

Springwell Solar Farm

Consultation Report

Appendix L-1.4

EN010149/APP/5.2
November 2024
Springwell Energyfarm Ltd

APFP Regulation 5(2)(q)
Planning Act 2008
Infrastructure Planning
(Applications: Prescribed Forms
and Procedure) Regulations 2009



Table of Contents

Appendix L-1.4 – Preliminary Environmental Information Report

Volume 3: Supporting Reports (Appendix 8.3: Geophysical Report to
Appendix 10.1: Preliminary Risk Appraisal)

Appendix L-1.4 – Preliminary Environmental Information Report



Appendix 8.3

Geophysical Report



ACRE22



SPRINGWELL SOLAR FARM AND CABLE OPTION ROUTE, LINCOLNSHIRE

GEOPHYSICAL SURVEY REPORT

commissioned by RSK
on behalf of Springwell Energyfarm Ltd

November 2023

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PROJECT INFO:

HA Project Code **ACRE22** / HA Project No **2023-75** / NGR **TF 05901 57035 and TF 502947 356183** / Parish **Ashby de Launde, Blankney, Cranwell, Graffoe, Rowston, Scopwick** / Local Authority **North Kesteven District Council** / Fieldwork Date - **17/10/2022 – 12/05/2023, Cable Option Route - 05/06/2023 – 07/06/2023 and 29/08/2023 – 31/08/2023** / OASIS Ref. **TBC**

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PROJECT SUMMARY

Headland Archaeology (UK) Ltd was instructed by RSK on behalf of Springwell Energyfarm Ltd (The Client) to undertake two geophysical (magnetometer) surveys on a contiguous parcel of land measuring approximately 1559ha in size (the Geophysical Survey Area – GSA), located 15km south of Lincoln between the villages of Metheringham and Brauntonwell, Lincolnshire, at the site of the proposed 800MW Springwell Solar Farm.

The results of both an initial geophysical survey covering the main areas which may form part of the solar farm proposals measuring approximately 1490ha and a subsequent survey across four fields being considered for cable route options measuring roughly 69ha were originally reported on separately but are both detailed herein. The later survey covering the cable route option is contained within the Appendix of this report. This geophysical survey report, together with an archaeological desk-based assessment (DBA, Headland Archaeology 2023a) and Aerial Investigation Report (Headland Archaeology 2023b) will inform the Environmental Impact Assessment (EIA, Headland Archaeology forthcoming) produced in support of a development consent order (DCO) application for the construction of the solar farm. The geophysical survey results will also inform future archaeological strategy.

The original larger survey evaluated an area of approximately 1390ha and not unexpectedly recorded a wide variety of archaeological and non-archaeological anomalies. The results of the survey largely corroborated, but also greatly expanded, the current understanding of the archaeological potential of the proposed site as contained within the Lincolnshire Historic Environment Record (LHER). It is evident from the survey results and information contained within the LHER that there were significant levels of prehistoric activity within different areas of the GSA from at least the Bronze Age, likely continuing through into the Iron Age before the two Roman roads that bisect the site were constructed.

The main findings of the original larger survey include several foci of archaeological activity ranging from ring ditches and likely round barrows, pit alignments and extended series and/or concentrations of ditches, enclosures and pit-like anomalies

located at the southern extent of the GSA near Brauncewell Quarry, to the north and south of Hall Farm (Bloxholm), surrounding RAF Digby to the south, east and north-east, north of Ashby de la Launde and Scopwick and west of Brickyard Farm where the archaeological potential must be considered very high. The only findings of note from the subsequent survey for the cable route option were two pit alignments, one located adjacent to the A15 and the other south-west of RAF Digby which marked a continuation of a much longer pit alignment recorded in the original survey.

Outside of these foci of activity, a regular gridded pattern of weakly magnetically enhanced, linear trend anomalies aligned north-west/south-east was identified in almost every field west of the B1191. An anthropogenic cause for these ditch-like anomalies, such as a relict field system, is still considered most likely given the homogeneity and regularity of the responses over such a large area. Elsewhere, magnetic anomalies identifying; former ponds, buildings, pits and extraction sites, agricultural trends including ridge and furrow and modern cultivation patterns, former boundaries, field drains and buried services and those arising from natural/geological variations are widely recorded across the GSA.

Where the survey has identified more significant levels of archaeological activity not previously recorded in the LHER includes the land between Ashby de la Laund and RAF Digby, north-east of RAF Digby and south of Blankney. Whilst the survey data has shown dense areas of archaeological activity exist within and between locations identified in the LHER as containing archaeological assets, the results also identify large areas within the GSA where the archaeological potential is considered low, particularly across fields adjacent to the A15 (but further north of Brauncewell Quarry) and the easternmost fields of the site.

The level of detail and range of anomalies recorded across both surveys is argued to provide a high level of confidence in the findings and that they accurately reflect the archaeological potential of the GSA, notwithstanding the limitations of magnetometer survey to define particularly small, very weakly enhanced or anomalies masked by areas of disturbance and/or stronger magnetic anomalies.

The results from a contiguous survey of this size have contributed a wealth of information to the understanding of not only individual foci of archaeological activity within the GSA but the archaeological potential of the area and wider landscape. Further analysis of the archaeological significance of some of the features recorded by the survey beyond their spatial distribution and potential relationship with other features is perhaps merited, however lies beyond the scope of this survey report.

CONTENTS

1	INTRODUCTION	1
	1.1 LOCATION, TOPOGRAPHY AND LAND-USE	1
	1.2 GEOLOGY AND SOILS	2
2	ARCHAEOLOGICAL BACKGROUND	2
	2.1 PREHISTORIC	2
	2.2 ROMANO-BRITISH	3
	2.3 MEDIEVAL	3
	2.4 POST-MEDIEVAL TO MODERN	3
3	AIMS, METHODOLOGY AND PRESENTATION	4
	3.1 MAGNETOMETER SURVEY	4
4	RESULTS	5
5	DISCUSSION AND CONCLUSION	17
6	REFERENCES	18
7	APPENDICES	433
	APPENDIX 1 SPRINGWELL SOLAR FARM CABLE OPTION ROUTE, LINCOLNSHIRE GEOPHYSICAL SURVEY REPORT	433
	APPENDIX 2 MAGNETOMETER SURVEY	490
	APPENDIX 3 SURVEY LOCATION INFORMATION	491
	APPENDIX 4 GEOPHYSICAL SURVEY ARCHIVE	491
	APPENDIX 5 MAGNETOMETER DATA PROCESSING	491

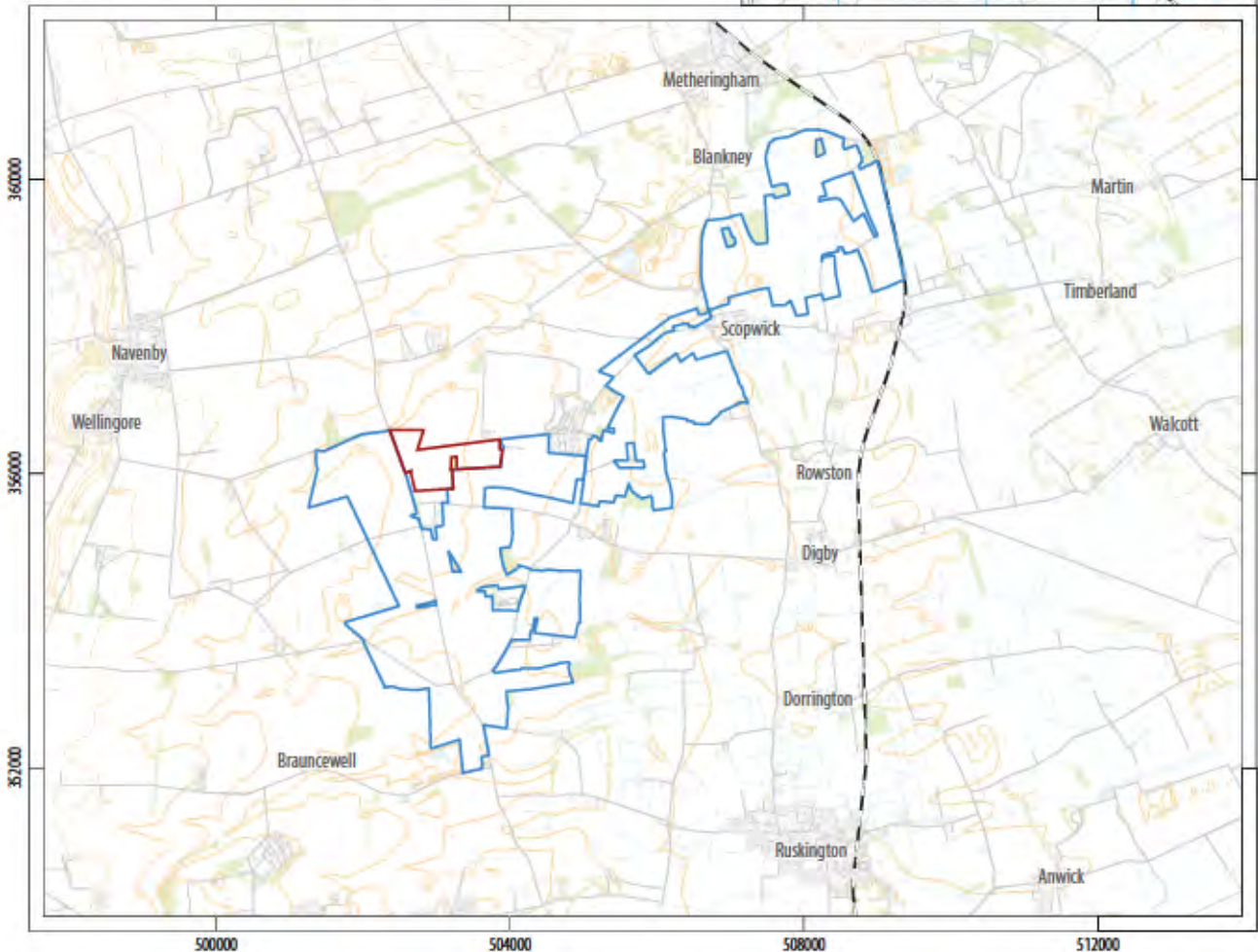
LIST OF ILLUSTRATIONS

ILLUS 1 SITE LOCATION	X
ILLUS 2 OVERALL PROCESSED GREYSCALE MAGNETOMETER DATA (1:40,000)	19
ILLUS 3 OVERALL INTERPRETATION OF MAGNETOMETER DATA (1:40,000)	21
ILLUS 4 SITE LOCATION SUPERIMPOSED ON LIDAR AND BEDROCK GEOLOGY DATA (1:34,000)	23
ILLUS 5 SECTOR 1 LOCATION MAP OF PROCESSED GREYSCALE, XY TRACE AND INTERPRETATION ILLUSTRATIONS (1:12,500)	25
ILLUS 6 SECTOR 1 GREYSCALE PLOT OF PROCESSED MAGNETOMETER DATA (1:12,500)	27
ILLUS 7 SECTOR 1 INTERPRETATION OF PROCESSED MAGNETOMETER DATA (1:12,500)	29
ILLUS 8 SECTOR 2 LOCATION MAP OF PROCESSED GREYSCALE, XY TRACE AND INTERPRETATION ILLUSTRATIONS (1:12,500)	31
ILLUS 9 SECTOR 2 GREYSCALE PLOT OF PROCESSED MAGNETOMETER DATA (1:12,500)	33
ILLUS 10 SECTOR 2 INTERPRETATION OF PROCESSED MAGNETOMETER DATA (1:12,500)	35
ILLUS 11 SECTOR 3 LOCATION MAP OF PROCESSED GREYSCALE, XY TRACE AND INTERPRETATION ILLUSTRATIONS (1:12,500)	37
ILLUS 12 SECTOR 3 GREYSCALE PLOT OF PROCESSED MAGNETOMETER DATA (1:12,500)	39
ILLUS 13 SECTOR 3 INTERPRETATION OF PROCESSED MAGNETOMETER DATA (1:12,500)	41
ILLUS 14 SECTOR 4 LOCATION MAP OF PROCESSED GREYSCALE, XY TRACE AND INTERPRETATION ILLUSTRATIONS (1:12,500)	43
ILLUS 15 SECTOR 4 GREYSCALE PLOT OF PROCESSED MAGNETOMETER DATA (1:12,500)	45
ILLUS 16 SECTOR 4 INTERPRETATION OF PROCESSED MAGNETOMETER DATA (1:12,500)	47
ILLUS 17–49 SECTOR 1 PROCESSED GREYSCALE, MINIMALLY PROCESSED XY TRACE PLOT AND INTERPRETATION OF MAGNETOMETER DATA (1:2,500)	49–81
ILLUS 50–106 SECTOR 2 PROCESSED GREYSCALE, MINIMALLY PROCESSED XY TRACE PLOT AND INTERPRETATION OF MAGNETOMETER DATA (1:2,500)	113–225
ILLUS 107–157 SECTOR 3 PROCESSED GREYSCALE, MINIMALLY PROCESSED XY TRACE PLOT AND INTERPRETATION OF MAGNETOMETER DATA (1:2,500)	227–327
ILLUS 158–208 SECTOR 4 PROCESSED GREYSCALE, MINIMALLY PROCESSED XY TRACE PLOT AND INTERPRETATION OF MAGNETOMETER DATA (1:2,500)	329–431

Springwell Solar Farm
Cable Option Route
Lincolnshire



0 200km
1:12,500,000 @ A4



0 2km
1:100,000 @ A4

- ▭ Springwell Solar Farm, Cable Option Route - geophysical survey area
- ▭ Springwell Solar Farm - geophysical survey area

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ILLUS 1 Site location

SPRINGWELL SOLAR FARM AND CABLE OPTION ROUTE, LINCOLNSHIRE

GEOPHYSICAL SURVEY REPORT

1 INTRODUCTION

Headland Archaeology (UK) Ltd was instructed by RSK on behalf of Springwell Energyfarm Ltd (The Client) to undertake a geophysical (magnetometer) survey on a contiguous parcel of land measuring approximately 1490ha in size located 15km south of Lincoln between the villages of Metheringham and Braucewell, Lincolnshire, at the site of the proposed 800MW Springwell Solar Farm (Illus 1).

The geophysical survey report, alongside an archaeological desk-based assessment (DBA, Headland Archaeology 2023a) and Aerial Investigation Report (Headland Archaeology 2023b) will inform the Environmental Impact Assessment (EIA, Headland Archaeology forthcoming) produced in support of a development consent order (DCO) application for the construction of the solar farm. The geophysics survey results will also inform future archaeological strategy, if required.

The survey was undertaken in accordance with a Written Scheme of Investigation for Geophysical Survey (WSI) (Headland Archaeology 2022), following guidance contained in the National Planning Policy Framework (MHCLG 2021) and was carried out in line with current best practice (Chartered Institute for Archaeologists 2014, Europae Archaeologia Consilium 2016).

The significant majority of the survey was undertaken during an initial largely uninterrupted phase of work (except for Christmas and New Year) between October 17th, 2022 and March 9th, 2023. Revisions to the Geophysical Survey Area (GSA) boundary during the survey led to the inclusion of three additional fields (E1, W1 and W2) at the southern end of the site which were surveyed between March 15th and April 4th, 2023. Other fields were removed as design proposals evolved. Initially unsuitable fields under heavy plough at the time of the original survey were subsequently surveyed between May 9th and May 12th 2023.

Additional fields have since been added to the GSA to evaluate cable route options. This survey is ongoing, and the results will be added as an Addendum to the current report in due course.

All the accessible parcels within the GSA were surveyed with the total area surveyed amounting to approximately 1390ha. For such a large area there were generally very few areas within the GSA that were unsuitable for survey with only a few examples of overgrown or waterlogged patches and strips of bird cover at the field margins.

1.1 LOCATION, TOPOGRAPHY AND LAND-USE

The GSA comprises an irregular shape parcel of land broadly aligned north-east to south-west located approximately 15km south of Lincoln, spread across adjoining fields situated between the villages of Metheringham and Braucewell, Lincolnshire. The GSA can broadly be sub-divided into three parcels spanning Sectors 1–4 (Illus 2–3) extending from NGR 503498 351995 adjacent to Braucewell quarry in the south, to the northernmost field bound by Blankney Moor Lane at NGR 507969 360600.

The western and southern parts of the GSA covered by Sectors 1 and 2 lie immediately adjacent to the A15 to the east and west between Braucewell Quarry and south of RAF Digby. Sector 3 spans the central section of the GSA surrounding RAF Digby to the south, east and north-east heading towards the village of Scopwick. The northernmost block of land within the GSA covered by Sector 4 lies north-east of Scopwick and is bound by the Peterborough to Lincoln railway to the east.

At the landscape scale the topography of the GSA gradually slopes down from a height of approximately 54m above Ordnance

Datum (AOD) west of the A15 at the north-west corner of Sector 1, down to roughly 7m AOD at the north-east corner of the GSA where it is bound by the railway and approximately 36m AOD at the southernmost boundary of the GSA. Generally, there is more topographic variation in the western half of the GSA, markedly in the location of sinuous variations in the underlying limestone bedrock geology as highlighted by LiDAR and geology data respectively (Illus 4). There is little topographic variation within the fields of the eastern half of the site.

The fields within the GSA are predominantly agricultural in nature containing a mix of arable crops and pasture. Ground conditions were generally very good across the GSA with many fields surveyed post-harvest and between crop rotations. Multiple wooded areas and coppices are scattered in and around the site and are not included in the GSA. There is one watercourse that runs roughly east/west through the GSA in Sector 3 to the water treatment plant east of RAF Digby.

1.2 GEOLOGY AND SOILS

The solid bedrock geology beneath most of the GSA consists of different formations of sedimentary Jurassic period limestone that belongs to the Southern Lincolnshire Edge, a north/south linear scarp of limestone running the length of Greater Lincolnshire. However, the geology is considerably more complex east of the B1191 compared to the west (Illus 4 inset). To the west limestone of the Upper Lincolnshire Limestone Member underlies nearly all the GSA covered by Sectors 1 and 2. The exception is a narrow band of Lower Lincolnshire Limestone Member limestone that runs from the B1191 in the east, on a broadly south-west/north-east alignment, to the western edge of the GSA on Temple Road, crossing fields TB3, TB4, Bcd114 and Bcd115. Just east of the A15 this band bi-furcates with a second band running in a north-westerly direction up to the western edge of the GSA in field BCD102. The sinuous spread of this band of Lower Lincolnshire limestone coincides with the topographic variations in this part of the GSA seen in LiDAR data (Illus 4) with dry valleys evident in the fields it crosses.

The only other variation in bedrock geology in these sectors underlies Bcd11 and Bcd120 where limestone of the Blisworth Limestone Formation is recorded surrounding a thin band of Argillaceous rocks with subordinate sandstone and limestone of the Rutland Formation.

The change in bedrock geology across Sector 3 largely respects the route of the B1191 through RAF Digby to the north and south where limestone of the Blisworth Formation lies to the east and Lincolnshire and Upper Lincolnshire Formations lay to the north-west and south-west respectively. Two small patches of mudstone of the Blisworth Clay formation lie within fields Rw02 and the north-eastern corner of RW10.

The bedrock geology underlying Sector 4 appears as four bands loosely aligned north to south the westernmost of which is recorded as Blisworth Limestone Formation limestone. To the east are two thin sinuous bands of mudstone and limestone of the Cornbrash Formation followed by a larger band of sandstone, siltstone and mudstone of the Kellaways Formation.

No superficial deposits are recorded over a significant majority of the GSA. Two sinuous bands of sedimentary sand and gravel deposits follow the course of dry valleys and natural depressions in the limestone bedrock aligned roughly east/west in the southern part of the GSA spanning the northern parts of fields Bcd108, Bcd109, Bcd110 and Bcd111 and across the southernmost field in the GSA, W2. A small spread of clay, silt, sand and gravel Head deposit is also recorded alongside the sand and gravel deposits in W2. A spread of clay and silt tidal flat deposits encroaches from the north into parts of By02 and By03 and are the only other superficial deposits recorded across the GSA (NERC 2022).

The overlying soils of the GSA are less varied than the underlying geology with three broad areas identified. To the south and west of RAF Digby (Sectors 1 and 2) the overlying soils are classified in the Soilscape 3 Association, characterised as shallow lime-rich loamy soils over chalk or limestone. To the east and north-east of RAF Digby (Sectors 3 and 4) the soils are classified in the Soilscape 5 Association described as freely draining lime-rich loamy soils. The easternmost fields of the GSA (Sector 4) around Acre Lane are classified in the Soilscape 22 Association, characterised as loamy soils with naturally high groundwater (Cranfield University 2021).

Guidance (English Heritage 2008; Table 4) indicates that magnetometer survey can be recommended over any sedimentary geology and average responses to magnetometer survey over Jurassic limestone are good, although a wide range of magnetic susceptibilities in the parent rock can result in very variable background responses to magnetometer survey. Also, any Quaternary deposits overlying the solid geology are a primary consideration as they often show a high degree of local variation, and the magnetic response is usually dependent on the magnetic mineralogy of the parent solid geology.

The combination of underlying limestone bedrock and widespread absence of superficial deposits means the prevailing geological and pedological conditions for much of the GSA are entirely appropriate for the application of magnetometer survey for the detection of archaeological features. Previous small scale magnetometer surveys bordering the GSA in advance of the expansion of the Braucewell Quarry site (Oxford Archaeotechnics 1996 and 2008) also yielded positive results highlighting the suitability of the technique in this location.

2 ARCHAEOLOGICAL BACKGROUND

The following archaeological background is adapted from information detailed within a comprehensive archaeological desk-based assessment (ADBA - Headland Archaeology 2023a) and aerial investigation report (Headland Archaeology 2023b) compiled in support of an Environmental Impact Assessment (EIA) for the proposed solar development.

2.1 PREHISTORIC

There are 34 records held by the Lincolnshire Historic Environment Record (LHER) relating to prehistoric activity located in part or fully within the GSA. Most of this evidence has been recorded from air

photographs during the National Mapping Programme (NMP). Fields within Sectors 1 and 2 show evidence for prehistoric settlement and funerary activity. On the eastern boundary of the GSA in Sector 2 (field Bcd111) a potential prehistoric settlement has been recorded from cropmarks (MLI84458); settlement is also recorded within the northern parts of Sector 3 (fields Bcd066 and Bcd148; MLI87414). Surrounding these areas of settlement is evidence for prehistoric barrow burials. Immediately north of the settlement evidence in Sector 3 is a potential barrow cemetery (MLI87416) and south of RAF Digby (Bcd079) three possible round barrows are recorded close to each other (MLI90994; MLI90995; MLI 90998). Other isolated round barrows are recorded in the wider GSA, further away from settlement evidence in fields Bcd120 (MLI84453) and Bcd148 (MLI90982). A Bronze Age cremation (MLI82506) has also been recorded just outside the GSA, 200m north of field By20 in Sector 4 east of Brickyard Farm but inside the railway bounding the GSA. The relative commonality of round barrows within the GSA and the presence of a Bronze Age burial is indicative of Bronze Age occupation within the GSA.

There is also evidence within the GSA that this area was used during prehistory for agricultural exploitation. More broadly all areas contain cropmark evidence for linear ditches and enclosures. Notably areas east of the A15 in Sectors 1 and 2 which contain two pit alignments (MLI84452; MLI88357) and Sector 3 where two trackways with enclosures nearby are recorded (MLI86753; MLI87413). It is clear that the GSA was occupied during the prehistoric period, the reliance on aerial imagery to identify sites has created a generalisation in time period. However, the considerable presence of round barrows is indicative of a Late Neolithic to Bronze Age presence.

There is assessed to be high potential for prehistoric remains to be present across the GSA due to the considerable evidence recorded here by the NMP. However, it is possible that the continuous ploughing of the area through at least the post-medieval and modern periods has caused damage to below ground archaeological remains.

2.2 ROMANO-BRITISH

The LHER records eight assets of Romano-British date within the GSA, the most significant evidence of which is the Roman road running through Sector 3 crossing fields Rw01, Rw07, Rw08, Rw12 and Bk02 (MLI60813). There is another recorded Roman road following the same alignment as the present A15 (MLI86228). Both roads, described as continuations of Mareham Lane, run from the Roman settlement at Sleaford to the fort at Lincoln. Evidence of Romano-British activity within the GSA is solely made up of artefactual finds which is indicative of this area being frequented by travellers heading between Sleaford and Lincoln.

There is assessed to be low to medium potential for archaeological remains of Romano-British date to survive within the GSA. It is most likely that any remains would most likely be found in Sector 3, probably associated with the Roman road recorded here. Any other remains would likely be artefactual. However, it is possible that the continuous ploughing of the area through at least the post-medieval and modern periods has caused damage to below ground archaeological remains.

2.3 MEDIEVAL

The medieval period is poorly represented within the GSA with cropmarks seen in Sector 2 (Bcd111; MLI84457), a parish boundary recorded in Sector 3 (MLI89155) and a brass jetton find recorded immediately north of C6 but outside the GSA (MLI82650). During this period the nearby settlements of Ashby-de-la-Launde (MLI89166), Scopwick (MLI86774), Braucewell (NHLE1018397) and Temple Bruer (MLI84449) started to develop and just outside Sectors 2, 3 and 4 medieval ridge and furrow is recorded (MLI60568; MLI87033; MLI87419; MLI87446). It is most likely that this area was used for agricultural exploitation during the medieval period.

There is assessed to be medium potential for archaeological remains of this date to survive within the GSA. There is good evidence that this area was farmed during the medieval period, so any remains are likely to be agricultural in nature, for example ridge and furrow ploughing. Such remains were unlikely detected by the NMP and are not visible on air photographs due to the post-medieval and modern ploughing here.

2.4 POST-MEDIEVAL TO MODERN

The agricultural use of the GSA continued into the post-medieval period. The field boundaries present today can largely all be traced back to tithe maps (Kirkby Green 1840 and Roulston 1843) and first edition Ordnance Survey mapping. The only other evidence recorded for the post-medieval period relates to highly localised, small-scale extraction dotted around the GSA.

The GSA has continued to be used for agriculture into the modern period and there is little evidence to suggest any other use of this area other than for agriculture. The LHER holds two records dating to the modern period: a World War 2 (WW2) aircraft crash site in Sector 4 (field By22; MLI125416) and RAF Digby in the north of Sector 3 (MLI60621).

There is medium to high potential that remains of a post-medieval to modern date survive within the GSA, but these would most likely be agricultural in nature. However, there is potential that remnants of localised post-medieval extraction could survive as well as evidence of the aircraft crash site in field By22.

There are 247 previous archaeological events within a 2km study area recorded by the Lincolnshire HER. Twenty-five of these are within the GSA. One of these archaeological events is an antiquarian investigation immediately outside the GSA east of Brickyard Farm in the location of a Bronze Age cremation (ELI2712). Another is a research-led investigation of a WW2 pillbox on the northern boundary of Bcd079 (ELI12971) and the remaining events are chance discoveries.

The GSA has been intensively ploughed since the post-medieval period which has caused extensive disturbance across the site. Many of the cropmarks are no longer visible on LiDAR or recent air photographs, likely due to modern agricultural activity.

3 AIMS, METHODOLOGY AND PRESENTATION

The general aim of the geophysical survey was to provide enough information to corroborate, identify and characterise sub-surface anomalies that may have an archaeological origin, including defining the spatial limits of already known or suspected heritage assets, within the defined survey areas. This information will form part of a much larger body of evidence from a variety of sources that, taken as a whole, will enable an assessment to be made of the impact of the proposed development on any sub-surface archaeological remains, where present and therefore help determine an appropriate mitigation strategy.

The specific archaeological objectives of the geophysical survey were:

- › to gather enough information to inform the extent, condition, character and date (as far as circumstances permit) of any archaeological features and deposits within the GSA,
- › to obtain information that will contribute to an evaluation of the significance of the proposed solar development upon cultural heritage assets, and
- › to prepare a fully illustrated report on the results of the survey that is compliant with all relevant standards, guidance and good practice.

3.1 MAGNETOMETER SURVEY

It is acknowledged that magnetometry has limitations and that certain types of sub-surface remains may, under certain circumstances, be more likely to be identified by other survey techniques such as earth resistance, ground penetrating radar (GPR) or electro-magnetic methods which measure different geophysical properties. However, to achieve the immediate project aims over such a large area constituting the GSA, magnetometry was selected as the best general-purpose methodology for assessing the site given the sub-surface remains most likely to be encountered, the results of earlier surveys and the project considerations.

Magnetic survey methods rely on the ability of a variety of instruments to measure very small magnetic fields associated with buried archaeological remains. A feature such as a ditch, pit or kiln can act like a small magnet, or series of magnets, that produce distortions (anomalies) in the earth's magnetic field. In mapping these slight variations, detailed plans of sites can be obtained as buried features often produce reasonably characteristic anomaly shapes and strengths (Gaffney & Gater 2003). Further information on soil magnetism and the interpretation of magnetic anomalies is provided in Appendix 1.

The surveys were undertaken using two adaptations of four Bartington Grad601 sensors mounted at 1m intervals (1m traverse interval) onto a rigid frame. For most of the survey the frame was carried manually by the surveyors. When ground conditions were suitable the frame was towed on a wheeled array behind a quadbike.

In both configurations the system was programmed to take readings at a frequency of 10Hz (allowing for a 10–15cm sample interval) on roaming traverses (swaths) 4m apart. These readings were stored on an external weatherproof laptop and later downloaded for processing and interpretation. The system was linked to a Trimble R12 Real Time Kinetic (RTK) differential Global Positioning System (dGPS) outputting in NMEA mode to ensure a high positional accuracy for each data point.

MLGrad601 and MultiGrad601 (Geomar Software Inc.) software was used to collect and export the data. A combination of Terrasurveyor v3.0.35.1 (DWConsulting) and Anomaly GeoSurvey v1.11.11 (© 2018 Robbie Austrums) software packages were used to process and export the data plots. Subsequent data interpretation and illustration work was undertaken using Autodesk AutoCAD and QGIS v3.22.12 respectively.

An overall location plan of the GSA is presented at a scale of 1:100,000 in Illus 1. Overall processed greyscale and interpretation illustrations are shown in Illus 2 and Illus 3 respectively at a scale of 1:40,000. LiDAR data with the GSA outline superimposed is displayed in Illus 4 at a scale of 1:34,000. Bedrock geology data with GSA outline is displayed as the inset to Illus 4.

Due to the size and geographic spread of the GSA, twelve overview illustrations (three per Sector 1 through 4) detailing the location of the 1:2,500 illustrations, processed greyscale data and magnetometer interpretation with field names and LHER monument and event data, are shown at a scale of 1:12,500 in Illus 5 through Illus 16. Individual fields are referred to by names provided to Headland Archaeology at the commencement of the project. The survey data is shown in fully processed greyscale format, minimally processed XY trace plot format with accompanying interpretation plots at 1:2,500 in Illustrations 17 to 208 inclusive.

The full survey report including illustrations for the cable option route are included in Appendix 1. Technical information on the equipment used, data processing and magnetometer survey methodology is given in Appendix 2. Details of the survey location information are in Appendix 3. A note on the format of the geophysical data archive is present in Appendix 4. Data processing details for the magnetometer survey are presented in Appendix 4. The OASIS Archive entry is included as Appendix 6.

The survey methodology, report and any recommendations comply with guidelines outlined by Europae Archaeologia Consilium (EAC 2016) and by the Chartered Institute for Archaeologists (CIFA 2014b). All Illustrations from Ordnance Survey (OS) mapping are reproduced with the permission of the controller of His Majesty's Stationery Office (© Crown copyright).

The illustrations in this report have been produced following analysis of the data in 'raw' (minimally processed) and processed formats (see above) and over a range of different display levels. All illustrations are presented to display and interpret the data from this site to best effect based on the experience and knowledge of management and reporting staff.

4 RESULTS

The results are described by Sector in Table 1 below. Within each Sector fields have been grouped based on their geographic proximity and/or similar types of geophysical responses identified within. Many of the broader geological anomalies and some foci of archaeological activity extend beyond the modern field boundary

limits and therefore grouping of fields was required to best describe and define the characteristics of these features. The list of associated archaeological LHER assets and events included in the results table is not exhaustive and only includes those assets relevant to the anomalies identified in the survey lying within or immediately adjacent to those fields being discussed as part of the GSA.

SECTOR 1 ILLUS 5-7 AND 17-49

FIELD NO.	ARCHAEOLOGICAL ANOMALIES	ASSOCIATED ARCHAEOLOGICAL LHER ASSETS AND EVENTS WITHIN GSA LIMITS	SURVEY INTERPRETATION
Tb1 (Illus 17-22 and 26-28)	No?	None	<p>No anomalies of clear archaeological potential are identified in this field. A series of faint, regular parallel and perpendicular linear trend anomalies forming a grid like pattern cross the southern part of the field in a general north-west/south-east direction. These anomalies are tentatively interpreted as possibly forming part of a very large field system extending across many of the fields contained within Sectors 1 and 2. The more consistent nature of these linear anomalies lies in contrast to the irregular background mottling effects likely derived from natural periglacial processes or surface cracks in the limestone. The northern extent of these ditch-like features appears to respect a dry valley evident in the LiDAR data (Illus 4), possibly identifying another depression in the limestone bedrock as seen elsewhere in the GSA, crossing the northern part of Tb1 and Tb2. However, the absence of response here may be a result of the more homogenous deposits present within the depression and does not necessarily indicate an absence of features.</p> <p>Contained within the southern half of the field and located predominantly towards the peripheries of the present field boundaries are several discrete magnetically enhanced anomalies of uncertain origin but which are thought to possibly identify former extraction pits.</p> <p>Faint trends, tentatively interpreted as possible ridge and furrow based on their more regular appearance, are identified north of the southernmost pylon. However, these curving anomalies could equally be modern and/or natural in origin.</p> <p>Sinuus and discrete magnetically enhanced anomalies likely identifying a wide shallow depression in the limestone bedrock splitting in two directions at the location of the northernmost pylon, dominate the magnetic responses in the northern half of the field.</p> <p>Two service pipes and two pylon bases are also located within the field.</p>
Tb2 (Illus 17-28 and 32-34)	Yes	ML186694 ML186228 ML186690 EL15330	<p>Except for a short 45m linear section of discrete anomalies identifying a pit alignment in the north-east corner of the field (Illus 23-25), no other anomalies of clear archaeological potential are recorded. A range of overlapping magnetic anomalies of natural and anthropogenic origin are recorded in the southern half of the field but their cause, extent and any possible associations remain uncertain. No clear anomalies of likely archaeological origin are recorded in the location of a findspot for a Middle Bronze Age socketed spearhead (ML186690) east of the centre of the field. It should be noted that the superimposition of anomalies makes interpretation of individual features difficult at this location.</p> <p>The pit alignment, not previously recorded in the LHER, is oriented north-east/south-west and lies adjacent to a former quarry site (ML186694) off the A15 and former Roman road (ML186228) at NGR 502311, 356494. The alignment possibly extends to the west as more of a continuous curving ditch-like feature, but the response becomes difficult to differentiate from sinuous geological responses derived from a wide shallow dry valley, possibly identifying a depression in the limestone bedrock as seen elsewhere in the GSA to the south, extending in a similar direction across the field. The pit alignment is recorded to the east on the eastern side of the A15 extending into field Bcd044(Part) subsequently surveyed in a separate phase of works relating to cable route options (Headland Archaeology 2023 forthcoming).</p> <p>The same pattern of regular parallel and perpendicular linear trend anomalies forming a grid like design, present in many other fields within Sectors 1 and 2, are evident in all parts of the field not dominated by responses from the topographic depression crossing the field. The pattern of anomalies again does not appear to respect present or former field boundaries and may identify a former system of land division.</p> <p>The superimposition of various types of anomalies, particularly in the southern half of this field restricts a more confident interpretation of the nature, extent and any interrelationship (if present) between any of the underlying features. It remains unclear whether more regular patterns of anomalies in this area are a result of coincidental arrangements of geological effects or may have possible anthropogenic causes potentially associated with the hypothesized field system. Any anomalies that appear distinct from the magnetic background either due to their shape and/or magnetic signature are interpreted as of uncertain origin.</p> <p>Also recorded in this part of the field are a series of parallel linear trends, oriented east/west, identifying a pattern of ridge and furrow, a linear anomaly recording a former boundary and two magnetically enhanced discrete anomalies likely locating former localised extraction.</p> <p>Similar to the southern half of Tb1 and most fields adjacent to the A15, several discrete, widely spaced, magnetically enhanced anomalies of uncertain origin are recorded predominantly at the periphery of the field. These anomalies possibly identify former extraction pits.</p>

Bcd082	No	MLJ89517	No anomalies of clear archaeological potential are recorded across these three fields adjacent to and west of the A15. Findings from these fields are limited to a small area of magnetic enhancement recording extraction adjacent to a former stone quarry pit (MLJ89157) next to the A15, a continuation of the north-west/south-east aligned grid system of ditch-like anomalies and periodic magnetically enhanced discrete anomalies around the periphery of the field that are possibly due to modern extraction.
Bcd094		MLJ86228	
Bcd098		MLJ60759	
(Illus 26-31 and 35-40)		ELJ7075	

