 14th century, that expanded following recovering from the black death in the 14th century. Pilham (MLI51332) may always have been a relatively small settlement, and there is no earthwork or cartographic evidence to suggest that it has shrunken extensively since the medieval period. To the south of Pilham, the deserted medieval village of Gilby (MLI50534) is first documented in the early 12th century, and is recorded together with Pilham in the Lay Subsidies of the early 14th century. The village of Aisby (MLI51345) may never have been particularly large, and no earthwork remains have been recorded that could suggest a shrunken settlement, although the remains of a number of ponds, ditches and post holes, together with a find of a silver brooch, have been recorded in the vicinity.

Similarly, there appears to be little evidence of settlement shrinkage at Corringham during the later medieval period. Earthwork remains of sunken road, crofts and surrounding ridge and furrow belonging to the former medieval village of Dunstall (MLI54223), which is located to the east of Section 4 of the proposed cable route.

Section 4 of the proposed cable route corridor are likely to have retained a primarily rural character since at least the early medieval period. The documentary and archaeological evidence for the area around the proposed cable route suggests that the present pattern of villages, hamlets and post-medieval farmsteads broadly represents the pattern of Late Anglo-Saxon, medieval and post-medieval settlement. An abundance of ridge and furrow has been recorded in the HER (MLI125520, MLI125593, MLI54076, MLI54077, MLI98184 relating to ridge and furrow are located immediately adjacent to Section 4 of the proposed cable route corridor) and in the results of the geophysical survey in the solar project sites at Cottam 2 and 3. Any potential buried archaeological features dating to the medieval and post-medieval period that may be present within the proposed cable route area are likely to primarily relate to agricultural activity, such as ridge and furrow, field boundaries and drainage.

The area surrounding the scheme was subjected to post-medieval mineral extraction; three gravel pits are recorded to the north-west of the scheme near Blyton (MLI52806 - MLI52808).

In early 1941, part of the area covered by the proposed Cottam 3 solar panel site was chosen for the site of RAF Blyton and the base was opened in November 1942 (MLI54074). The former field pattern within the centre of the Cottam 3 study site was cleared, and the Blyton Field farmstead demolished, to make way for a standard ‘Class A’ runway pattern, consisting of three hardened runways and a concrete perimeter track linking 36 hard-standings. Following the war, the base was used for storage until 1947, and was used as a relief landing field in the 1950s, but finally closed in May 1954, and the area of the airfield within the study site reverted back to agricultural use.

3 Aims, Methodology and Presentation

The aims and objectives of the programme of geophysical survey were to gather sufficient information to establish the presence/absence, character and extent, of any archaeological remains within the specific area and to inform an assessment of the archaeological potential of the site. To achieve this aim, a magnetometer survey covering all amenable parts of the study site was undertaken (see Fig. 2).

The general objectives of the geophysical survey were:

- to provide information about the nature and possible interpretation of any magnetic anomalies identified;

- to therefore determine the presence/absence and extent of any buried archaeological features; and
- to prepare a report summarising the results of the survey.

Magnetometer survey

The study site was surveyed using either a cart-based survey or hand-held survey. The cart-based survey was undertaken using an eight channel SenSYS MX V3 system containing eight FGM650 sensors. Readings are taken every 20MHz (between 0.05 and 0.1m). Data were recorded onto a device, using a Carlson GNSS Smart antenna, for centimetre accuracy. These readings were stored in the memory of the instrument and downloaded for processing and interpretation. DLMGPS and MAGNETO software, alongside bespoke in-house software was used to process and present the data. Further details are given in Appendix 1.

Where a cart-based survey was not suitable the survey was undertaken using Bartington Grad601 magnetic gradiometers. These were employed taking readings at 0.25m intervals on zig-zag traverses 1.0m apart within 30m by 30m grids, so that 3600 readings were recorded in each grid. These readings were stored in the memory of the instrument and later downloaded to computer for processing and interpretation. Bespoke in-house software was used to process and present the data. Further details are given in Appendix 1.

Reporting

A general site location plan, incorporating the 1:50000 Ordnance Survey (OS) mapping, is shown in Figure 1. Figure 2 displays the location of the study site at a scale of 1:12500. Figure 3 shows the location of survey areas T1-T35 at a scale of 1:10000. Figure 4 shows the processed magnetometer data at a scale of 1:10000, whilst Figure 5 shows an overview of the interpretation at the same scale. Figure 6 shows the location of survey areas T26 - T44 at a scale of 1:10000. Figure 7 shows the processed magnetometer data at a scale of 1:10000, whilst Figure 8 shows an overview of the interpretation at the same scale. Figure 9 shows the location of survey areas T45-T68 at a scale of 1:10000. Figure 10 shows the processed magnetometer data at a scale of 1:10000, whilst Figure 11 shows an overview of the interpretation at the same scale. Figure 12 shows the location of survey areas T69-T88 at a scale of 1:10000. Figure 13 shows the processed magnetometer data at a scale of 1:10000, whilst Figure 14 shows an overview of the interpretation at the same scale. Processed and minimally processed data, together with interpretation of the survey results are presented in Figures 15 to 98 inclusive at a scale of 1:1500.

Technical information on the equipment used, data processing and survey methodologies are given in Appendix 1. Technical information on locating the survey area is provided in Appendix 2. Appendix 3 describes the composition and location of the archive. A copy of the

completed OASIS form is included in Appendix 4. Appendix 5 includes the WSI prepared by Lanpro (James 2022).

The survey methodology, report and any recommendations comply with guidelines outlined by the European Archaeological Council (Schmidt *et al*. 2015) and by the Chartered Institute for Archaeologists (CIfA 2014). All figures reproduced from Ordnance Survey mapping are with the permission of the controller of His Majesty's Stationery Office (© Crown copyright).

The figures in this report have been produced following analysis of the data in processed formats and over a range of different display levels. All figures are presented to most suitably display and interpret the data from this site based on the experience and knowledge of Archaeological Services staff.

4 Results and Discussion (see Figures 15 to 98)

Ferrous anomalies and magnetic disturbance

Ferrous anomalies, as individual 'spikes', or as large discrete areas are typically caused by ferrous (magnetic) material, either on the ground surface or in the plough-soil. Little importance is normally given to such anomalies, unless there is any supporting evidence for an archaeological interpretation, as modern ferrous debris or material is common on rural sites, often being present as a consequence of manuring or tipping/infilling. There is no obvious pattern or clustering to their distribution in this survey to suggest anything other than a random background scatter of ferrous debris in the plough-soil.

Linear dipolar trends have been recorded in Areas T1, T2, T3, T45, T50, T54 and T55 which relate to service pipes. The service in Areas T2 and T3 have produced a strong magnetic halo and is likely to reflect a mains service pipe.

Magnetic disturbance in the centre of Area T38 (Sector 13) corresponds to the location of a former building marked on historic mapping dating from 1885 and is still shown on the map dated 1954 (NLS 2022).

Magnetic disturbance along the limits of the survey areas is due to metal fencing within the field boundaries, adjacent farm buildings and roads.

Geological anomalies

The survey has detected a handful of anomalies that have been interpreted as geological in origin. It is thought that the responses have been detected because of the variation in the composition and depth of the deposits of superficial material in which they derive.

Agricultural anomalies

At least fifteen former field boundaries (**FB1** – **FB15**) have been recorded throughout the study site. All of these boundaries correspond to historic mapping dating from 1905 and are still visible on the historic map published in 1956 (NLS 2022).

Field drains can be seen within most of the fields. They are of differing magnetic strength which is likely to be associated with the construction material of the drains. Those that are particularly strong, such as in Areas T7 – T14 (Sectors 3-5), Areas T44 (Sector 17), Areas T61 and T62 (Sector 22), Areas T64 and T65 (Sector 23) and T82 (Sector 27), are likely to be of a fired clay construction.

Medieval or post-medieval ridge and furrow cultivation has been recorded within a number of the areas.

Other parallel linear trends can be seen within all areas and are associated with modern ploughing. Only a selection of these have been highlighted on the interpretation diagrams to show the direction of the plough lines.

Uncertain anomalies

A number of anomalies within the dataset have been interpreted as having an uncertain origin, the majority of these are magnetically weak isolated trends which are on a different alignment to the current ploughing regime.

It is likely that the majority of the uncertain anomalies are associated with agriculture or desiccation cracks within the topsoil.

Possible and definite archaeological anomalies

Anomalies (**A1**) recorded in Area T65 (Sector 23) are likely to indicate settlement activity. The features are broken, likely due to damage from the ridge and furrow and modern ploughing within the field. Weak responses (**P3**) follow through to the east in Area T66. It is likely that further archaeological remains are present to the west of Area T65. Due to other similar features recorded as part of the main Cottam survey, these anomalies are indicative of settlement activity over a probable Romano-British to medieval time period.

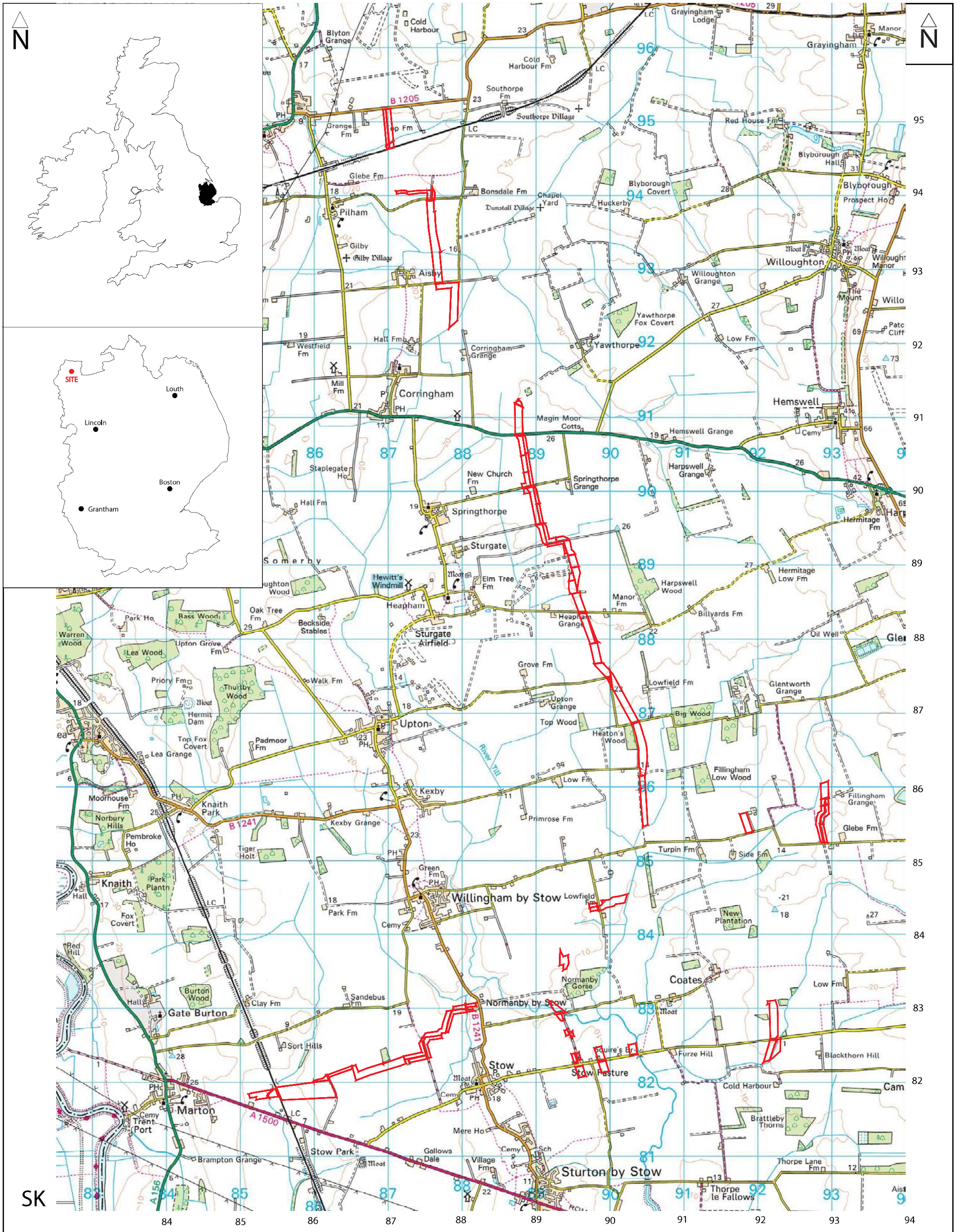
A weak linear trend (**P1**) in Area T29 (Sector 11) is likely to indicate a former boundary which is not shown on historic mapping. If the feature was to continue to the north it would hit a bend in the current boundary, adding weight to this interpretation. In the same area, anomaly **P2** appears to form a small rectilinear feature measuring approximately 35m by 9m which abuts the above possible boundary.

5 Conclusions

The geophysical survey has detected a number of magnetic anomalies associated mainly with an agricultural landscape including former field boundaries, medieval/post-medieval ridge and furrow cultivation, modern ploughing and land drains. Archaeological responses have been recorded in only one of the areas, comprising broken linear trends and ditches. Possible archaeological responses have also been recorded within a few of the other areas.

Magnetic disturbance within the dataset can be attributed to adjacent tracks and metal fencing within field boundaries, as well as the location of a former building within one of the fields. Service pipes have also been recorded.

Based on the geophysical survey, the archaeological potential of the study site is deemed to be high in the area with likely archaeological activity and low elsewhere.



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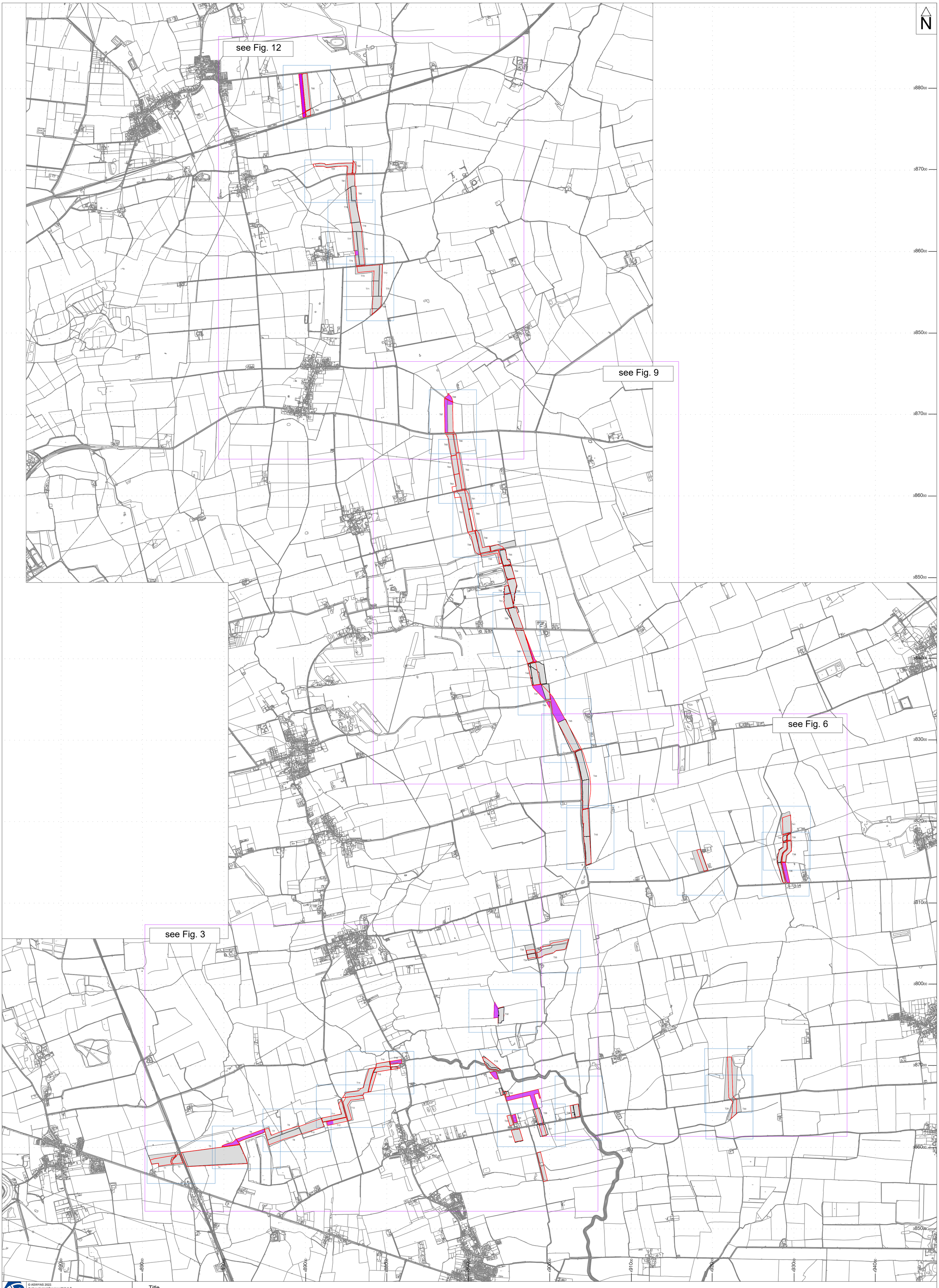
Project No. XB85	*Project Code: CWB22*
Fig. 1	
Site location	

0 2km



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Location of study site

Fig. 2

Title

	SURVEY AREA
A1	FIELD NUMBERS
	PARCEL AREA
	SECTOR BOUNDARY

0 750m

1:20,000 @ A1

N

SECTOR 1
SEE FIGS 15-17

SECTOR 2
SEE FIGS 18-20

SECTOR 3
SEE FIGS 21-23

SECTOR 4
SEE FIGS 24-26

SECTOR 5
SEE FIGS 27-29

SECTOR 6
SEE FIGS 30-32

SECTOR 7
SEE FIGS 33-35

SECTOR 8
SEE FIGS 36-38

SECTOR 9
SEE FIGS 39-41

SECTOR 10
SEE FIGS 42-44

T1 T2 T3 T4 T5 T6 T7 T8 T9 T10 T11 T12 T13 T14 T15 T16 T17 T18 T19 T20 T21 T22 T23 T24 T25 T26 T27 T28 T32 T33 T34 T35

3840000
3830000
3820000
3810000
3800000

3850000 3860000 3870000 3880000 3890000 3900000

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Location of survey areas T1-T35

Fig. 3

Title

- SURVEY AREA
- T1 FIELD NUMBERS
- SECTOR BOUNDARY
- UNSUITABLE FOR SURVEY

0 400m

1:10,000 @ A2

N

SECTOR 6
SEE FIGS 30-32

SECTOR 7
SEE FIGS 33-35

SECTOR 8
SEE FIGS 36-38

SECTOR 9
SEE FIGS 39-41

SECTOR 10
SEE FIGS 42-44

SECTOR 5
SEE FIGS 27-29

SECTOR 4
SEE FIGS 24-26

SECTOR 3
SEE FIGS 21-23

SECTOR 2
SEE FIGS 18-20

SECTOR 1
SEE FIGS 15-17

T1 T2 T3 T4 T5 T6 T7 T8 T9 T10 T11 T12 T13 T14 T15 T16 T17 T18 T19 T20 T21 T22 T23 T24 T25 T26 T27 T28 T32 T33 T34 T35

3840000
3830000
3820000
4850000
4860000
4870000
4880000
4890000
4900000

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Processed magnetometer data; Areas T1-T35

Fig. 4

Title

SURVEY AREA
SECTOR BOUNDARY
UNSUITABLE FOR SURVEY

nT -1.0 2.0

0 400m

1:10,000 @ A2

N

SECTOR 1
SEE FIGS 15-17

SECTOR 2
SEE FIGS 18-20

SECTOR 3
SEE FIGS 21-23

SECTOR 4
SEE FIGS 24-26

SECTOR 5
SEE FIGS 27-29

SECTOR 6
SEE FIGS 30-32

SECTOR 7
SEE FIGS 33-35

SECTOR 8
SEE FIGS 36-38

SECTOR 9
SEE FIGS 39-41

SECTOR 10
SEE FIGS 42-44

T1 T2 T3 T4 T5 T6 T7 T8 T9 T10 T11 T12 T13 T14 T15 T16 T17 T18 T19 T20 T21 T22 T23 T24 T25 T26 T27 T28 T32 T33 T34 T35

3840000
3830000
3820000
850000
860000
870000
880000
890000
900000

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Interpretation of magnetometer data; Areas T1-T35

Fig. 5

Title

- SURVEY AREA
- SECTOR BOUNDARY
- UNSUITABLE FOR SURVEY

Interpretation

- FERROUS
- SERVICE PIPE
- MAGNETIC DISTURBANCE
- FIELD DRAIN
- RIDGE & FURROW
- AGRICULTURAL
- FORMER FIELD BOUNDARY
- GEOLOGY
- UNCERTAIN
- INTERFERENCE

0 400m

1:10,000 @ A2

N

T45

T44

SECTOR 17
SEE FIGS 63-65

T43

SECTOR 16
SEE FIGS 60-62

SECTOR 15
SEE FIGS 57-59

T42

SECTOR 14
SEE FIGS 54-56

T41

T40

T39

T38

T37

T36

SECTOR 13
SEE FIGS 51-53

T35

T31

SECTOR 11
SEE FIGS 45-47

SECTOR 12
SEE FIGS 48-50

T29

T30

T26

T28

T27

3870 00

3860 00

3850 00

3840 00

3830 00

4900 00

4910 00

4920 00

4930 00

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Interpretation of magnetometer data; Areas T26-T44

Fig. 8

Title

- SURVEY AREA
- SECTOR BOUNDARY
- UNSUITABLE FOR SURVEY

Interpretation

- FERROUS
- SERVICE PIPE
- MAGNETIC DISTURBANCE
- FIELD DRAIN
- RIDGE & FURROW
- AGRICULTURAL
- FORMER FIELD BOUNDARY
- GEOLOGY
- UNCERTAIN
- INTERFERENCE

0 400m

1:10,000 @ A2

N

T45

T44

T43

T42

T41

T40

T39

T38

T37

T36

T35

T31

T29

T30

T27

T26

T28

SECTOR 17
SEE FIGS 63-65

SECTOR 16
SEE FIGS 60-62

SECTOR 15
SEE FIGS 57-59

SECTOR 14
SEE FIGS 54-56

SECTOR 13
SEE FIGS 51-53

SECTOR 11
SEE FIGS 45-47

SECTOR 12
SEE FIGS 48-50

3870 00

3860 00

3850 00

3840 00

3830 00

4900 00

4910 00

4920 00

4930 00

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Location of survey areas T26-T44

Fig. 6

Title

	SURVEY AREA
T1	FIELD NUMBERS
	SECTOR BOUNDARY
	UNSUITABLE FOR SURVEY

0 400m

1:10,000 @ A2

N

T45

T44

SECTOR 17
SEE FIGS 63-65

SECTOR 14
SEE FIGS 54-56

T43

SECTOR 16
SEE FIGS 60-62

T42

SECTOR 15
SEE FIGS 57-59

T41

T40

T39

T38

T37

T36

SECTOR 13
SEE FIGS 51-53

T35

T31

SECTOR 11
SEE FIGS 45-47

T29

T30

SECTOR 12
SEE FIGS 48-50

T26

T28

T27

3870 00

3860 00

3850 00

3840 00

3830 00

4900 00

4910 00

4920 00

4930 00

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Processed magnetometer data; Areas T26-T44

Fig. 7

Title

SURVEY AREA

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

nT -1.0 2.0

0 400m

1:10,000 @ A2

N

T68
T67
SECTOR 24
SEE FIGS 84-86
T66
T65
T64
T65
SECTOR 23
SEE FIGS 81-83
T63
T61
T62
T60
SECTOR 22
SEE FIGS 78-80
T58
T57
T59
T55
T56
SECTOR 21
SEE FIGS 75-77
T54
T52
T53
T51
SECTOR 20
SEE FIGS 72-74
T50
T49
T48
SECTOR 19
SEE FIGS 69-71
T47
T46
T45
SECTOR 18
SEE FIGS 66-68
T44
SECTOR 17
SEE FIGS 63-65

3910 00
3900 00
3890 00
3880 00
3870 00

4880 00
4890 00
4900 00
4910 00

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Location of survey areas T45-T68

Fig. 9

Title

	SURVEY AREA
T1	FIELD NUMBERS
	SECTOR BOUNDARY
	UNSUITABLE FOR SURVEY

0 400m

1:10,000 @ A2

N

T68
T67
SECTOR 24
SEE FIGS 84-86
T66
T65
T64
T63
SECTOR 23
SEE FIGS 81-83
T61
T62
T60
SECTOR 22
SEE FIGS 78-80
T58
T57
T59
T55
T56
SECTOR 21
SEE FIGS 75-77
T54
T52
T53
T51
T50
SECTOR 20
SEE FIGS 72-74
T49
T48
SECTOR 19
SEE FIGS 69-71
T47
T46
T45
SECTOR 18
SEE FIGS 66-68
T44
SECTOR 17
SEE FIGS 63-65

3910 00
3900 00
3890 00
3880 00
3870 00

4880 00
4890 00
4900 00
4910 00

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Processed magnetometer data; Areas T45-T68