FIELD NO.	ARCHAEOLOGICAL ANOMALIES	ASSOCIATED ARCHAEOLOGICAL LHER ASSETS AND EVENTS WITHIN GSA LIMITS	SURVEY INTERPRETATION
Bcd084	Yes	MLJ88357	<p>A pit alignment (MLJ88357), oriented predominantly north/south spanning nine adjoining fields, extends uninterrupted for 2.1km southwards from the GSA limits to the north in Bcd084 at NGR 503463, 356058, towards the centre of field Bcd115 at NGR 503243, 354000 (discussed further below in Sector 2). In this sector the pit alignment crosses fields Bcd084, Bcd093, Bcd096, Bcd100, Bcd104 and Bcd105 but does not appear to be associated with any other anomalies/features recorded by the survey. The survey data adds detail to the LHER record showing that the two previously recorded pit alignments identified from cropmarks MLJ84452 and MLJ88357 are in fact a unified feature.</p> <p>The same arrangement of regular parallel and perpendicular linear trend anomalies forming a grid like pattern aligned north-west/south-east, present in many other fields within Sectors 1 and 2, are evident to varying degrees within all these fields. No definitive interpretation of these anomalies presents itself, but they could represent an extensive field system or form of land division predating the modern field arrangements which are identified from title maps from the mid-19th century (Headland Archaeology 2023a; Table 5 and Table 6). It remains unclear whether three faint partial circular anomalies identified adjacent/within the grid like anomalies in fields Bcd096 (NGR 503263, 355392), Bcd100 (NGR 503455, 355186) and Bcd104 (NGR 503292, 355499, very tentatively interpreted as of possible archaeological origin) are associated with these 'fields' or even if they have an anthropogenic cause (Illus 47-49).</p> <p>Two parallel ditch-like anomalies of uncertain origin, aligned roughly east/west, are recorded extending across fields Bcd096 and Bcd097 (Illus 47-49 and 113-115). No relationship is established with other features with which these anomalies appear to intersect including a wide, sinuous natural feature possibly identifying a depression in the limestone bedrock, pit alignment (MLJ88357) and the regular gridded arrangement of linear trend anomalies. These parallel anomalies could potentially define a trackway heading in the direction of Ashby de la Launde approximately 800m to the east. Two further ditch-like anomalies, also aligned roughly east/west and of uncertain origin, are identified at the boundary between fields Bcd084 and Bcd093. These remain difficult to interpret as they are parallel in part to modern agricultural trends close to the current field boundary.</p> <p>A former extraction pit (MLJ89203) recorded on historic mapping presents as a concentration of magnetic disturbance in the south-eastern corner of Bcd093 (Illus 44-46). South of this, at the eastern end of Bcd105, another area of likely extraction not identified on historic mapping is recorded as a cluster of magnetically enhanced amorphous responses. These anomalies lie immediately adjacent to LHER assets recording an unnamed farmstead (MLJ20943) and Gamekeepers Cottage and pheasantry (MLJ89194) located within a wood inside the GSA (Illus 47-49). No relationship between the previously recorded heritage assets and the magnetic anomalies can be established from the data and therefore these anomalies are interpreted as of uncertain origin.</p> <p>A small area of magnetic disturbance is also recorded in the location of a former windpump depicted on historic mapping due east of Ashby Lodge along the northern boundary of Bcd100 (Illus 47-49). The strong magnetic signature along the shared boundary between Bcd096 and Bcd100 in the direction of the former windpump suggests a service is buried within the boundary.</p> <p>As in most fields adjacent to the A15, several discrete, widely spaced, magnetically enhanced anomalies of uncertain origin, but possibly identifying former extraction pits, are recorded in field Bcd099.</p> <p>A broad sinuous feature of varied magnetic response identifying a geological trend, possibly a depression in the limestone bedrock, crosses fields Bcd096 and Bcd097 in an east/west direction.</p>
Bcd086		MLJ89203	
Bcd093		MLJ84520	
Bcd096		ELJ7068	
Bcd097		MLJ88323	
Bcd099		MLJ20943	
Bcd100		MLJ89194	
Bcd104		ELJ6372	
Bcd105		MLJ86228	
(Illus 35-40 and 44-49)			

**SECTOR 2
ILLUS 8-10 AND 50-106**

FIELD NO.	ARCHAEOLOGICAL ANOMALIES	ASSOCIATED ARCHAEOLOGICAL LHER ASSETS AND EVENTS WITHIN GSA LIMITS	SURVEY INTERPRETATION
Bcd102 Bcd106 Bcd114 (Illus 38-40, 50-52 and 59-64)	No?	MLI89204 MLI86228	<p>Except for the continuation of the faint ditch-like responses, tentatively interpreted as possibly identifying a former field system, no anomalies of clear archaeological potential are identified in these three large fields adjacent to the A15. These fields broadly contain the same types of anomalies as those recorded further to the north where the most prominent features identified are either natural in origin, such as the sinuous geological trends crossing all the fields, or possibly identify localised areas of extraction respecting the periphery of the modern field boundaries.</p> <p>Two parallel ditch-like anomalies of uncertain origin are recorded in Bcd114 aligned north-east/south-west extending to/from the pylon base in this field at NGR 502759, 354024 (Illus 62-64). It remains unclear whether these are associated with the pylon but do share an alignment with other ditch like features of possible archaeological origin further to the south heading in the direction of the pit alignments and ditches approximately 450m to the south-west. A further linear anomaly of uncertain origin, identified in Bcd114 oriented east/west at the eastern edge of the field, could mark the continuation of a possible archaeological ditch from field Bcd115 immediately to the east.</p> <p>Two parallel ditch-like anomalies of uncertain origin are recorded in Bcd114 aligned north-east/south-west extending to/from the pylon base in this field at NGR 502759, 354024 (Illus 62-64). It remains unclear whether these are associated with the pylon but do share an alignment with other ditch like features of possible archaeological origin further to the south heading in the direction of the pit alignments and ditches approximately 450m to the south-west. A further linear anomaly of uncertain origin, identified in Bcd114 oriented east/west at the eastern edge of the field, could mark the continuation of a possible archaeological ditch from field Bcd115 immediately to the east.</p> <p>An area of magnetic disturbance recorded in the south-eastern corner of field Bcd106 adjacent to the A15 identifies the location of a former windpump recorded on historic mapping (Illus 59-61). Discrete magnetic responses immediately north of the former windpump possibly identify a further extraction site similar to others recorded adjacent to the A15.</p>
Bcd099 Bcd105 Bcd107 Bcd108 Bcd109 Bcd115 Bcd118 Bcd123 Bcd129 (Illus 38-40, 50-52, 59- 64, 71-79 and 86-97)	Yes	MLI84452 MLI88357 MLI86228 MLI89159 MLI89201	<p>Fields in this sector contain part of the continuous pit alignment recorded in the LHER as two separate features MLI84452 and MLI88357. In this sector the pit alignment alters course from a north/south alignment seen to the north in Sector 1, to a north-east/south-west alignment extending across the north-west corner of Bcd108, through the sinuous geological trend recording a change in limestone geology in Bcd107 and into Bcd115 (Illus 62-64 and Illus 71-76). In this field the survey data suggests there is a gap of approximately 130m in the pit alignment across Bcd115 and is not a continuous feature as suggested by cropmark data detailed in the LHER. The pit alignment does not appear to extend to the south-west beyond the western boundary of Bcd115 which is bound by the A15, also the former Roman road marking an extension to Mareham Lane (MLI86228). Given the clarity of magnetic response of the pit alignment across the remainder of the field with similar magnetic background, the absence of anomalies across a 130m stretch suggests a deliberate gap rather than a failure to detect anomalies in this location.</p> <p>An isolated ring ditch approximately 13m in diameter not previously recorded in the LHER is identified towards the north-west corner of Bcd123 at NGR 503652, 353874 (Illus 74-76). Two similar sized but much less clear circular anomalies possibly identifying ring ditches are identified towards the eastern edge of Bcd123 (NGR 503972, 353803; Illus 89-91) and to the north in Bcd118 (NGR 503661, 354049; Illus 74-76).</p> <p>The same pattern of regular parallel and perpendicular linear trend anomalies forming a grid like design, present in many other fields within Sectors 1 and 2, and possibly identifying a relict field system, are recorded to varying extents in all parts of these fields other than where there are high magnitude responses from natural variations in the bedrock geology. It remains unclear whether these possible boundary features deliberately respect the location of geological/topographic changes or whether there is a lack of magnetic contrast provided in the location of these leading to reduced visibility of anomalies. Fields in this area appear to mark the eastern extent of these anomalies/features which broadly correlate with north/south aligned changes in bedrock geology from different limestone formations to the east and west bounding a strip of argillaceous rocks in between. It remains uncertain whether the failure to detect these regular, weak trend anomalies outside of areas underlain by Upper Lincolnshire Limestone Member bedrock geology is a genuine characterisation of their extent or a reflection of changing magnetic properties of the underlying bedrock geologies leading to a lack of visibility.</p> <p>Further evidence for localised extraction presents as amorphous patches of enhanced magnetic responses adjacent to the B1191 to the east of Bcd108, Bcd118, Bcd123 and Bcd129. All these responses lie close to former extraction pits recorded by the LHER (MLI89201).</p> <p>A series of parallel, widely spaced and slightly curving low magnitude responses along eastern parts of fields Bcd118 and Bcd123 (Illus 74-76 and Illus 89-91) and across Bcd105 and Bcd108 (Illus 71-73) likely identify patterns of ridge and furrow cultivation.</p> <p>A broad sinuous anomaly of varied magnetic response identifies a sinuous spread of Lower Lincolnshire Limestone Member limestone and lime-wackestone crossing fields Bcd108 and Bcd109 in a south-west/north-east direction, before forking at the boundary between fields Bcd107 and Bcd115 and heading separately into fields Bcd106 and Bcd114 west of the A15 detailed in Sector 1. A further spread of this bedrock branches off at the western edge of Bcd115 where it heads in a south-east direction towards the southern edge of the field.</p> <p>Other linear anomalies in these fields identify former boundaries often parallel to the present layout that are detailed on historic mapping, field drains and/or modern agricultural trends.</p>

FIELD NO.	ARCHAEOLOGICAL ANOMALIES	ASSOCIATED ARCHAEOLOGICAL LHER ASSETS AND EVENTS WITHIN GSA LIMITS	SURVEY INTERPRETATION
Bcd110	Yes	MLJ88453	<p>The survey data records archaeological features in each of these three fields that largely corroborates, but also greatly expands, the current understanding of the archaeological potential of this part of the GSA. The survey has identified two adjacent foci of settlement activity in the form of interconnected enclosures, ditches and pits in the northern half of Bcd111 extending into Bcd110 (illus 86-88 and illus 98-100), which in part are recorded as cropmarks (MLJ84458), and by a Romano-British artefact scatter (MLJ60743 and ELJ7074) in the LHER. Immediately south of the settlement activity a small, previously unrecorded ring ditch, measuring approximately 11m in diameter, is identified at NGR 504774, 354247 (illus 89-91).</p> <p>Towards the southern boundary of Bcd111 (NGR 504562, 353902; illus 89-91) a series of conjoining rectangular enclosures aligned roughly north/south correlate to cropmarks interpreted as late medieval crofts (MLJ84457) recorded in the LHER. At the south-eastern corner of the field (NGR 504877, 353916; illus 101-103) two small adjoining enclosures with possible associated trackway are identified in the survey. These features are also recorded as cropmarks (MLJ84454). In both instances the magnetometer survey has not identified extensive remains beyond those already detailed within the LHER.</p> <p>Two well-defined ring ditches are recorded in Bcd120 (illus 89-91). The southernmost, and larger of the two features located at NGR 504084, 353866, measures approximately 24m in diameter and is recorded as a round barrow in the LHER (MLJ84453). The smaller of the ring ditches located towards the centre of the field at NGR 504222, 354098, measures approximately 16m in diameter. Roughly 12.5m north-east of this second barrow at NGR 504320, 354205, is a circular anomaly of possible archaeological origin measuring 22.5m in diameter (illus 86-88). The precise nature of this feature however remains unclear due to the enhanced and varied magnetic background across this field which is not located on the surrounding limestone geology but on a band of argillaceous rocks. A further partial ring ditch is recorded in the northern part of adjacent field Bcd110 at NGR 504428, 354609 (illus 86-88).</p> <p>Several ditch-like anomalies identified across these fields, which appear to extend from the settlement activity and/or that are determined less likely to be indicative of field drains or modern cultivation effects, are interpreted as possibly archaeological in origin.</p> <p>Outside of those features determined to have archaeological or possible archaeological causes are several linear and discrete anomalies characterised as of uncertain and natural/geological origin in addition to those due to modern and historic agricultural activity (cultivation trends, field drains and traces of ridge and furrow ploughing).</p> <p>Those anomalies of uncertain origin that are noteworthy include; a roughly circular cluster of magnetically enhanced anomalies in the north-west corner of Bcd110 close to Springwell Brook (NGR 504312, 354631; illus 86-88), that possibly identify localised extraction, as recorded by other similar anomalies and HER entries to the north-east and north-west (MLJ89159), pit-like anomalies immediately north of the round barrow (MLJ84453) that are difficult to differentiate from the magnetic background and a linear anomaly lying almost parallel to the modern cultivation effects along the western edge of fields Bcd110 and Bcd120.</p>
Bcd111		MLJ84458	
Bcd120		MLJ89519	
(illus 86-94 and 98-103)		MLJ84454	
		MLJ84457	
		MLJ89160	
		MLJ89201	
		MLJ60743	
		ELJ7074	

FIELD NO.	ARCHAEOLOGICAL ANOMALIES	ASSOCIATED ARCHAEOLOGICAL LHER ASSETS AND EVENTS WITHIN GSA LIMITS	SURVEY INTERPRETATION
Tb3	Yes	MLJ86228	<p>These fields cover a large area constituting the southern part of the GSA but have been grouped together because of the shared archaeological features that are identified within and across them. The results of the survey expand upon the existing archaeological knowledge of this part of the GSA which is already known to contain prehistoric archaeological assets (MLJ81846, MLJ81843 and MLJ81840) from features identified from cropmarks, earlier magnetometer surveys (ELJ8535, ELJ10911, ELJ2132; Oxford Archaeotechnics 1996 and 2008) and excavations (ELJ2127, ELJ9267, ELJ6674, ELJ6675; Lindsey Archaeological Services 1994 and 2004) undertaken prior to the most recent expansion of Brauncewell Quarry which borders the GSA (fields W1 and W2) to the south-west.</p> <p>The survey results confirm the presence of extensive curving boundary ditches (MLJ81837), extending from the Brauncewell Quarry to the north, arcing across W1 before heading east into field E1 entering Warren Pit Plantation immediately outside the GSA, and that are detailed within the LHER (Illus 65-70 and Illus 77-85). These ditches were excavated during archaeological investigations at Brauncewell Quarry though their dating remains uncertain, however were determined likely to have been in use during the Later if not Middle Iron Age (Lindsey Archaeological Services 2004).</p> <p>In addition to these ditch extents recorded in the LHER, the survey data identifies the ditches extending to the north-west along the southern boundary and northwards across Tb5 (Illus 65-67) and south in E1 (Illus 77-79). Further ditches seemingly not appended to, but with a similar magnetic response, and likely associated are recorded in Tb3, Tb4, Tb5 (Illus 53-58 and Illus 62-67), Bcd128 and Bcd138 (Illus 74-79). The data also shows that the continuous ditch response for these anomalies is sometimes interrupted or replaced by a pit alignment, the significance of which (if any) is unknown. It remains unclear whether there is a link, other than similar anomalous magnetic response, between the ditches/pit alignments identified extending from Brauncewell Quarry and the pit alignment (MLJ84452 and MLJ88357) extending south from Bcd084 over 3.8km away from the quarry. Also unclear is the relationship (if any) between the northern terminus of two of the ditches in Tb3 and Tb4 which coincides with the southern extent of the gridded pattern of linear trends tentatively interpreted as possibly identifying a relict field system.</p> <p>Also, in the vicinity of Brauncewell Quarry in W2, the survey has recorded an oval (NGR 503563, 352331) and square enclosure (NGR 503620, 352426) in addition to possible interconnecting ditches and discrete pit-like responses of possible archaeological origin (Illus 80-82). These anomalies/features are identified against a varied magnetic background derived from overlying Head (clay, silt, sand and gravel) and Sand and Gravel deposits. Of note are the several discrete pit-like responses recorded within the oval enclosure. These anomalies stand out clearly against a very localised homogenous magnetic background. This cluster of anomalies correlates with multiple asset locations recorded in the LHER identifying prehistoric cropmarks (MLJ83187), cropmarks of enclosures (MLJ60845), Bronze Age pottery (MLJ60845), Romano British pottery (MLJ60846) and medieval pottery (MLJ60847). Possible archaeological responses here are difficult to differentiate from sinuous natural background variations aligned east-west.</p> <p>In the southernmost fields Bcd138, Bcd139, W1, W2 and E1, curvilinear, parallel trend anomalies identifying ridge and furrow cultivation are evident and possibly linked to medieval activity (MLJ81840, MLJ60855 and MLJ60859) identified just outside the GSA on the western edge of Brauncewell village.</p> <p>Further examples of discrete, widely spaced, magnetically enhanced anomalies of uncertain origin, but that might identify former extraction pits, are recorded predominantly at the periphery of fields in this area adjacent to the A15. Other examples of possible extraction sites are recorded in W1 and E1 and quarrying activity more broadly in this area is attested to in the LHER in locations immediately outside the GSA (MLJ83180 and MLJ83181).</p> <p>A characteristic example of a lightning strike (LIRM - lightning-induced remanent magnetization) is evident in the data set towards the centre of an archaeological ditch at the southern end of field Bcd127 at NGR 503038, 353225 (Illus 65-67). Other prominent anomalies of natural/geological origin consist of a sinuous continuation of the Lower Lincolnshire Limestone Member limestone bedrock extending across the GSA (Bcd127, Tb3, Tb4 and Tb5) towards the south-west and east-west aligned variations identified in W1 and W2.</p> <p>Numerous linear agricultural trend anomalies in these fields are either caused by field drains and/or former field boundaries that are recorded on historic mapping.</p> <p>Areas of magnetic disturbance are recorded in various places at the field margins and surrounding the large electricity pylons that carry overhead wires across this part of the GSA.</p>
Tb4		MLJ81837	
Tb5		MLJ83186	
Bcd127		MLJ60845	
Bcd128		MLJ60845	
Bcd138		MLJ60846	
Bcd139		MLJ60847	
E1		MLJ81843	
W1		MLJ81840	
W2		MLJ81841	
(Illus 53-58, 62-70, 74-85 and 92-97)		MLJ81845	
		MLJ81846	
		MLJ81849	
		ELJ2127	
		ELJ9267	
		ELJ6674	
		ELJ6675	
	ELJ8535		
	ELJ10911		
	MLJ83181		
Bcd140	Yes	MLJ83188	<p>A complex arrangement of archaeological and non-archaeological magnetic anomalies is recorded spread across these two fields at the south-eastern limit of the GSA (NGR 504573, 353190). A clear sub-rectangular enclosure approximately 180m in diameter containing numerous ditch and pit like anomalies, indicating likely settlement activity, is clearly mapped at the southern boundary of the adjoining fields. Linear and curvilinear ditches extend from the main enclosure to the north and north-west. These anomalies directly coincide with the location of records of prehistoric cropmarks (MLJ83188) and Romano-British metal detecting finds (MLJ86164 and ELJ4828) and more broadly with a pattern of prehistoric activity in this area attested to by further records of prehistoric cropmarks (MLJ84455 and MLJ84456) in adjacent fields outside the GSA detailed in the LHER. Anomalies likely associated with the settlement activity and with high archaeological potential roughly span an area of 5ha across the two fields.</p> <p>Also present within these two fields and to a large degree superimposed on the archaeological features are a range of linear and curvilinear responses identifying ridge and furrow cultivation, modern agricultural ploughing trends, patterns of systematic field drains and natural/geological trends. It remains unclear whether the linear anomaly that extends across both fields, aligned south-west/north-east, through the archaeological enclosure (but which lies parallel to the ridge and furrow and also appears to delineate the extent of field drains in the south-east corner of Bcd141) is of archaeological, modern or even natural origin and hence an uncertain interpretation is given.</p>
Bcd141		MLJ86164	
(Illus 92-94 and 104-106)		ELJ4828	
		MLJ89202	

SECTOR 3
ILLUS 11-13 AND 107-157

FIELD NO.	ARCHAEOLOGICAL ANOMALIES	ASSOCIATED ARCHAEOLOGICAL LHER ASSETS AND EVENTS WITHIN GSA LIMITS	SURVEY INTERPRETATION
Bcd076	Yes	MLJ90993	<p>Most of the anomalies of archaeological potential identified in these fields are in the north-east corner of Bcd079 immediately south of RAF Digby (MLJ60621) where at least five ring ditches, two rectangular enclosures, one partial square enclosure and numerous ditch and pit-like anomalies are recorded east of the B1191 encompassing an area of approximately 7ha (Illus 122-127).</p> <p>Most of these anomalies are identified in the LHER including the three largest ring ditches identified as possible round barrows (MLJ90994, MLJ90995 and MLJ90998), a square enclosure bisected by the B1191 (MLJ90990) and two prominent ditches surrounding these features (MLJ90993 and MLJ90997). In addition to these features the survey results also identify a pit alignment oriented roughly north/south extending across fields Bcd076 (NGR 504396, 356507), Bcd078 and Bcd086 (NGR 504141, 355775) approximately 450m to the west of the concentration of features in Bcd079 (Illus 107-112). It remains unclear whether this pit alignment is associated with the other features within Bcd079, or indeed other pit alignments recorded elsewhere in the magnetometer data roughly 700m to the west or 1.5km to the north-east.</p> <p>These anomalies lie at the very edge of the Upper Lincolnshire Limestone Member bedrock geology which produces a more varied magnetic background than seen in fields immediately to the east that lay atop Blisworth formation limestone. As with other areas within the GSA on the same bedrock, for example in Tb2, the irregular background mottling effects likely derived from surface cracks in the limestone bedrock and/or possible periglacial processes has complicated the identification of individual anomalies. This raises the possibility that there may be other archaeological features that have not been identified in this area.</p> <p>In addition to the anomalies of clear archaeological potential the survey has recorded further traces of the north-west/south-east aligned possible field system that extends across most of the GSA in Sectors 1 and 2, different patterns of ridge and furrow, a former field boundary and the occasional isolated low magnitude ditch-like feature of uncertain origin.</p> <p>A further wide, sinuous spread of increased magnetic background variation recorded in Bcd076 likely identifies variations in the limestone bedrock geology similar to the variation recorded in other locations across the GSA. This also occurs close to the boundary where the limestone geology changes to Lincolnshire Limestone Formation limestone recorded across RAF Digby and north of this.</p> <p>A modern service aligned north-northeast/south-southwest towards the RAF airfield is also recorded in Bcd076. Modern cultivation effects parallel to the present boundaries are common across all these fields.</p>
Bcd078		MLJ90994	
Bcd079		MLJ90995	
Bcd086		MLJ90997	
Bcd088		MLJ90998	
Bcd097		MLJ90990	
(Illus 107-115 and 122-127)		MLJ60568	
		MLJ60621	
		MLJ89187	
		ELJ2971	

FIELD NO.	ARCHAEOLOGICAL ANOMALIES	ASSOCIATED ARCHAEOLOGICAL LHER ASSETS AND EVENTS WITHIN GSA LIMITS	SURVEY INTERPRETATION
Rw01	Yes	MLJ90990	<p>The fields in this contiguous block of land lying north of Ashby de la Launde and east of RAF Digby have been grouped together because of the shared archaeological features that are identified within and across them. The results of the survey here show this part of the CSA has a greater archaeological potential than previously recorded in the LHER though magnetic anomalies consistent with the records of prehistoric cropmarks (MLJ90987, MLJ90990, MLJ86753 and MLJ87411) in fields Bk02, Bk04, Bk07 (Illus 131-136) and pit alignment (MLJ87412) in Bk08 have been confirmed (Illus 140-145).</p> <p>Anomalies not previously recorded in the LHER include an almost contiguous spread of irregular shaped, rectilinear and square enclosures appended by ditches, trackways and pit-like anomalies running from the southern boundary of Rw10 immediately north of the hexagonal walled garden (MLJ883 18) of Ashby Hall northwards towards RAF Digby and then also detected to the north-east parallel to the south of the B1911 heading towards the village of Scopwick. This encompasses an area of roughly 50 hectares and does not include other nearby areas of archaeological potential recorded west of the B1191 (Illus 122-133, Illus 140-142 and Illus 161-163) and in Rw04 and Rw06 (Illus 134-139).</p> <p>Though the individual anomalies are too numerous to describe, anomalies of note from this area include several ring ditches, the most striking being two large ring ditches, probably round barrows, measuring approximately 32m (NGR S05561, 357333) and 25m (NGR S05453, 357179) in diameter located at the centre and southern parts of Bk03 respectively (Illus 131-133). Another smaller ring ditch is recorded in Bk03 (NGR S05540, 357239), three are recorded in Bk07 (NGR S05554, 357137, S05638, 357010 and S05664, 357017), two isolated examples are mapped in fields Rw01 (NGR S05341, 356469 and S05259, 356441; Illus 122-124) and Rw11 (NGR S05049, 355972 and S05243, 356002; Illus 125-127) with as many as five ring ditches in Rw12 (NGR NGR S05193, 356404, S05334, 356334, S05320, 356386, S05173, 356369 and S05138, 356618; Illus 122-124) and a further two ring ditches at the south-east corner of Rw10 (NGR S05410, 355643 and S05414, 355666; Illus 137-139).</p> <p>Other anomalies and/or features of particular interest include a pit alignment curving across fields Bk11 and Bk12 for approximately 400m (Illus 140-145 and Illus 155-157) and another along the northern boundaries of Bk03 and Bk07 (Illus 128-133), two partially complete concentric square (NGR S05096, 355739) and circular (NGR S05129, 355774) anomalies approximately 22m and 17m in diameter respectively in the western part of Rw10 (Illus 125-127), a rectilinear enclosure at the north-east boundary of Bk12 (Illus 140-142 and 152-154), possible sites of localised extraction within Rw01, Bk07, Bk12 and Bk15 and possible locations of burning identified by a strongly enhanced magnetic signature within the densest concentrations of ditches and enclosures within Bk02, Bk06 and Bk07 (Illus 131-136).</p> <p>No magnetic anomalies consistent with the conjectured route of a Roman road (MLJ60813) crossing fields Bk02, Rw01, Rw07 and Rw08 are visible in the survey data. However, the distribution of surrounding archaeological findings ranging from settlement and funerary activity, enclosures, ditches and trackways perhaps indicates such a route existed nearby.</p> <p>A host of other magnetic anomalies of uncertain and/or non-archaeological origin are mapped in these fields ranging from linear features of uncertain origin adjacent to the B1191 south of RAF Digby and the south-eastern corner of Rw12, service pipes in fields Rw10, Rw11, Rw12 and Bk08 and former ponds in Rw10 and Rw12.</p> <p>Ridge and furrow agricultural trends are evident in most fields, as are modern ploughing trends, with an increasing presence of field drains further to the east as the overlying soil type changes.</p>
Rw10		MLJ90987	
Rw11		MLJ87411	
Rw12		MLJ87412	
Bk03		MLJ87413	
Bk07		MLJ86753	
Bk08		MLJ60813	
Bk09			
Bk11			
Bk12			
Bk15			
(Illus 119-145 and 152-157)			

B1	Yes	MLJ90981	<p>The area covered by this group of fields comprises a curving corridor between 130m and 150m in width that lies adjacent to the B1191 to the north which links RAF Digby to the village of Scopwick. From the LHER data it is evident that this area contains further prehistoric archaeological activity likely associated with that identified around RAF Digby with heritage assets of a possible prehistoric settlement (MLJ87414), possible round barrow (MLJ90982) and cropmark of an undated linear feature (MLJ90983) recorded within the GSA limits and cropmarks of a possible pit alignment (MLJ90984), later prehistoric enclosure MLJ909845) and possible round barrow cemetery (MLJ87416) laying immediately outside the GSA.</p> <p>The survey results from these fields have confirmed the presence of several of the archaeological features recorded in the LHER, added detail to existing records and identified several more previously unrecorded features, thus raising the archaeological potential of this area. The character of the archaeological findings from these fields are slightly different however to those that are south of the B1191, with no further evidence of settlement activity as seen in fields Bk07 and Bk02.</p> <p>Findings from these fields consist of four pit alignments located at the boundary of Bcd067 and Bcd068 (Illus 128-33), across Bcd148 forming a right-angle at the boundary with field B1 (Illus 140-142 and Illus 161-163) and across Bcd065 and Bcd066 (Illus 128-130), the latter being recorded as a cropmark of an undated linear feature (MLJ90983) in the LHER, an oval enclosure approximately 27m by 20m at the western end of Bcd068 (NGR 505641, 357595; Illus 128-130) and three, possibly four, ring ditches in the western half of Bcd148 (Illus 140-142). Of the ring ditches recorded in Bcd148, the two largest, which measure 36m and 20m in diameter respectively (NGR 506038, 358098 and 506374, 358123), are possibly associated with the possible round barrow cemetery (MLJ87416, MLJ90982 and MLJ86755) identified in the LHER in the adjoining field approximately 100m to the north.</p> <p>Anomalies of possible archaeological potential are identified in Bcd066 where three possible ring ditches are recorded and in Bcd068 where a right-angled ditch-like anomaly and possible area of burning are recorded (Illus 128-130).</p> <p>Outside of these anomalies of clear or possible archaeological potential the survey has recorded a large area of discrete, magnetically enhanced anomalies covering B1. The anomalies likely attest to ground disturbance caused by quarrying activity (MLJ87402) immediately to the north but also may record anomalies of archaeological potential that remain difficult to differentiate from the varied magnetic background (Illus 140-142 and Illus 161-163).</p> <p>Ridge and furrow and modern cultivation patterns are common across these fields as are natural/geological variations in Bcd066 and Bcd148.</p> <p>Three buried services are identified by very high magnitude linear anomalies crossing Bcd066 (Illus 128-130) and a further two are recorded in Bcd148 (Illus 140-142 and Illus 161-163).</p>
Bcd065		MLJ90982	
Bcd066		MLJ90983	
Bcd067		MLJ90984	
Bcd068		MLJ90985	
Bcd148		MLJ87414	
(Illus 119-121, 128-133, 140-142 and 161-163)		MLJ87416	
		MLJ87417	
		MLJ86755	
		MLJ87402	

FIELD NO.	ARCHAEOLOGICAL ANOMALIES	ASSOCIATED ARCHAEOLOGICAL LHER ASSETS AND EVENTS WITHIN GSA LIMITS	SURVEY INTERPRETATION
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Rw04	Yes	MLJ87032	<p>The survey has identified anomalies of archaeological potential in these two fields located east and south-east of Rowston Top Farm (Illus 137-139). Two partial rectangular enclosures measuring approximately 30m by 45m and joined by a curving ditch to the south are identified in the southern half of Rw04 (NGR 505958, 356019) in the location of LHER assets of a probable prehistoric cropmark enclosure (MLJ87032) and undated mound (MLJ89494).</p> <p>A vague cluster of linear ditch and pit-like anomalies surrounding two discrete, strongly enhanced anomalies indicative of burning are recorded towards the centre of Rw06 (NGR 506061, 355658; Illus 137-139). No LHER assets are recorded in this field. However, the conjectured route of a Roman road associated with Mareham Lane (MLJ60813) is projected immediately to the west of the field, as is the parish boundary (MLJ89155) and the site of a possible Roman villa (MLJ60353) lies roughly 300m outside the GSA to the south-west. It remains unclear whether features identified in these fields are linked or associated with settlement activity identified in the survey approximately 600m to the west in Rw10.</p>
Rw06		MLJ89494	
(Illus 137-139 and 149-151)		MLJ60813	
		MLJ60353 MLJ89155	

Rw05	No?	MLJ60813	<p>Though these fields adjoin others containing archaeological features identified in the survey data and the projected line of a Roman road (MLJ60813) crosses the centre of Rw07 and Rw08, no anomalies of clear archaeological potential are identified in these three fields. Findings are limited to three ditch-like anomalies of possible archaeological origin recorded at the eastern boundary of Rw05 (Illus 149-151) and across Rw08 (Illus 137-139).</p> <p>One LHER asset is recorded in this area, a former extraction pit (MLJ89163) in the northern half of Rw05, subsequently identified as a pond on historic mapping. The survey has recorded a small area of localised magnetic disturbance in this location.</p>
Rw07		MLJ89163	
Rw08			
(Illus 137-139 and 149-151)			

Bk05	Yes (limited)	—	<p>Despite the proximity of these three large fields, located between RAF Digby and the B1188, to varied and dense archaeological activity mapped in adjoining fields, the only anomaly of clear archaeological potential identified across the north-east corner of Bk05 (illus 143-145) is a short section of the pit alignment recorded in the LHER (MLJ87412). Although the individual responses are very faint the pit alignment may extend into the north-west corner of Bk10. There is no evidence in the data that the pit alignment continues west of the service pipe that crosses Bk05 and Bk08; the response from the pipe completely swamps the response from the individual pits in the vicinity of the pipe.</p> <p>The remainder of the survey findings from these fields are limited to a small rectangular enclosure of possible archaeological origin at the eastern end of Bk10 (illus 155-157), uncertain linear anomalies possibly forming a rectangular enclosure approximately 95m in diameter at the southern boundary of Rwo2, a small circular anomaly of uncertain origin approximately 10.5m in diameter at the eastern edge of Rwo2 (illus 134-136) and two short parallel linear anomalies located towards the centre of Bk05 (illus 143-145).</p> <p>Patterns of ridge and furrow are recorded in each field in addition to a former boundary in Rwo2 and Bk05. Linear trends derived from modern cultivation are evident in all three fields which also contain at least one pattern of field drains. The increasing presence of fields drains heading eastwards reflects the change in underlying geology and soils away from the shallower soils, overlying Upper Lincolnshire Limestone Member limestone which provided greater magnetic contrast and therefore visibility to anomalies west of the B1191.</p>
Bk10			
Rwo2			
(illus 131-136, 143-145 and 155-157)			

SECTOR 4 ILLUS 5-7 AND 158-208

FIELD NO.	ARCHAEOLOGICAL ANOMALIES	ASSOCIATED ARCHAEOLOGICAL LHER ASSETS AND EVENTS WITHIN GSA LIMITS	SURVEY INTERPRETATION
C7	Yes	MLJ90986	<p>A long ditch feature with appended rectilinear enclosures is recorded extending for at least 800m north from the southern boundary of Md05 at Scopwick village through these three fields before linking to a small cluster of adjoining enclosures at the south-west corner of C7 close to the B1188 (NGR 506469, 359141; illus 158-163). Though the main ditch feature linking these enclosures is recorded as an undated cropmark in the HER (MLJ90986), the identification of several adjoining enclosures along the length of the ditch is additional detail provided by the magnetometer survey. In the location of at least three of the enclosures, one in each field, large, discrete anomalies with low levels of magnetic enhancement are recorded. These anomalies possibly locate large pit-type features rather than areas of burning. Also located adjacent to this extended ditch feature in C7 and Md03 are small, amorphous areas of enhanced magnetic response possibly indicative of localised extraction. The linear spread of these anomalies covers an area of approximately 7.5ha just east of the B1188.</p> <p>Patterns of ridge and furrow cultivation and modern ploughing on differing orientations are evident in all three fields.</p> <p>A buried service runs along the southern boundary of Md03 and Md04 and likely links to another service which runs along the edge of the B1188 (illus 161-163 and 173-175).</p>
Md04		MLJ87383	
Md05		ELJ5920	
(illus 158-163 and 173-175)			
Md01	Yes? (limited)	MLJ90986	<p>There is limited evidence of anomalies with archaeological potential within these three fields. The survey findings are restricted to a right-angled ditch like anomaly located west of centre in Md02 (illus 173-175) and a small, amorphous patch of magnetic enhancement at NGR 506823, 358672, possibly due to localised extraction associated with enclosures off linear feature (MLJ90986) in adjacent field Md04. The identification of clear archaeological features in adjoining fields to the north and south suggests that although the magnetic background is more homogenous across these parts of the GSA, overall, the geological and pedological conditions are suitable for the detection of archaeological features. Therefore, the absence of anomalies in this location likely reflects a genuine absence of archaeological features.</p> <p>The remaining anomalies recorded across these fields are caused by field drains, agricultural activity (although ridge and furrow is only recorded in Md03) and a buried service identified in Md04 and Md03 running along the southern boundary of Md01 and Md02 (illus 173-175 and 185-187).</p>
Md02			
Md03			
(illus 158-163, 170-175 and 185-187)			

C6 C8 C9 By22 LF05 (Illus 167-172 and 179-187)	Yes	MLJ87423 MLJ20843 MLJ125417 ELB473	<p>Three concentrations of archaeological activity are identified in these three (C6, C8 and C9) adjoining fields east of the B1188 and south of Hall Farm.</p> <p>A sub-square enclosure, approximately 68m by 72m, centred at NGR 507326, 359070 in C8, is partitioned by internal ditches (Illus 170-172). Several discrete anomalies are also clearly recorded within this enclosure. A ditch extending from the south-western corner of this enclosure appears to link to a larger open sided rectangular enclosure measuring 145m by 90m which spans both fields C8 and C9. This enclosure corresponds with cropmarks interpreted as a probable prehistoric enclosure (MLJ87423).</p> <p>Two further clusters of archaeological activity not previously recorded in the LHER are also recorded. Firstly, in C6, a double-ditched curving sub-rectangular enclosure again with internal linear subdivisions and discrete pit-like responses indicative of small-scale settlement activity, is identified on the eastern boundary of the field at NGR 507136, 359431 (Illus 167-172). Secondly, a large rectangular enclosure measuring approximately 85m by 210m containing a possible ring ditch and further subdivision is located at the shared boundaries of C8, C9, Md01, BY22 and LF05 at NGR 507570, 358962 (Illus 170-172).</p> <p>Three separate but adjacent clusters of discrete magnetically enhanced anomalies of uncertain origin are recorded south of centre in field By22 (Illus 170-172 and Illus 182-184). These anomalies lie close to the recorded spot of a World War 2 Hurricane plane crash site (MLJ125417 and ELB473) and could potentially record the cleaned-up location of the crash site. The anomalies are largely devoid of ferrous responses one might expect from a crash site unless any aircraft debris was removed, and any impact craters infilled. However, it is perhaps equally plausible that the anomalies have a more prosaic explanation, perhaps identifying accumulations of material/debris associated with efforts to drain the field.</p> <p>Field drains are present to varying extents in each of the fields as are modern agricultural trends. Former field boundaries are recorded in By22 and LF05 where two ponds are also identified as concentrations of magnetic disturbance within the former boundary itself. The service pipe previously identified along the southern boundaries of Md01-Md04 also continues along the southern boundary of LF05 (Illus 185-187).</p> <p>Localised variations in the magnetic background are identified in the north-west corner of By22 possibly as a result of the presence of encroaching clay and silt tidal flat deposits recorded to the north and in C8, C9 and north-west corner of LF05 where the anomaly response is indicative of surface cracks in the limestone bedrock or periglacial effects.</p>
LF07 LF13 (Illus 182-187)	No	None	<p>Although these two fields lie adjacent to others where the survey has identified anomalies/features of archaeological potential, no anomalies/features of interest have been recorded in either of these fields. The survey findings are limited to extensive patterns of field drains, a continuation of the buried service in LF07 (also recorded in LF05 and Md01-Md04) and traces of a former pond from localised magnetic disturbance at the western boundary of LF13.</p>