Fig. 10

Title

- SURVEY AREA
- SECTOR BOUNDARY
- UNSUITABLE FOR SURVEY

nT -1.0 2.0

0 400m

1:10,000 @ A2

N

T68
T67
SECTOR 24
SEE FIGS 84-86
T66
T65
T64
T65
SECTOR 23
SEE FIGS 81-83
T63
T61
T62
T60
SECTOR 22
SEE FIGS 78-80
T58
T57
T59
T55
T56
SECTOR 21
SEE FIGS 75-77
T54
T52
T53
T51
SECTOR 20
SEE FIGS 72-74
T50
T49
T48
SECTOR 19
SEE FIGS 69-71
T47
T46
T45
SECTOR 18
SEE FIGS 66-68
T44
SECTOR 17
SEE FIGS 63-65

3910000
3900000
3890000
3880000
3870000

4880000
4890000
4900000
4910000

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Interpretation of magnetometer data; Areas T45-T68

Fig. 11

Title
- SURVEY AREA
- SECTOR BOUNDARY
- UNSUITABLE FOR SURVEY

Interpretation
- FERROUS
- SERVICE PIPE
- MAGNETIC DISTURBANCE
- FIELD DRAIN
- RIDGE & FURROW
- AGRICULTURAL
- FORMER FIELD BOUNDARY
- GEOLOGY
- UNCERTAIN
- ARCHAEOLOGY?
- ARCHAEOLOGY
- INTERFERENCE

0 400m
1:10,000 @ A2

N

SECTOR 28
SEE FIGS 96-98

SECTOR 27
SEE FIGS 93-95

SECTOR 26
SEE FIGS 90-92

SECTOR 25
SEE FIGS 87-89

SECTOR 24
SEE FIGS 84-86

T88 T85 T87 T84 T86

T83 T82 T81 T80 T79 T78 T77 T76 T75 T74 T73 T72 T71 T70 T69

T68 T67 T66 T65 T64

Pilham

Corringham

3950 00
3940 00
3930 00
3920 00
3910 00

4860 00
4870 00
4880 00
4890 00

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Location of survey areas T69-T88

Fig. 12

Title

	SURVEY AREA
T1	FIELD NUMBERS
	SECTOR BOUNDARY
	UNSUITABLE FOR SURVEY

0 400m

1:10,000 @ A2

N

T88
T85
T87
T84
T86

SECTOR 28
SEE FIGS 96-98

T83
T82
T81
T80
T79

SECTOR 27
SEE FIGS 93-95

SECTOR 26
SEE FIGS 90-92

T78
T77
T76
T75
T74
T73
T72

SECTOR 25
SEE FIGS 87-89

T71
T70
T69

T68
T67
T66
T65
T64

SECTOR 24
SEE FIGS 84-86

3950 00
3940 00
3930 00
3920 00
3910 00
4860 00
4870 00
4880 00
4890 00

Pilham
Corringham

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Processed magnetometer data, Areas T69-T88

Fig. 13

Title

SURVEY AREA
SECTOR BOUNDARY
UNSUITABLE FOR SURVEY

0 400m

1:10,000 @ A2

N

T88
T85
T87
T84
T86
SECTOR 28
SEE FIGS 96-98

T83
T82
T81
T80
T79
SECTOR 27
SEE FIGS 93-95
SECTOR 26
SEE FIGS 90-92
T78
T77
T76
T75
T74
T73
T72
SECTOR 25
SEE FIGS 87-89
T71
T70
T69
T68
T67
SECTOR 24
SEE FIGS 84-86
T66
T65
T64

3950 00
3940 00
3930 00
3920 00
3910 00
4860 00
4870 00
4880 00
4890 00

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Interpretation of magnetometer data, Areas T69-T88

Fig. 14

Title

- SURVEY AREA
- SECTOR BOUNDARY
- UNSUITABLE FOR SURVEY

Interpretation

- FERROUS
- SERVICE PIPE
- MAGNETIC DISTURBANCE
- FIELD DRAIN
- RIDGE & FURROW
- AGRICULTURAL
- FORMER FIELD BOUNDARY
- GEOLOGY
- UNCERTAIN
- ARCHAEOLOGY?
- ARCHAEOLOGY
- INTERFERENCE

0 400m

1:10,000 @ A2

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Processed greyscale magnetometer data; Sector 1

Fig. 15

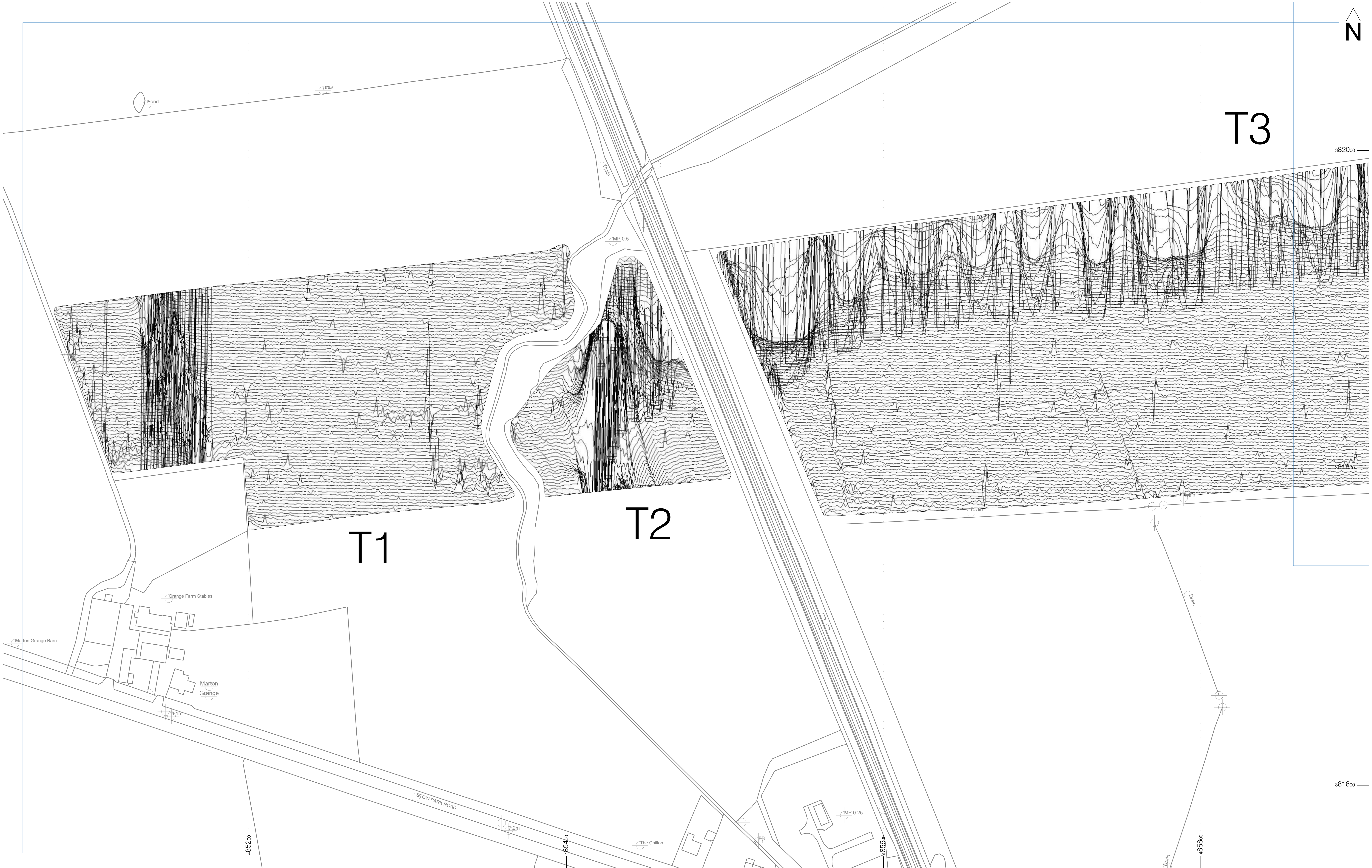
Title

SECTOR BOUNDARY

nT -1.0 2.0

0 60m

1:1,500 @ A2



Title

SECTOR BOUNDARY

15.0 nT/cm

0 60m

1:1,500 @ A2

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XY trace plot of minimally processed magnetometer data; Sector 1

Fig. 16

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XY trace plot of minimally processed magnetometer data; Sector 1

Fig. 16

Title

SECTOR BOUNDARY

Interpretation

FERROUS	RIDGE & FURROW
SERVICE PIPE	AGRICULTURAL
MAGNETIC DISTURBANCE	FORMER FIELD BOUNDARY
FIELD DRAIN	UNCERTAIN

0 60m

1:1,500 @ A2

T5

T6

T7

T4

Ruins

Culvert

Solar Panels

Drain

N

3822.00

3820.00

3818.00

4860.00

4862.00

4864.00

4866.00

Project ID: XB85_CWB22 Cottam Cable Route

Processed greyscale magnetometer data; Sector 2

Fig. 18

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

nT -1.0 2.0

0 60m

1:1,500 @ A2

T5

T6

T7

T4

Ruins

Solar Panels

Drain

N

3822 00

3820 00

3818 00

4860 00

4862 00

4864 00

4866 00

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XY trace plot of minimally processed magnetometer data; Sector 2

Fig. 19

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

15.0 nT/cm

0 60m

1:1,500 @ A2

Title

SECTOR BOUNDARY
UNSUITABLE FOR SURVEY

Interpretation

FERROUS
SERVICE PIPE
MAGNETIC DISTURBANCE
FIELD DRAIN
RIDGE & FURROW
AGRICULTURAL
FORMER FIELD BOUNDARY
UNCERTAIN
INTERFERENCE

0 60m
1:1,500 @ A2

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Interpretation of magnetometer data;
Sector 2

Fig. 20

N

T7

T9

T8

T10

Drain

Drain

3824 00

3822 00

3820 00

4866 00

4868 00

4870 00

4872 00

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Processed greyscale magnetometer data; Sector 3

Fig. 21

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

nT -1.0 2.0

0 60m

1:1,500 @ A2

N

T9

T7

T10

T8

Drain

Drain

3824000

3822000

3820000

4866000

4868000

4870000

4872000

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XY trace plot of minimally processed magnetometer data; Sector 3

Fig. 22

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

15.0 nT/cm

0 60m

1:1,500 @ A2

N

T9

T7

T10

T8

Track

Drain

Drain

Drain

3824 00

3822 00

3820 00

3866 00

3868 00

3870 00

3872 00

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Interpretation of magnetometer data;
Sector 3

Fig. 23

Title

- SECTOR BOUNDARY
- UNSUITABLE FOR SURVEY

Interpretation

- FERROUS
- MAGNETIC DISTURBANCE
- FIELD DRAIN
- RIDGE & FURROW
- AGRICULTURAL
- UNCERTAIN

0 60m

1:1,500 @ A2

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Processed greyscale magnetometer data; Sector 4

Fig. 24

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

nT -1.0 2.0

0 60m

1:1,500 @ A2

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XY trace plot of minimally processed magnetometer data; Sector 4

Fig. 25

Title

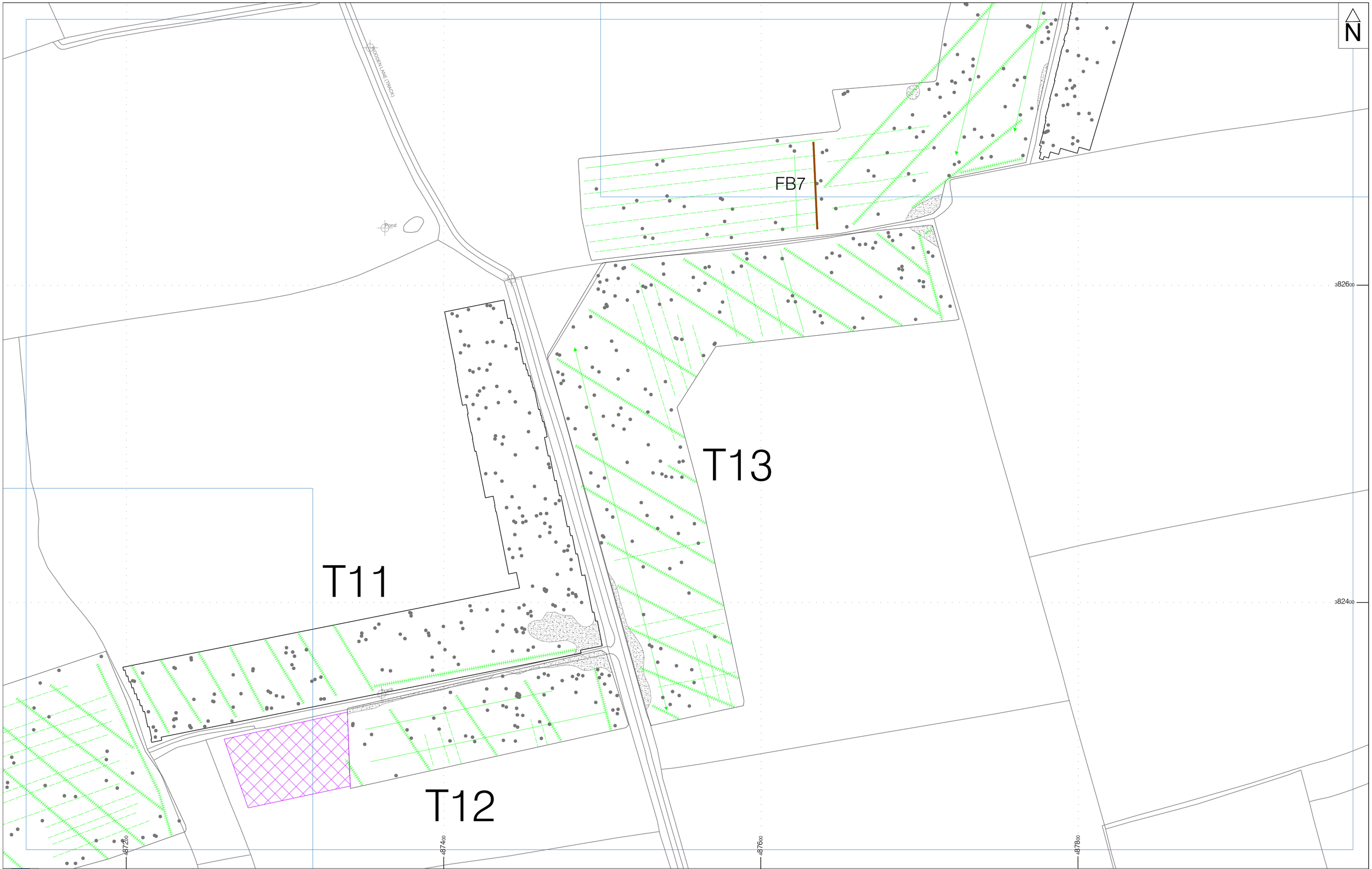
SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

15.0 nT/cm

0 60m

1:1,500 @ A2



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Interpretation of magnetometer data;
Sector 4

Fig. 26

Title

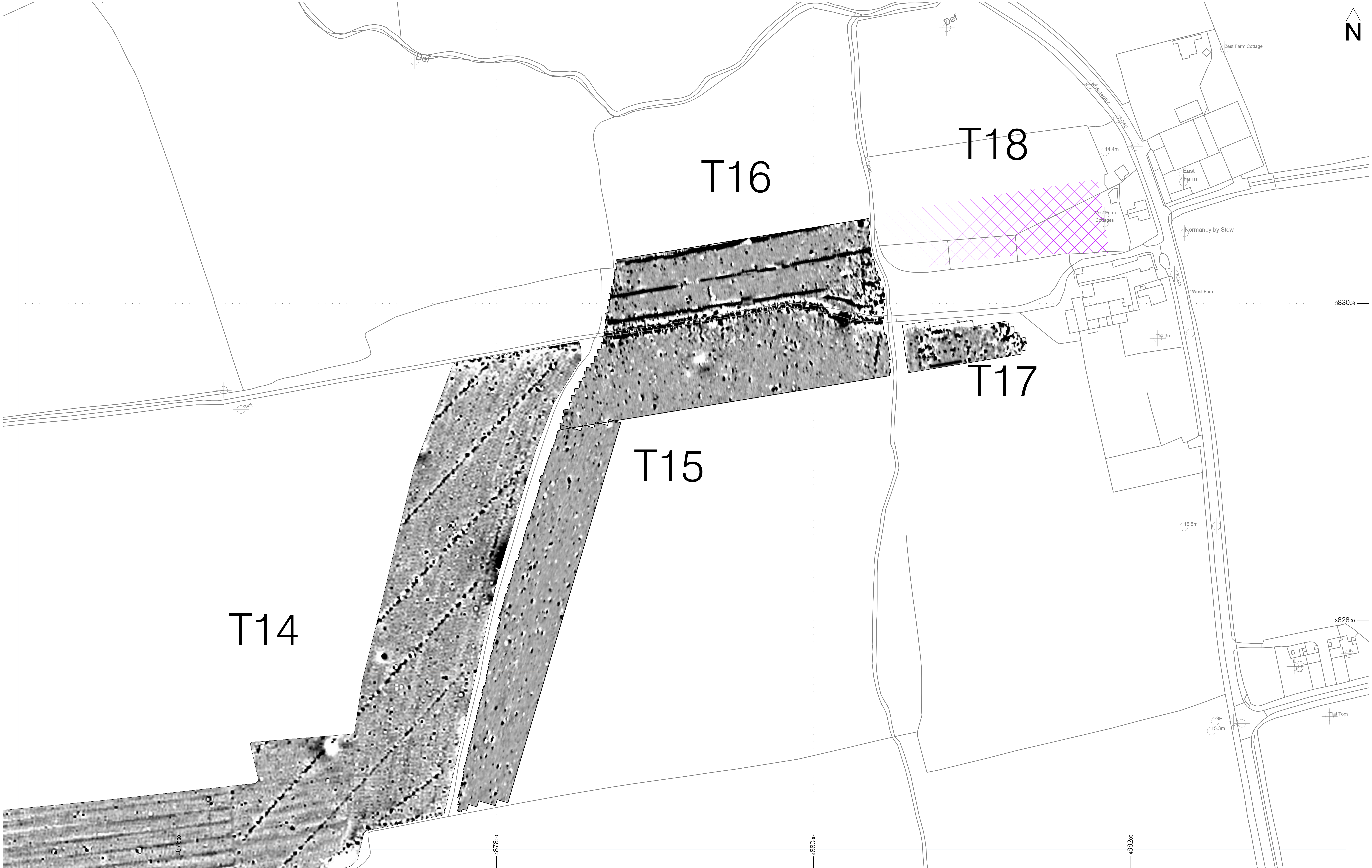
- SECTOR BOUNDARY
- UNSUITABLE FOR SURVEY

Interpretation

- FERROUS
- MAGNETIC DISTURBANCE
- FIELD DRAIN
- RIDGE & FURROW
- AGRICULTURAL
- FORMER FIELD BOUNDARY

0 60m

1:1,500 @ A2



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Processed greyscale magnetometer data; Sector 5

Fig. 27

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

nT -1.0 2.0

0 60m

1:1,500 @ A2

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XY trace plot of minimally processed magnetometer data; Sector 5

Fig. 28

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

15.0 nT/cm

0 60m

1:1,500 @ A2

N

T16

T18

T17

T15

T14

FB7

Def

Track

East Farm Cottage

NORMANBY ROAD

East Farm

West Farm Cottages

Normanby by Stow

West Farm

Flat Tops

14.4m

14.9m

15.5m

15.3m

TSP

3830 00

3828 00

3876 00

3878 00

3880 00

3882 00

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Interpretation of magnetometer data;
Sector 5

Fig. 29

Title

- SECTOR BOUNDARY
- UNSUITABLE FOR SURVEY

Interpretation

- FERROUS
- MAGNETIC DISTURBANCE
- FIELD DRAIN
- RIDGE & FURROW
- AGRICULTURAL
- FORMER FIELD BOUNDARY

0 60m

1:1,500 @ A2

N

T33

T34

T35

Drain

SOUTH LANE

Drain

11.3m

Lowfield Farm

Pond

Track

Drain

9.8m

Moor Farm

Drain

3846000

3844000

3842000

4896000

4898000

4900000

4902000

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Processed greyscale magnetometer data; Sector 6

Fig. 30

Title

SECTOR BOUNDARY

nT -1.0 2.0

0 60m

1:1,500 @ A2

N

T33

T34

T35

Drain

SOUTH LANE

Drain

11.3m

Lowfield Farm

Pond

Track

Drain

9.8m

Moor Farm

Drain

3846 00

3844 00

3842 00

4896 00

4898 00

4900 00

4902 00

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XY trace plot of minimally processed magnetometer data; Sector 6

Fig. 31

Title

SECTOR BOUNDARY

15.0 nT/cm

0 60m

1:1,500 @ A2

N

T33

T34

T35

Drain

SOUTH LANE

Drain

11.3m

Lowfield Farm

Pond

Track

Drain

9.8m

Moor Farm

Drain

3846 00

3844 00

3842 00

896 00

898 00

900 00

902 00

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Interpretation of magnetometer data;
Sector 6

Fig. 32

Title

	SECTOR BOUNDARY

Interpretation

	FERROUS		RIDGE & FURROW
	MAGNETIC DISTURBANCE		AGRICULTURAL
	FIELD DRAIN		FORMER FIELD BOUNDARY

0 60m

1:1,500 @ A2

N

T32

3838000

3836000

Drain

1.22m RH

Def

Def

1.22m RH

1.22m RH

Drain

FB

Path (um)

3892000

3894000

3896000

3898000

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Processed greyscale magnetometer data; Sector 7

Fig. 33

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

nT -1.0 2.0

0 60m

1:1,500 @ A2

N

T32

3838.00

3836.00

Drain

Drain

FB

1.22m RH

1.22m RH

1.22m RH

Def

Def

Path (um)

4892.00

4894.00

4896.00

4898.00

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XY trace plot of minimally processed magnetometer data; Sector 7

Fig. 34

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

15.0 nT/cm

0 60m

1:1,500 @ A2

N

T32

3838000

3836000

Drain

1.22m RH

Def

Def

Drain

FB

1.22m RH

Path (um)

4892000

4894000

4896000

4898000

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Interpretation of magnetometer data;
Sector 7

Fig. 35

Title

- SECTOR BOUNDARY
- UNSUITABLE FOR SURVEY

Interpretation

- FERROUS
- AGRICULTURAL

0 60m

1:1,500 @ A2

N

3832000

3830000

3828000

3826000

4892000

4894000

4896000

T19

T20

T21

T22

Drain

FB

Drain

Track

Drain

River Till

Pond

Track

Track

River Till

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Processed greyscale magnetometer data; Sector 8

Fig. 36

Title

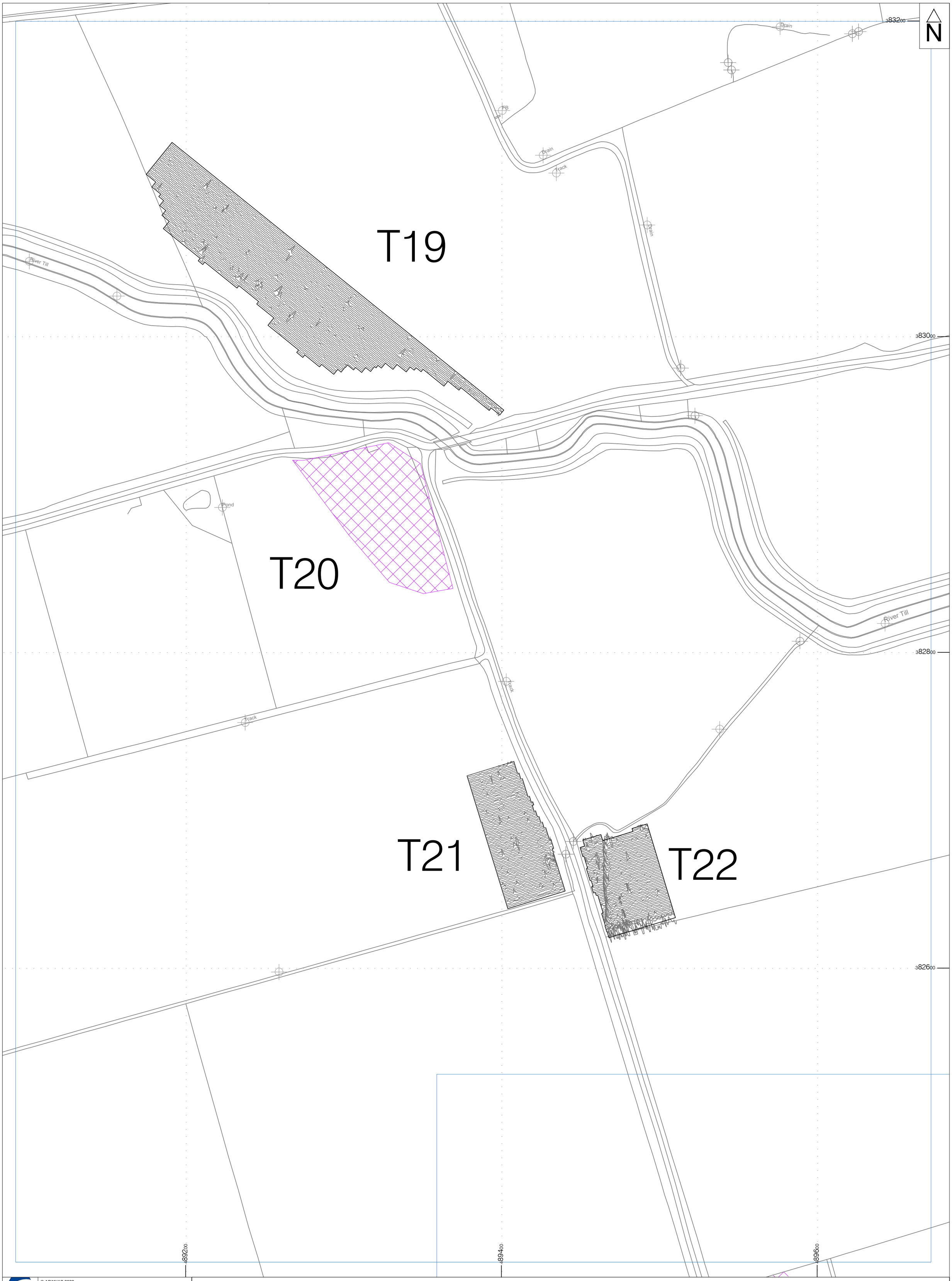
SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

nT -1.0 1.0

0 60m

1:1,500 @ A2



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XY trace plot of minimally processed magnetometer data; Sector 8