FIELD NO.	ARCHAEOLOGICAL ANOMALIES	ASSOCIATED ARCHAEOLOGICAL LHER ASSETS AND EVENTS WITHIN GSA LIMITS	SURVEY INTERPRETATION
Lf08	Yes	MLJ86860	Anomalies of clear archaeological potential have been recorded in these three fields located towards the southern boundary of Sector 4 north of Main Street which runs between the villages of Scopwick and Kirkby Green. There is some correlation between the survey data and records held in the LHER which attests to prehistoric activity in Lf08 in the form of possible prehistoric (MLJ87443) and undated cropmarks (MLJ87444) and the findspot of a Palaeolithic hand axe (MLJ60508). Here the survey data records a clear, isolated, concentric ring ditch, measuring approximately 25m in diameter, at NGR S08306, 358559 in the location of possible prehistoric (MLJ87443) and undated cropmarks (MLJ87444; Illus 185-187). However no further anomalies of archaeological potential are identifiable. The remaining anomalies in Lf08 comprise a small cluster of discrete, low magnitude anomalies of uncertain origin and anomalies due to agricultural activity such as ridge and furrow and modern cultivation and field drainage. Three further areas of archaeological potential are recorded across Lf12 and Lf16 in locations where no prior information was held in the LHER (Illus 173-175 and Illus 185-187). A small square enclosure, likely part of a bigger enclosure is recorded at the north-west corner of Lf12 (NGR S07597, 358489) immediately north of a larger enclosure in the south-west corner of the field centred at NGR S07619, 358364. The square enclosure in the north-west corner of the field is not detected in the adjacent field to the north M001. A linear spread of magnetically enhanced responses within the larger enclosure in the south-western corner of the field could indicate another ditch-like feature but remains unclear positioned so close to the field boundary. Collectively it is also unclear whether these features are associated with medieval earthworks (MLJ87419) recorded immediately to the west outside the GSA. Approximately 200m east of these enclosures, but still within Lf12 (NGR S07856, 358489), are faint traces of a square enclosure approximately 50m in diameter (Illus 185-187). No clear internal features are visible and any possible association with either the enclosures to the west or a series of other faint ditch-like anomalies forming possible enclosures to the south in Lf16 remains uncertain. The remaining anomalies in these fields are predominantly agricultural in nature recording systematic patterns of field drains and ploughing trends.
Lf12		MLJ87443	
Lf16		MLJ87444	
(Illus 173-175, 182-187 and 194-199)		MLJ60508	
		MLJ87455	
		MLJ87419	
		MLJ87446	
		MLJ87419	
		ELI5478	
		ELI5363	
	ELI5401		
By11	Yes	MLJ82639	Anomalies of clear archaeological potential have been recorded in three out of four of these fields located towards the centre of Sector 4 west of Bridyard Farm and north of Low Field Farm. LHER references to Roman material (MLJ82639), casual findspots (ELI7864) and undated cropmarks (MLJ87449) across these fields are clearly indicative of some archaeological potential. Likely settlement activity in the form of a series of adjoining enclosures, ditches and trackways covering an area of approximately 3.5ha, is recorded extending southwards from the centre of By12 (Illus 176-181 and Illus 188-193). It is probable that this activity extends into field By18 immediately to the south, however, this field is not included within the GSA. The location of this archaeological activity centred at NGR S08421, 360164, correlates with recorded position of LHER assets relating to the collection of Roman material (MLJ82639) and events recording fieldwalking (ELI2860). It remains likely these features are associated with a second, more faint set of rectilinear enclosures and ditches located roughly 150m to the west in the north-west corner of the field at NGR S08194, 360202 not previously identified in the LHER. Two parallel curvilinear anomalies, interpreted as ditches possibly defining a trackway extending from the likely settlement site identified in By12, are recorded crossing the centre of By11 at NGR S08008, 360166 in the location of a casual find (ELI7864) recorded on the LHER (Illus 179-181). Further south, towards the southern boundary of By24 (Illus 194-196), the survey has recorded a square enclosure, approximately 42m in diameter, with a possible entrance on its eastern side in the location of an undated cropmark boundary ditch (MLJ87449) recorded on the LHER at NGR S08433, 359346. No obvious internal features are evident in the magnetic data but a series of weakly enhanced ditch-like anomalies, possible ring ditch and short section of pit alignment are tentatively interpreted immediately to the north-west. Two widely spaced but parallel linear ditch-like anomalies aligned north/south in the eastern half of Lf02 are interpreted as of uncertain origin due to an absence of any archaeological potential nearby (Illus 194-196). These anomalies could record an extension to cropmarks recorded in the LHER (MLJ87445) and/or relate to a potential prehistoric cropmark enclosure (MLJ87448) just to the east but are located over 160m from the square enclosure identified in the south of By24. The location of former ponds detailed on historic mapping identified in By12, By24 and Lf02, a service crossing Lf02 and traces of ridge and furrow in Lf02, By11 and By12 constitute the remaining anomalies of interest from these fields. Extensive patterns of field drains are also evident in each field.
By12		MLJ87445	
By24		MLJ87448	
Lf02		MLJ87449	
(Illus 176-184, and 188-196)		ELI7864	
		ELI2860	
		ELI2826	
		ELI2825	

FIELD NO.	ARCHAEOLOGICAL ANOMALIES	ASSOCIATED ARCHAEOLOGICAL HER ASSETS AND EVENTS WITHIN GSA LIMITS	SURVEY INTERPRETATION
By13 By20 By28 LF03 LF04 LF10 LF11 (Illus 188-208)	No	MLJ82678 MLJ87448 MLJ87449 ELJ2838	<p>No anomalies of clear or possible archaeological potential are identified in any of these fields which lie along the eastern edge of the GSA.</p> <p>One anomaly of uncertain origin is recorded spanning fields By20 and By28 at the eastern edge of the GSA (NGR 508985, 359923), an angular, weakly enhanced and poorly defined linear trend (Illus 191-193). The anomaly response is not indicative of a field drain but is not so vague or indistinct as to suggest a natural/geological feature. The anomaly could have an anthropogenic cause and the lack of visibility possibly explained by changes in both the underlying geology and overlying soils in this location. The underlying geology changes from limestone recorded to the west, which is more receptive to magnetometer survey, to sandstone, siltstone and mudstone of the Kellaways Formation. In conjunction with changes to the parent geology the overlying soils also change from more freely draining loamy soils in the west, to loamy soils with naturally high groundwater. The combined effect of these changes has created a more homogenous magnetic background with little contrast and reduced visibility.</p> <p>The change in geology and overlying soils also explains the concentration of field drains evident in all these fields. The only other findings of note from these fields are two buried services immediately south of Brickyard Farm (MLJ82678), across the southern parts of LF10 and LF11 (Illus 197-199 and Illus 206-208) and the south-western corner of LF03 (Illus 194-196).</p> <p>LF03 was largely surveyed before design alterations lead to it being dropped from the GSA. No anomalies of archaeological potential were identified within the part of the field that was initially started although the HER does record potential prehistoric cropmarks (MLJ87449) and Roman material (MLJ82639) in adjoining fields to the south and north respectively.</p>
By02 By03 (Illus 164-169 and 176-178)	No?	MLJ82732 MLJ82733 MLJ82734 MLJ82735 MLJ82736 MLJ60764	<p>LHER references to cropmark field boundaries (MLJ82375) within the eastern part of By02 and to prehistoric and undated cropmarks of enclosures and field boundaries (MLJ82732, MLJ82733, MLJ82734 and MLJ82736) and a Romano-British artefact scatter (MLJ60764) immediately outside the GSA to the north and east attest to archaeological activity in the vicinity of By02 and By03 located at the very northern end of the GSA adjacent to Blankney Moor Lane.</p> <p>No anomalies of clear archaeological potential however are recorded in these two fields, but a linear ditch anomaly and possible partial enclosure are identified towards the centre of By03 just north of a buried service (Illus 164-166 and Illus 176-178).</p> <p>The interpretation of anomalies in By02 is complicated in part by a more variable magnetic background derived from clay and silt tidal flat deposits encroaching from the north (Illus 176-178). Amongst this more variable magnetic background, towards the centre of the field, is a cluster of discrete strongly enhanced magnetic anomalies of uncertain origin but that have a magnetic signature indicative of an anthropogenic cause. One linear ditch-like anomaly, not obviously a drain or cultivation effect, is also identified in addition to very faint curving trend anomalies recorded towards the southern boundary of the field, the causes of which remain uncertain.</p> <p>Ridge and furrow cultivation and a pattern of field drains are also recorded in By03. Two former boundaries and a former pond in By02 are recorded as faint linear anomalies and area of magnetic disturbance respectively.</p>
By04 By05 By10 By16 By23 CS (Illus 167-169 and 176-184)	No	MLJ82735 MLJ82734	<p>No anomalies of clear or possible archaeological potential are recorded in any of these fields located towards the centre of the block of land constituting Sector 4.</p> <p>One isolated linear ditch-like anomaly of uncertain origin is recorded at the eastern boundary of By05 in the location of prehistoric cropmarks recorded within (MLJ82735) and immediately outside (MLJ82734) the GSA boundary (Illus 188-190). No heritage assets are identified in any of the other fields. All the anomalies recorded within these fields are predominantly prescribed an agricultural (ploughing trends, field drains, former boundaries) and/or natural interpretation.</p>

5 DISCUSSION AND CONCLUSION

The survey has successfully evaluated all the suitable areas contained within the Geophysical Survey Area (GSA) and has recorded a wide variety of archaeological and non-archaeological features. The level of detail and range of anomalies recorded across the survey is argued to provide a high level of confidence in the findings and that they accurately reflect the archaeological potential of the GSA having likely recorded the extent of any significant archaeological remains, notwithstanding the limitations of magnetometer survey to define particularly small, very weakly enhanced or anomalies masked by areas of disturbance and/or stronger magnetic anomalies.

The results from a contiguous survey of this size have contributed a wealth of information to the understanding of not only individual foci of archaeological activity within the GSA but the archaeological potential of the area and wider landscape. The results of the survey largely corroborate but also greatly expand the current understanding of the archaeological potential of the GSA as contained within the Lincolnshire HER and detailed in the archaeological desk-based assessment for the project (Headland Archaeology 2023a).

The most significant concentrations of archaeological activity, containing examples of ring ditches and likely round barrows, pit alignments and extended series and/or concentrations of ditches, enclosures and pit-like anomalies are identified at the southern extent of the GSA near Braucewell Quarry, to the north and south of Hall Farm (Bloxholm), surrounding RAF Digby to the south, east and north-east, north of Ashby de la Launde and Scopwick and west of Brickyard Farm, were broadly recorded in areas identified in the LHER as having at least some archaeological potential, which can now be confirmed as very high.

Where the survey has proved invaluable is being able to accurately map the layout and extent of these extended areas of archaeological activity at a truly landscape level, features such as the multiple pit alignments spread across western and central areas of the GSA. One drawback however of the geology being so receptive to magnetometer survey has been in select locations where the superimposition of various types of anomalies of natural and/or anthropogenic origin has restricted a more confident interpretation of the nature, extent and any interrelationship (if present) between features recorded. Although the survey has detailed landscape scale archaeological features, further discussion of their archaeological significance beyond their spatial distribution as recorded by the survey however lies beyond the scope of this survey report.

Where the survey has identified more significant levels of archaeological activity not previously recorded in the LHER includes the land between Ashby de la Launde and RAF Digby, north-east of RAF Digby and south of Blankney.

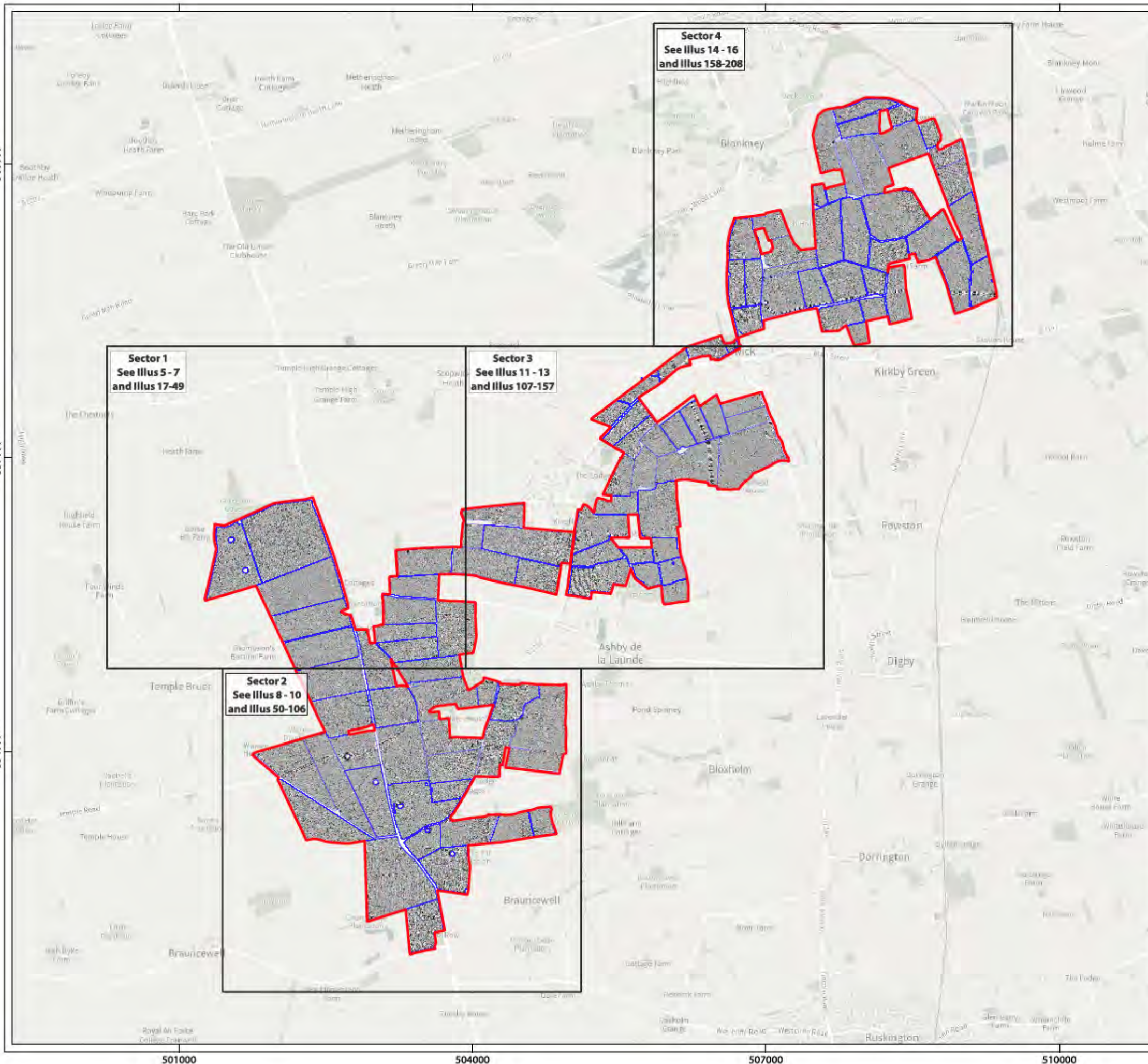
Perhaps the most enigmatic feature recorded by the survey is the extensive gridded pattern of weakly magnetically enhanced linear trend anomalies, aligned north-west/south-east that are identified in almost every field west of the B1191 constituting the western third of the GSA. An anthropogenic cause for these ditch-like anomalies, such as a relict field system, is considered most likely given the homogeneity and regularity of the responses over such a large area. If this large feature was to identify some form of systematic, pre-modern land management it would certainly be of archaeological interest but perhaps of low intrinsic value. Their relationship (if any) with the other landscape scale features recorded by the survey remains uncertain. However, it is noteworthy these anomalies are not detected in the location of broad, sinuous geological variations crossing the western part of the GSA. It is unclear whether the failure to detect these regular, weak trend anomalies outside of areas underlain by Upper Lincolnshire Limestone Member bedrock geology is a genuine characterisation of their extent or a reflection of changing magnetic properties of the underlying bedrock geologies leading to a lack of visibility.

Other broad trends discernible from the results includes the propensity of archaeological activity to be predominantly sited on the higher ground underlain by the limestone geology of the Blisworth Limestone Formation and eastern fringes of the limestone of the Upper Lincolnshire Limestone Member towards the west and centre of the GSA. The identification of some anomalies of archaeological potential away from these areas suggests a preference for these conditions and is not necessarily a bias due to a lack of magnetic contrast on the other geologies.

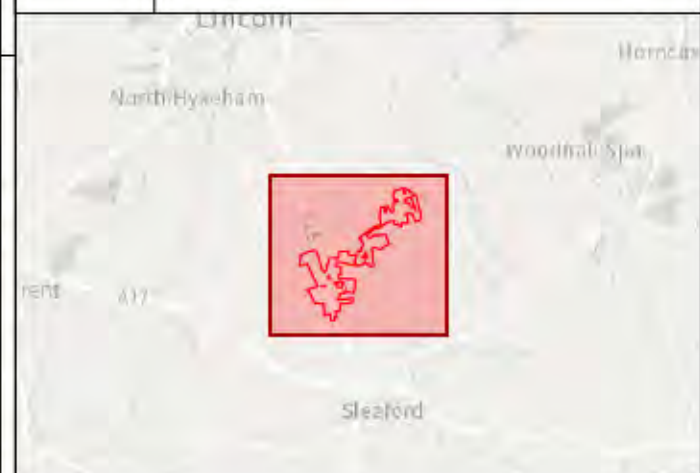
It is evident from the survey results and information contained within the LHER that there were significant levels of prehistoric activity within different areas of the GSA from at least the Bronze Age, likely continuing through into the Iron Age before the two Roman roads that bisect the site were constructed. The vast majority of the archaeological anomalies identified by the survey appear prehistoric in character and generally fit the narrative of later medieval settlement being more focused towards the modern-day villages of Ashby de Launde, Braucewell, Scopwick, Thorpe Tilney and Temple Bruer located outside the GSA. It is important to highlight the anomalies at the southern end of GSA lie within an archaeological prehistoric landscape with excavations at Braucewell Quarry some of the largest and most concentrated investigations of prehistoric multiple boundaries in Lincolnshire and the East Midlands as a whole. The results of the survey which have accurately mapped the extent and layout of these enigmatic landscape features across large areas will further contribute to the understanding of these features and the archaeological record of the region.

6 REFERENCES

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- Oxford Archaeotechnics (2008) *Braucewell Limestone Quarry, Lincolnshire Topsoil Magnetic Susceptibility and Gradiometer Survey*

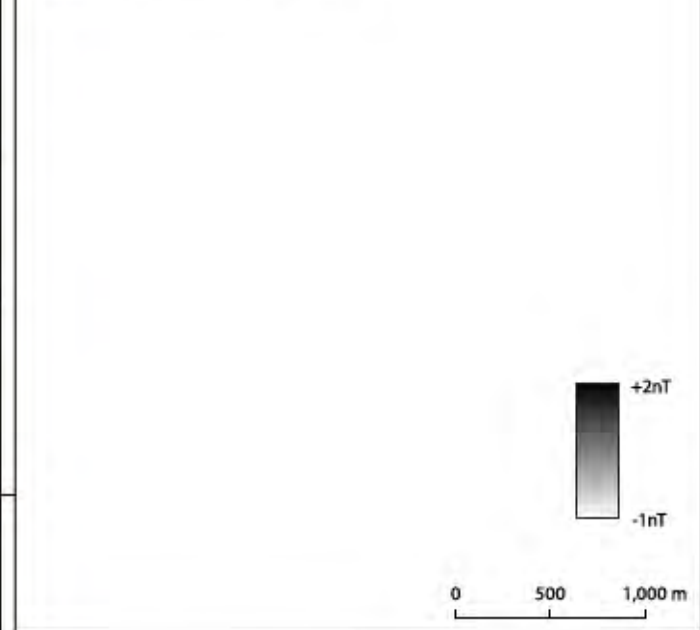



HEADLAND
ARCHAEOLOGY
 part of the **RSK** Group



Key

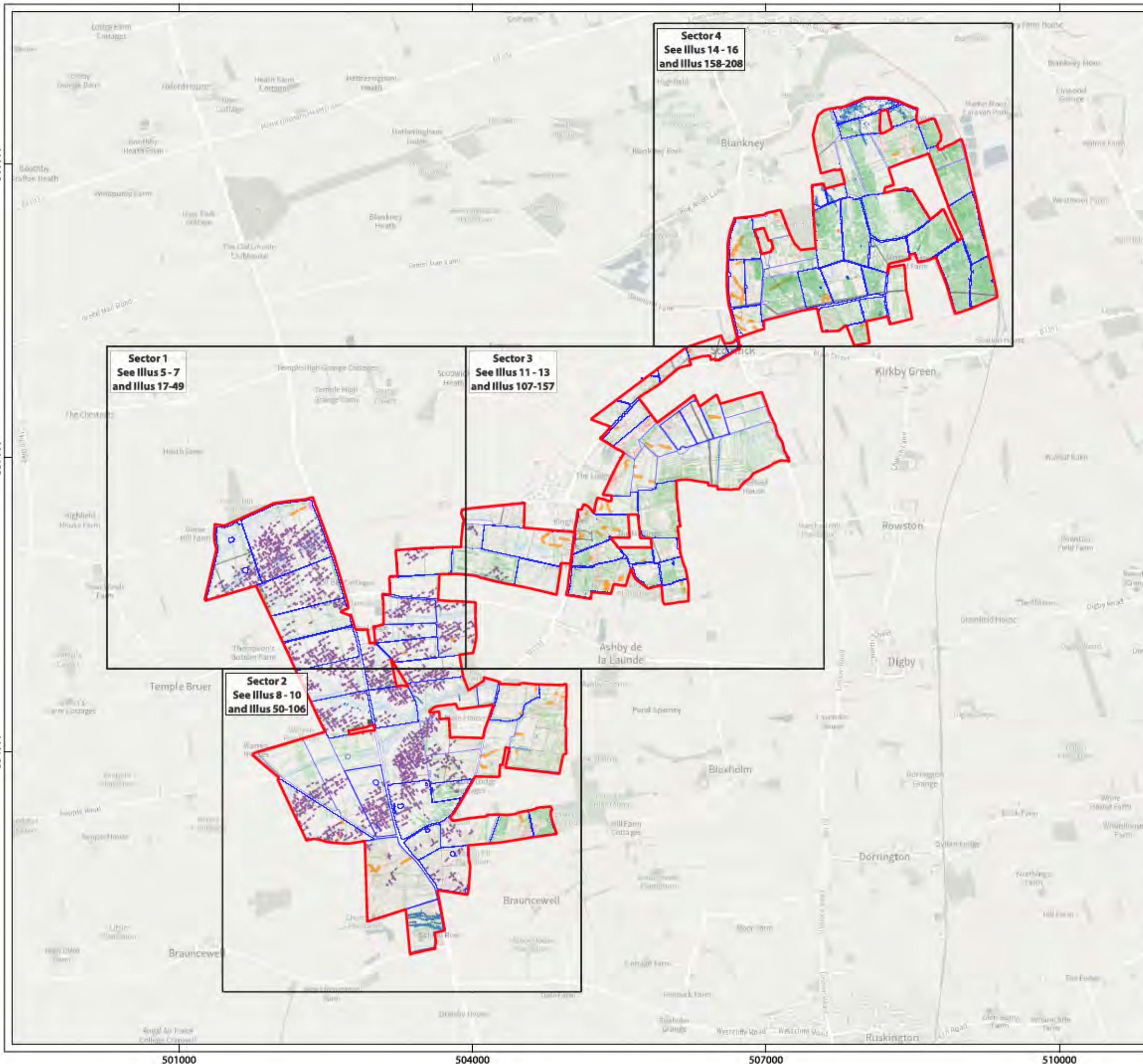
- Geophysical Survey Area
- Survey Extent
- Areas for illus 5 - 16 - Scale 12500



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Scale:	1:40,000 @ A3

illus 02 - Overall greyscale plot of processed magnetometer data



Key

Geophysical Survey Area	Archaeology
Survey Extent	Magnetic Disturbance
Areas for Illus 5 - 16 - Scale 12500	Possible Archaeology

Interpretation

Agriculture	Quarry
Field Boundary	Uncertain
Possible Field Boundary	Former Building
Field Drain	Former Pond
Natural	Geology
Pipe	Burning
Uncertain	Null Value
Ridge and Furrow	
LIRM	
Field System	
Possible Archaeology	
Quarry	

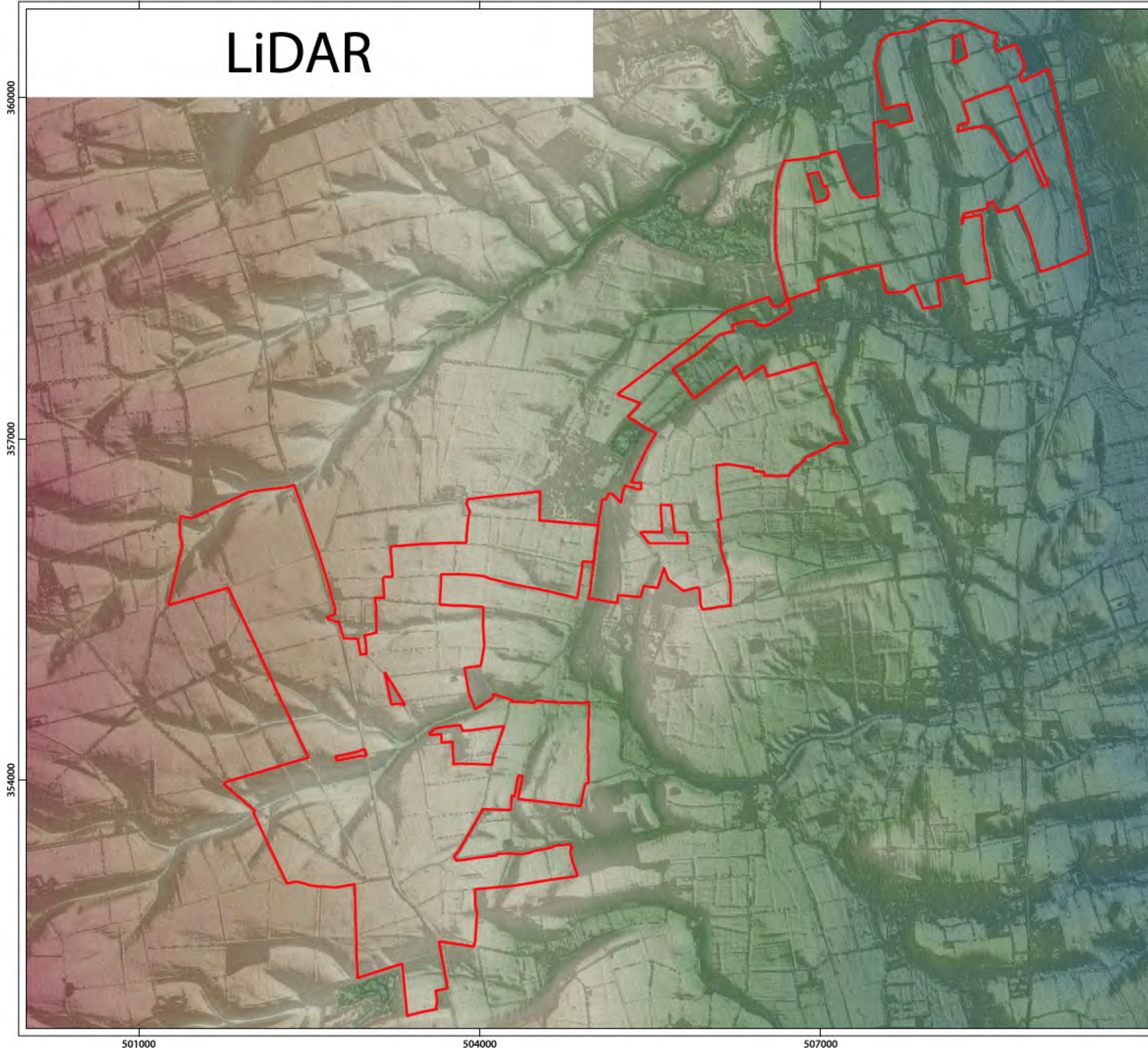
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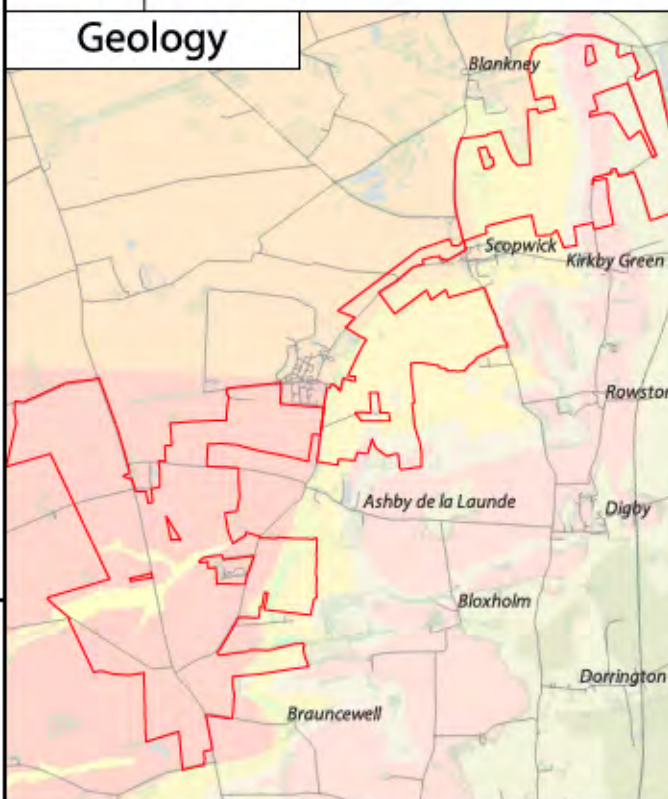
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Illus 03 - Overall interpretation of processed magnetometer data

LiDAR



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Key

Geophysical Survey Area

Key for BGS Geology Map

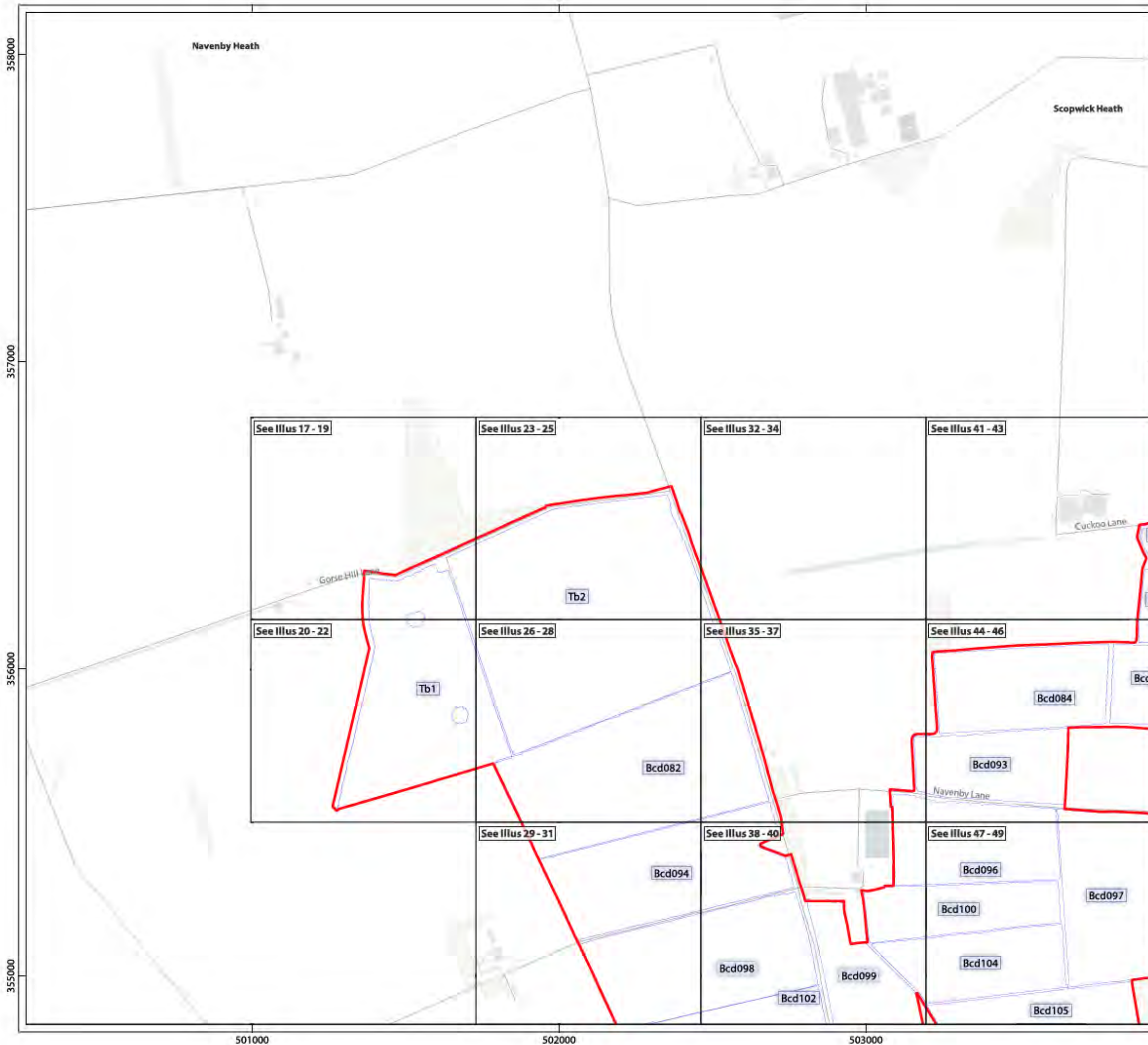
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- Lincolnshire Limestone Formation - Limestone
- Blisworth Limestone Formation - Limestone
- Rutland Formation - Limestone
- Blisworth Clay Formation - Mudstone
- Cornbrash Formation - Limestone
- Peterborough Member - Mudstone
- Kellaways Sand Member - Sandstone and siltstone, interbedded
- Kellaways Clay Member - Mudstone

0 500 1,000 m

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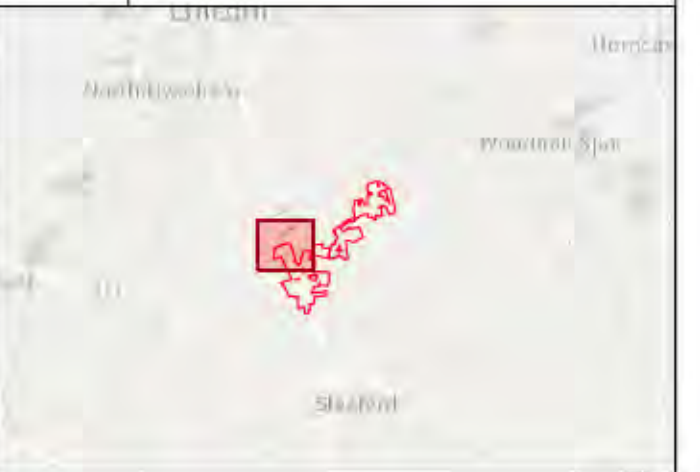
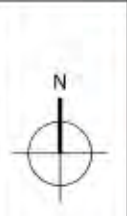
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Illus 04 - Site location superimposed on LiDAR and bedrock geology data

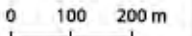


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355000

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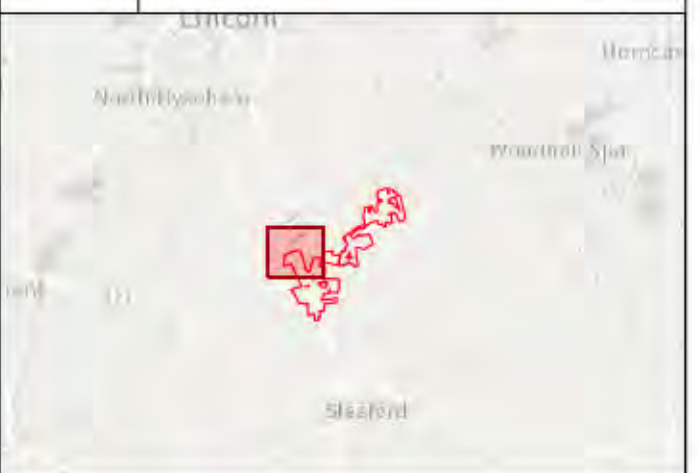
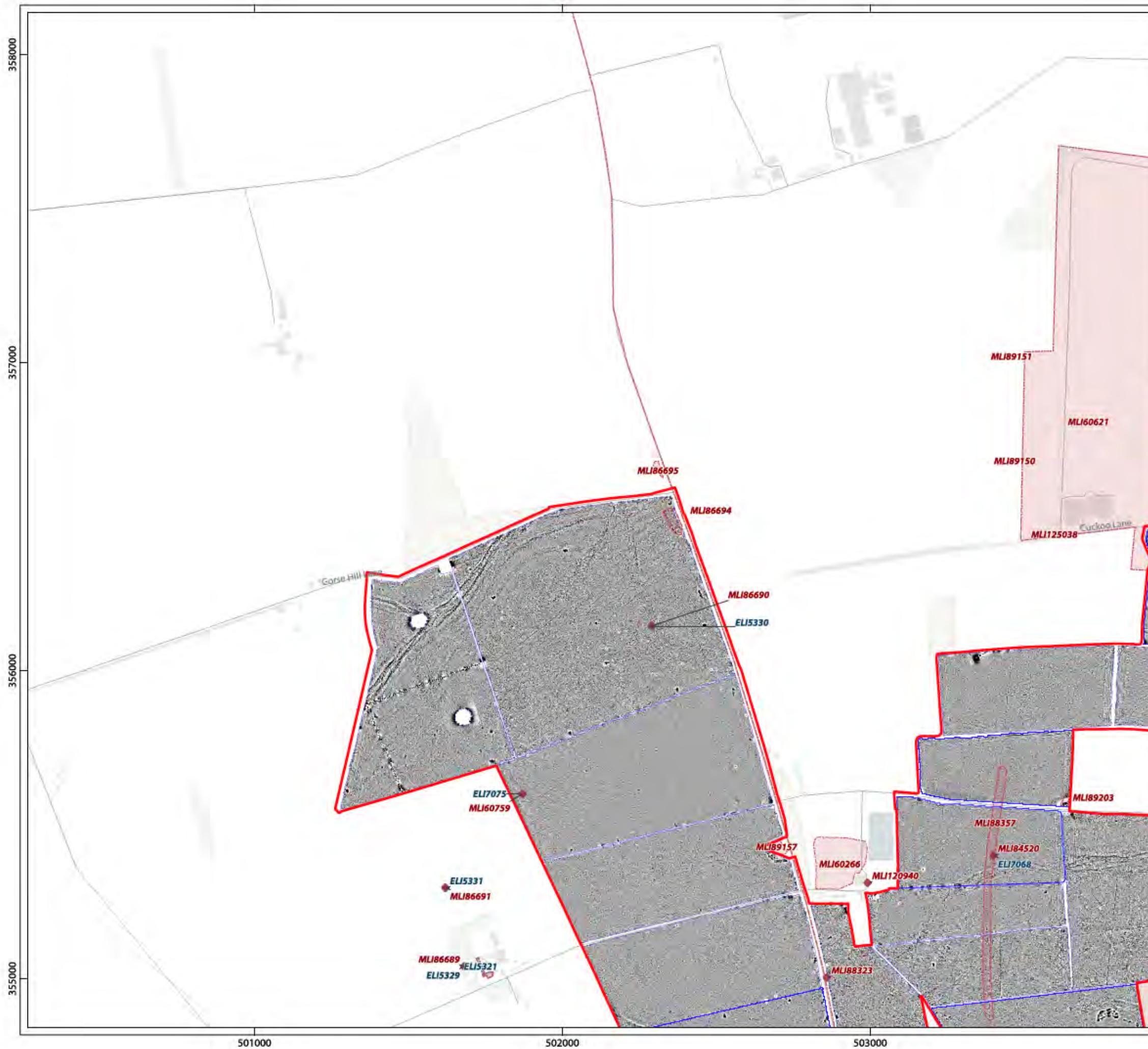
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- Geophysical Survey Area
 - Survey Extent
 - Area 1:2500
 - Areas for Illus 17 - 208 - Scale 2500