Fig. 37

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

15.0 nT/cm

0 60m

1:1,500 @ A2

N

T19

FB8

T20

T21

T22

Drain

FB

Drain

Track

Drain

River Till

Pond

Track

Track

River Till

3832 00

3830 00

3828 00

3826 00

4892 00

4894 00

4896 00

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Interpretation of magnetometer data;
Sector 8

Fig. 38

Title

- SECTOR BOUNDARY
- UNSUITABLE FOR SURVEY

Interpretation

- FERROUS
- MAGNETIC DISTURBANCE
- FIELD DRAIN
- AGRICULTURAL

0 60m

1:1,500 @ A2

N

T23

T24

T25

T26

T27

Ponds

Pond

Tank

The Pastures

INGHAM ROAD

8.2m

Stow Pasture

9.5m

9.3m

Stow Pasture

INGHAM ROAD

9.1m

LEET'S LANE

3824 00

3822 00

4894 00

4896 00

4898 00

4900 00

4902 00

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Processed greyscale magnetometer data; Sector 9

Fig. 39

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

nT -1.0 2.0

0 60m

1:1,500 @ A2

N

T23

T24

T25

T26

T27

Ponds

Pond

Tank

The Pastures

INGHAM ROAD

8.2m

Stow Pasture

9.5m

9.3m

Stow Pasture

INGHAM ROAD

9.3m

LEETS LANE

3824000

3822000

894000

896000

898000

900000

902000

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XY trace plot of minimally processed magnetometer data; Sector 9

Fig. 40

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

15.0 nT/cm

0 60m

1:1,500 @ A2

N

T23

T24

T25

T26

T27

Pond

Tank

Ponds

The Pastures

INGHAM ROAD

Stow Pasture

Stow Pasture

9.3m

9.5m

8.2m

LEETS LANE

824000

822000

894000

896000

898000

900000

902000

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Interpretation of magnetometer data;
Sector 9

Fig. 41

Title

- SECTOR BOUNDARY
- UNSUITABLE FOR SURVEY

Interpretation

- FERROUS
- MAGNETIC DISTURBANCE
- FIELD DRAIN
- AGRICULTURAL

0 60m

1:1,500 @ A2

N

T28

Drain

Pond

River Till

Ward Bdy

7.3m

7.9m

7.3m

8.2m

The Pastures

INGHAM ROAD

w Pasture

Post

3828 00

3826 00

3824 00

3822 00

490200

490400

490600

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Processed greyscale magnetometer data; Sector 10

Fig. 42

Title

SECTOR BOUNDARY

nT -1.0 1.0

0 60m

1:1,500 @ A2

N

3828000

3826000

3824000

3822000

4902000

4904000

4906000

Drain

Pond

River Till

T28

The Pastures

INGHAM ROAD

8.2m

7.3m

Squire's Bridge

7.9m

Ward Bdy

7.3m

Pond

w Pasture

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XY trace plot of minimally processed magnetometer data; Sector 10

Fig. 43

Title

SECTOR BOUNDARY

15.0 nT/cm

0 60m

1:1,500 @ A2

N

3828000

3826000

3824000

3822000

4902000

4904000

4906000

T28

Drain

Pond

River Till

Pond

Squire's Bridge

7.9m

7.3m

Ward Bdy

7.3m

The Pastures

INGHAM ROAD

8.2m

w Pasture

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Interpretation of magnetometer data;
Sector 10

Fig. 44

Title

SECTOR BOUNDARY

Interpretation

- FERROUS
- MAGNETIC DISTURBANCE
- RIDGE & FURROW
- AGRICULTURAL
- GEOLOGY

0 60m

1:1,500 @ A2

N

3832 00

3830 00

3828 00

3826 00

4920 00

4922 00

4924 00

Coates Gorse

Ward Bdy 6S

Ward Bdy

CS

112m

CS

121m

1.22m RH

1.22m RH

1.22m RH

CS

105m

Drain

T29

T30

T31

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Processed greyscale magnetometer data; Sector 11

Fig. 45

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

nT -1.0 1.0

0 60m

1:1,500 @ A2

N

3832$_{00}$

3830$_{00}$

3828$_{00}$

3826$_{00}$

4920$_{00}$

4922$_{00}$

4924$_{00}$

Coates Gorse

Ward Bdy 6S

Ward Bdy

6S

6S

112m

121m

122m RH

122m RH

122m RH

T29

T30

T31

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XY trace plot of minimally processed magnetometer data; Sector 11

Fig. 46

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

15.0 nT/cm

0 60m

1:1,500 @ A2

N

3832 00

3830 00

3828 00

3826 00

4920 00

4922 00

4924 00

Coates Gorse

Ward Boy CS

Ward Bdy

CS

112m

CS

121m

1.22m RH

1.22m RH

1.22m RH

105m

Drain

P2

P1

T29

T30

T31

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Interpretation of magnetometer data;
Sector 11

Fig. 47

Title

- SECTOR BOUNDARY
- UNSUITABLE FOR SURVEY

Interpretation

- FERROUS
- MAGNETIC DISTURBANCE
- FIELD DRAIN
- RIDGE & FURROW
- AGRICULTURAL
- UNCERTAIN
- ARCHAEOLOGY?

0 60m

1:1,500 @ A2

N

T29

T30

T31

Ward Bdy

CS

Drain

12.1m

12.2m

12.1m

12.2m RH

10.6m

10.1m

10.9m

10.1m

12.2m RH

3828 00

3826 00

3824 00

3822 00

492000

492200

492400

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Processed greyscale magnetometer data; Sector 12

Fig. 48

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

nT -1.0 2.0

0 60m

1:1,500 @ A2

N

T29

T30

T31

Ward Bdy

CS

Drain

3828000

3826000

3824000

3822000

4920000

4922000

4924000

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XY trace plot of minimally processed magnetometer data; Sector 12

Fig. 49

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

15.0 nT/cm

0 60m

1:1,500 @ A2

N

P1

P2

T29

T30

T31

CS

Ward Bdy

Drain

12.1m

12.2m

1.22m RH

10.9m

10.7m

3828 00

3826 00

3824 00

3822 00

4920 00

4922 00

4924 00

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Interpretation of magnetometer data;
Sector 12

Fig. 50

Title

- SECTOR BOUNDARY
- UNSUITABLE FOR SURVEY

Interpretation

- FERROUS
- MAGNETIC DISTURBANCE
- FIELD DRAIN
- RIDGE & FURROW
- AGRICULTURAL
- UNCERTAIN
- ARCHAEOLOGY?

0 60m

1:1,500 @ A2

T40

T39

T38

T37

T36

N

Fillingham Grange

FB

Path(Num)

Pond

Pond

Pond

Ruin

Glebe Farm Cottage

Glebe Farm

193m

228m

Greystones Cottage

Path(Num)

3858 00

3856 00

3854 00

3852 00

4928 00

4930 00

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Processed greyscale magnetometer data; Sector 13

Fig. 51

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

nT -1.0 2.0

0 60m

1:1,500 @ A2

T40

T39

T38

T37

T36

Fillingham Grange

FB

Path (Num)

Pond

Pond

Ruin

Glebe Farm Cottage

Glebe Farm

Greystones Cottage

Pond

19.3m

22.0m

Track

N

3858 00

3856 00

3854 00

3852 00

4928 00

4930 00

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XY trace plot of minimally processed magnetometer data; Sector 13

Fig. 52

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

15.0 nT/cm

0 60m

1:1,500 @ A2

T40

T39

T38

T37

T36

Fillingham Grange

FB

Path (um)

Pond

Pond

Ruin

Glebe Farm Cottage

Glebe Farm

19.3m

22.0m

Pond

Greystones Cottage

Track

N

3858 00

3856 00

3854 00

3852 00

4928 00

4930 00

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Interpretation of magnetometer data;
Sector 13

Fig. 53

Title

- SECTOR BOUNDARY
- UNSUITABLE FOR SURVEY

Interpretation

- FERROUS
- SERVICE PIPE
- MAGNETIC DISTURBANCE
- FIELD DRAIN
- AGRICULTURAL

0 60m

1:1,500 @ A2

N

T41

T40

T39

T38

T37

T26

Fillingham Grange

Pond

Pond

Path (um)

3860 00

3858 00

3856 00

3852 00

4928 00

4930 00

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Processed greyscale magnetometer data; Sector 14

Fig. 54

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

nT -1.0 2.0

0 60m

1:1,500 @ A2

N

T41

T40

T39

T38

T37

T36

Fillingham Grange

Pond

Pond

Path (um)

3860 00

3858 00

3856 00

3852 00

4928 00

4930 00

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XY trace plot of minimally processed magnetometer data; Sector 14

Fig. 55

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

15.0 nT/cm

0 60m

1:1,500 @ A2

N

T41

T40

T39

T38

T37

T36

Fillingham Grange

Pond

Pond

Path (um)

3860 00

3858 00

3856 00

3854 00

3852 00

4928 00

4930 00

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Interpretation of magnetometer data;
Sector 14

Fig. 56

Title

- SECTOR BOUNDARY
- UNSUITABLE FOR SURVEY

Interpretation

- FERROUS
- SERVICE PIPE
- MAGNETIC DISTURBANCE
- FIELD DRAIN
- AGRICULTURAL

0 60m

1:1,500 @ A2

N

T42

Track

North Farm

Pond

12.8m

14.3m

3858 00

3856 00

3854 00

3852 00

491600

491800

492000

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Processed greyscale magnetometer data; Sector 15

Fig. 57

Title

SECTOR BOUNDARY

nT -1.0 2.0

0 60m

1:1,500 @ A2

N

T42

Track

North Farm

Pond

14.3m

12.8m

385800

385600

385400

385200

491600

491800

492000

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XY trace plot of minimally processed magnetometer data; Sector 15

Fig. 58

Title

SECTOR BOUNDARY

15.0 nT/cm

0 60m

1:1,500 @ A2

N

T42

Track

North Farm

Pond

14.3m

14.0m

12.8m

3858 00

3856 00

3854 00

3852 00

4916 00

4918 00

4920 00

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Interpretation of magnetometer data;
Sector 15

Fig. 59

Title

SECTOR BOUNDARY

Interpretation

FERROUS

MAGNETIC DISTURBANCE

RIDGE & FURROW

AGRICULTURAL

UNCERTAIN

0 60m

1:1,500 @ A2

N

T43

Pond

Drain

Ward Bdy

Ward Bdy

HUNGRY SPOT (TRACK)

Ward Bdy

Drain

Ward Bdy

Pond

Gipsy Lane Bridge

3860 00

3858 00

3856 00

4904 00

4906 00

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Processed greyscale magnetometer data; Sector 16