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Illus - 05 Location map of processed greyscale, XY trace and interpretation illustrations; Sector 1



Key

- Geophysical Survey Area
- Survey Extent

HER

- Acre Lane Monuments Point
- ◆ Acre Lane Events Point
- Acre Lane Monuments Line
- Acre Lane Monuments Polygon
- Acre Lane Events Polygon



+2nT
-1nT

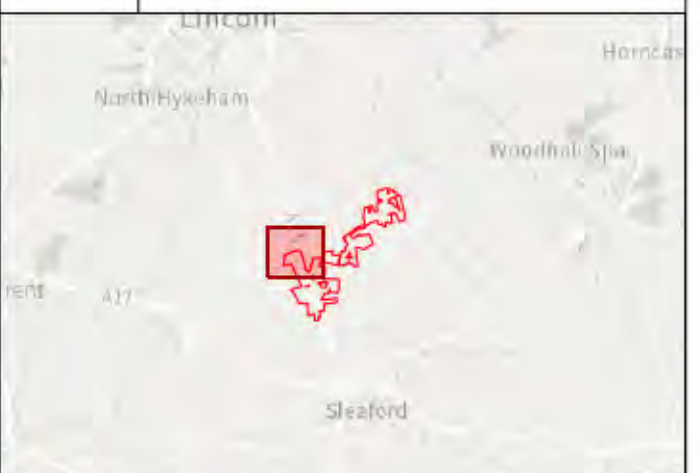
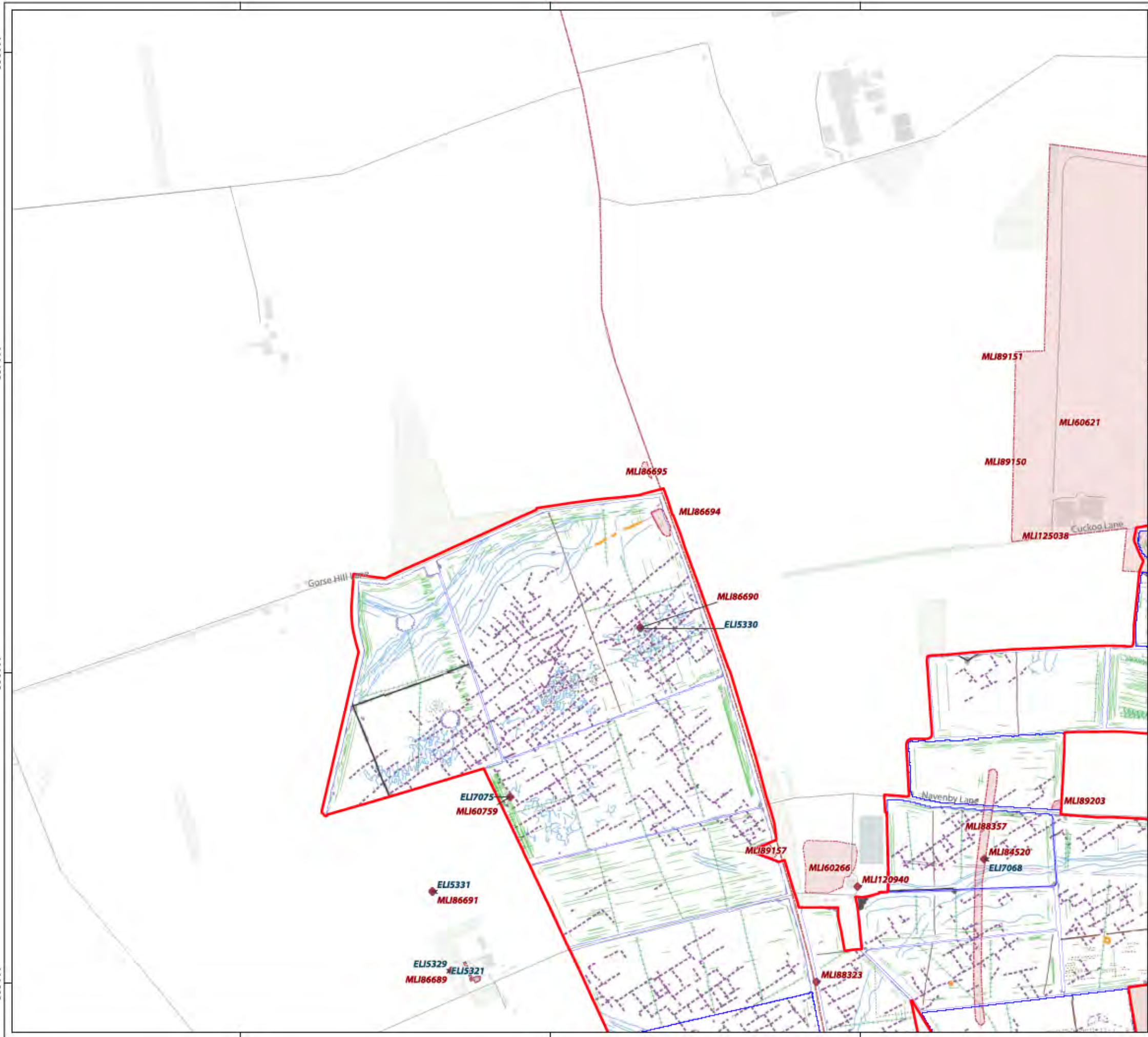


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501000 502000 503000



Key

- Geophysical Survey Area
- Survey Extent
- Acre Lane Monuments Point
- ◆ Acre Lane Events Point
- Acre Lane Monuments Line
- Acre Lane Monuments Polygon
- Acre Lane Events Polygon
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Quarry
- Uncertain
- Former Building

HER

- Agriculture
- Field Boundary
- Possible Field Boundary
- - - Field Drain
- Natural
- Pipe
- Uncertain
- Ridge and Furrow
- - - Field System
- Possible Archaeology
- Quarry

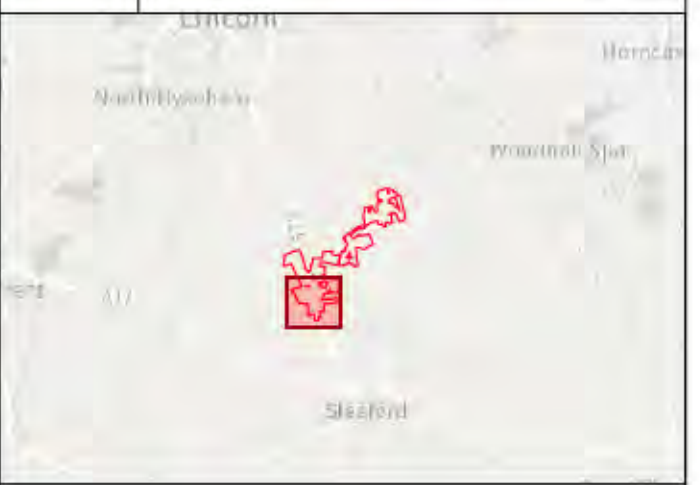
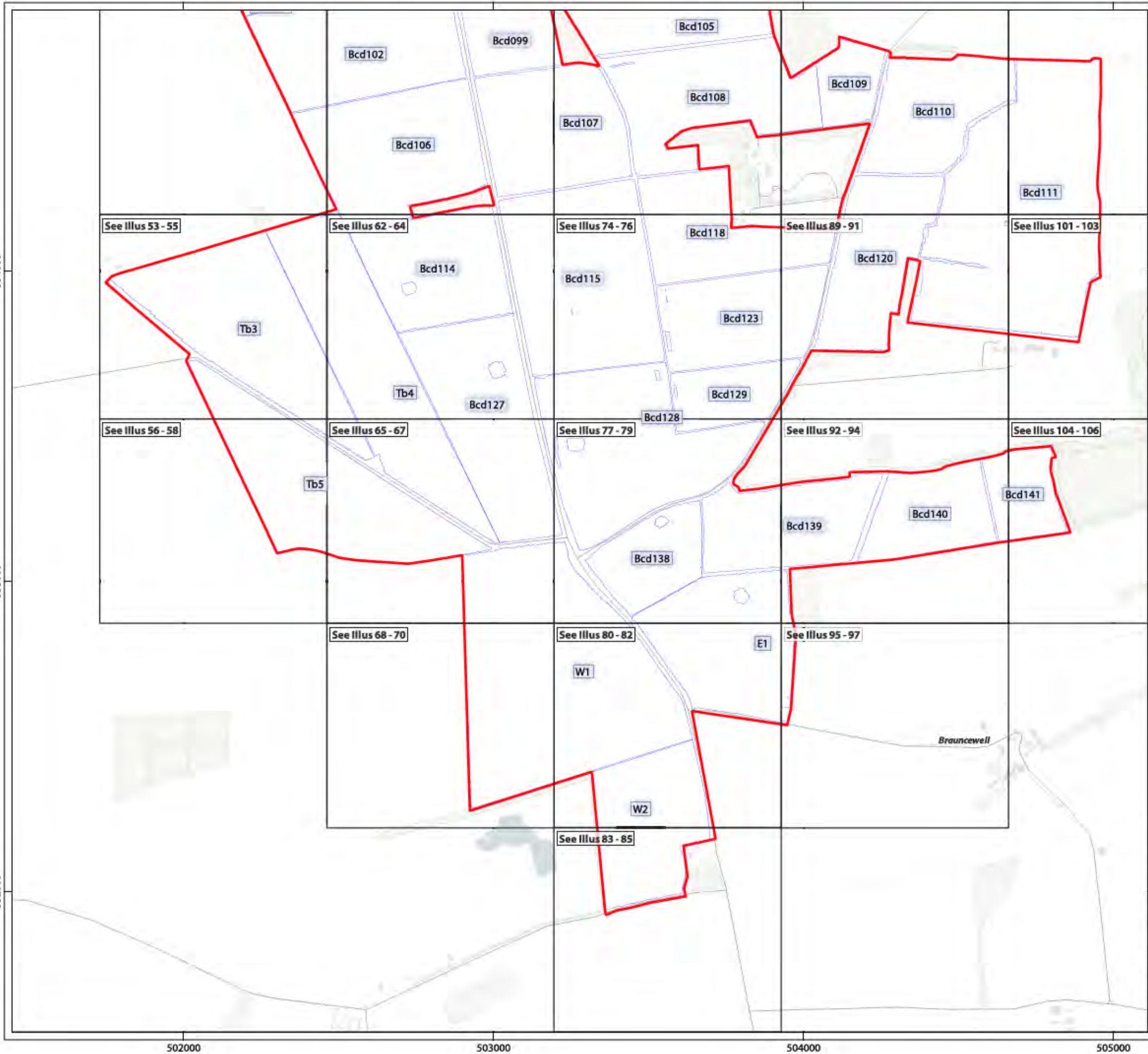
Interpretation

- Agriculture
- Field Boundary
- Possible Field Boundary
- - - Field Drain
- Natural
- Pipe
- Uncertain
- Ridge and Furrow
- - - Field System
- Possible Archaeology
- Quarry

0 100 200 m

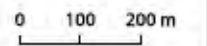
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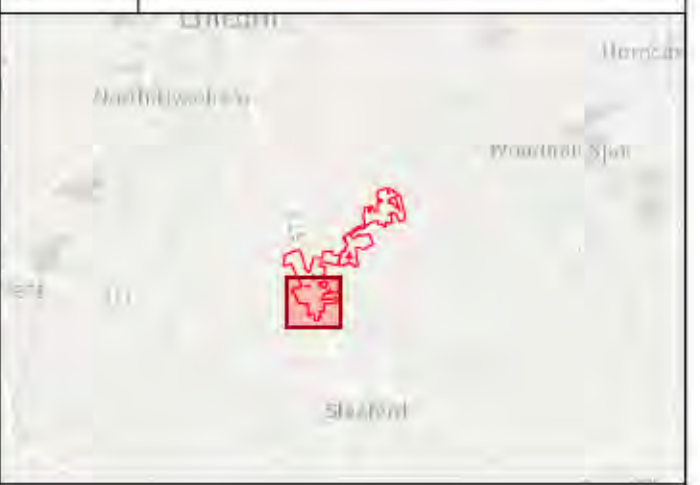
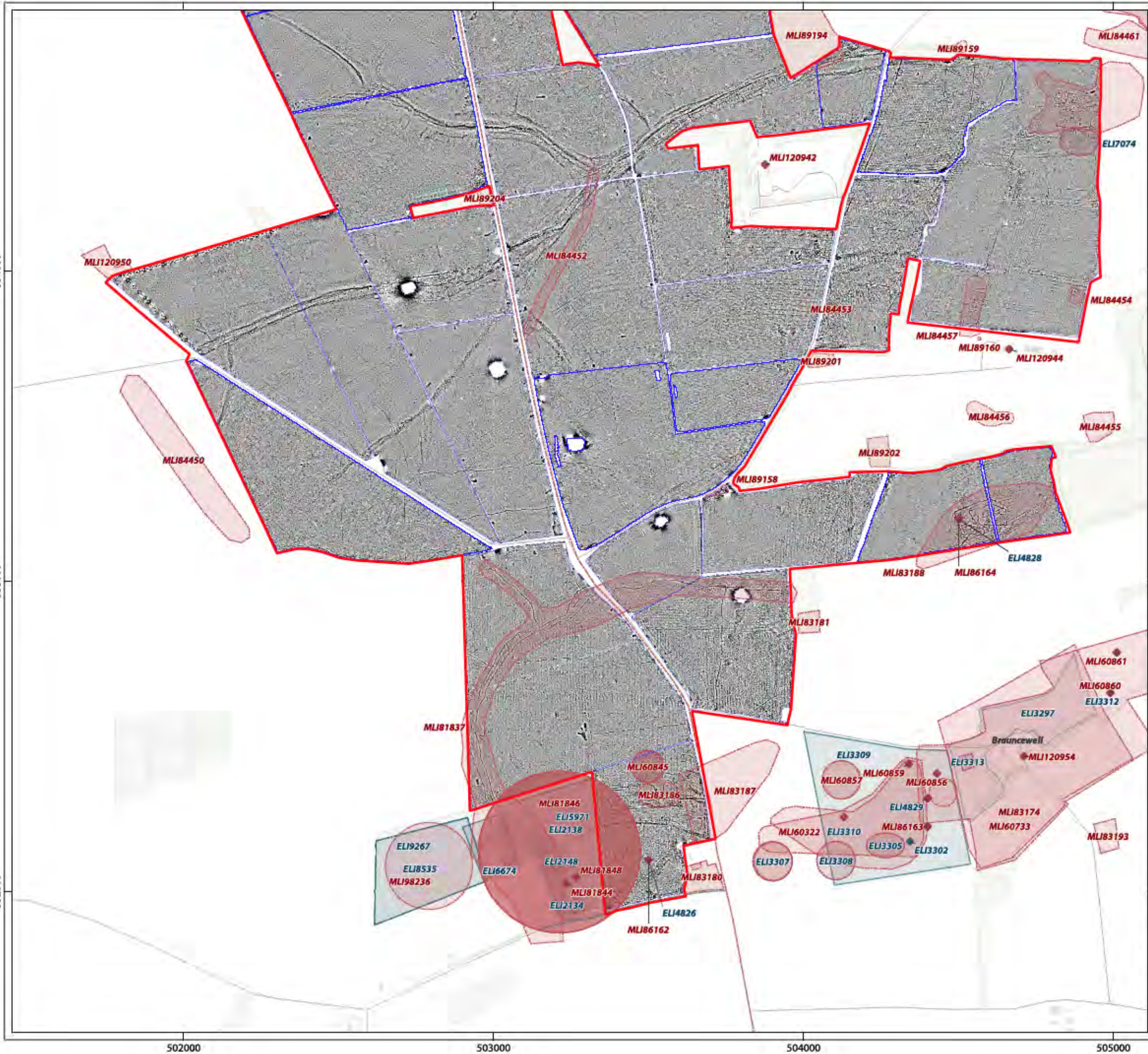
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- Survey Extent
- Area 1:2500
- Areas for illus 17 - 208 - Scale 2500

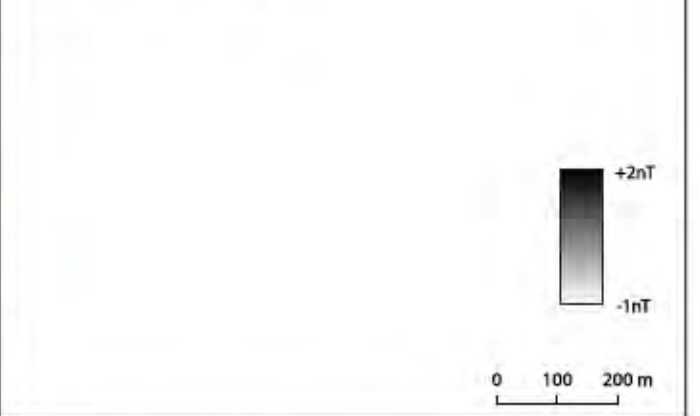


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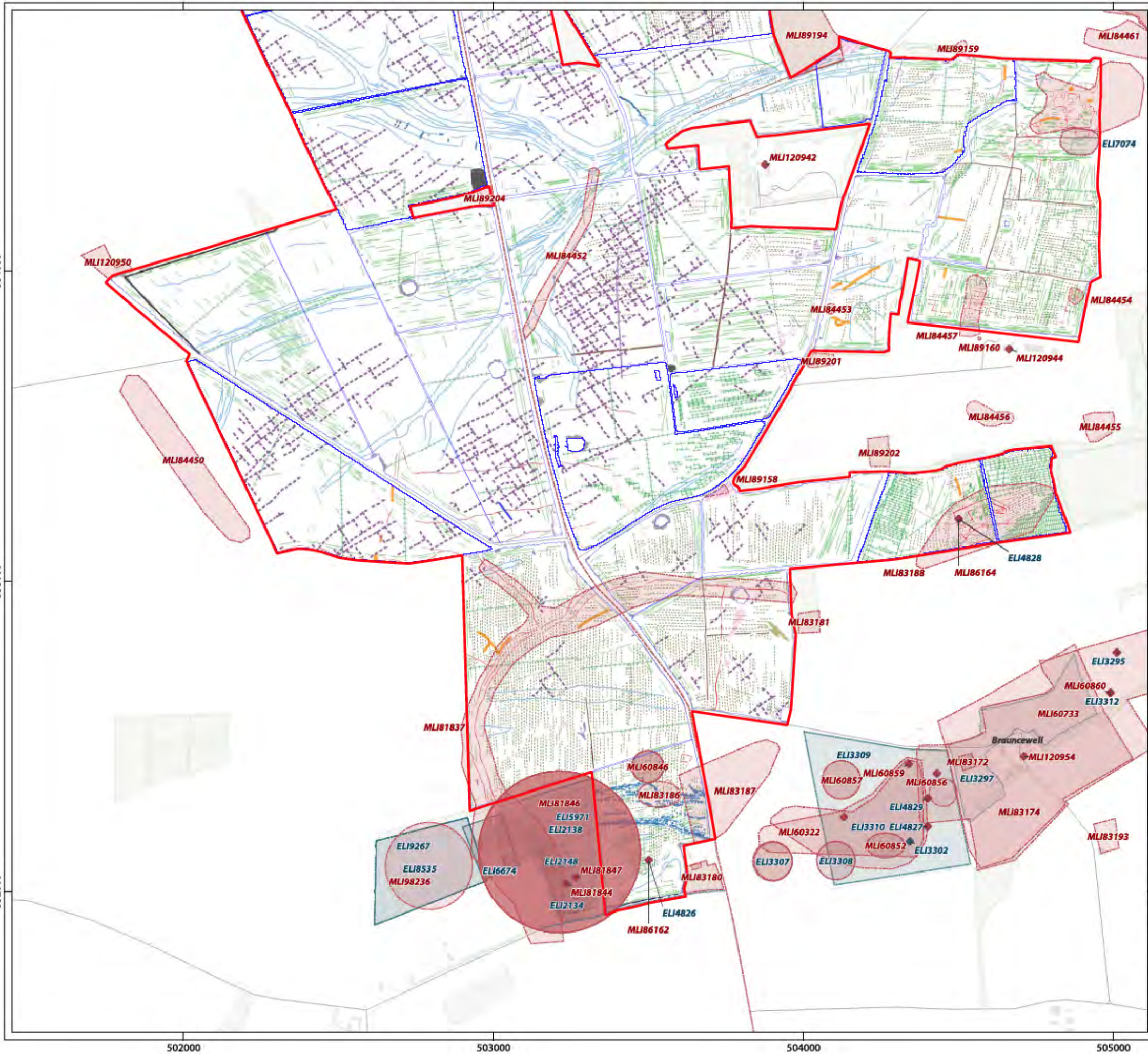
- Key**
- Geophysical Survey Area
 - Survey Extent
- HER**
- Acre Lane Monuments Point
 - Acre Lane Events Point
 - Acre Lane Monuments Line
 - Acre Lane Events Line
 - Acre Lane Monuments Polygon
 - Acre Lane Events Polygon



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Illus - 09 Greyscale plot of processed magnetometer data; Sector 2



Key

- Geophysical Survey Area
- Survey Extent
- Acre Lane Monuments Point
- Acre Lane Events Point
- Acre Lane Monuments Line
- Acre Lane Events Line
- Acre Lane Monuments Polygon
- Acre Lane Events Polygon
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Quarry
- Uncertain
- Former Building
- Former Pond
- Geology
- Burning
- Null Value

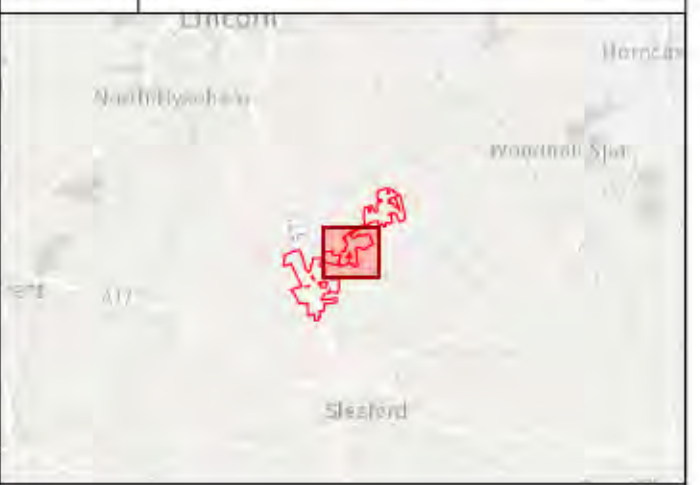
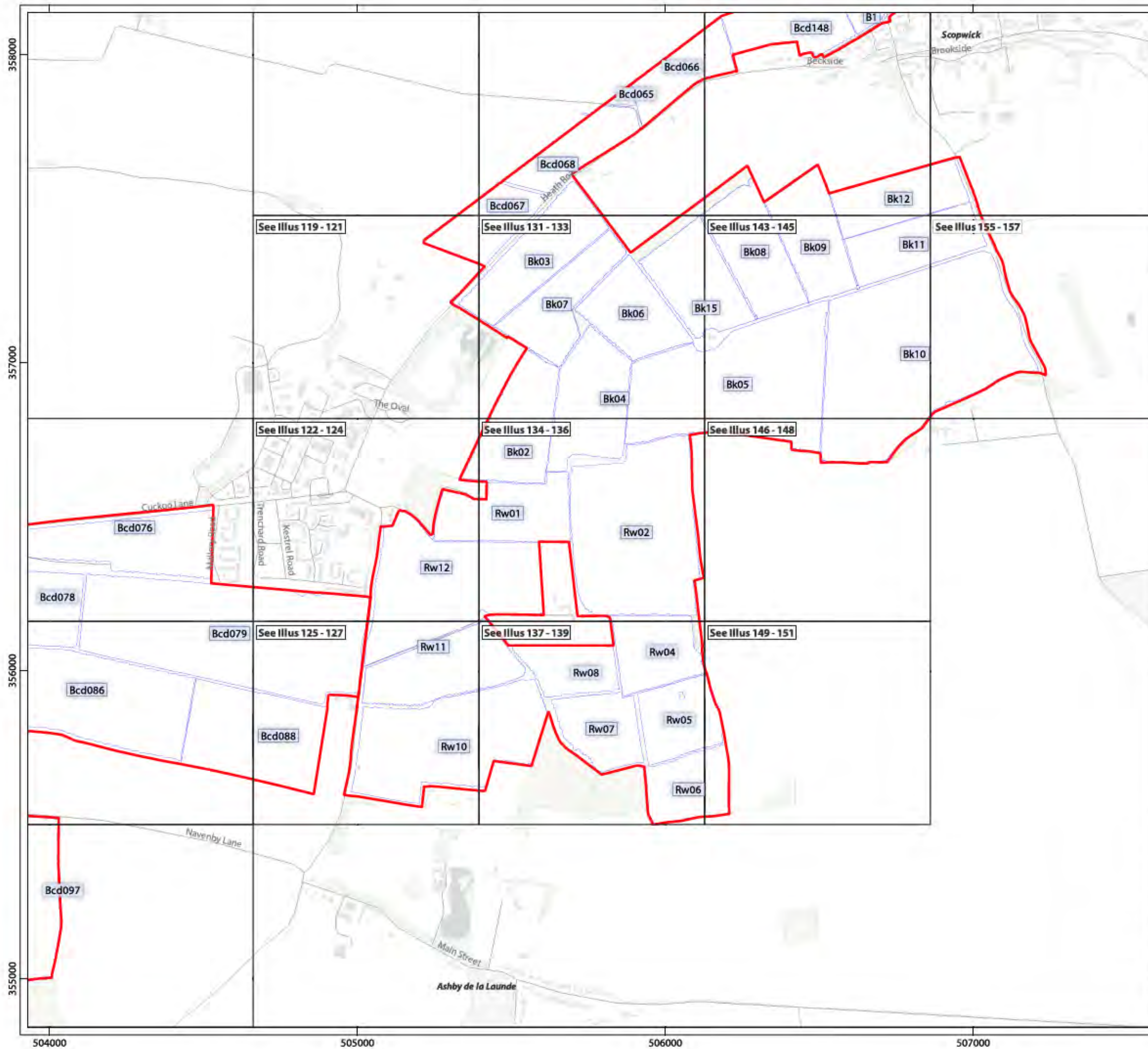
Interpretation

- Agriculture
- Field Boundary
- Possible Field Boundary
- Field Drain
- Natural
- Pipe
- Uncertain
- Ridge and Furrow
- LIRM
- Field System
- Possible Archaeology

0 100 200 m

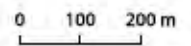
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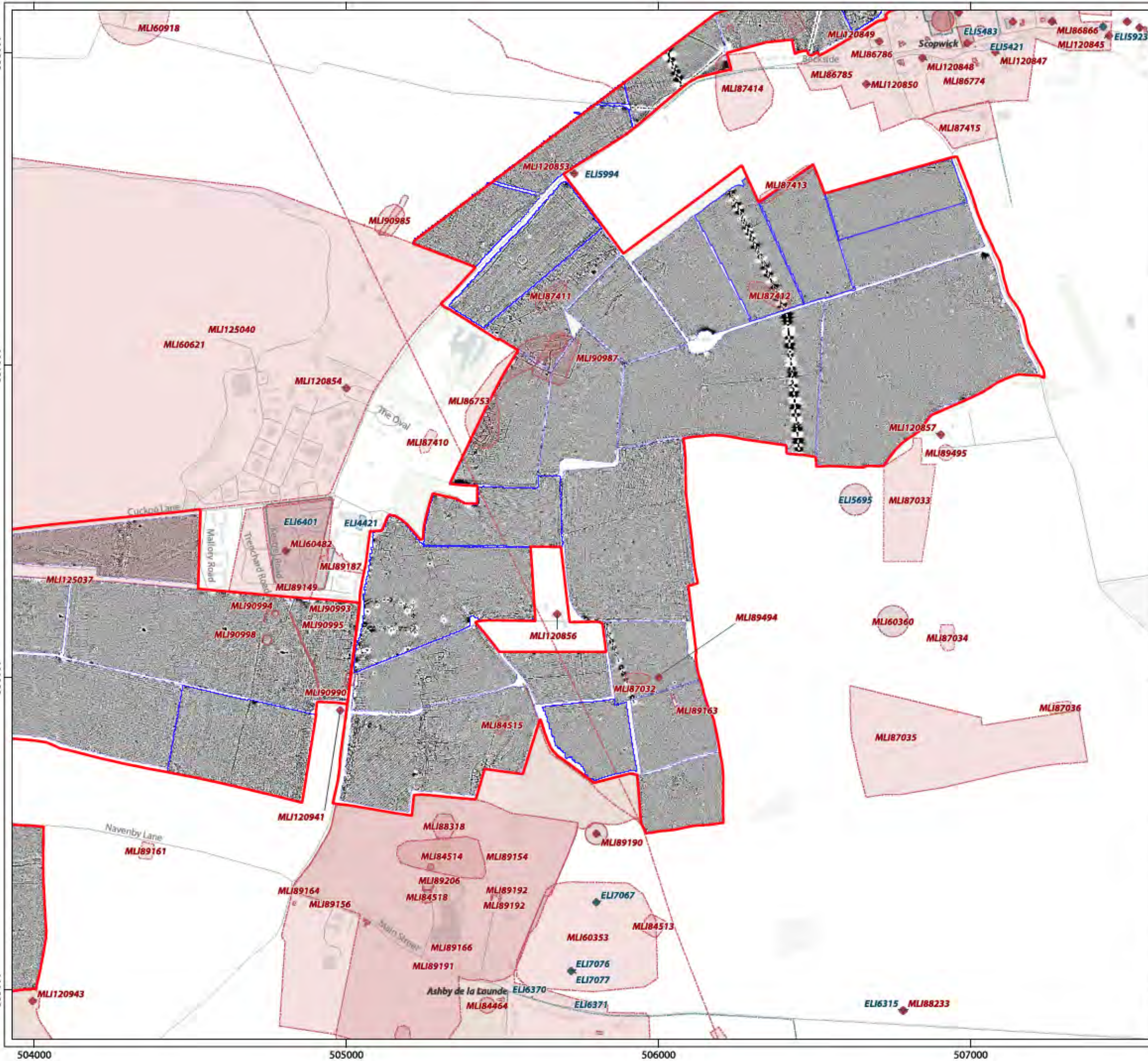
Key

- Geophysical Survey Area
- Survey Extent
- Area 1:2500
- Areas for illus 17 - 208 - Scale 2500



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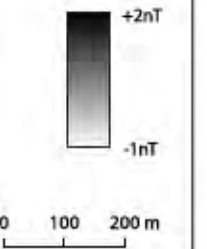


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- Survey Extent

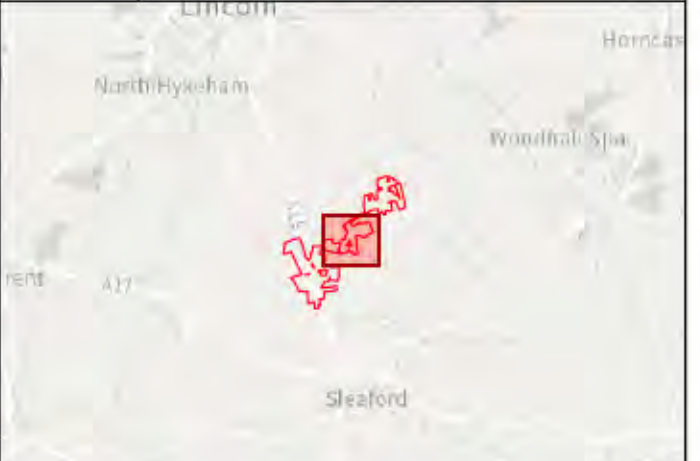
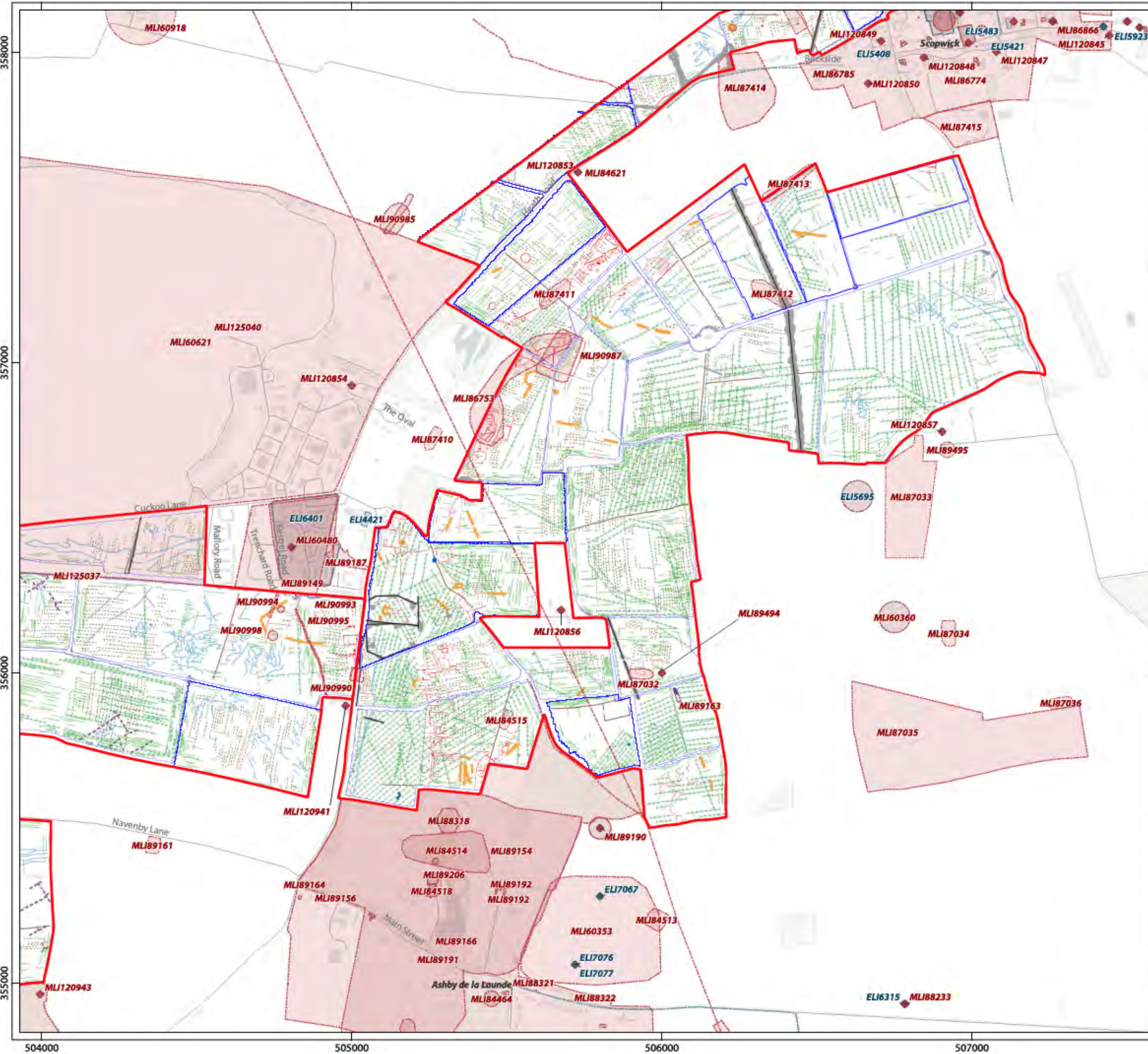
HER

- Acre Lane Monuments Point
- ◆ Acre Lane Events Point
- Acre Lane Monuments Line
- Acre Lane Events Line
- Acre Lane Monuments Polygon
- Acre Lane Events Polygon



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Key

- Geophysical Survey Area
- Survey Extent
- Acre Lane Monuments Point
- ◆ Acre Lane Events Point
- Acre Lane Monuments Line
- Acre Lane Events Line
- Acre Lane Monuments Polygon
- Acre Lane Events Polygon
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Quarry
- Uncertain
- Former Pond
- Burning