Fig. 60

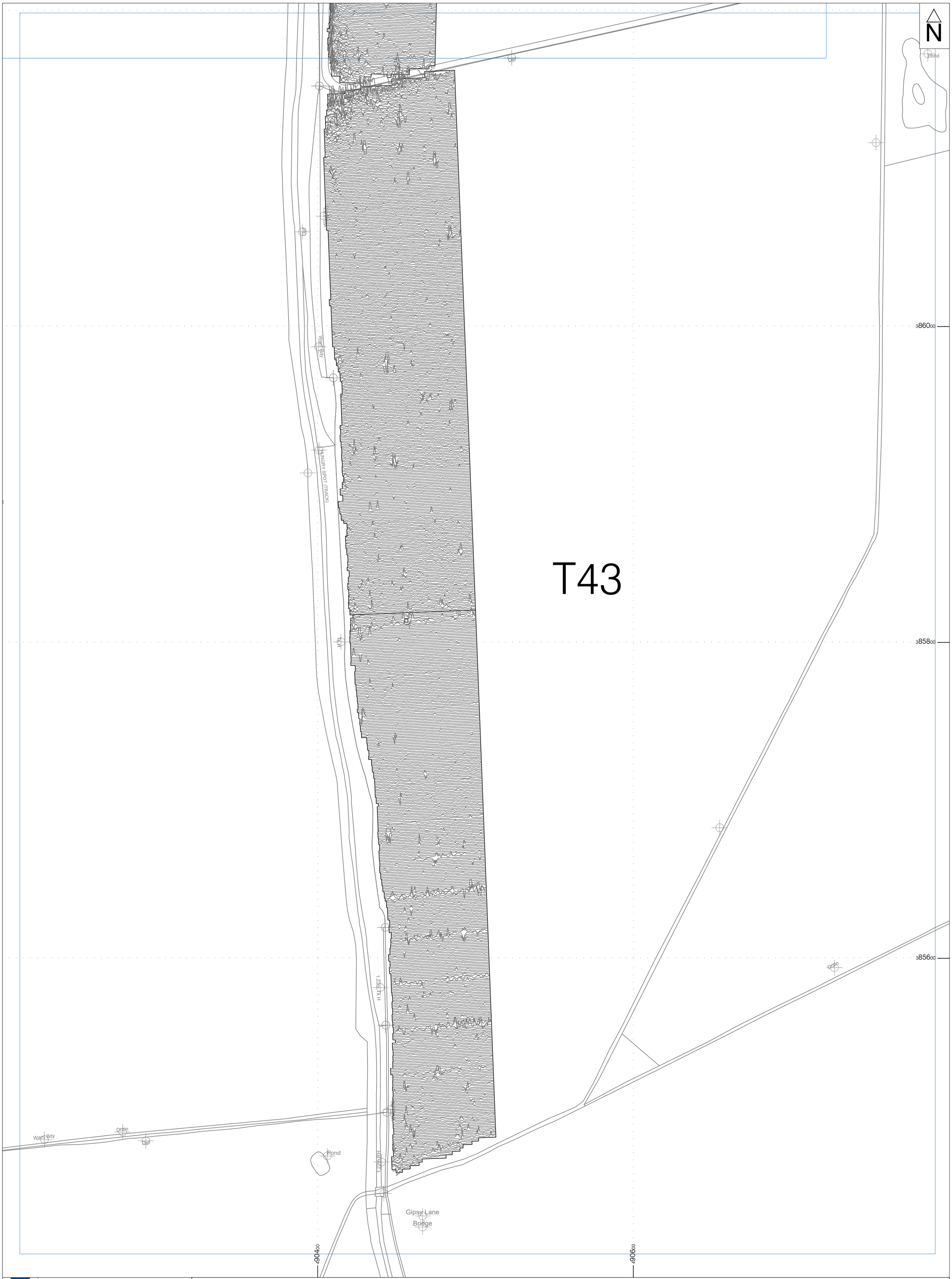
Title

SECTOR BOUNDARY

nT -1.0 2.0

0 60m

1:1,500 @ A2



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Project ID: XB85_CWB22 Cottam Cable Route

XY trace plot of minimally processed magnetometer data; Sector 16

Fig. 61

Title

SECTOR BOUNDARY

15.0 nT/cm

0 60m

1:1,500 @ A2

N

ED & Ward Bdy

Ward Bdy

HUNGRY SPOT (TRACK)

T43

FB9

Pond

Drain

Ward Bdy

Ward Bdy

Ward Bdy

Pond

Gipsy Lane Bridge

3860 00

3858 00

3856 00

4904 00

4906 00

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Interpretation of magnetometer data;
Sector 16

Fig. 62

Title

- SECTOR BOUNDARY

Interpretation

- FERROUS
- MAGNETIC DISTURBANCE
- FIELD DRAIN
- RIDGE & FURROW
- AGRICULTURAL
- FORMER FIELD BOUNDARY
- UNCERTAIN

0 60m

1:1,500 @ A2

N

T44

Def

1.22m RH

17.6m

17.2m

16.5m

16.2m

KEXBY ROAD

Drain

Heaton's Wood

1.22m RH

Drain

GLENTWORTH ROAD

14.0m

14.4m

Track

Def

386800

386600

386400

386200

490200

490400

490600

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Project ID: XB85_CWB22 Cottam Cable Route

Processed greyscale magnetometer data; Sector 17

Fig. 63

Title

SECTOR BOUNDARY

nT -1.0 2.0

0 60m

1:1,500 @ A2

N

KEXBY ROAD

Drain

Def

1.22m RH

17.6m

16.2m

ANF

16.5m

Heaton's Wood

1.22m RH

Drain

GLENTWORTH ROAD

14.0m

14.4m

Track

Def

3868 00

3866 00

3864 00

3862 00

4902 00

4904 00

4906 00

T44

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XY trace plot of minimally processed magnetometer data; Sector 17

Fig. 64

Title

SECTOR BOUNDARY

15.0 nT/cm

0 60m

1:1,500 @ A2

N

KEXBY ROAD

Drain

16.2m

Guide Post

Def

1.22m RH

17.2m

17.6m

ANF

386800

16.5m

Heaton's Wood

1.22m RH

386600

T44

Drain

FB10

GLENTWORTH ROAD

386400

14.0m

14.4m

Track

386200

490200

490400

490600

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Project ID: XB85_CWB22 Cottam Cable Route

Interpretation of magnetometer data;
Sector 17

Fig. 65

Title

- SECTOR BOUNDARY

Interpretation

- FERROUS
- MAGNETIC DISTURBANCE
- FIELD DRAIN
- RIDGE & FURROW
- AGRICULTURAL
- FORMER FIELD BOUNDARY
- UNCERTAIN

0 60m

1:1,500 @ A2

T46

T45

N

21.3m

1.22m RH

COWLANE

19.1m

ED & Field Boy

Def

1.22m RH

17.6m

COW LANE

Drain

Track

1.22m RH

Drain

Guide Post

17.2m

16.5m

Low Fie

The Barn

Pon

3874 00

3872 00

3870 00

3868 00

490 00

492 00

494 00

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Project ID: XB85_CWB22 Cottam Cable Route

Processed greyscale magnetometer data; Sector 18

Fig. 66

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

nT -1.0 2.0

0 60m

1:1,500 @ A2

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Project ID: XB85_CWB22 Cottam Cable Route

XY trace plot of minimally processed magnetometer data; Sector 18

Fig. 67

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

15.0 nT/cm

0 60m

1:1,500 @ A2

T46

T45

N

21.3m

1.22m RH

COWLANE

19.1m

Def

1.22m RH

17.6m

COW LANE

Drain

Track

1.22m RH

17.2m

Guide Post

16.5m

Drain

ED & Weld Bdy

Low Fie

The Barn

Pon

3874 00

3872 00

3870 00

3868 00

4900 00

4902 00

4904 00

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Project ID: XB85_CWB22 Cottam Cable Route

Interpretation of magnetometer data;
Sector 18

Fig. 68

Title

	SECTOR BOUNDARY
	UNSUITABLE FOR SURVEY

Interpretation

	FERROUS		RIDGE & FURROW
	MAGNETIC DISTURBANCE		AGRICULTURAL
	FIELD DRAIN		FORMER FIELD BOUNDARY

0 60m

1:1,500 @ A2

T49

T48

T47

T46

N

1.22m RH

Drain

ED & Weld Bdy

Pond

21.3m

17.2m

3880 00

3878 00

3876 00

3874 00

4898 00

4900 00

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Project ID: XB85_CWB22 Cottam Cable Route

Processed greyscale magnetometer data; Sector 19

Fig. 69

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

nT -1.0 2.0

0 60m

1:1,500 @ A2

T49

T48

T47

T46

N

3880 00

3878 00

3876 00

3874 00

4898 00

4900 00

1.22m RH

Drain

ED & Weld Bdy

Pond

21.3m

17.2m

Project ID: XB85_CWB22 Cottam Cable Route

XY trace plot of minimally processed magnetometer data; Sector 19

Fig. 70

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

15.0 nT/cm

0 60m

1:1,500 @ A2

T49

T48

T47

T46

N

1.22m RH

ED & Ward Bdy

Drain

Pond

ED & Weld Bdy

21.3m

17.2m

1.22m RH

3880 00

3878 00

3876 00

3874 00

4898 00

4900 00

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Project ID: XB85_CWB22 Cottam Cable Route

Interpretation of magnetometer data;
Sector 19

Fig. 71

Title

- SECTOR BOUNDARY
- UNSUITABLE FOR SURVEY

Interpretation

- FERROUS
- MAGNETIC DISTURBANCE
- FIELD DRAIN
- RIDGE & FURROW
- AGRICULTURAL
- UNCERTAIN

0 60m

1:1,500 @ A2

T51

T50

T49

N

3888 00

3886 00

3884 00

3882 00

4894 00

4896 00

4898 00

Drain

Track

Pond

Heapham C

COMMON LANE

18.9m

21.2m

Cattle Grid

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Processed greyscale magnetometer data; Sector 20

Fig. 72

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

nT -1.0 2.0

0 60m

1:1,500 @ A2

N

T52

T53

T51

T50

T49

Drain

Pond

COMMON LANE

18.9m

21.2m

Cattle Grid

Heapham C

3888 00

3886 00

3884 00

3882 00

4894 00

4896 00

4898 00

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XY trace plot of minimally processed magnetometer data; Sector 20

Fig. 73

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

15.0 nT/cm

0 60m

1:1,500 @ A2

T52

T53

T51

T50

T49

FB11

N

388000

386000

384000

382000

Drain

Pond

Heapham C

18.9m

COMMON LANE

21.2m

Cattle Grid

894000

896000

898000

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Interpretation of magnetometer data;
Sector 20

Fig. 74

Title

- SECTOR BOUNDARY
- UNSUITABLE FOR SURVEY

Interpretation

- FERROUS
- SERVICE PIPE
- MAGNETIC DISTURBANCE
- FIELD DRAIN
- RIDGE & FURROW
- AGRICULTURAL
- FORMER FIELD BOUNDARY
- UNCERTAIN

0 60m

1:1,500 @ A2

N

T58

T57

T56

T55

T54

T53

T52

22.6m

Drain

BRATFIELD SOUTH ROAD (TRACK)

1.22m BKH

Auction Mart

389400

389200

389000

388800

389200

389400

389600

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Processed greyscale magnetometer data; Sector 21

Fig. 75

Title

SECTOR BOUNDARY

nT -1.0 2.0

0 60m

1:1,500 @ A2

N

T58

T57

T56

T55

T54

T53

T52

22.6m

1.22m IRH

Drain

BRATT FIELD SOUTH ROAD (TRACK)

Auction Mart

389400

389200

389000

388800

489200

489400

489600

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Project ID: XB85_CWB22 Cottam Cable Route

XY trace plot of minimally processed magnetometer data; Sector 21

Fig. 76

Title

SECTOR BOUNDARY

15.0 nT/cm

0 60m

1:1,500 @ A2

N

T58

T57

T56

T55

T54

T53

T52

22.6m

BRATT FIELD SOUTH ROAD (TRACK)

1.22m RH

Drain

Auction Mart

3894 00

3892 00

3890 00

3888 00

4892 00

4894 00

4896 00

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Project ID: XB85_CWB22 Cottam Cable Route

Interpretation of magnetometer data;
Sector 21

Fig. 77

Title

SECTOR BOUNDARY

Interpretation

FERROUS	RIDGE & FURROW	UNCERTAIN
MAGNETIC DISTURBANCE	AGRICULTURAL	
FIELD DRAIN	GEOLOGY	

0 60m

1:1,500 @ A2

N

3900 00

T61

T62

T60

3898 00

3896 00

BRATT FIELD MIDDLE ROAD (TRACK)

T58

T57

T59

3884 00

1.22m RH

Drain

3890 00

3892 00

3894 00

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Project ID: XB85_CWB22 Cottam Cable Route

Processed greyscale magnetometer data; Sector 22

Fig. 78

Title

SECTOR BOUNDARY

nT -1.0 2.0

0 60m

1:1,500 @ A2

T61

T62

T60

T58

T57

T59

BRATT FIELD MIDDLE ROAD (TRACK)

3900 00

3898 00

3896 00

3894 00

3892 00

3890 00

3884 00

1.22m RH

1.22m RH

Drain

Drain

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Project ID: XB85_CWB22 Cottam Cable Route

XY trace plot of minimally processed magnetometer data; Sector 22

Fig. 79

Title

SECTOR BOUNDARY

15.0 nT/cm

0 60m

1:1,500 @ A2

N

T61

T62

T60

T58

T57

T59

BRATT FIELD MIDDLE ROAD (TRACK)