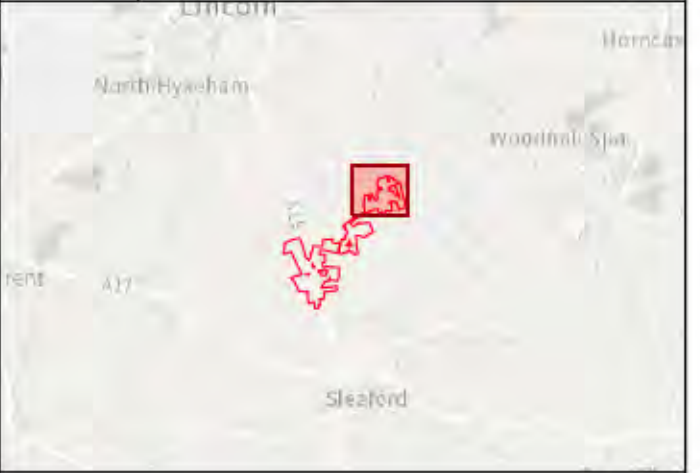
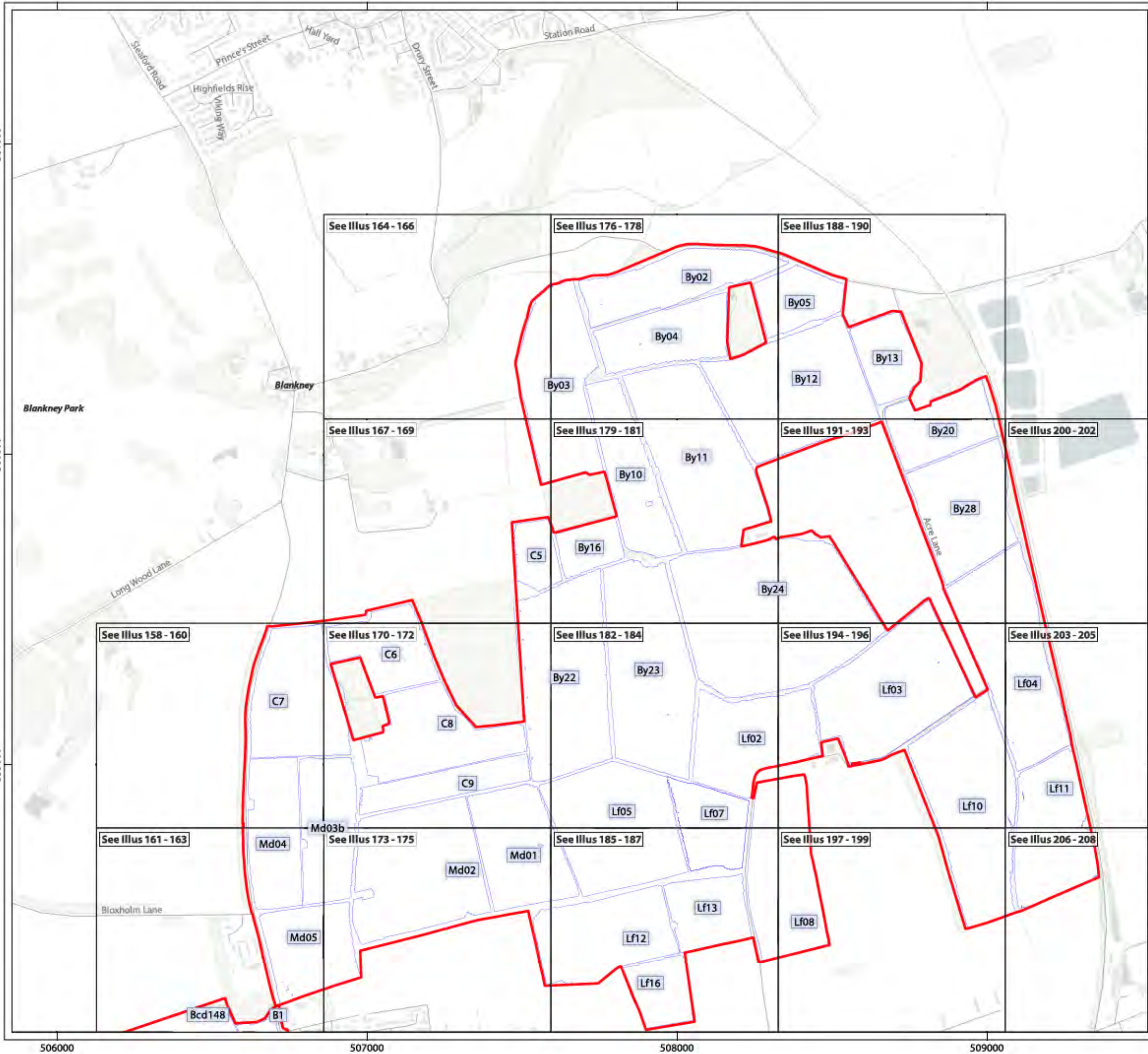
Interpretation

- Agriculture
- Field Boundary
- Possible Field Boundary
- Field Drain
- Natural
- Pipe
- Uncertain
- Ridge and Furrow
- Field System
- Possible Archaeology

0 100 200 m

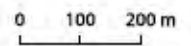
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- Survey Extent
- Area 1:2500
- Areas for illus 17 - 208 - Scale 2500



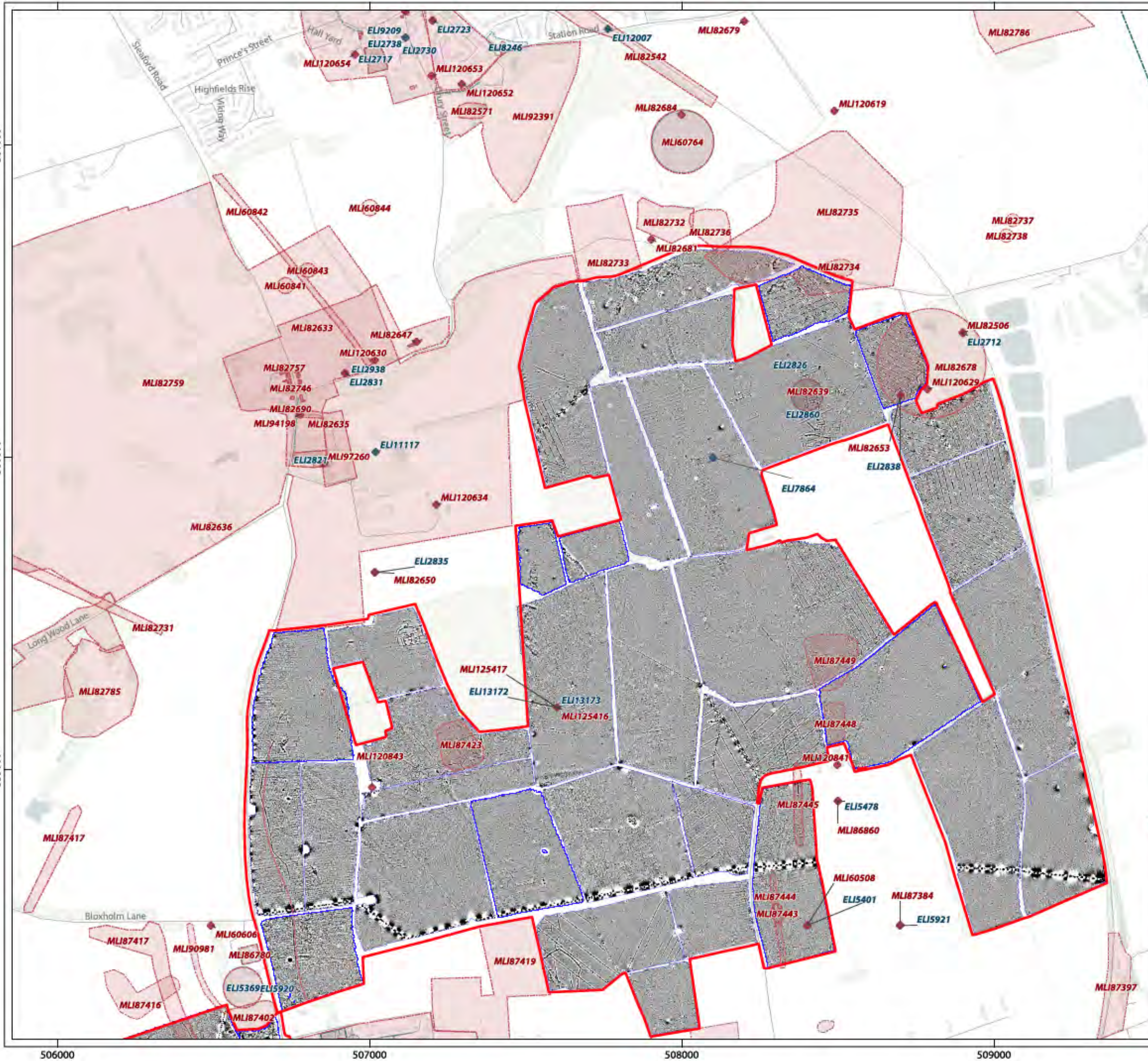
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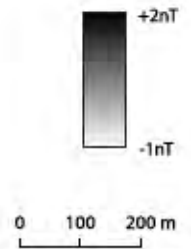
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illus - 14 Location map of processed greyscale, XY trace and interpretation illustrations; Sector 4



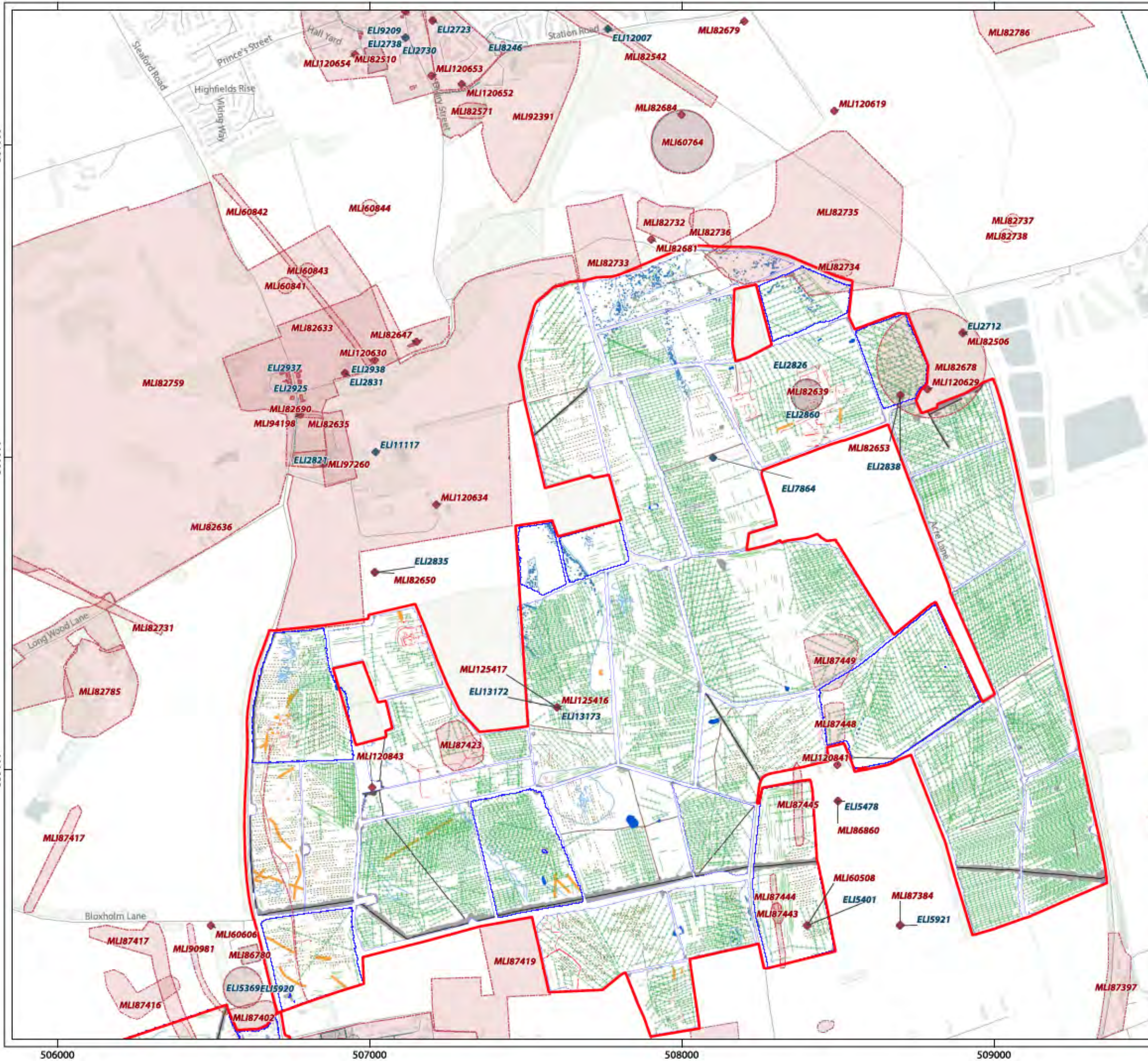
- Key**
- Geophysical Survey Area
 - Survey Extent
 - HER**
 - ◆ Acre Lane Monuments Point
 - ◆ Acre Lane Events Point
 - Acre Lane Monuments Line
 - Acre Lane Events Line
 - Acre Lane Monuments Polygon
 - Acre Lane Events Polygon



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Illus - 15 Greyscale plot of processed magnetometer data; Sector 4



Key

Geophysical Survey Area	Archaeology
Survey Extent	Magnetic Disturbance
Acre Lane Monuments Point	Possible Archaeology
Acre Lane Events Point	Quarry
Acre Lane Monuments Line	Uncertain
Acre Lane Events Line	Former Building
Acre Lane Monuments Polygon	Former Pond
Acre Lane Events Polygon	Geology
	Burning

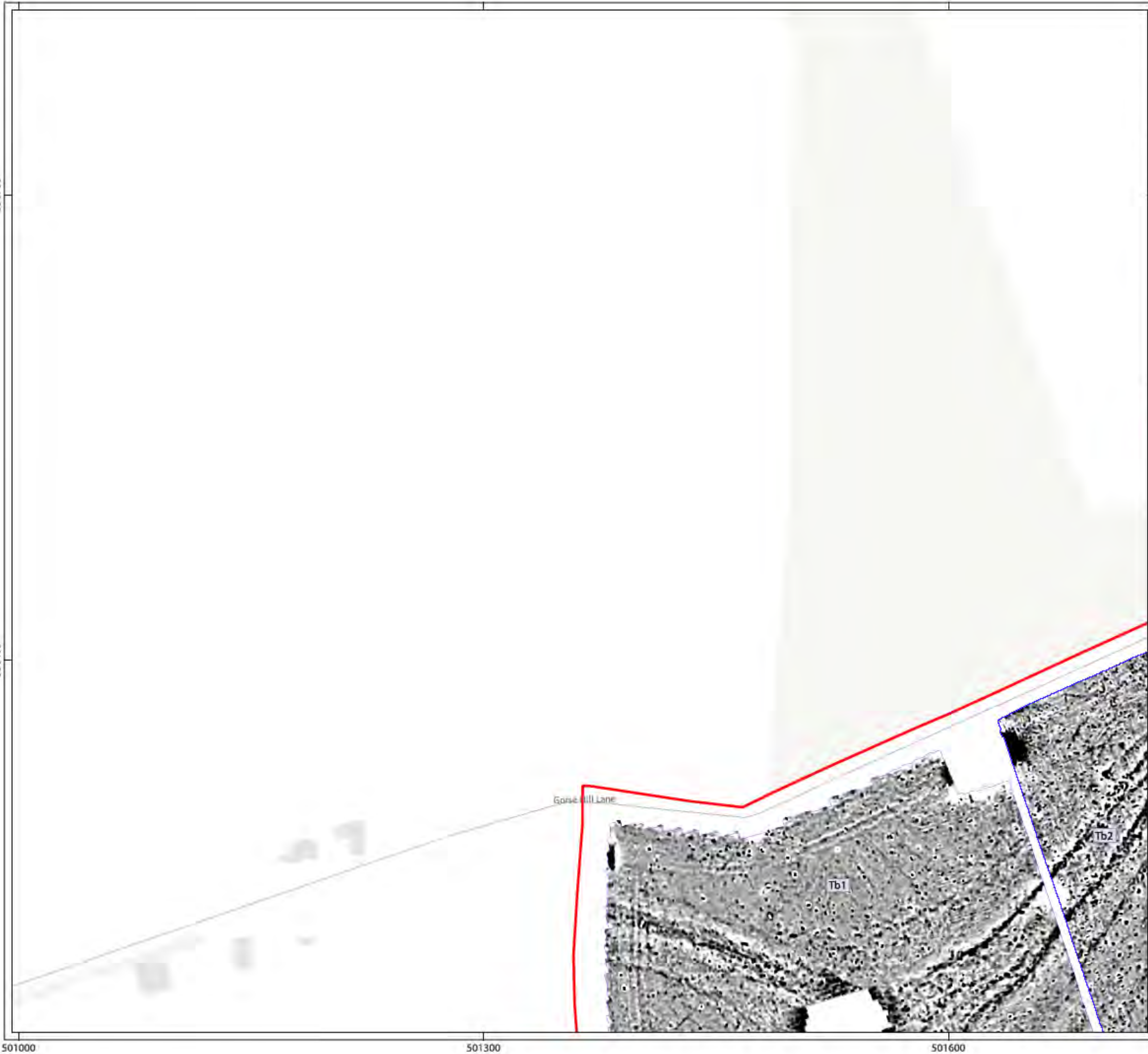
Interpretation

- Agriculture
- Field Boundary
- Possible Field Boundary
- Field Drain
- Natural
- Pipe
- Uncertain
- Ridge and Furrow
- Possible Archaeology

0 100 200 m

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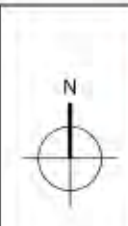
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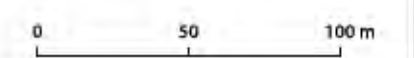
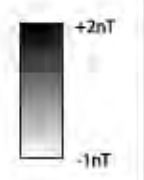
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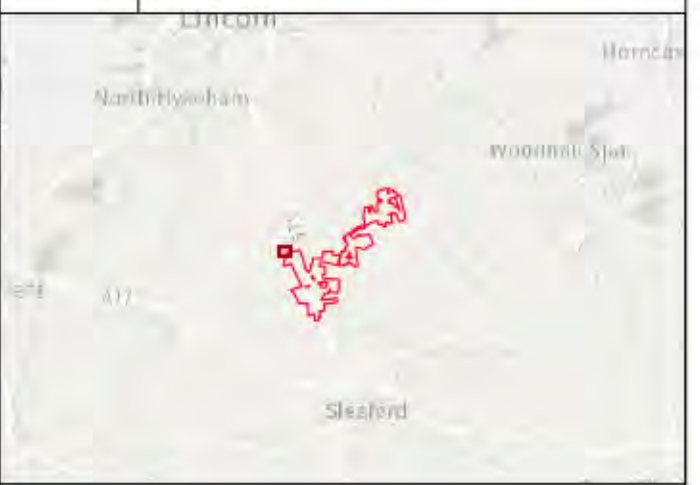
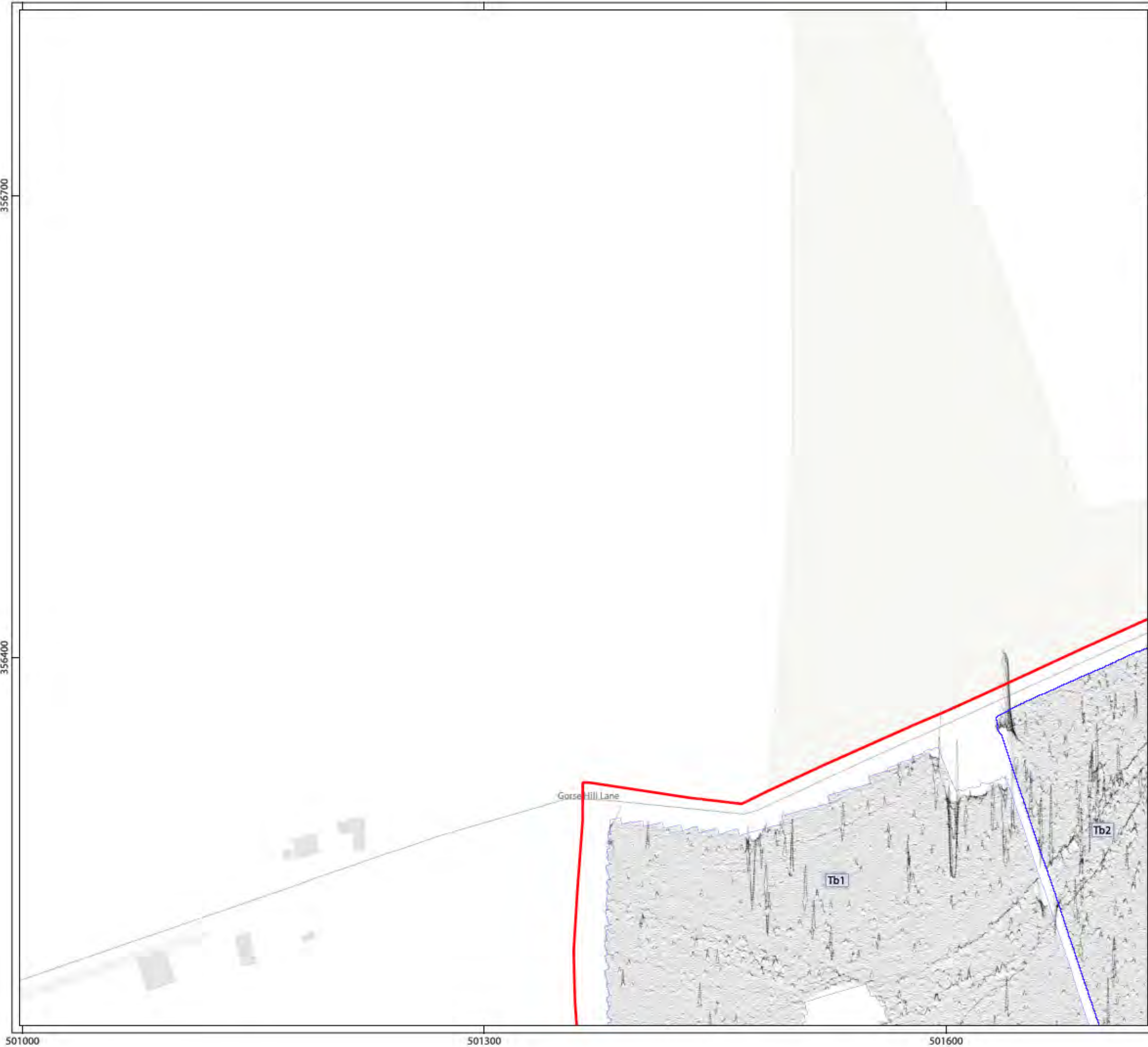
Key

- Geophysical Survey Area
- Survey Extent



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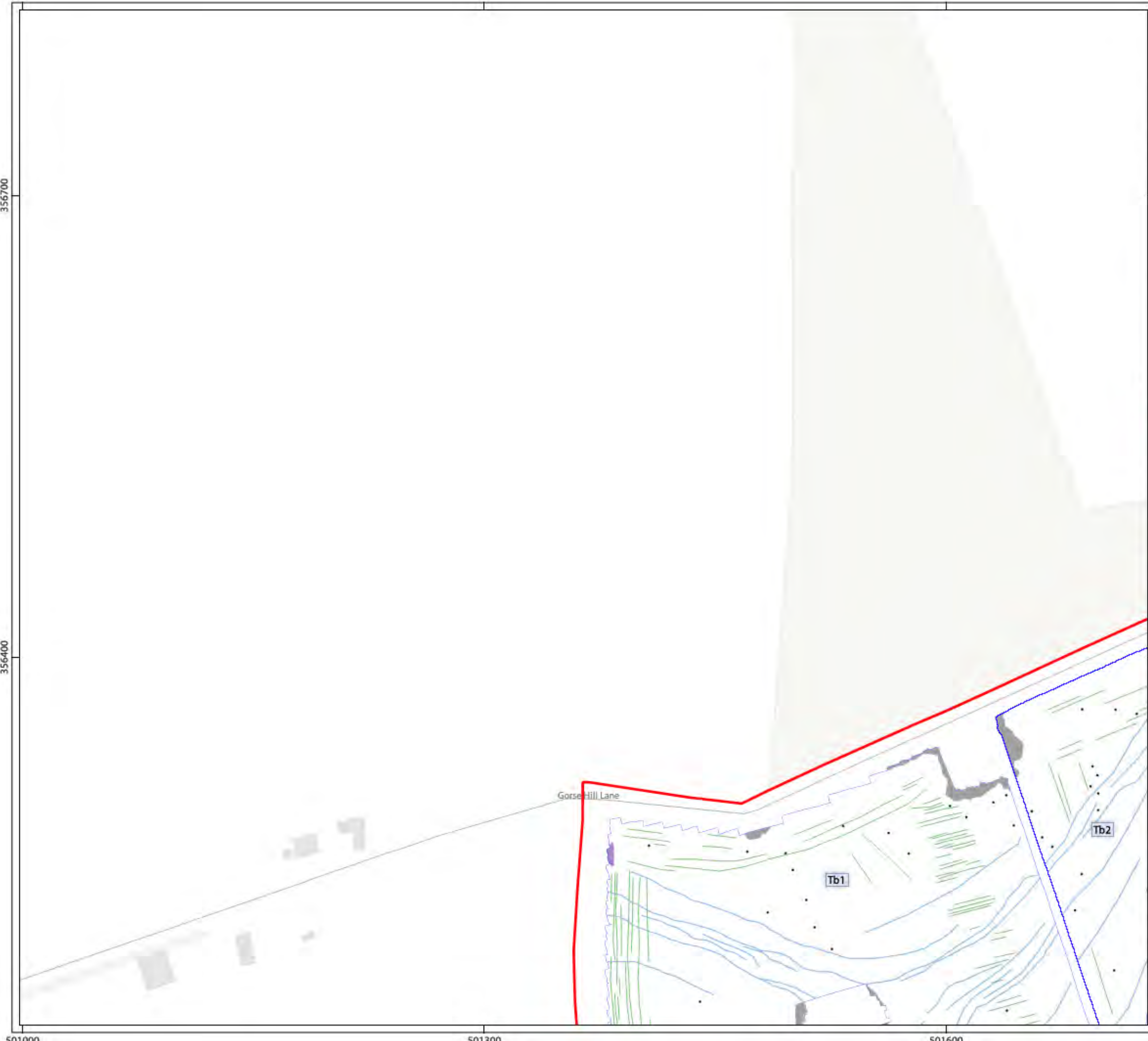
Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)

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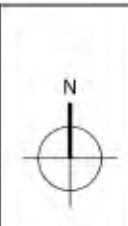
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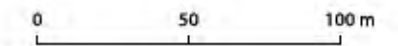
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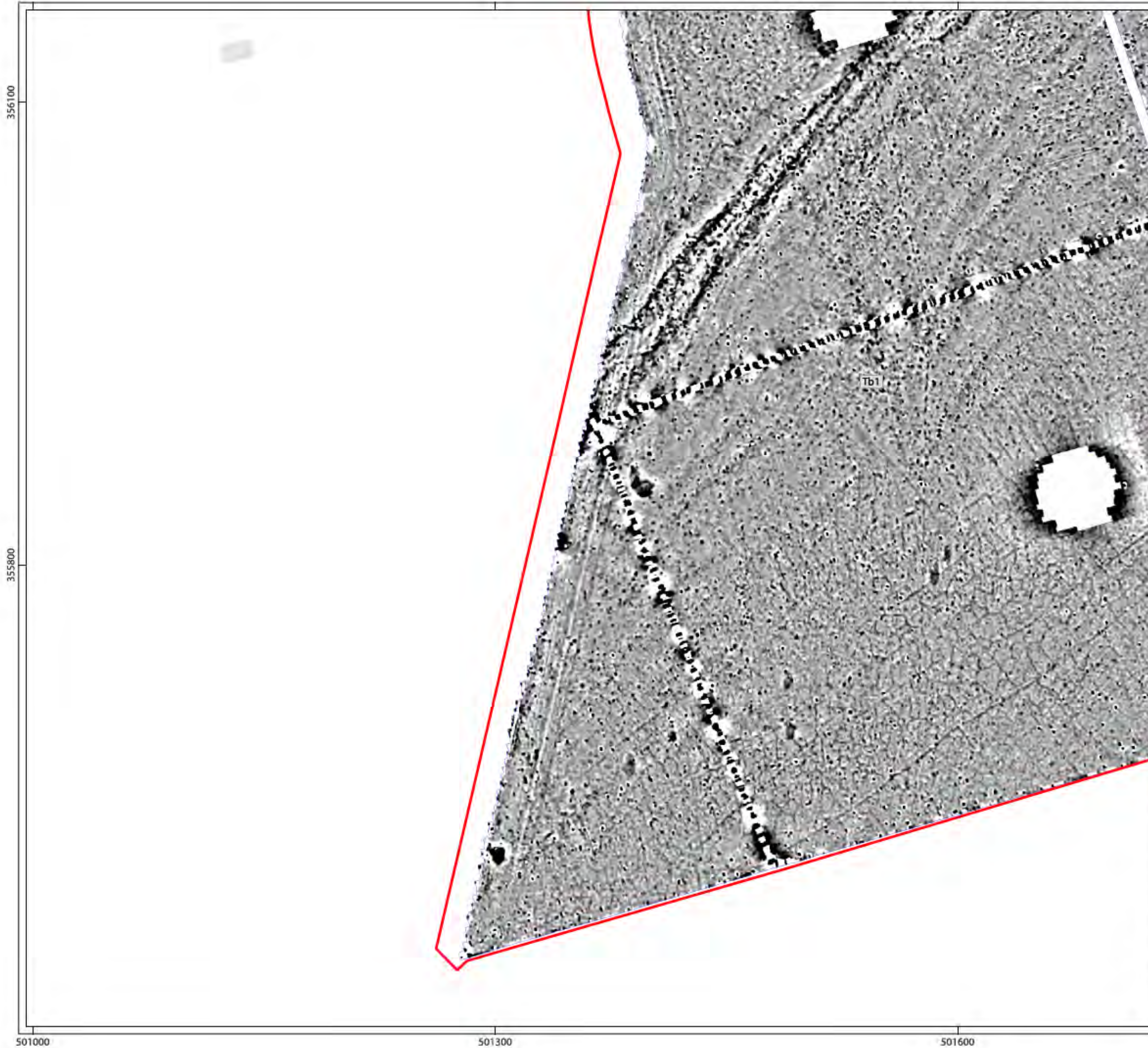
Key

- Geophysical Survey Area
- Survey Extent
- Interpretation**
- Ferrous Objects
- Agriculture
- Natural
- Magnetic Disturbance
- Uncertain

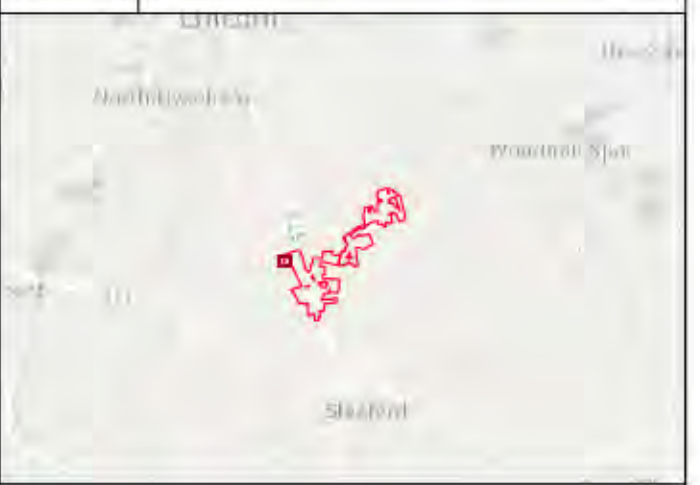


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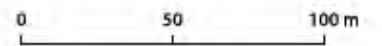


Key

- Geophysical Survey Area
- Survey Extent



+2nT
-1nT



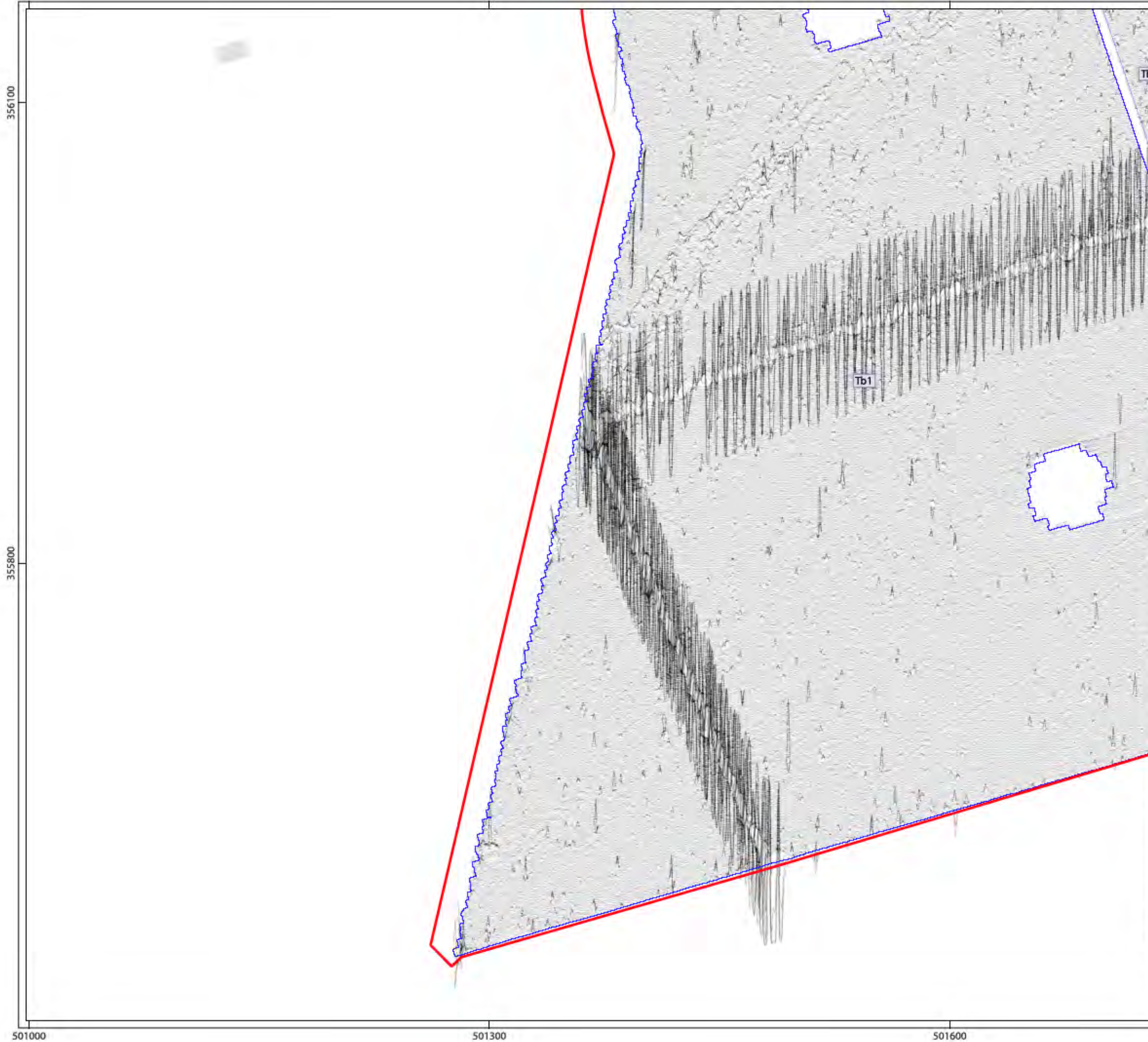
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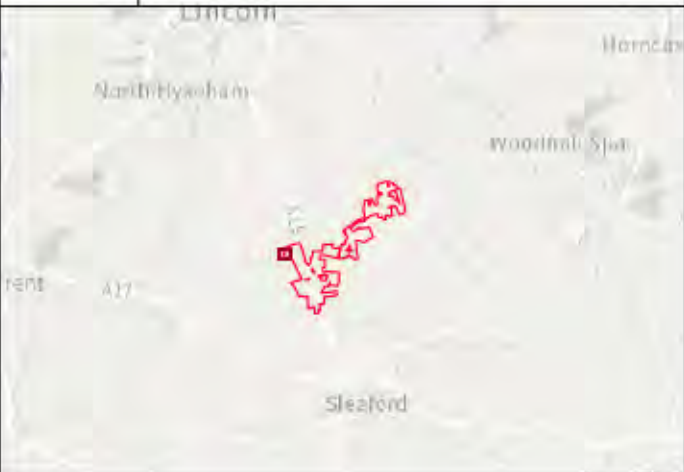
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Illus - 20 XY trace plot of minimally processed magnetometer data; Sector 1





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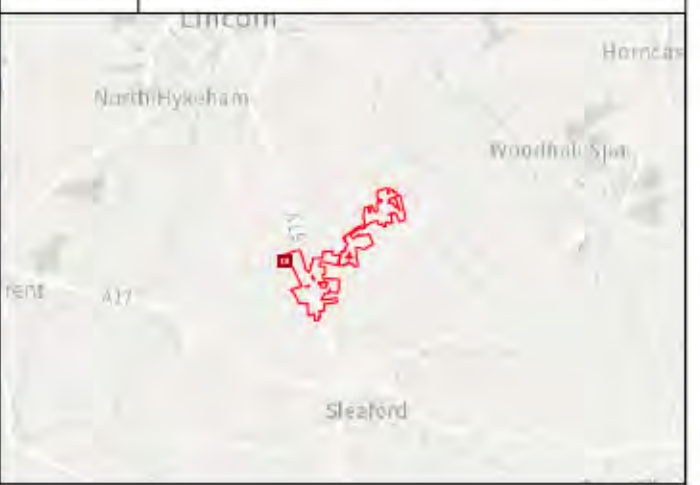
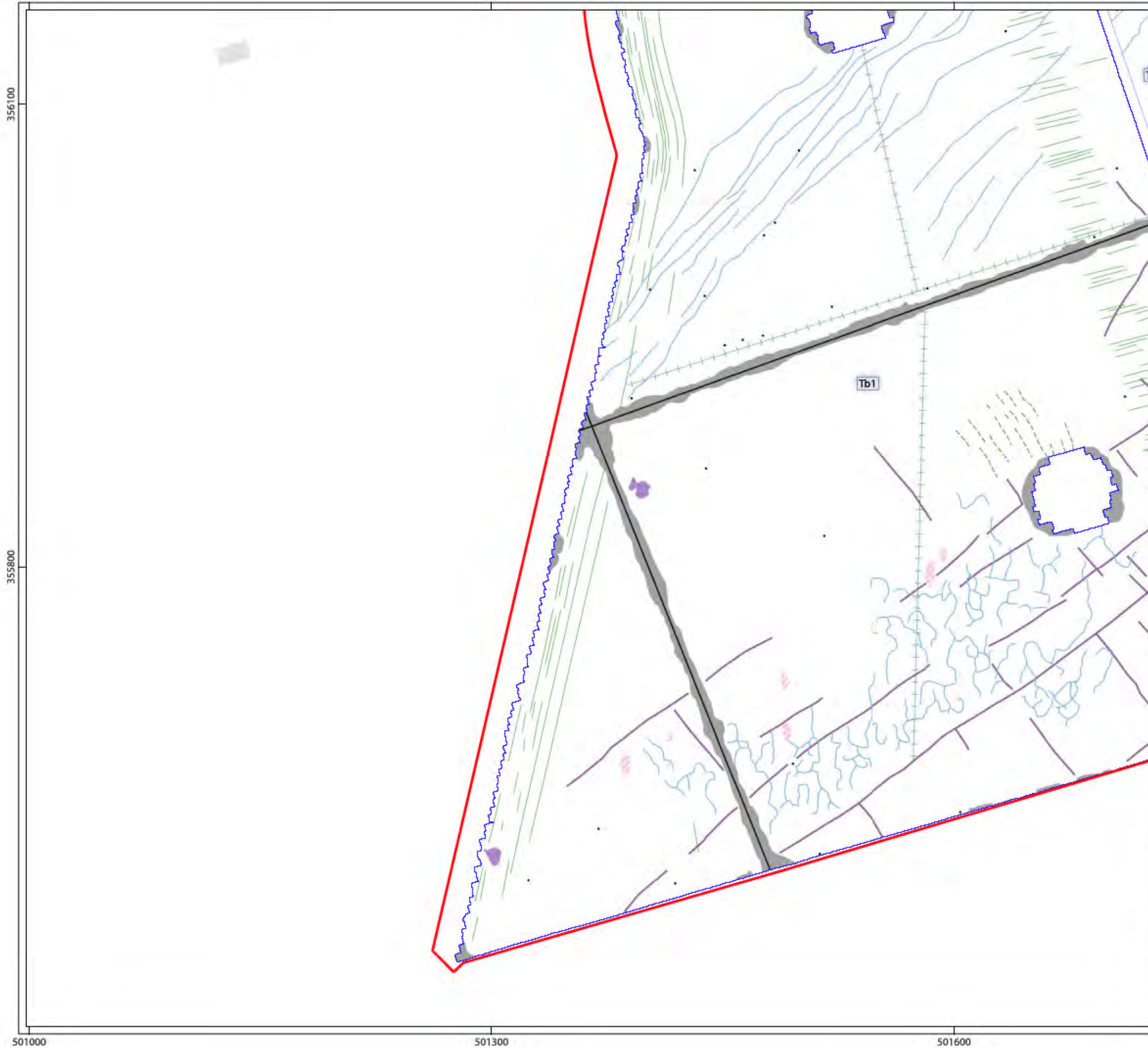
Key