Drain

1.22m RH

3900 00

3898 00

3896 00

3894 00

4890 00

4892 00

4894 00

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Project ID: XB85_CWB22 Cottam Cable Route

Interpretation of magnetometer data;
Sector 22

Fig. 80

Title

SECTOR BOUNDARY

Interpretation

FERROUS	RIDGE & FURROW
MAGNETIC DISTURBANCE	AGRICULTURAL
FIELD DRAIN	GEOLOGY

0 60m

1:1,500 @ A2

N

T66

T65

T64

T65

T63

T61

3906 00

3904 00

3902 00

3900 00

488 00

489 00

492 00

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Processed greyscale magnetometer data; Sector 23

Fig. 81

Title

SECTOR BOUNDARY

nT -1.0 2.0

0 60m

1:1,500 @ A2

T66

T65

T64

T65

T63

T61

N

3906 00

3904 00

3902 00

3900 00

4888 00

4890 00

4892 00

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XY trace plot of minimally processed magnetometer data; Sector 23

Fig. 82

Title

SECTOR BOUNDARY

15.0 nT/cm

0 60m

1:1,500 @ A2

T66

T65

A1

P3

T64

T65

T63

T61

N

390600

390400

390200

390000

488000

489000

489200

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Interpretation of magnetometer data;
Sector 23

Fig. 83

Title

- SECTOR BOUNDARY

Interpretation

- FERROUS
- MAGNETIC DISTURBANCE
- FIELD DRAIN
- RIDGE & FURROW
- AGRICULTURAL
- ARCHAEOLOGY?
- ARCHAEOLOGY

0 60m

1:1,500 @ A2

N

T68

T67

T66

T65

Drain

Drain

Drain

Track

21.1m

1722m RH

24.1m

A63

3912000

3910000

3908000

3906000

488600

488800

489000

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Processed greyscale magnetometer data; Sector 24

Fig. 84

Title

SECTOR BOUNDARY

nT -1.0 2.0

0 60m

1:1,500 @ A2

N

T68

T67

T66

T65

Drain

Drain

Drain

Track

21.1m

1722m RH

24.1m

A63

3912000

3910000

3908000

3906000

4886000

4888000

4890000

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Project ID: XB85_CWB22 Cottam Cable Route

XY trace plot of minimally processed magnetometer data; Sector 24

Fig. 85

Title

SECTOR BOUNDARY

15.0 nT/cm

0 60m

1:1,500 @ A2

N

T68

T67

T66

T65

A1

P3

Drain

Drain

Drain

Track

24.1m

24.1m

1722m RH

A63

3912000

3910000

3908000

3906000

488600

488800

489000

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Project ID: XB85_CWB22 Cottam Cable Route

Interpretation of magnetometer data;
Sector 24

Fig. 86

Title

SECTOR BOUNDARY

Interpretation

- FERROUS
- MAGNETIC DISTURBANCE
- FIELD DRAIN
- RIDGE & FURROW
- AGRICULTURAL
- ARCHAEOLOGY
- ARCHAEOLOGY?

0 60m

1:1,500 @ A2

T74

T73

T72

T71

T70

T69

17.4m

16.9m

18.7m

Path (4m)

Drain

Corringham Beck

The Cottage

N

3928 00

3926 00

3924 00

3922 00

487600

487800

488000

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Project ID: XB85_CWB22 Cottam Cable Route

Processed greyscale magnetometer data; Sector 25

Fig. 87

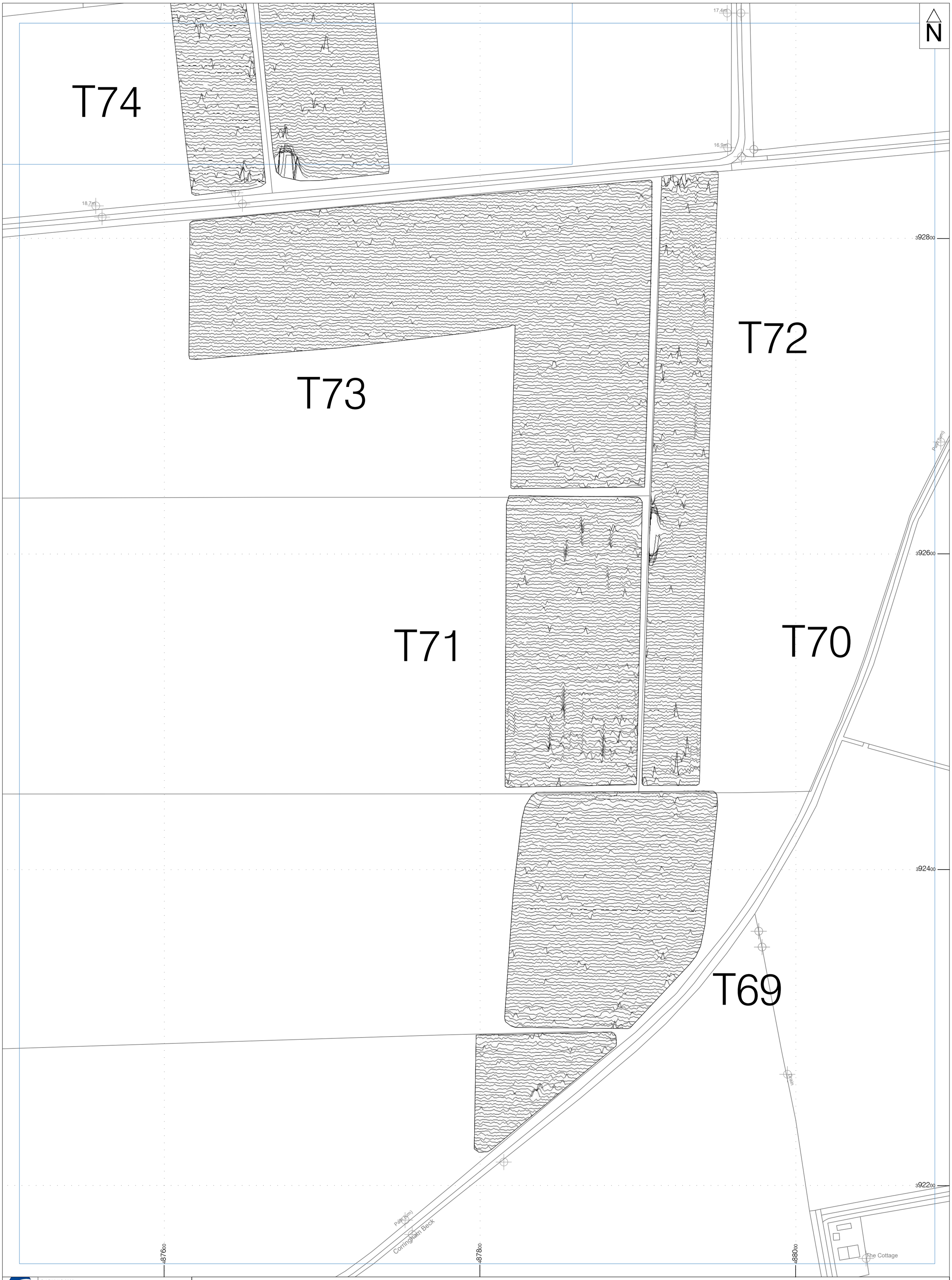
Title

SECTOR BOUNDARY

nT -1.0 2.0

0 60m

1:1,500 @ A2



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Project ID: XB85_CWB22 Cottam Cable Route

XY trace plot of minimally processed magnetometer data; Sector 25

Fig. 88

Title

SECTOR BOUNDARY

15.0 nT/cm

0 60m

1:1,500 @ A2

T74

T73

T72

T71

T70

T69

17.4m

16.9m

19.1m

18.7m

Path (4m)

Drain

Corringham Beck

The Cottage

3928 00

3926 00

3924 00

3922 00

4876 00

4878 00

4880 00

N

Archaeological Services W Y A S,
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Project ID: XB85_CWB22 Cottam Cable Route

Interpretation of magnetometer data;
Sector 25

Fig. 89

Title

SECTOR BOUNDARY

Interpretation

FERROUS	RIDGE & FURROW	UNCERTAIN
MAGNETIC DISTURBANCE	AGRICULTURAL	
FIELD DRAIN	GEOLOGY	

0 60m

1:1,500 @ A2

N

T79

T78

T77

T76

T75

T74

122mRH

Def

CS

Aisby Beck

Olive Tree House

Aisby House

Ruin

LP

OLD STACK YARD LANE

Track

3936 00

3934 00

3932 00

3930 00

4874 00

4876 00

4878 00

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Project ID: XB85_CWB22 Cottam Cable Route

Processed greyscale magnetometer data; Sector 26

Fig. 90

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

nT -1.0 2.0

0 60m

1:1,500 @ A2

N

T79

T78

T77

T76

T75

T74

1.22m RH

Def

CS

Aisby Beck

Olive Tree House

Pisby House

Ruin

TP

OLD STACK YARD LANE

Track

$_{3}936_{00}$

$_{3}934_{00}$

$_{3}932_{00}$

$_{3}930_{00}$

$_{4}874_{00}$

$_{4}876_{00}$

$_{4}878_{00}$

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Project ID: XB85_CWB22 Cottam Cable Route

XY trace plot of minimally processed magnetometer data; Sector 26

Fig. 91

Title

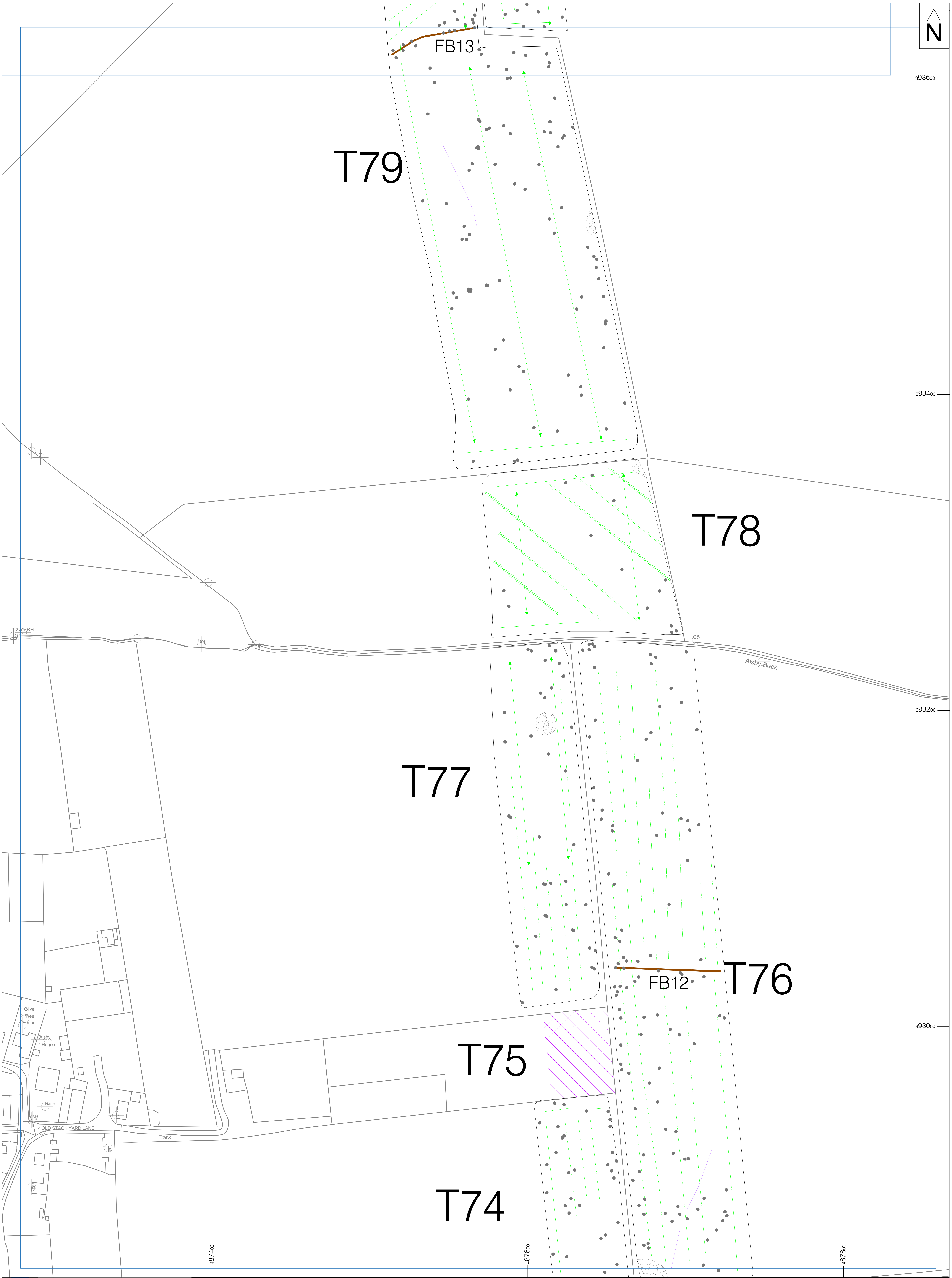
SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

15.0 nT/cm

0 60m

1:1,500 @ A2



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Project ID: XB85_CWB22 Cottam Cable Route

Interpretation of magnetometer data;
Sector 26

Fig. 92

Title

	SECTOR BOUNDARY
	UNSUITABLE FOR SURVEY

Interpretation

	FERROUS		RIDGE & FURROW		UNCERTAIN
	MAGNETIC DISTURBANCE		AGRICULTURAL		
	FIELD DRAIN		FORMER FIELD BOUNDARY		

0 60m

1:1,500 @ A2

N

T83

T82

T81

T80

GREEN LANE

19.5m

26.0m

17.1m

s940$_{00}$

s938$_{00}$

s936$_{00}$

s870$_{00}$

s872$_{00}$

s874$_{00}$

s876$_{00}$

s878$_{00}$

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Project ID: XB85_CWB22 Cottam Cable Route

Processed greyscale magnetometer data; Sector 27

Fig. 93

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

nT -1.0 2.0

0 60m

1:1,500 @ A2

N

T83

T82

T81

T80

GREEN LANE

19.5m

26.0m

17.7m

s940$_{00}$

s938$_{00}$

s936$_{00}$

s870$_{00}$

s872$_{00}$

s874$_{00}$

s876$_{00}$

s878$_{00}$

Archaeological Services W Y A S,
Nepshaw Lane South, Morley, LS27 7JQ
Tel: 0113 535 0163 Email: archaeology@wyjs.org.uk www.aswyas.com

Project ID: XB85_CWB22 Cottam Cable Route

XY trace plot of minimally processed magnetometer data; Sector 27

Fig. 94

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

15.0 nT/cm

0 60m

1:1,500 @ A2

N

T83

T82

T81

T80

FB15

FB14

FB13

GREEN LANE

177m

19.5m

20.0m

s940$_{00}$

s938$_{00}$

s936$_{00}$

s870$_{00}$

s872$_{00}$

s874$_{00}$

s876$_{00}$

s878$_{00}$

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Project ID: XB85_CWB22 Cottam Cable Route

Interpretation of magnetometer data;
Sector 27

Fig. 95

Title

- SECTOR BOUNDARY
- UNSUITABLE FOR SURVEY

Interpretation

- FERROUS
- MAGNETIC DISTURBANCE
- FIELD DRAIN
- RIDGE & FURROW
- AGRICULTURAL
- FORMER FIELD BOUNDARY
- UNCERTAIN

0 60m

1:1,500 @ A2

N

T88

T85

T87

T84

T86

B1205

21.6m

20.6m

20.9m

The Fields Farm

MP 0.75

MP 0.5

Drain

Drain

Drain

3952 00

3950 00

3948 00

3946 00

4868 00

4870 00

4872 00

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Project ID: XB85_CWB22 Cottam Cable Route

Processed greyscale magnetometer data; Sector 28

Fig. 96

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

nT -1.0 2.0

0 60m

1:1,500 @ A2

N

T88

T85

T87

T84

T86

B1205

21.6m

20.6m

20.9m

The Fields Farm

MP 0.75

MP 0.5

D1aH

D1aH

3952 00

3950 00

3948 00

3946 00

4868 00

4870 00

4872 00

Archaeological Services W Y A S,
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Project ID: XB85_CWB22 Cottam Cable Route

XY trace plot of minimally processed magnetometer data; Sector 28

Fig. 97

Title

SECTOR BOUNDARY

UNSUITABLE FOR SURVEY

15.0 nT/cm

0 60m

1:1,500 @ A2

N

T88

T85

T87

T84

T86

B1205

20.6m

20.9m

21.6m

The Fields Farm

MP 0.75

MP 0.5

Drain

Drain

3952 00

3950 00

3948 00

3946 00

4868 00

4870 00

4872 00

Archaeological Services W Y A S,
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Project ID: XB85_CWB22 Cottam Cable Route

Interpretation of magnetometer data;
Sector 28

Fig. 98

Title

- SECTOR BOUNDARY
- UNSUITABLE FOR SURVEY

Interpretation

- FERROUS
- MAGNETIC DISTURBANCE
- FIELD DRAIN
- RIDGE & FURROW
- AGRICULTURAL

0 60m

1:1,500 @ A2

Appendix 1: Magnetic survey - technical information

Magnetic Susceptibility and Soil Magnetism

Iron makes up about 6% of the Earth's crust and is mostly present in soils and rocks as minerals such as maghaemite and haemetite. These minerals have a weak, measurable magnetic property termed magnetic susceptibility. Human activities can redistribute these minerals and change (enhance) others into more magnetic forms. Areas of human occupation or settlement can then be identified by measuring the magnetic susceptibility of the topsoil because of the attendant increase (enhancement) in magnetic susceptibility. If the enhanced material subsequently comes to fill features, such as ditches or pits, localised isolated and linear magnetic anomalies can result whose presence can be detected by a magnetometer (fluxgate gradiometer).

In general, it is the contrast between the magnetic susceptibility of deposits filling cut features, such as ditches or pits, and the magnetic susceptibility of topsoils, subsoils and rocks into which these features have been cut, which causes the most recognisable responses. This is primarily because there is a tendency for magnetic ferrous compounds to become concentrated in the topsoil, thereby making it more magnetic than the subsoil or the bedrock. Linear features cut into the subsoil or geology, such as ditches, that have been silted up or have been backfilled with topsoil will therefore usually produce a positive magnetic response relative to the background soil levels. Discrete feature, such as pits, can also be detected. The magnetic susceptibility of a soil can also be enhanced by the application of heat and the fermentation and bacterial effects associated with rubbish decomposition. The area of enhancement is usually quite large, mainly due to the tendency of discard areas to extend beyond the limit of the occupation site itself, and spreading by the plough.

Types of Magnetic Anomaly

In the majority of instances anomalies are termed 'positive'. This means that they have a positive magnetic value relative to the magnetic background on any given site. However some features can manifest themselves as 'negative' anomalies that, conversely, means that the response is negative relative to the mean magnetic background.

Where it is not possible to give a probable cause of an observed anomaly a '?' is appended.

It should be noted that anomalies interpreted as modern in origin might be caused by features that are present in the topsoil or upper layers of the subsoil. Removal of soil to an archaeological or natural layer can therefore remove the feature causing the anomaly.

The types of response mentioned above can be divided into five main categories that are used in the graphical interpretation of the magnetic data:

Isolated dipolar anomalies (iron spikes)

These responses are typically caused by ferrous material either on the surface or in the topsoil. They cause a rapid variation in the magnetic response giving a characteristic 'spiky' trace. Although ferrous archaeological artefacts could produce this type of response, unless there is supporting evidence for an archaeological interpretation, little emphasis is normally given to such anomalies, as modern ferrous objects are common on rural sites, often being present as a consequence of manuring.

Areas of magnetic disturbance

These responses can have several causes often being associated with burnt material, such as slag waste or brick rubble or other strongly magnetised/fired material. Ferrous structures such as pylons, mesh or barbed wire fencing and buried pipes can also cause the same disturbed response. A modern origin is usually assumed unless there is other supporting information.

Linear trend

This is usually a weak or broad linear anomaly of unknown cause or date. These anomalies are often caused by agricultural activity, either ploughing or land drains being a common cause.

Areas of magnetic enhancement/positive isolated anomalies

Areas of enhanced response are characterised by a general increase in the magnetic background over a localised area whilst discrete anomalies are manifest by an increased response on two or three successive traverses. In neither instance is there the intense dipolar response characteristic exhibited by an area of magnetic disturbance or of an 'iron spike' anomaly (see above). These anomalies can be caused by infilled discrete archaeological features such as pits or post-holes or by kilns. They can also be caused by pedological variations or by natural infilled features on certain geologies. Ferrous material in the subsoil can also give a similar response. It can often therefore be very difficult to establish an anthropogenic origin without intrusive investigation or other supporting information.

Linear and curvilinear anomalies

Such anomalies have a variety of origins. They may be caused by agricultural practice (recent ploughing trends, earlier ridge and furrow regimes or land drains), natural geomorphological features such as palaeochannels or by infilled archaeological ditches.

Methodology: Gradiometer Survey

The main method of using the fluxgate gradiometer for commercial evaluations is referred to as ***detailed survey*** and requires the surveyor to walk at an even pace carrying the instrument within a grid system. A sample trigger automatically takes readings at predetermined points, typically at 0.25m intervals, on traverses 1m apart. These readings are stored in the memory of the instrument and are later dumped to computer for processing and interpretation.

During this survey an eight channel Sensys MX V3 system containing eight FGM650 sensors was also used which was towed across the area using an ATV. Readings were taken every 20MHz (between 0.05 and 0.1m). Data was be recorded onto a device, using a Carlson GNSS Smart antenna, for centimetre accuracy. These readings were stored in the memory of the instrument and downloaded for processing and interpretation.

Within some of the areas where a cart system could not be used, a Bartington Grad601 magnetic gradiometer was used taking readings on the 0.1nT range, at 0.25m intervals on zig-zag traverses 0.5m apart within 30m by 30m square grids. The instrument was checked for electronic and mechanical drift at a common point and calibrated as necessary. The drift from zero was not logged.

The gradiometer data have been presented in this report in processed greyscale format. The data in the greyscale images have been interpolated and selectively filtered to remove the effects of drift in instrument calibration and other artificial data constructs and to maximise the clarity and interpretability of the archaeological anomalies.

Appendix 2: Survey location information

An initial survey station was established using a Trimble VRS differential Global Positioning System (Trimble R6 model). The data was geo-referenced using the geo-referenced survey station with a Trimble RTK differential Global Positioning System (Trimble R6 model). The accuracy of this equipment is better than 0.01m. The survey grids were then super-imposed onto a base map provided by the client to produce the displayed block locations. However, it should be noted that Ordnance Survey positional accuracy for digital map data has an error of 0.5m for urban and floodplain areas, 1.0m for rural areas and 2.5m for mountain and moorland areas. This potential error must be considered if co-ordinates are measured off hard copies of the mapping rather than using the digital co-ordinates.

Archaeological Services WYAS cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party.

Appendix 3: Geophysical archive

The geophysical archive comprises:-

- an archive disk containing compressed (WinZip 8) files of the raw data, report text (Microsoft Word 2013), and graphics files (Adobe Illustrator CS2 and AutoCAD 2022) files; and
- a full copy of the report.

At present the archive is held by Archaeological Services WYAS although it is anticipated that it may eventually be lodged with the Archaeology Data Service (ADS). Brief details may also be forwarded for inclusion on the English Heritage Geophysical Survey Database after the contents of the report are deemed to be in the public domain (i.e. available for consultation in the Lincolnshire Historic Environment Record).

Appendix 4: Oasis form

Summary for archaeol11-510500

OASIS ID (UID)	archaeol11-510500
Project Name	Geophysical Survey at Cottam Cable Roue
Sitename	Cottam Cable Roue
Activity type	Geophysical Survey, MAGNETOMETRY SURVEY
Project Identifier(s)	
Planning Id	
Reason For Investigation	Planning: Pre application
Organisation Responsible for work	Archaeological Services WYAS
Project Dates	11-Apr-2022 - 07-Oct-2022
Location	Cottam Cable Roue NGR : SK 85090 81830 LL : 53.3265588662344, -0.723897965855773 12 Fig : 485090,381830
Administrative Areas	Country : England County : Lincolnshire District : West Lindsey Parish : Marton
Project Methodology	The study site was surveyed using either a cart-based survey or hand-held survey. The cart-based survey was undertaken using an eight channel SenSYS MX V3 system containing eight FGM650 sensors. Readings are taken every 20MHz (between 0.05 and 0.1m). Data were recorded onto a device, using a Carlson GNSS Smart antenna, for centimetre accuracy. These readings were stored in the memory of the instrument and downloaded for processing and interpretation. DLMGPS and MAGNETO software, alongside bespoke in-house software was used to process and present the data. Where a cart-based survey was not suitable the survey was undertaken using Bartington Grad601 magnetic gradiometers. These were employed taking readings at 0.25m intervals on zig-zag traverses 1.0m apart within 30m by 30m grids, so that 3600 readings were recorded in each grid. These readings were stored in the memory of the instrument and later downloaded to computer for processing and interpretation. Bespoke in-house software was used to process and present the data.
Project Results	
Keywords	Settlement - UNCERTAIN - FISH Thesaurus of Monument Types
Funder	
HER	Lincolnshire HER - unRev - STANDARD
Person Responsible for work	Emma, Brunning
HER Identifiers	
Archives	