- ▭ Geophysical Survey Area
- ▭ Survey Extent
- XY Trace (25nT/cm)

0 50 100 m

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Key

- Geophysical Survey Area
- Survey Extent

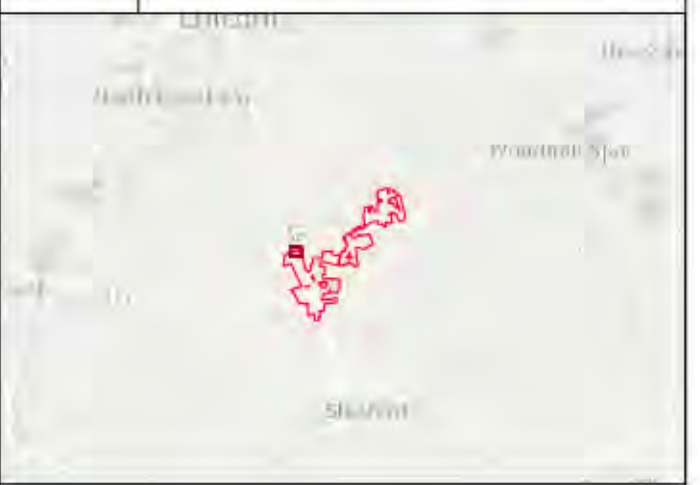
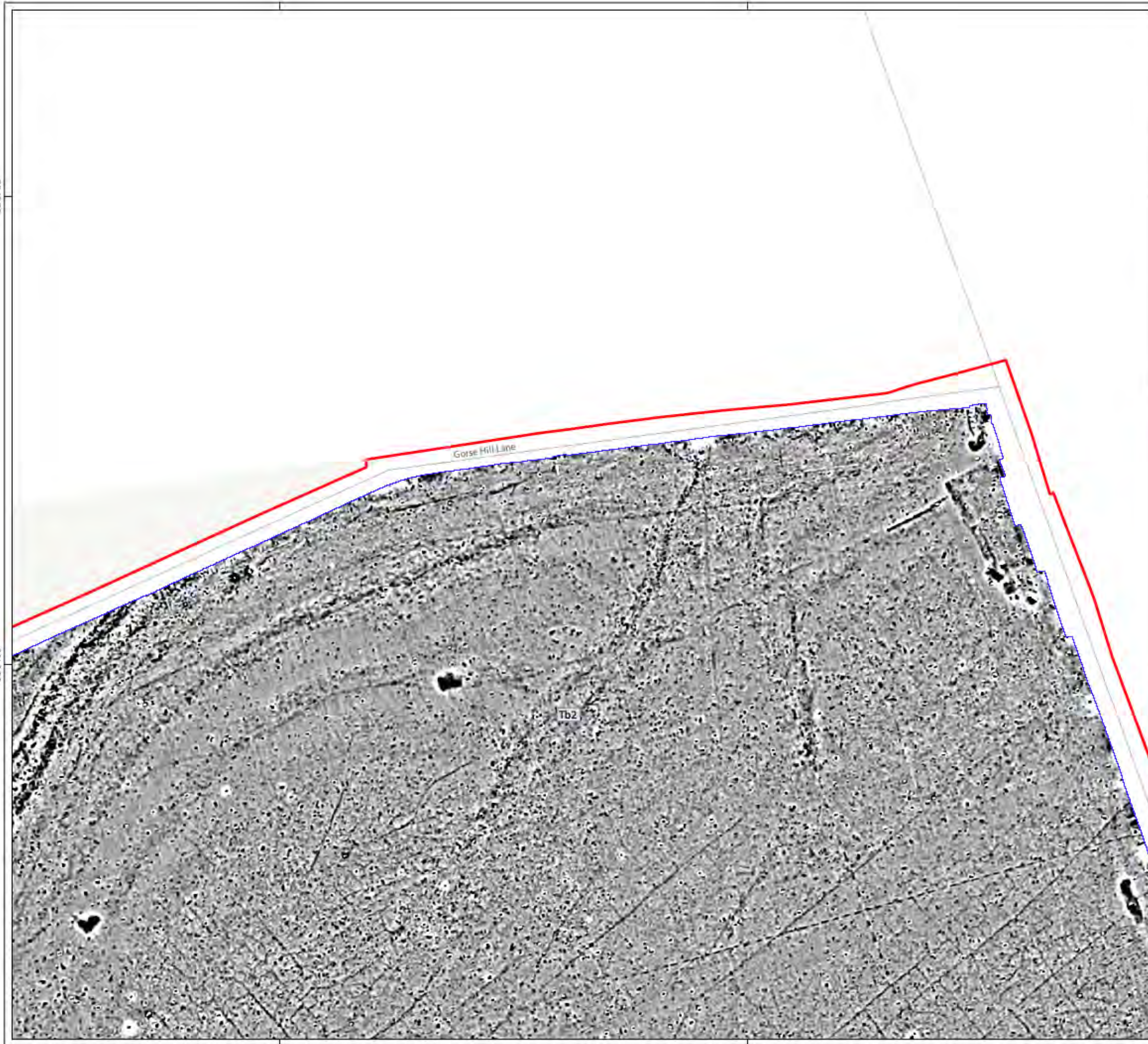
Interpretation

- Ferrous Objects
- Agriculture
- Field Drain
- Natural
- Pipe
- Ridge and Furrow
- Field System
- Magnetic Disturbance
- Quarry
- Uncertain

0 50 100 m

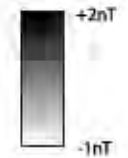
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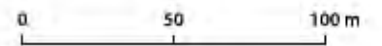
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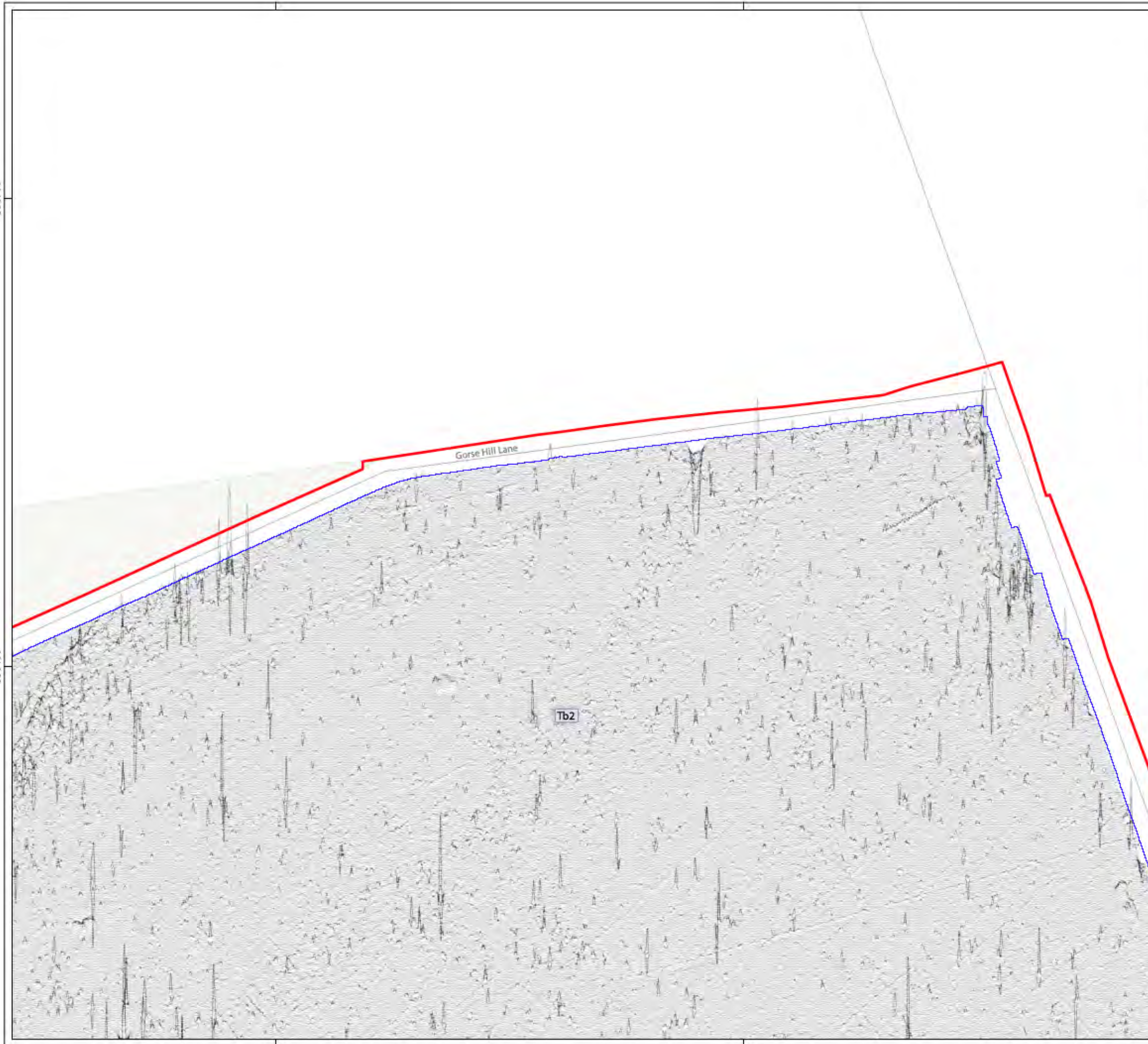
- Geophysical Survey Area
- Survey Extent





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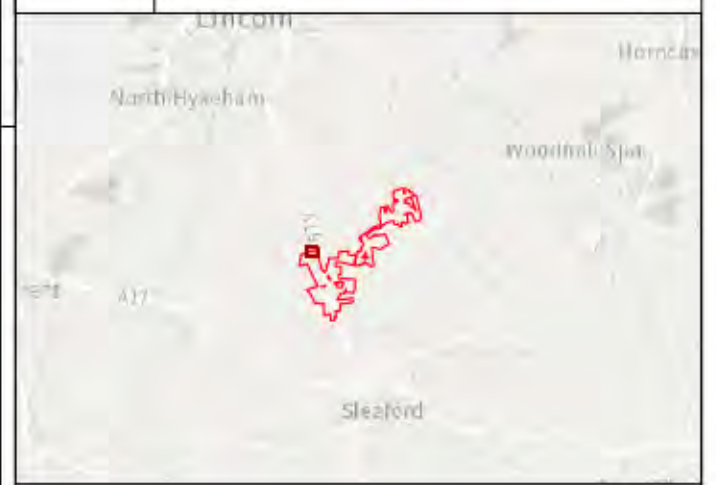
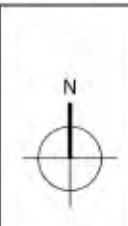


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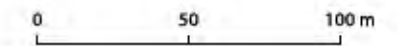
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Key

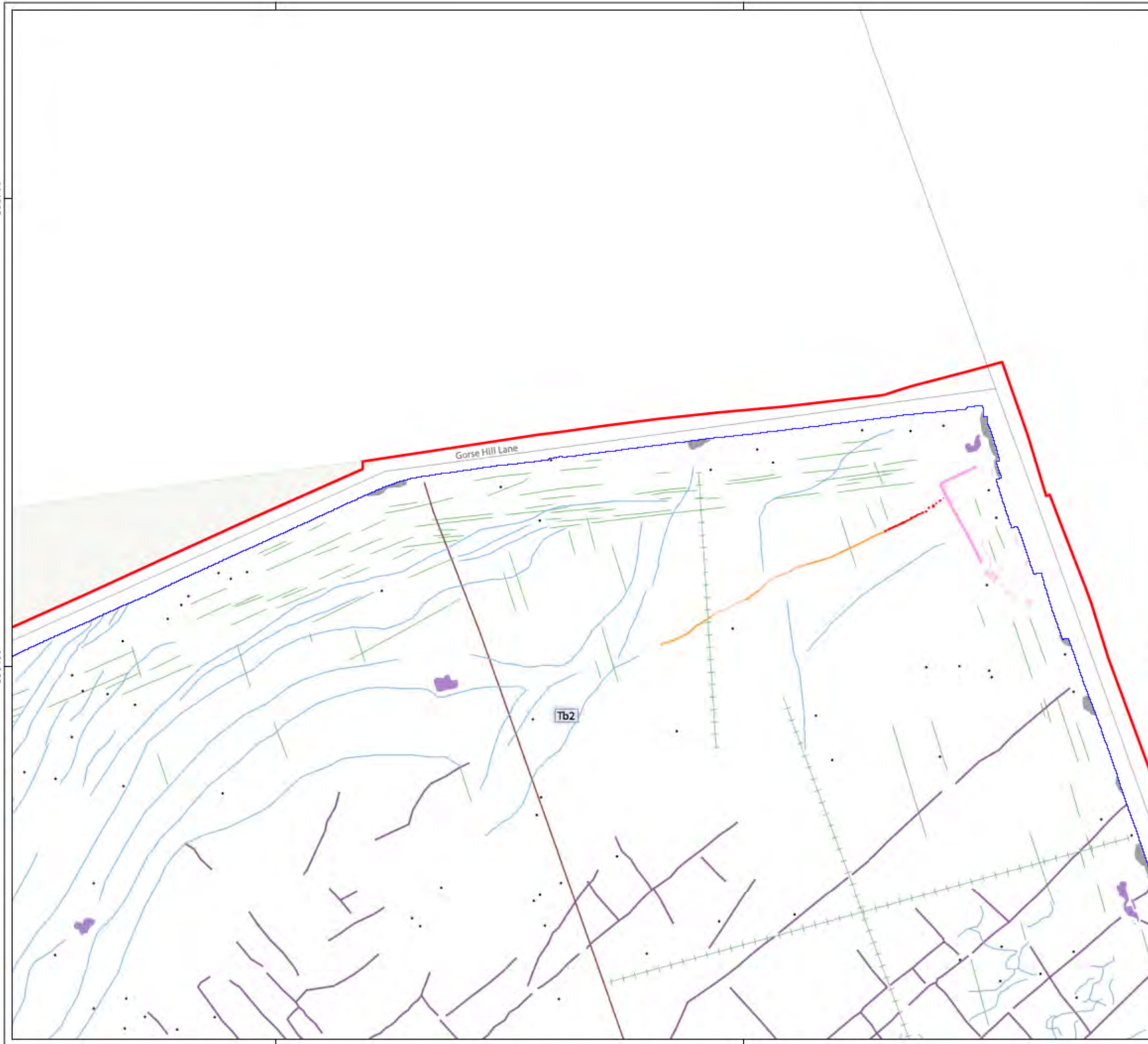
- ▭ Geophysical Survey Area
- ▭ Survey Extent
- XY Trace (25nT/cm)



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Illus - 24 XY trace plot of minimally processed magnetometer data; Sector 1

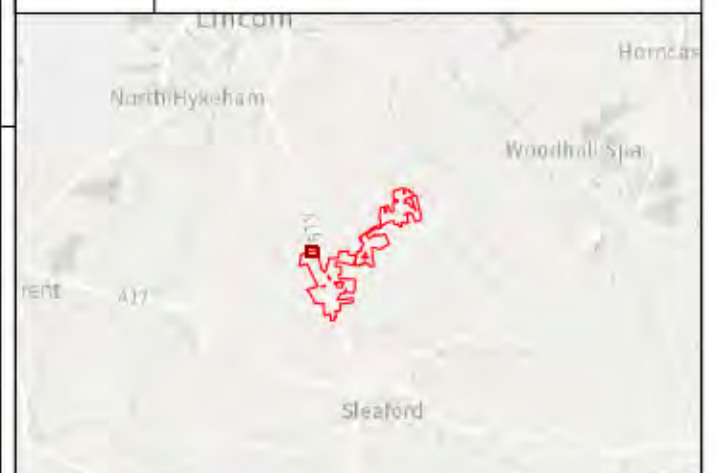
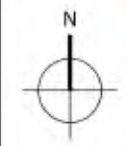


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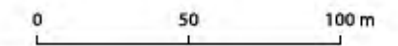
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Key

- Geophysical Survey Area
- Survey Extent
- Interpretation**
- Ferrous Objects
- Agriculture
- Field Boundary
- Field Drain
- Natural
- Field System
- Possible Archaeology
- Quarry
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Quarry
- Uncertain

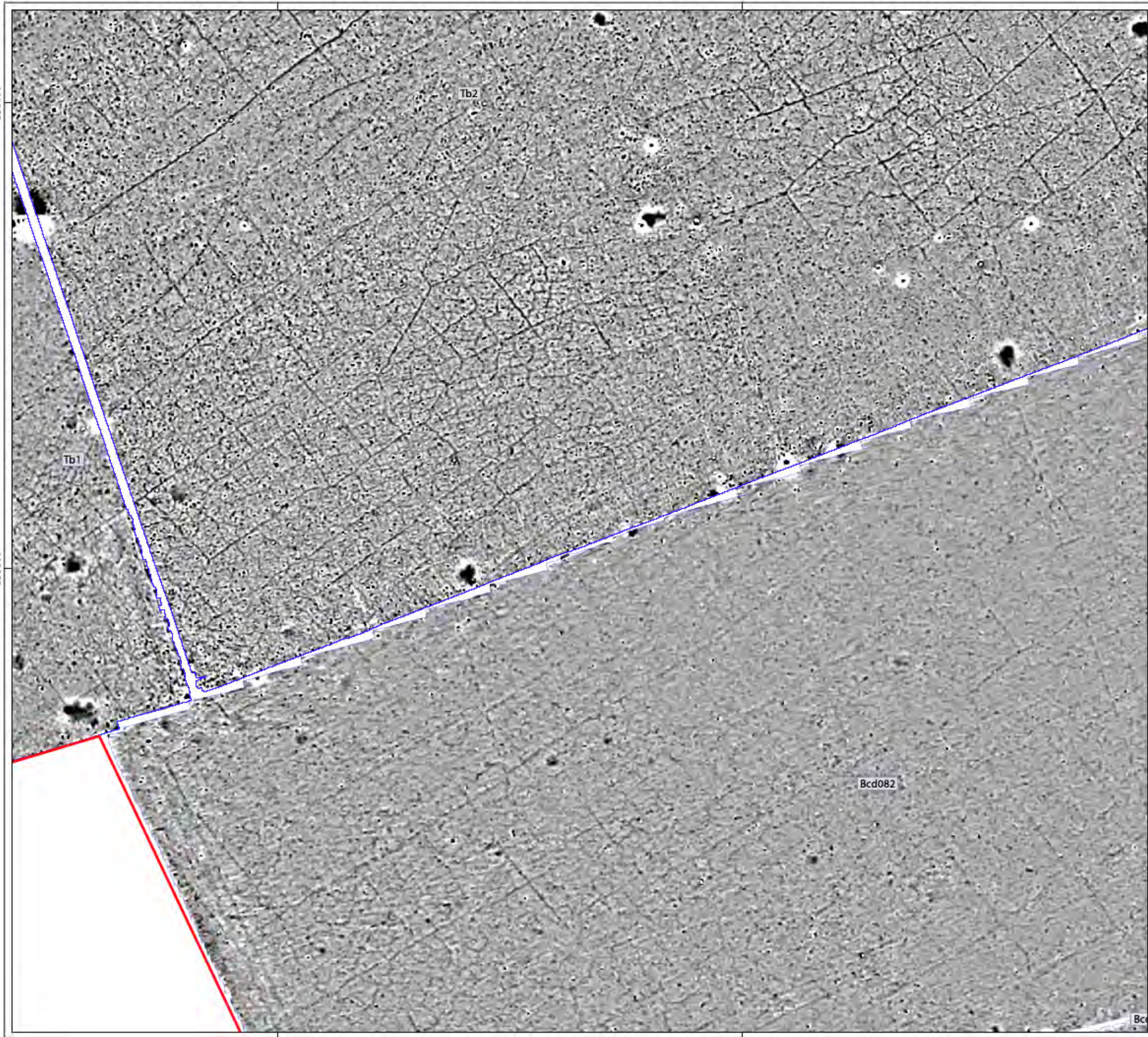


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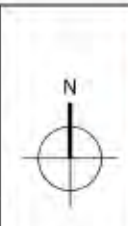


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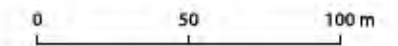
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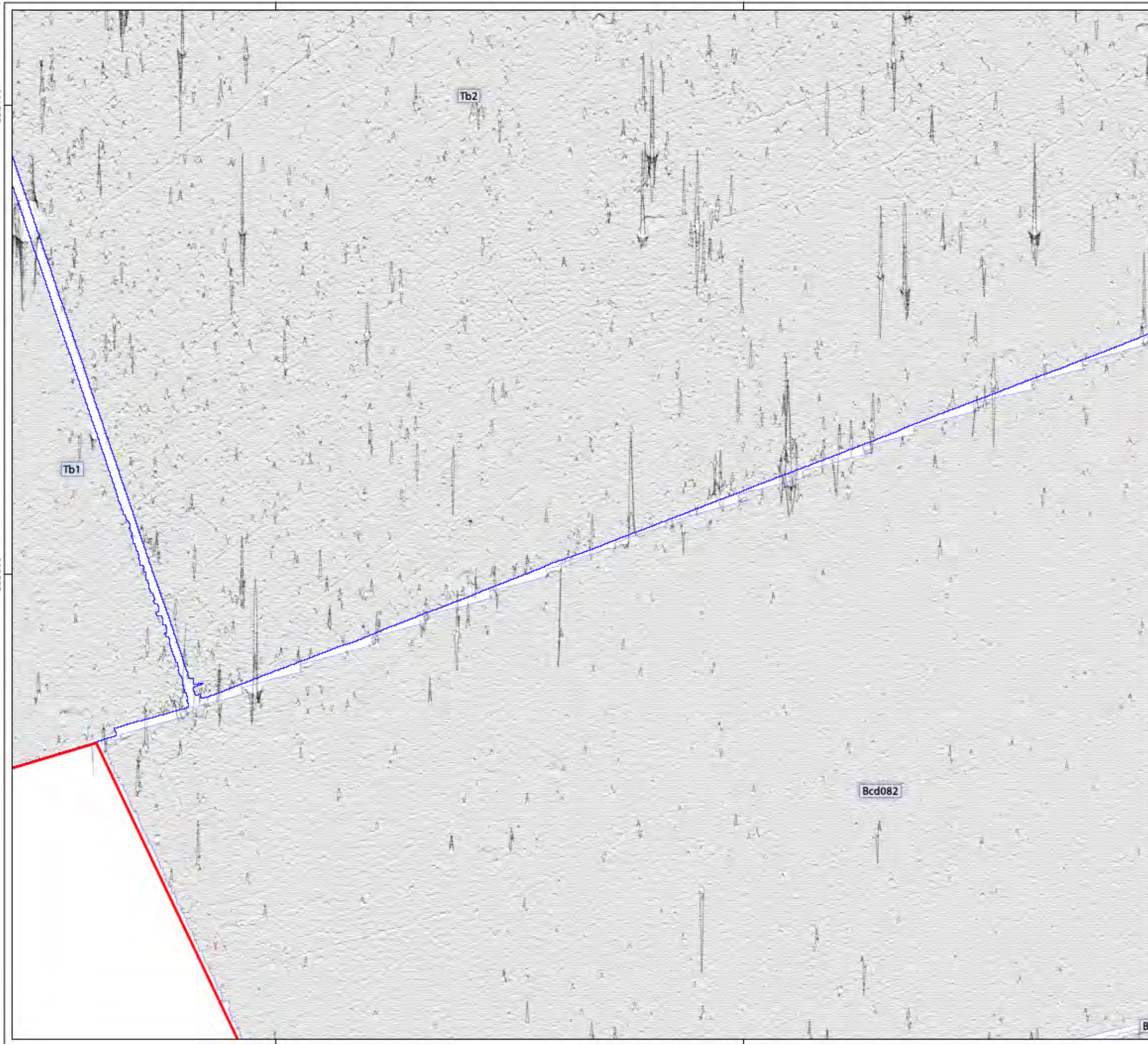
Key

- Geophysical Survey Area
- Survey Extent



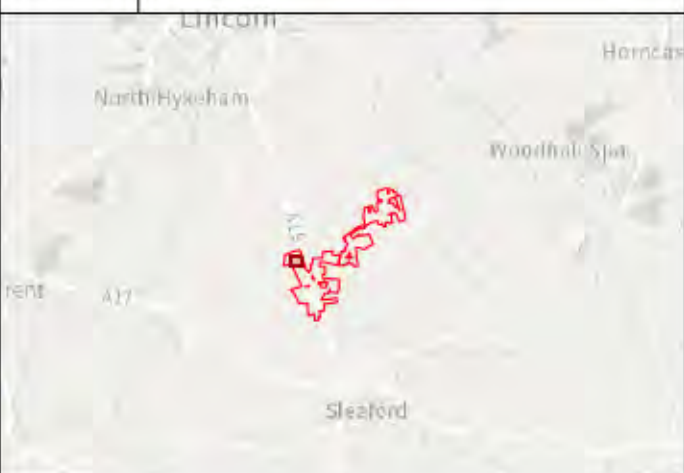
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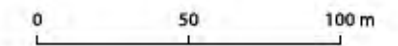


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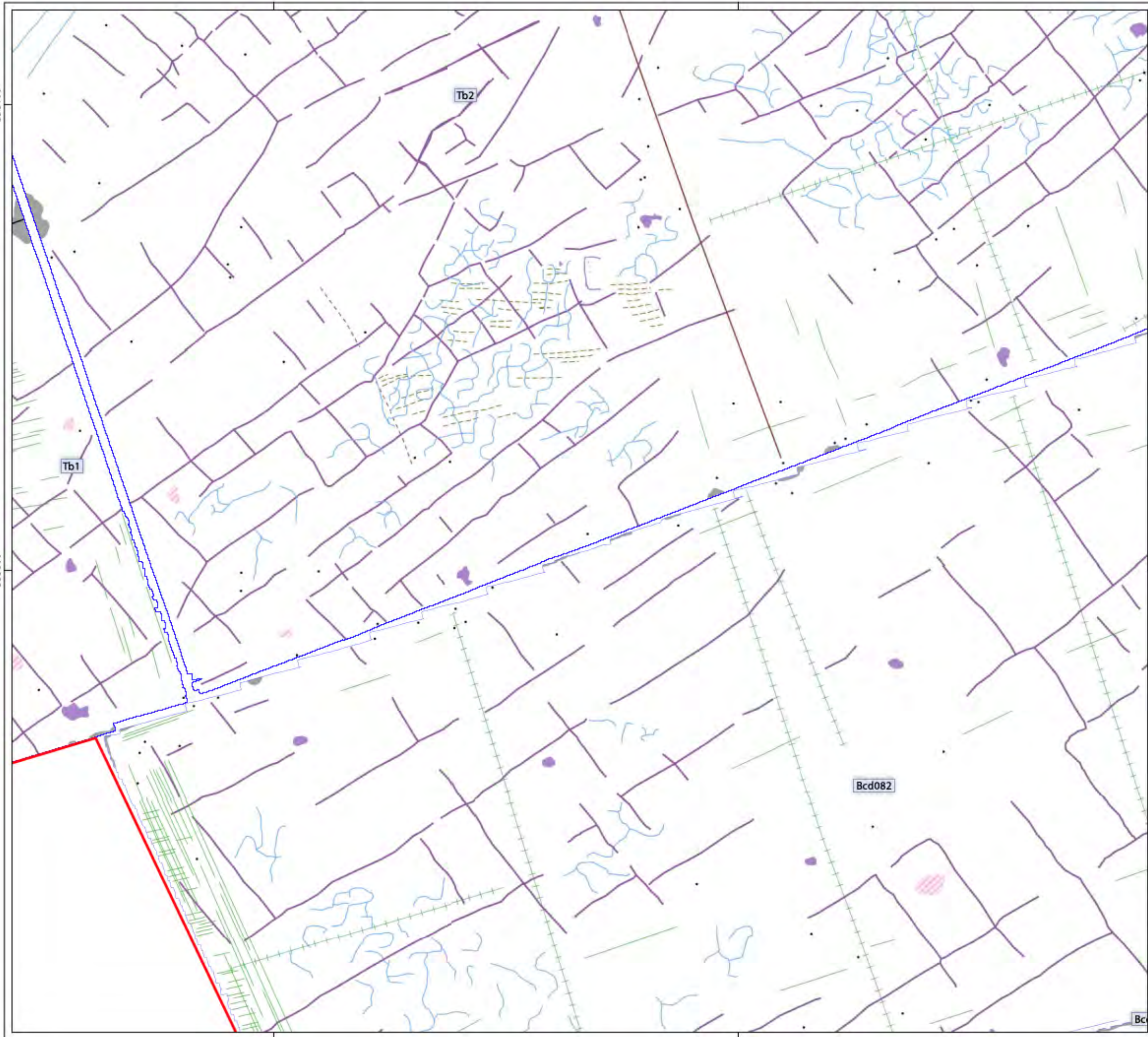
- Key**
- Geophysical Survey Area
 - Survey Extent
 - XY Trace (25nT/cm)



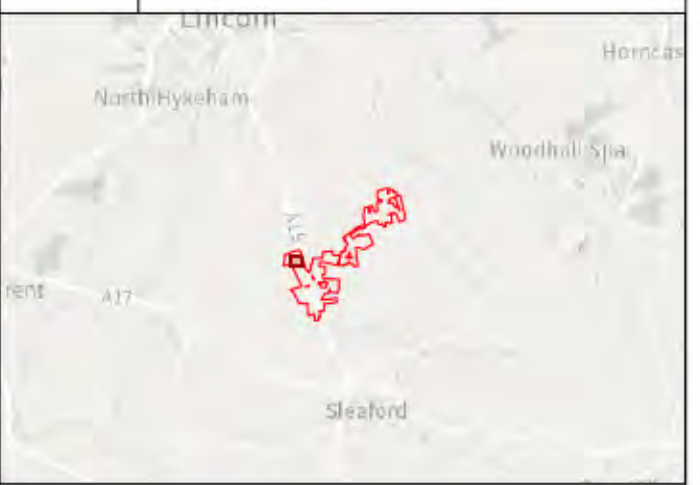
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501900 502200




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Key

- Geophysical Survey Area
- Survey Extent

Interpretation

- Ferrous Objects
- Agriculture
- Field Boundary
- Possible Field Boundary
- Field Drain
- Natural
- Pipe
- Ridge and Furrow
- Field System
- Magnetic Disturbance
- Quarry
- Uncertain

0 50 100 m

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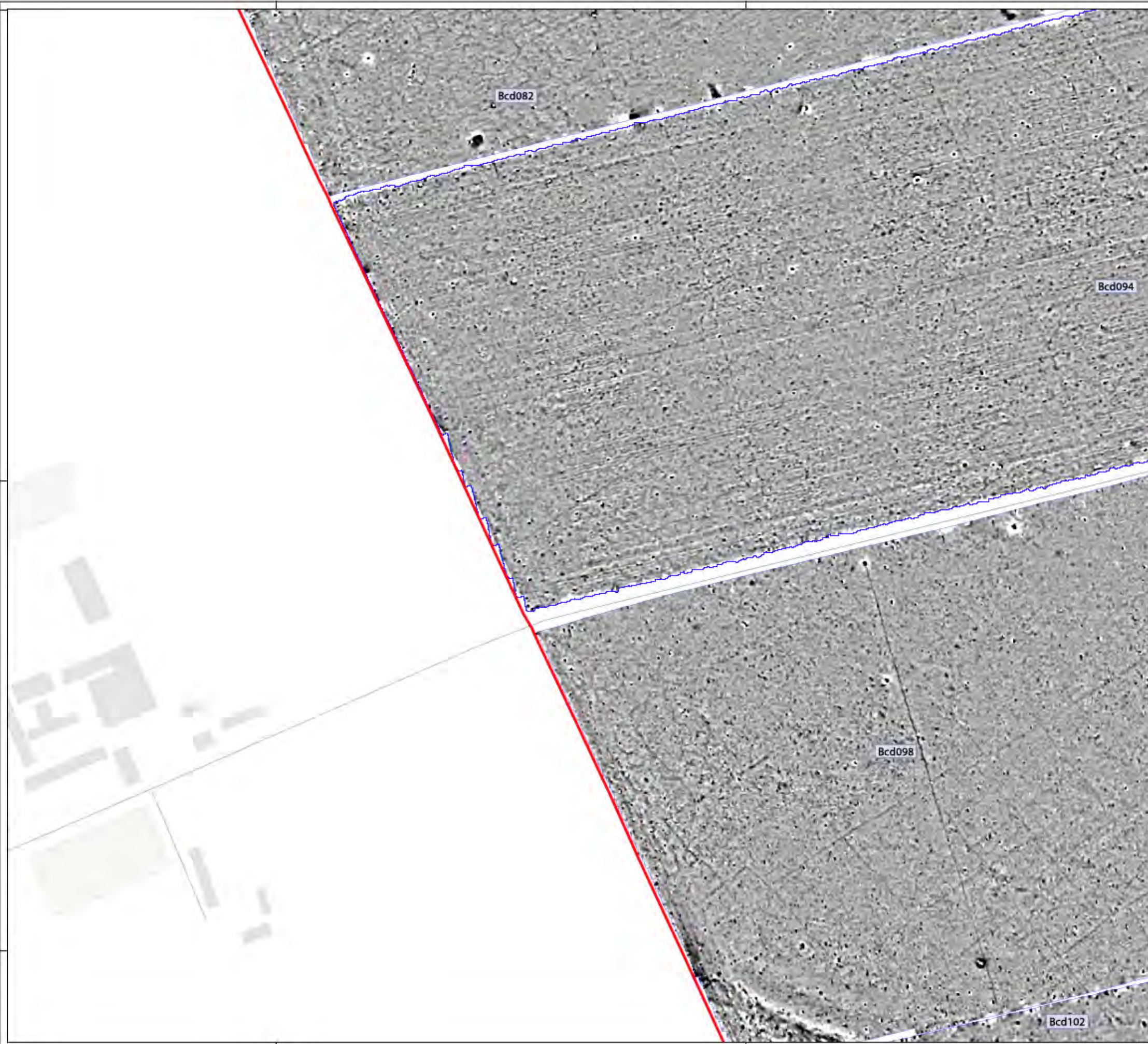
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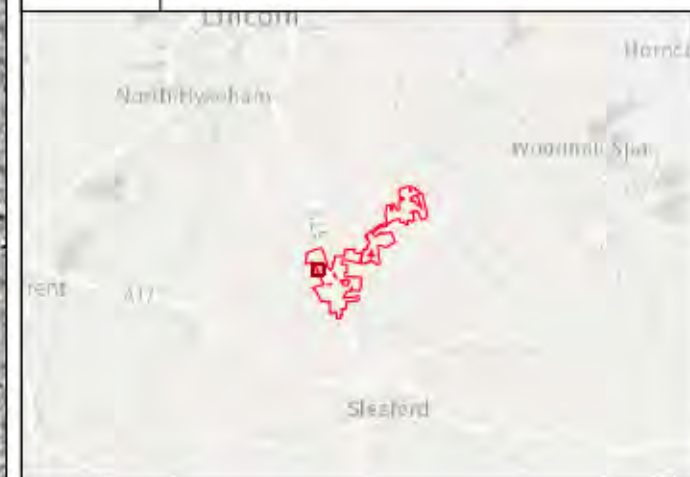
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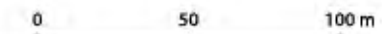
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Key

- Geophysical Survey Area
- Survey Extent



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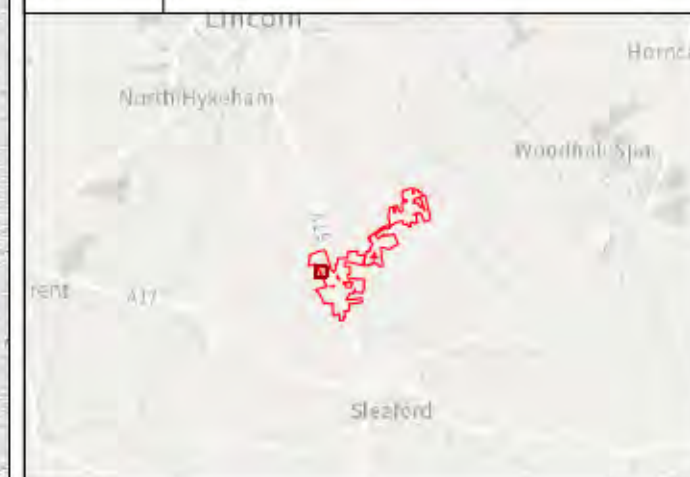
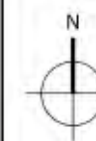
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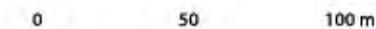
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Key

- ▭ Geophysical Survey Area
- ▭ Survey Extent
- XY Trace (25nT/cm)



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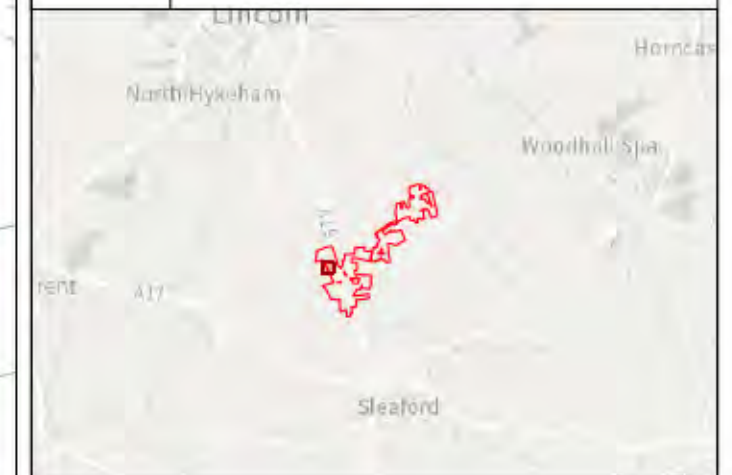
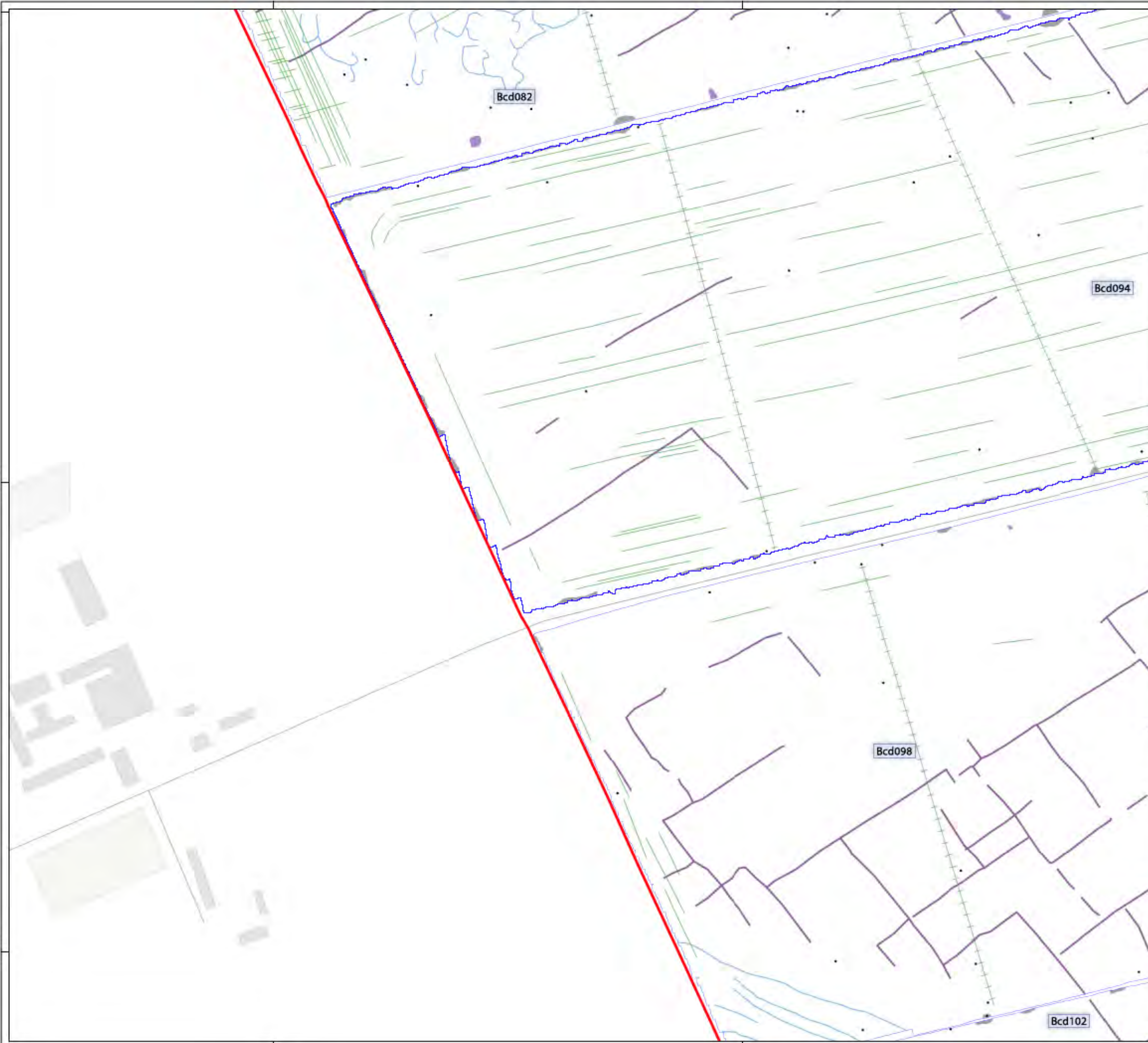
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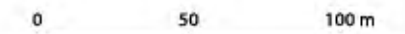
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Key

- Geophysical Survey Area
- Survey Extent
- Interpretation**
- Ferrous Objects
- Agriculture
- + Field Drain
- Natural
- Field System
- Magnetic Disturbance
- Uncertain



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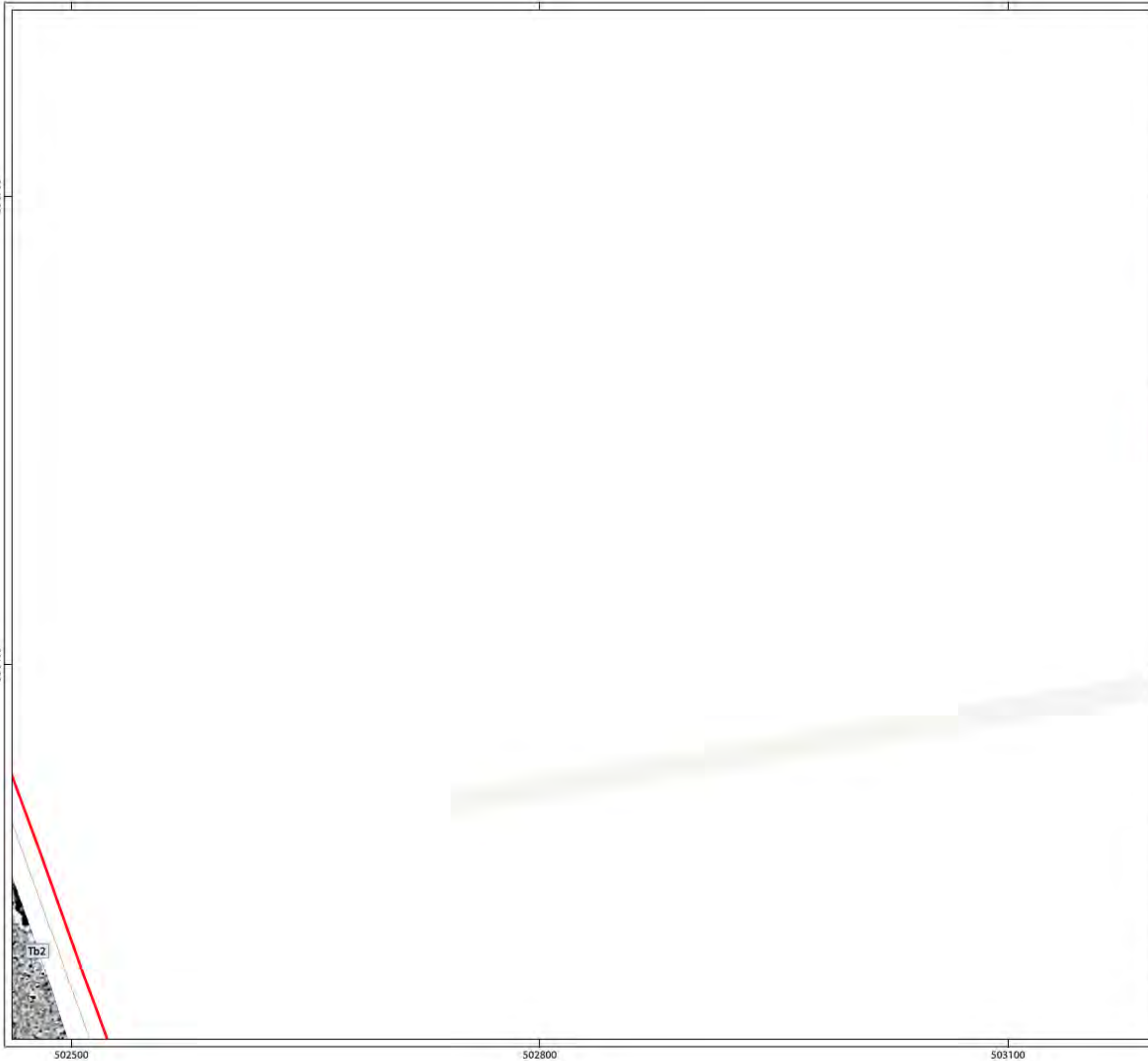
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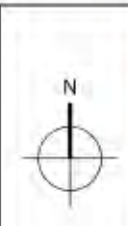
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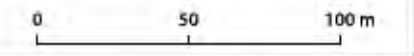
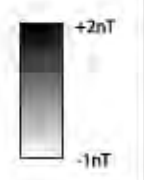
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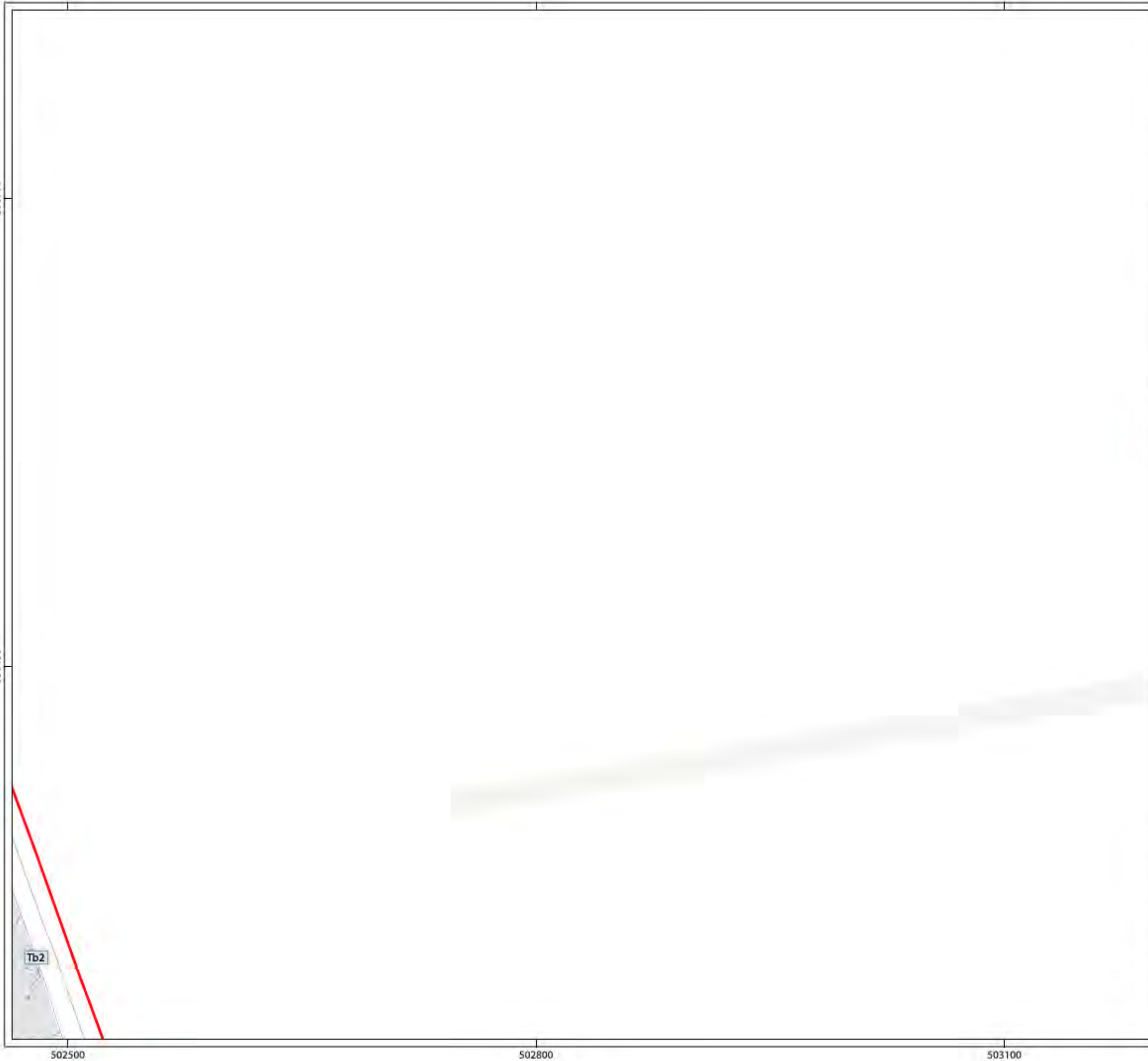
Key

- Geophysical Survey Area
- Survey Extent



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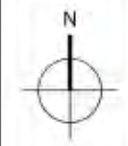
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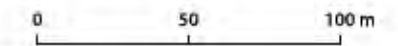
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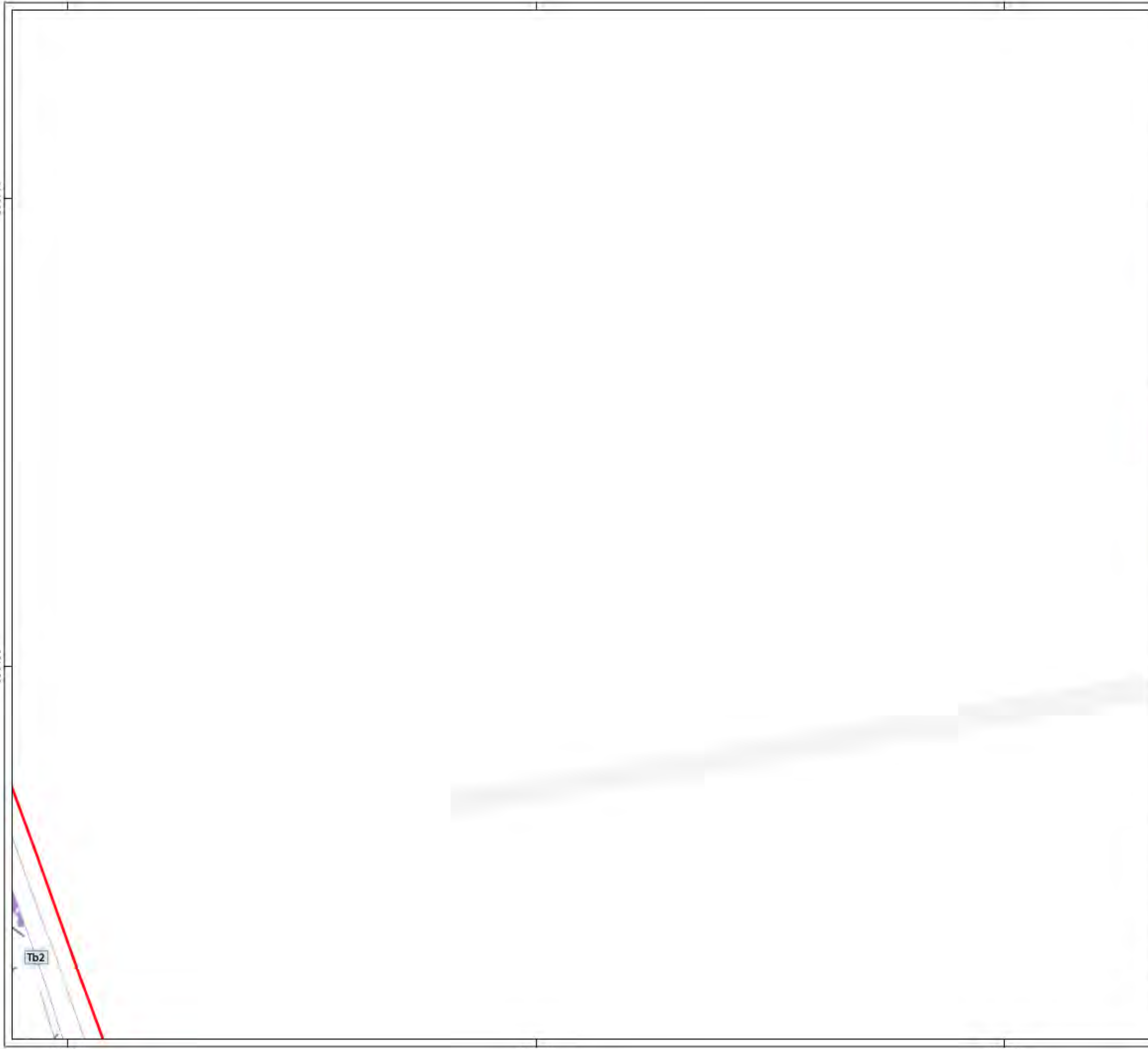
Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)



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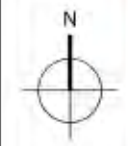
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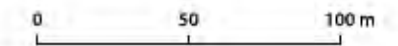
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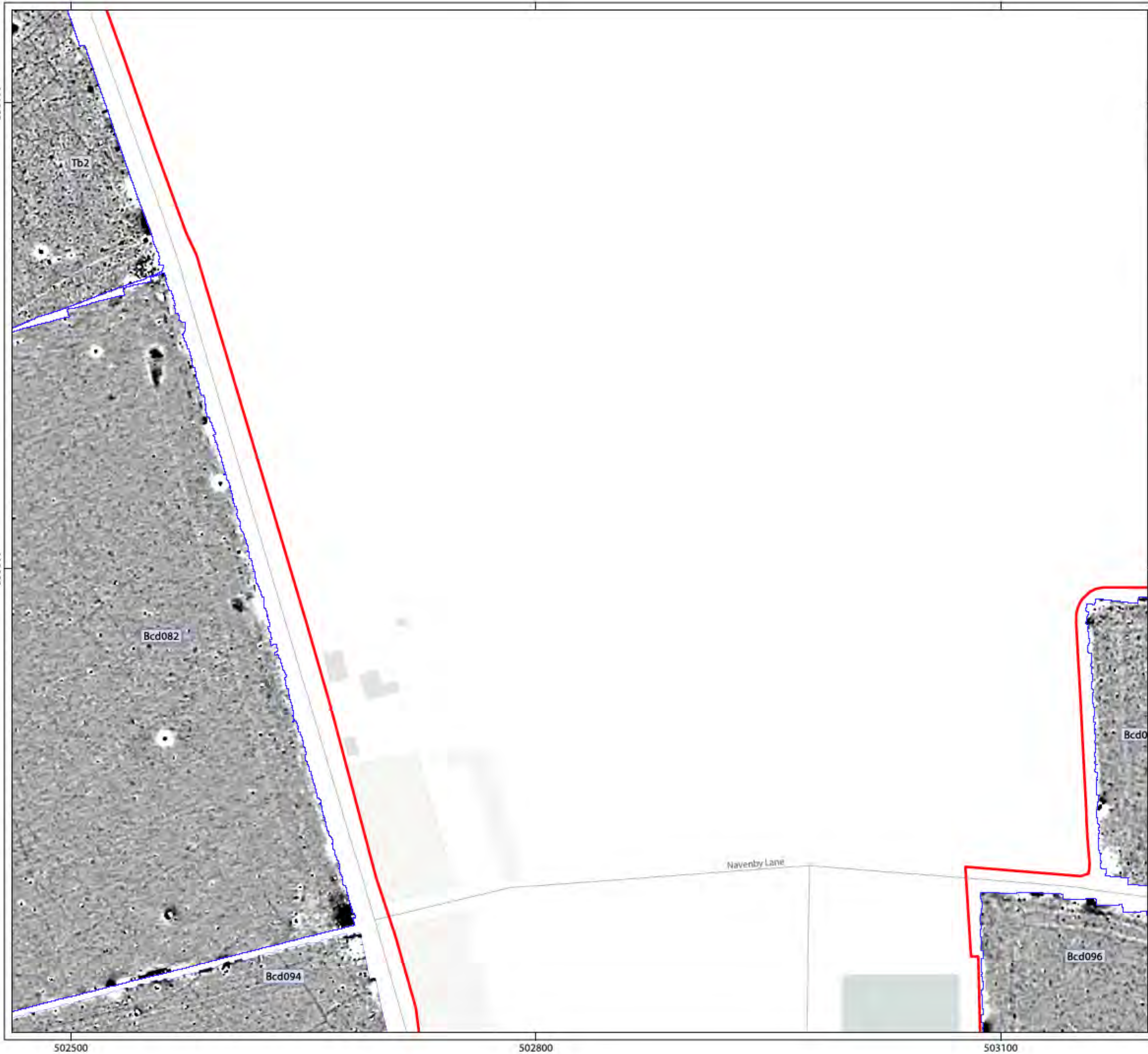
Key

- Geophysical Survey Area
- Survey Extent
- Interpretation**
- Agriculture
- Natural
- Field System
- Uncertain



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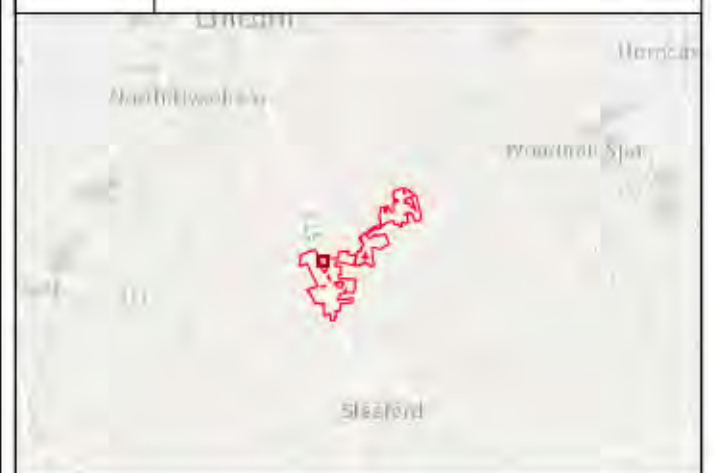
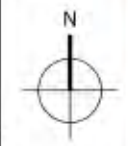
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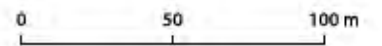
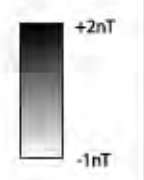
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Key

- Geophysical Survey Area
- Survey Extent

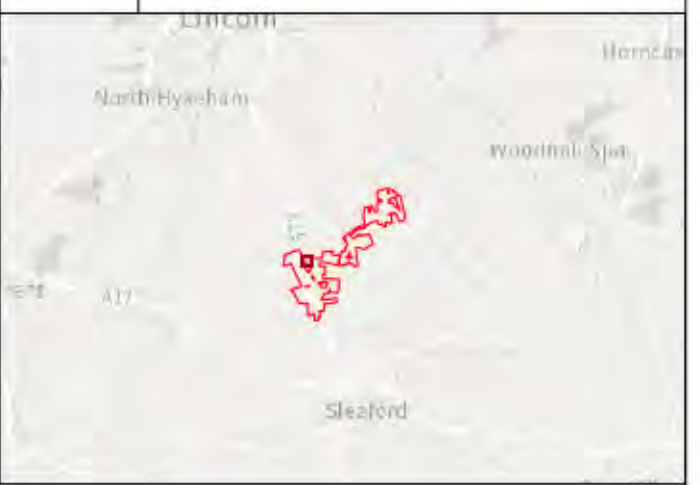


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Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)

0 50 100 m

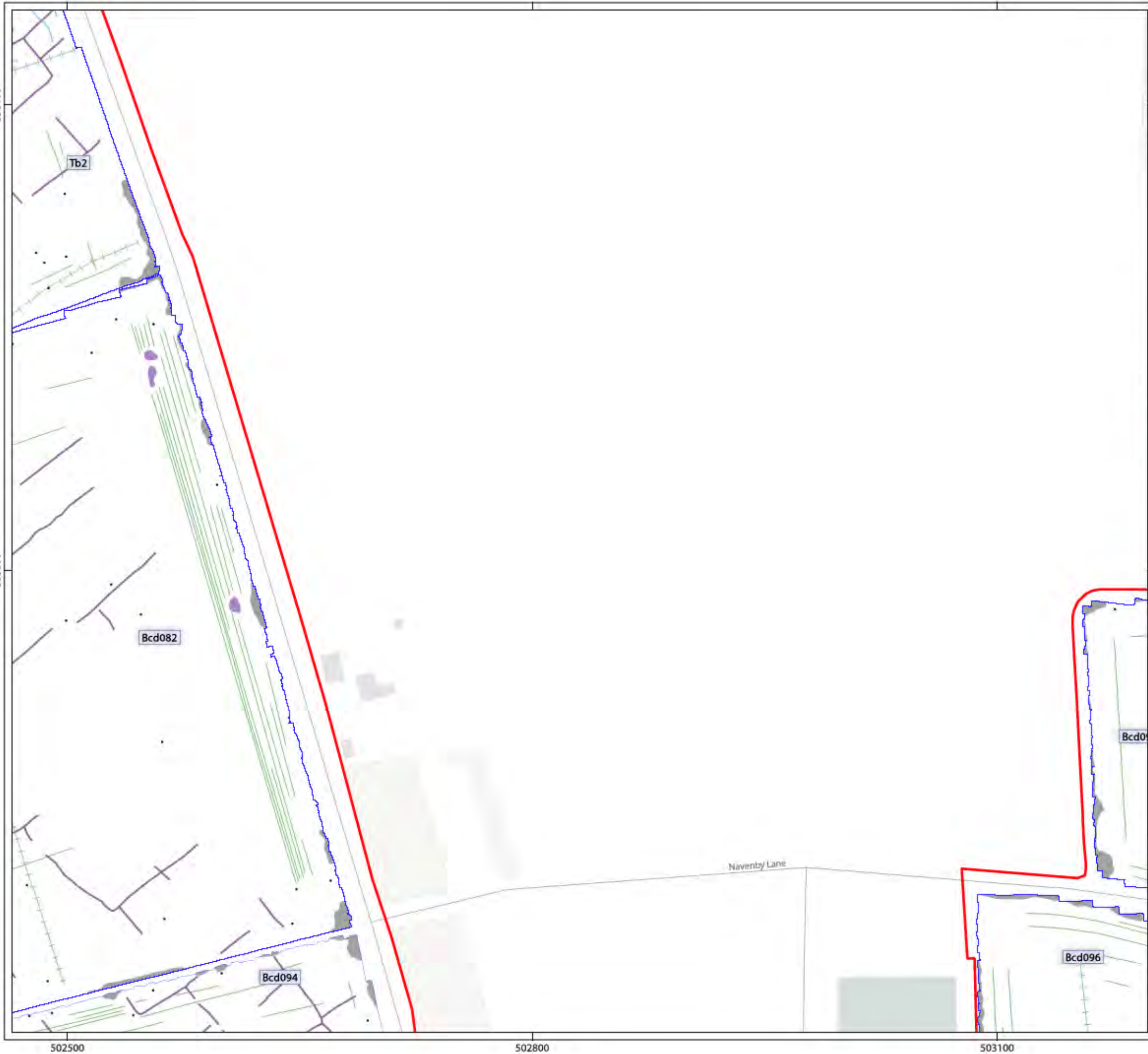
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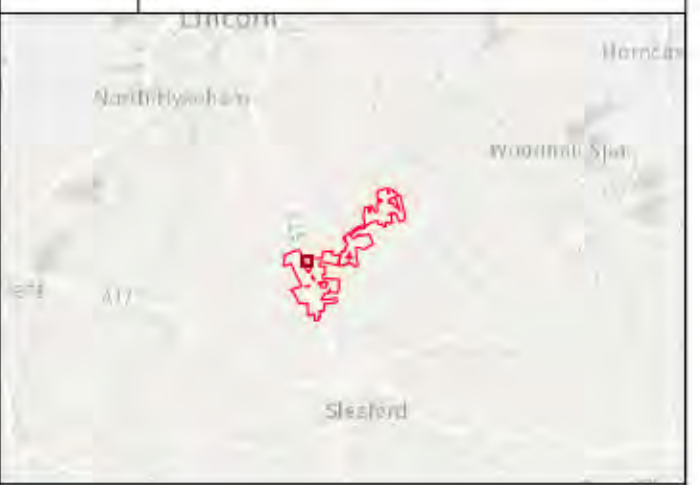
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Key

- Geophysical Survey Area
- Survey Extent

Interpretation

- Ferrous Objects
- Agriculture
- Field Drain
- Natural
- Field System
- Magnetic Disturbance
- Uncertain

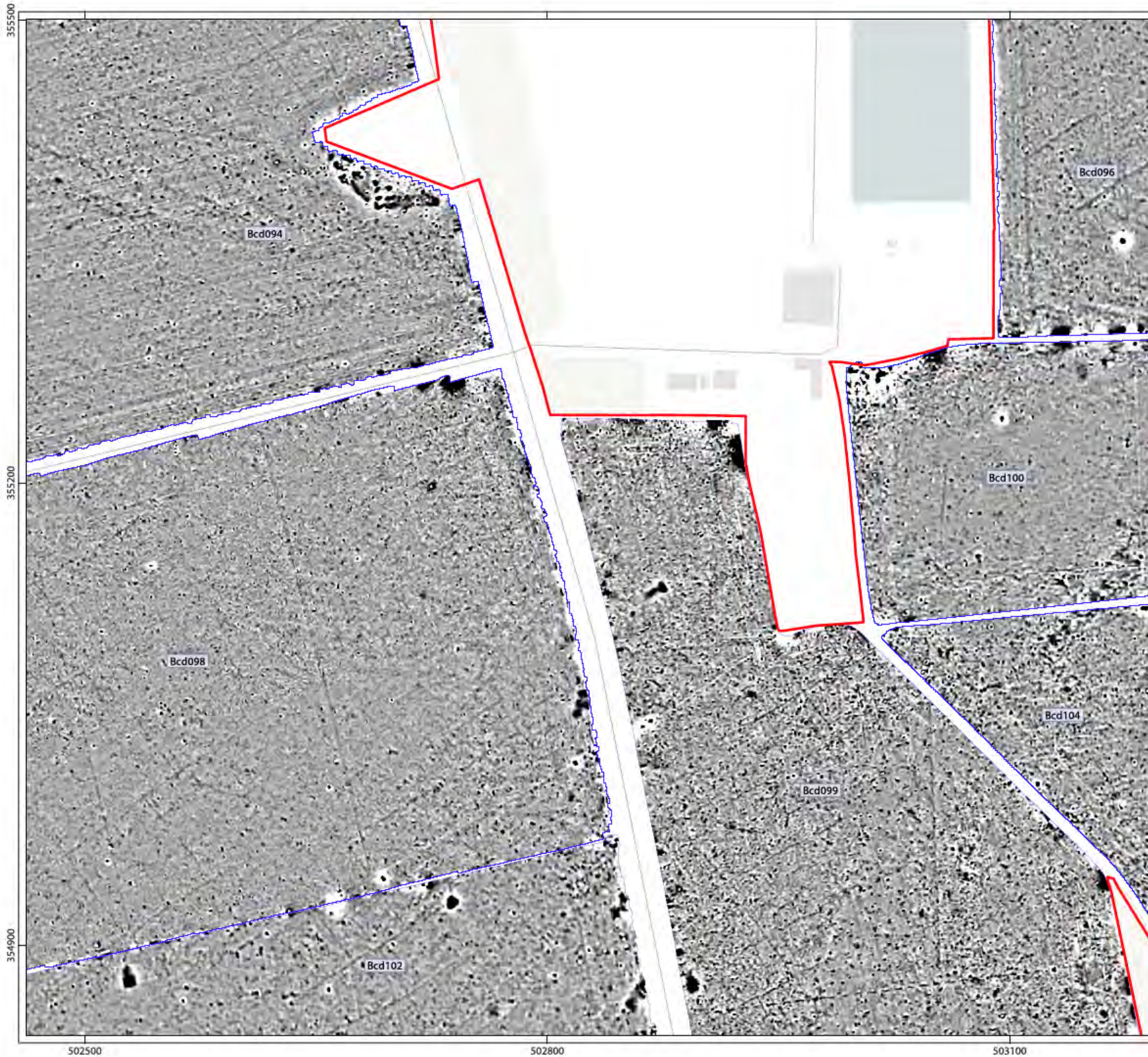
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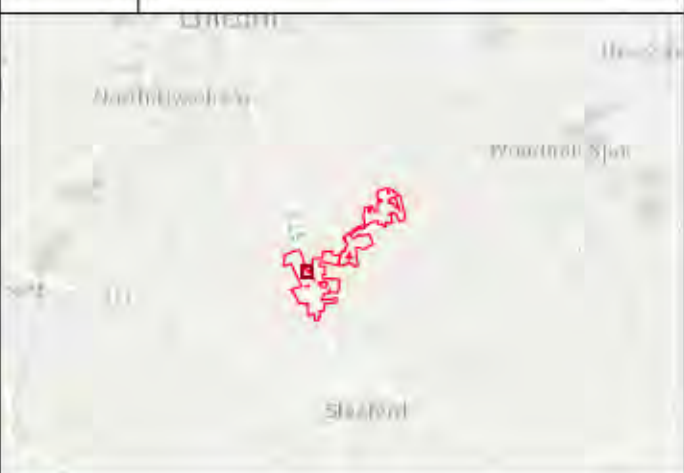
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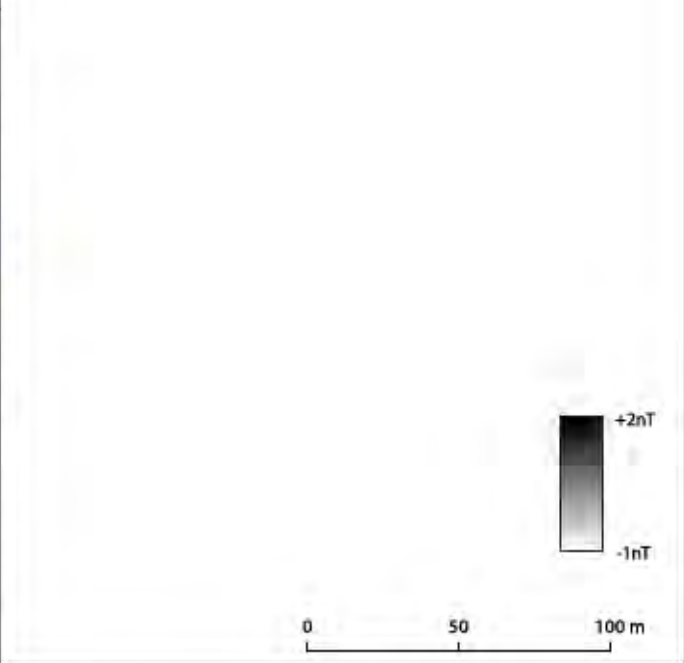



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Key

- Geophysical Survey Area
- Survey Extent



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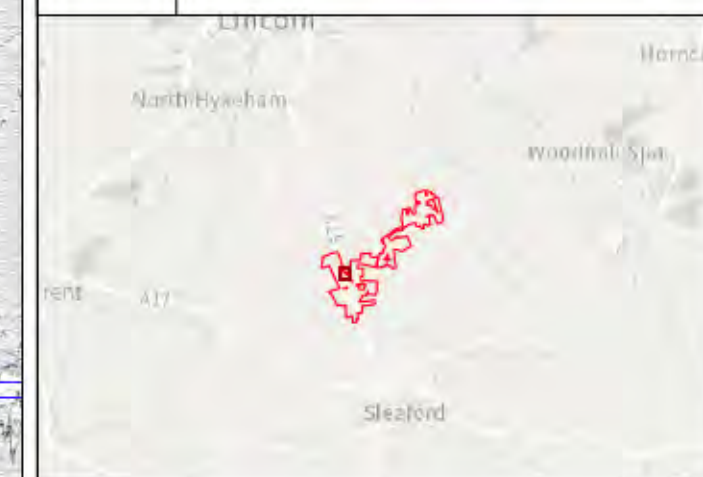
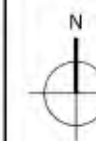
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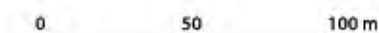
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Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)



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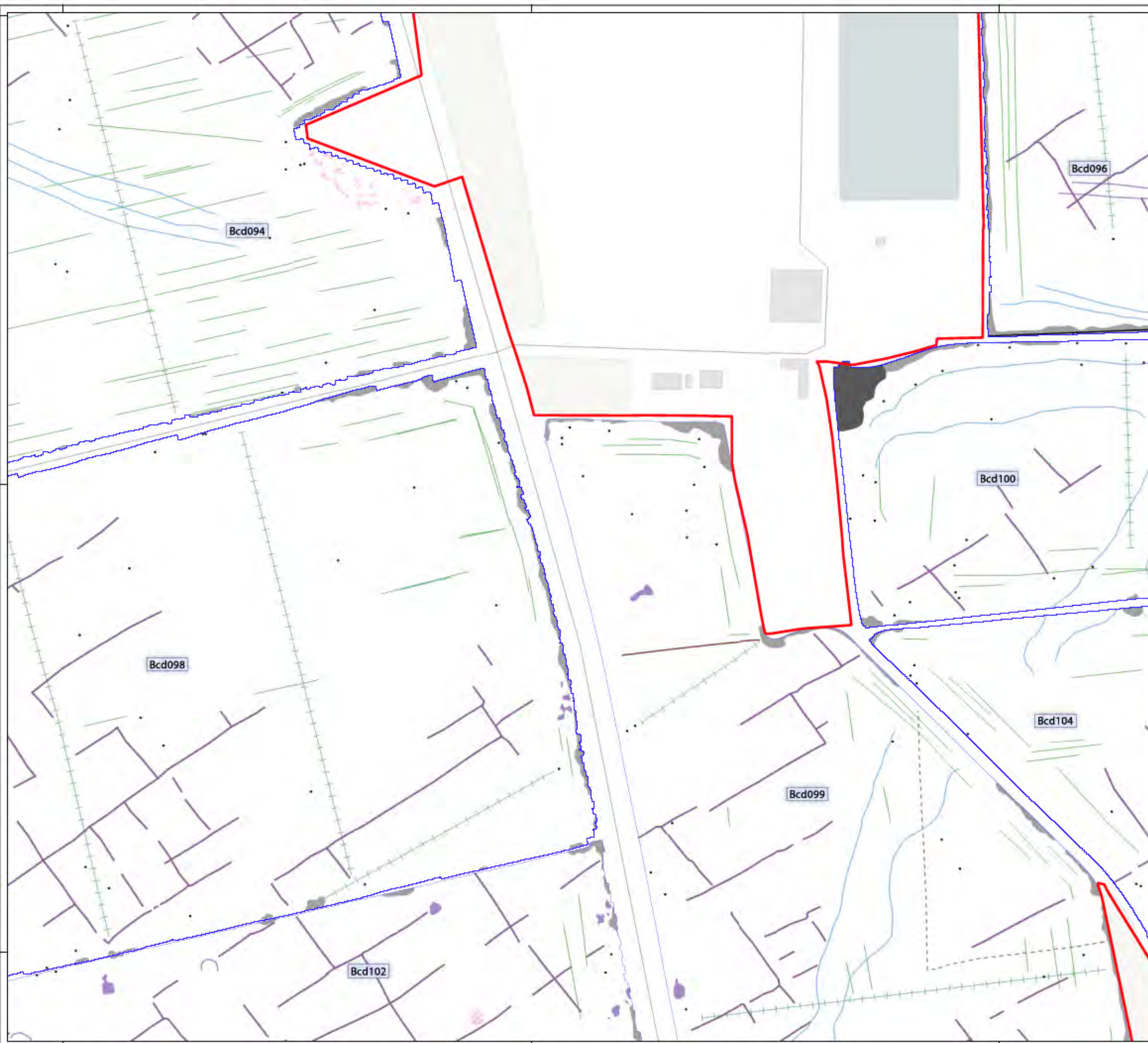
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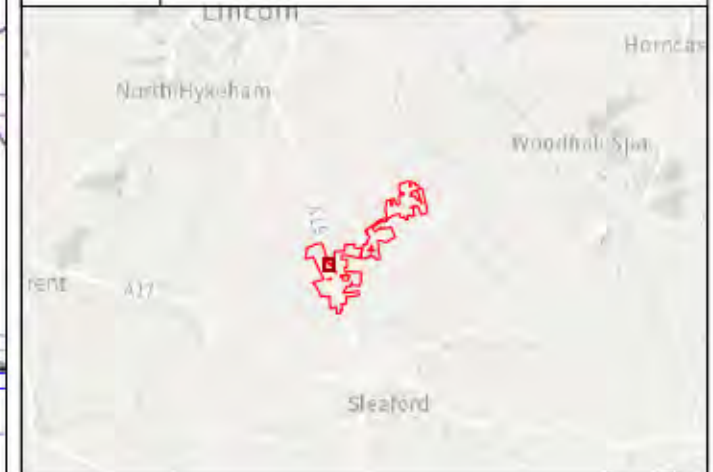
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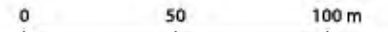
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Key

- Geophysical Survey Area
- Survey Extent
- Interpretation**
- Ferrous Objects
- Agriculture
- Field Boundary
- Possible Field Boundary
- Field Drain
- Natural
- Pipe
- Uncertain
- Field System
- Magnetic Disturbance
- Quarry
- Uncertain
- Former Building



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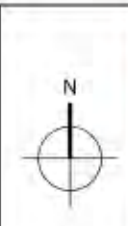


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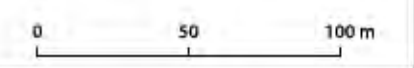
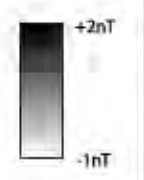
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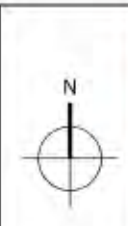
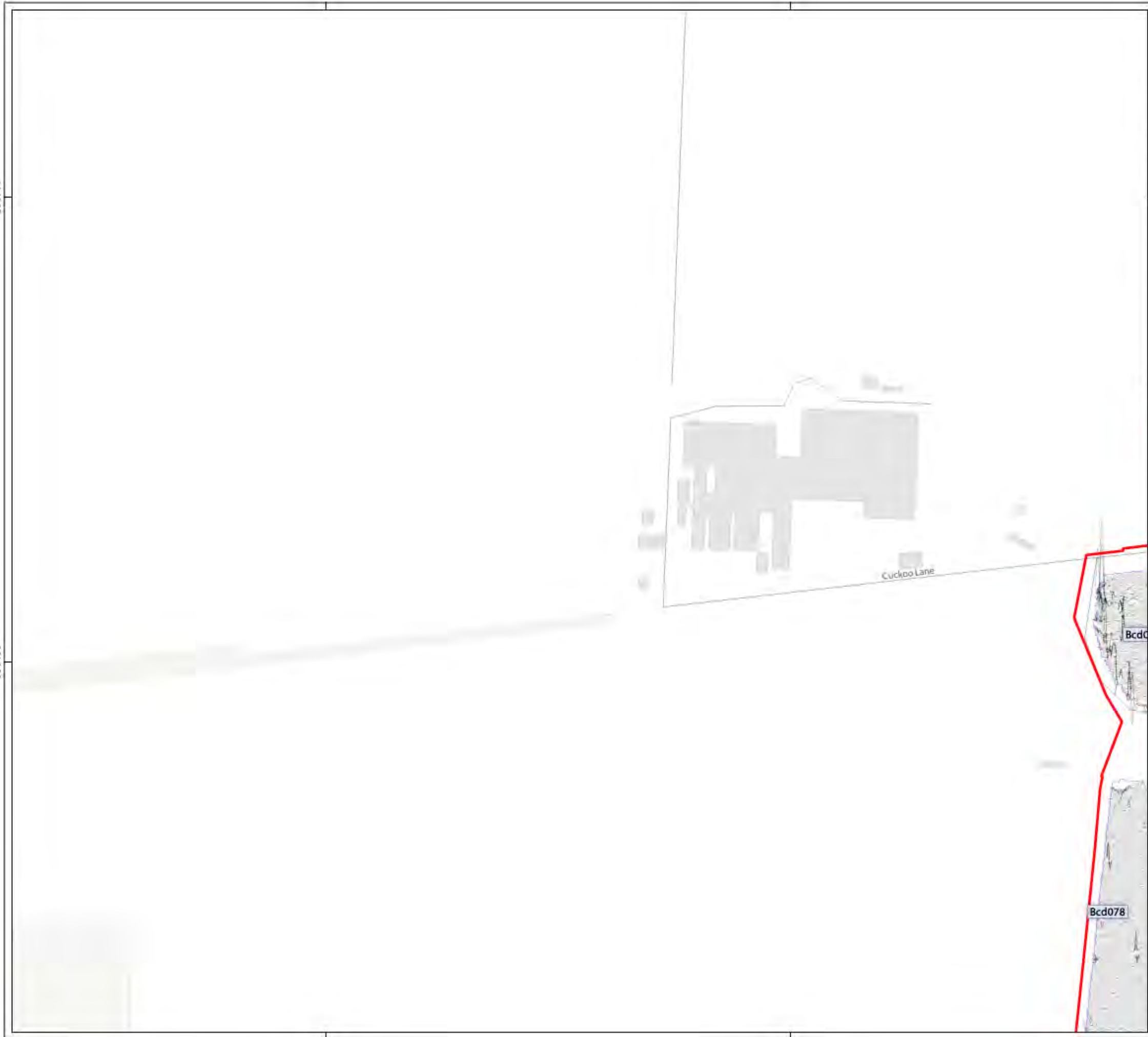
Key

- Geophysical Survey Area
- Survey Extent

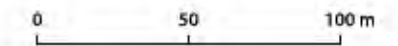


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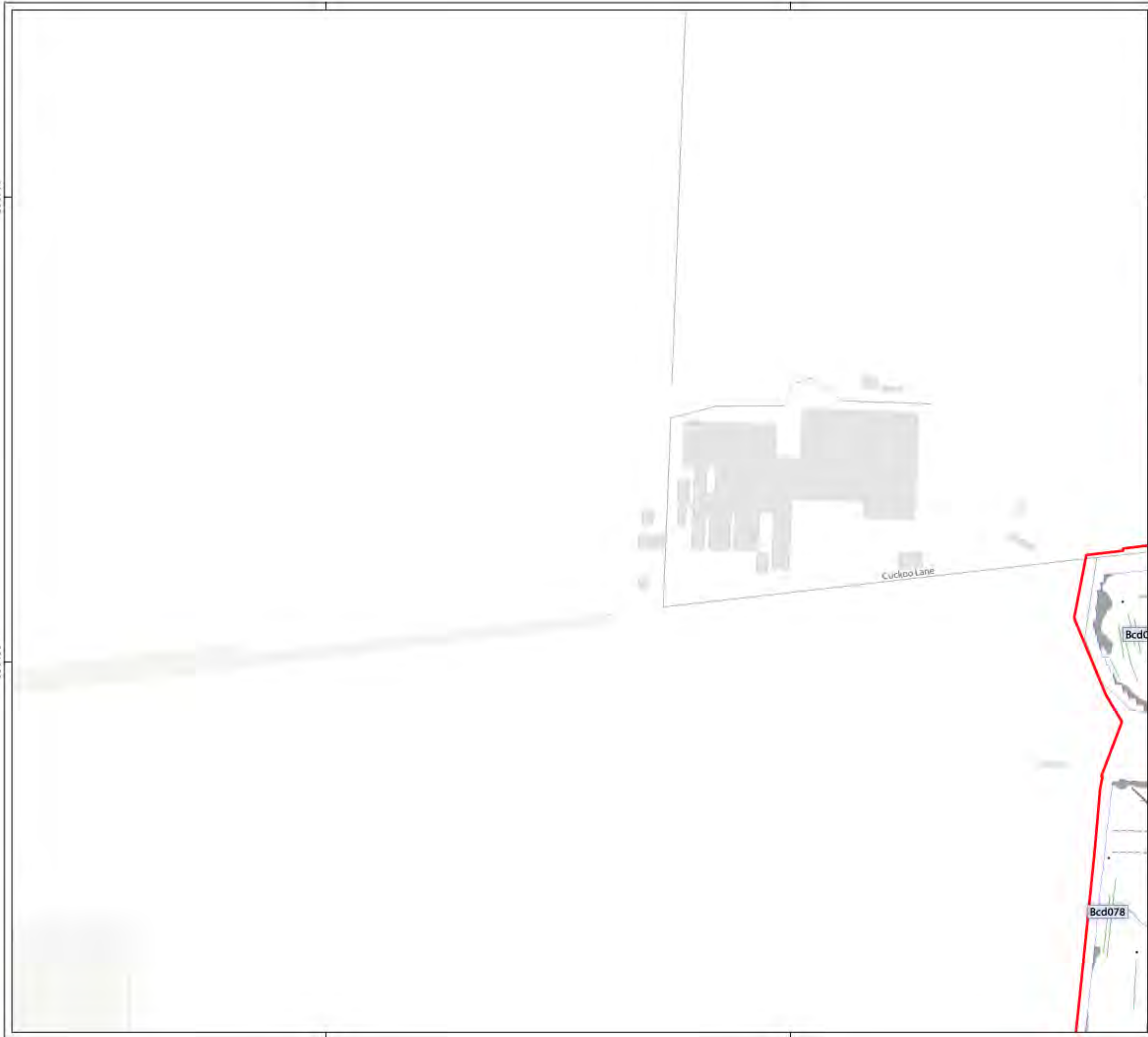
- Key**
- Geophysical Survey Area
 - Survey Extent
 - XY Trace (25nT/cm)



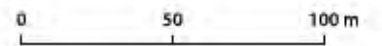
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- Key**
- Geophysical Survey Area
 - Survey Extent
- Interpretation**
- Ferrous Objects
 - Agriculture
 - Natural
 - Ridge and Furrow
 - Field System
 - Magnetic Disturbance

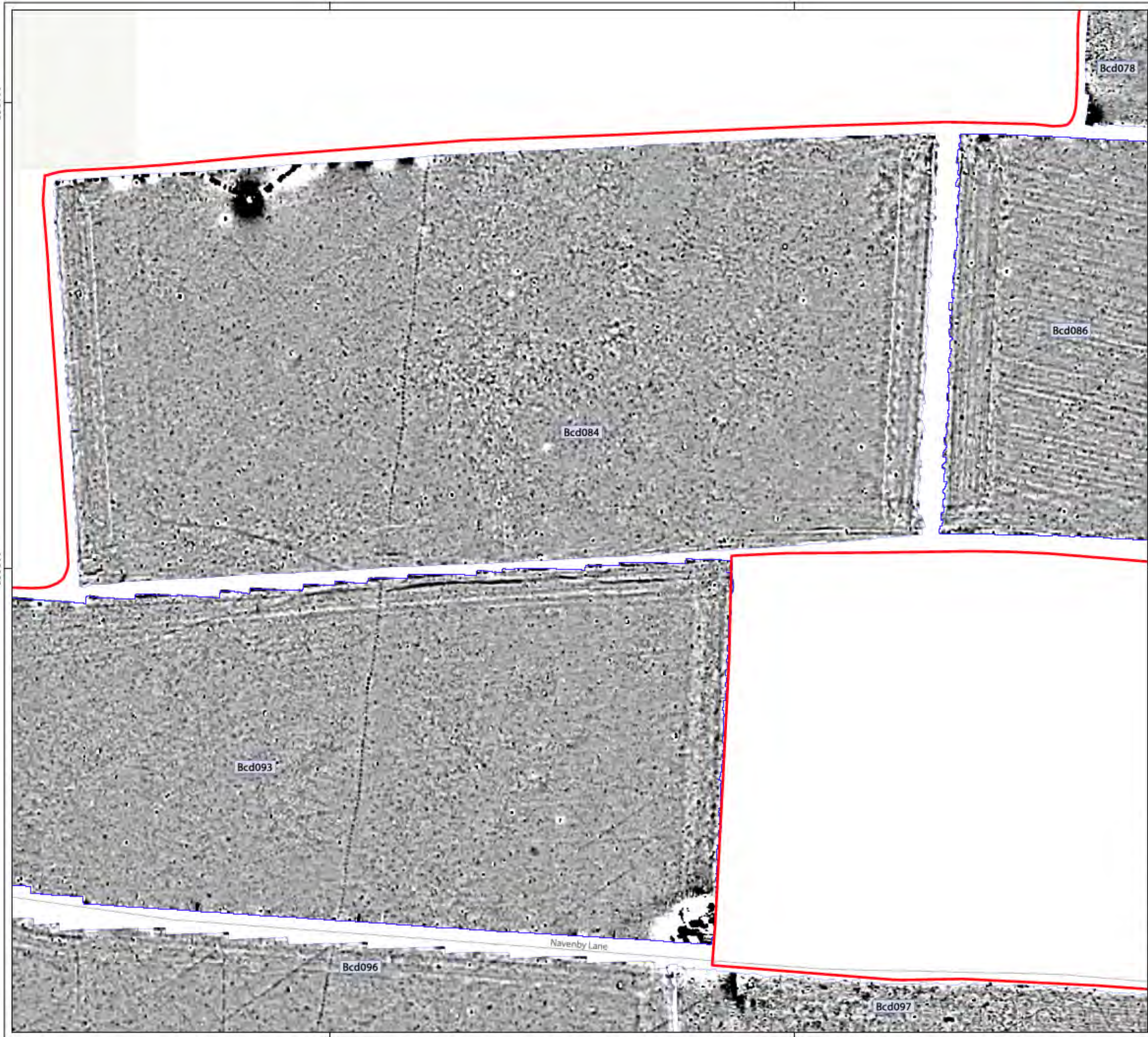


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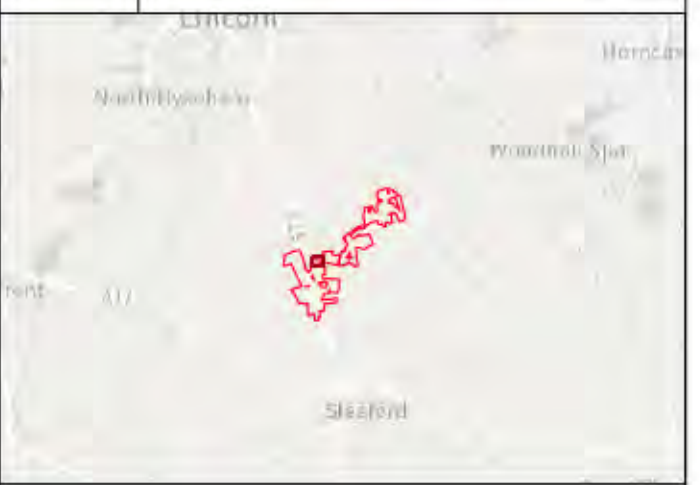
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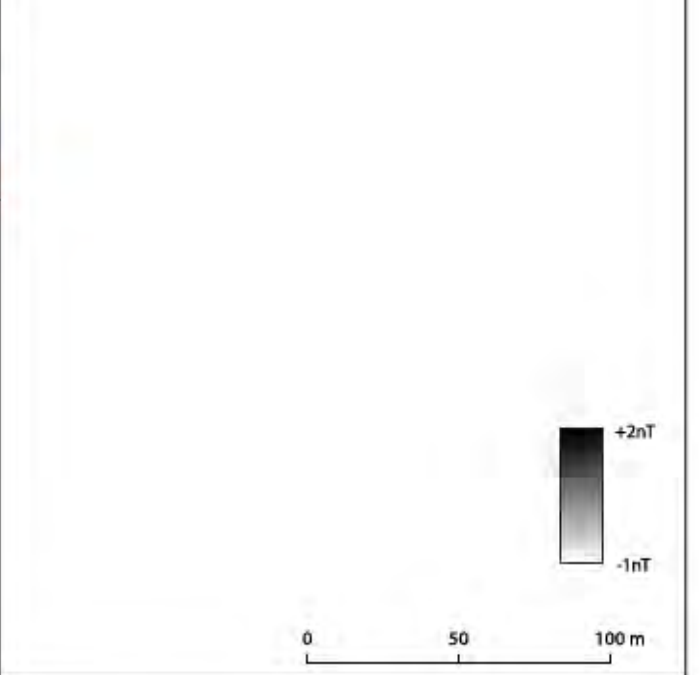



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Key

- Geophysical Survey Area
- Survey Extent

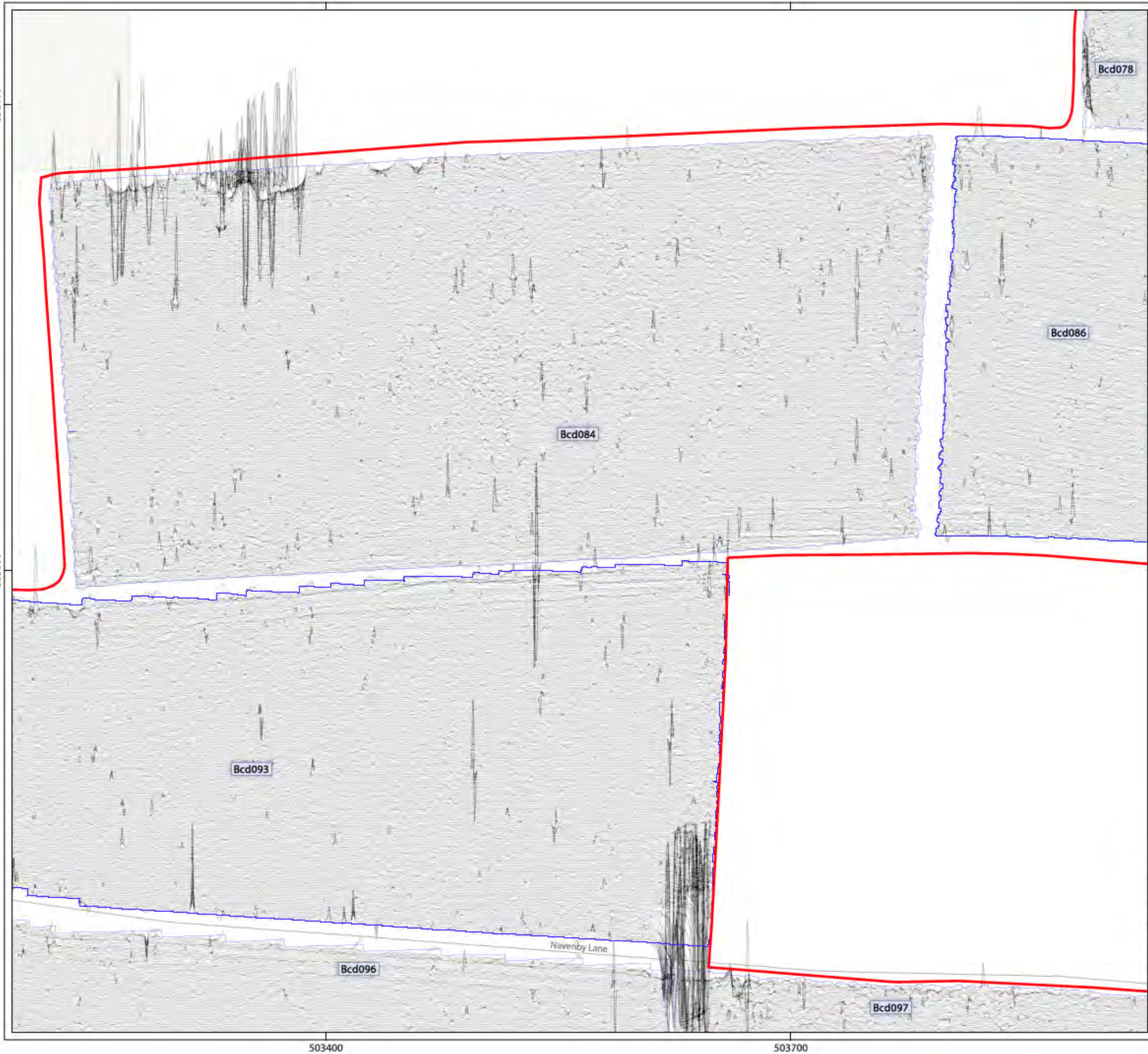


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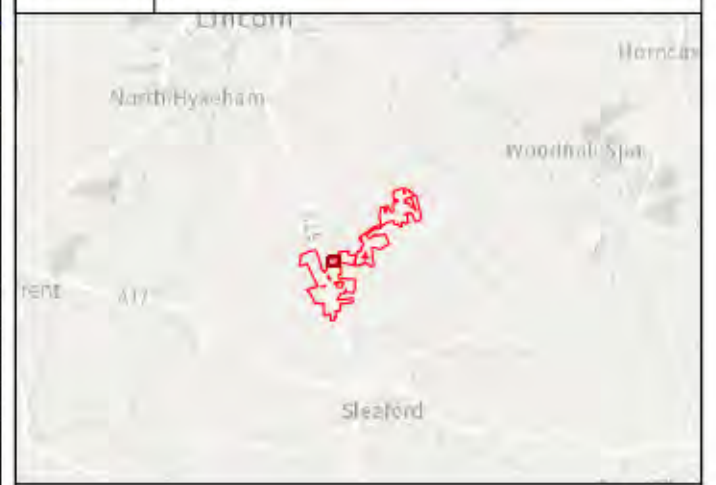
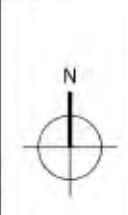


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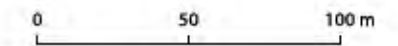
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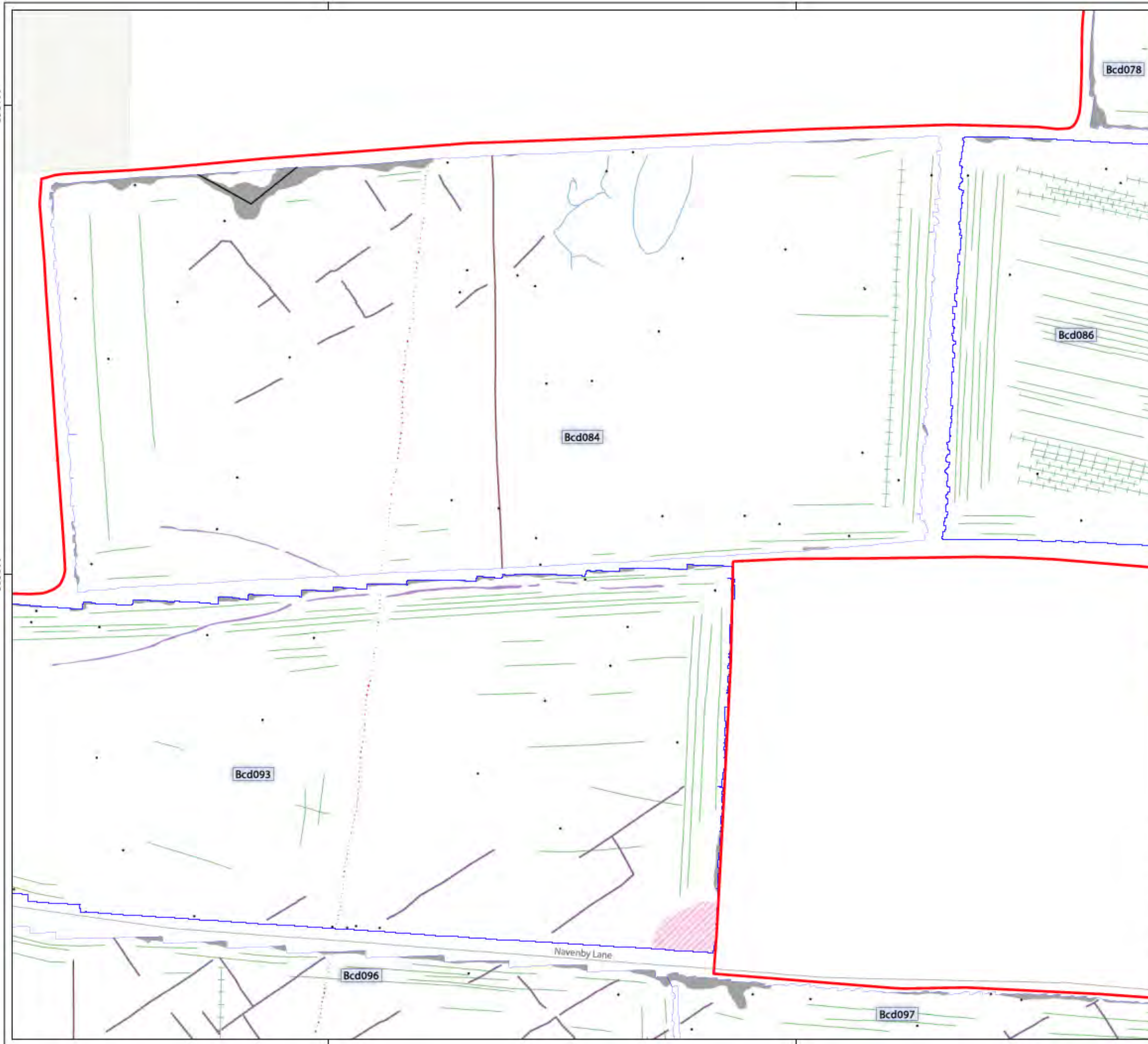
- ▭ Geophysical Survey Area
- ▭ Survey Extent
- XY Trace (25nT/cm)



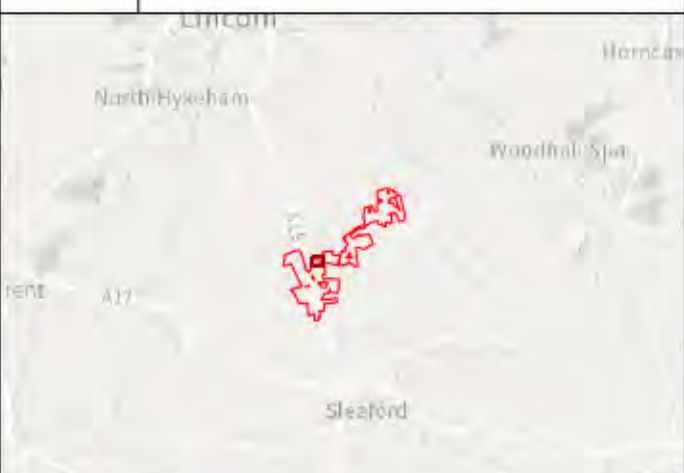
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Illus - 45 XY trace plot of minimally processed magnetometer data; Sector 1




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Key

- Geophysical Survey Area
- Survey Extent

Interpretation

- Ferrous Objects
- Agriculture
- Field Boundary
- Field Drain
- Natural
- Pipe
- Ridge and Furrow
- Field System
- Archaeology
- Magnetic Disturbance
- Quarry
- Uncertain

0 50 100 m

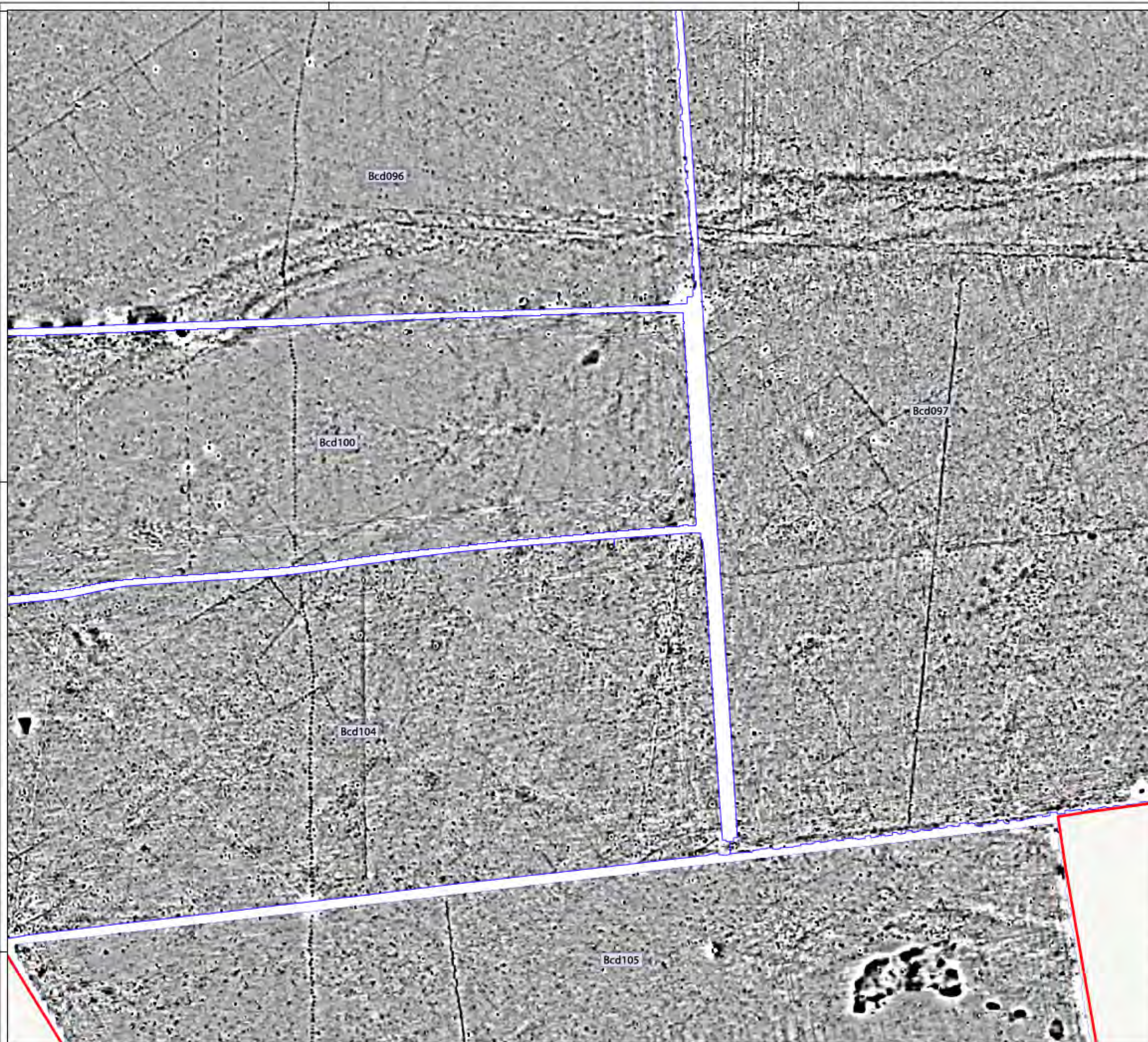
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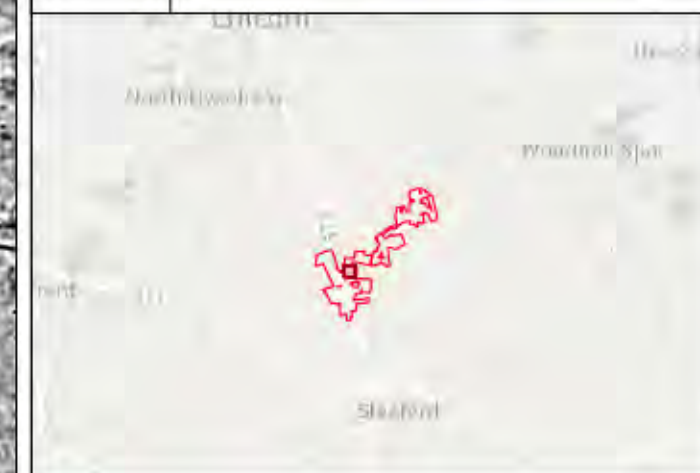
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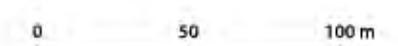
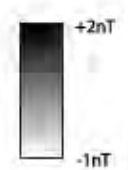
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Key

- Geophysical Survey Area
- Survey Extent



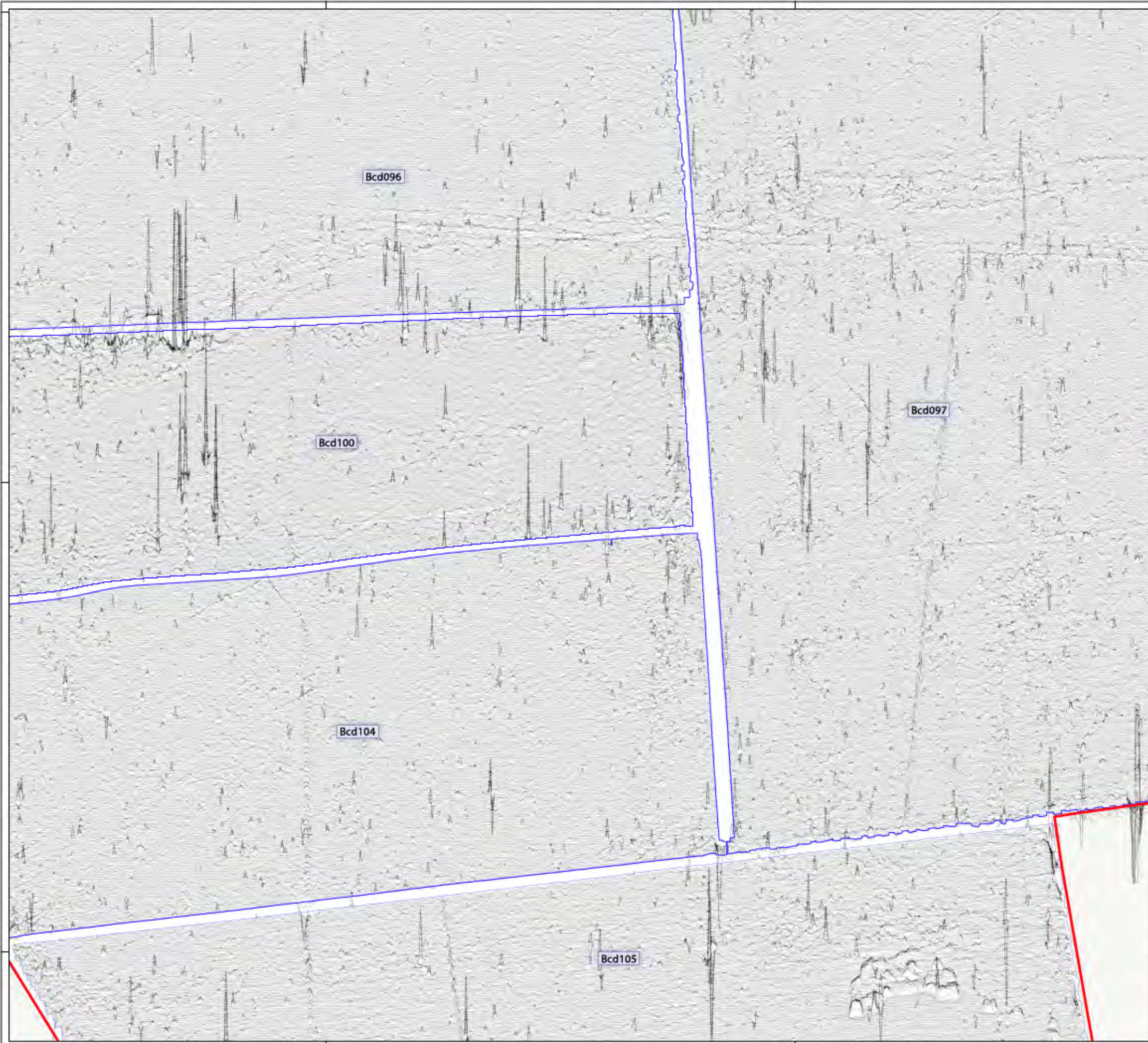
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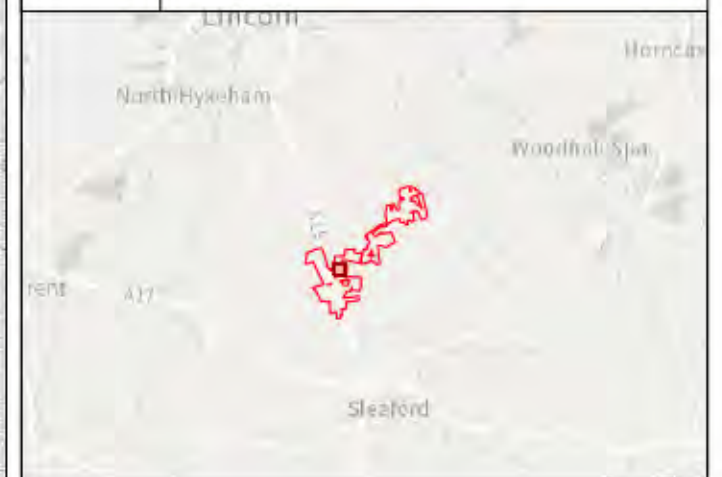
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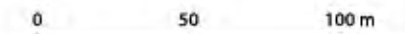
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Key

- ▭ Geophysical Survey Area
- ▭ Survey Extent
- XY Trace (25nT/cm)



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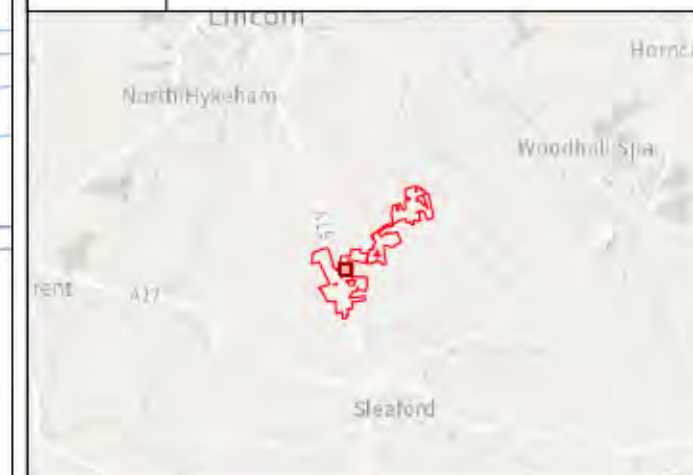
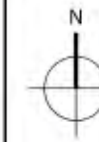
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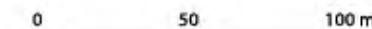


Key

- Geophysical Survey Area
- Survey Extent

Interpretation

- Ferrous Objects
- Agriculture
- Field Boundary
- Field Drain
- Natural
- Pipe
- Uncertain
- Ridge and Furrow
- Field System
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Uncertain
- Former Building

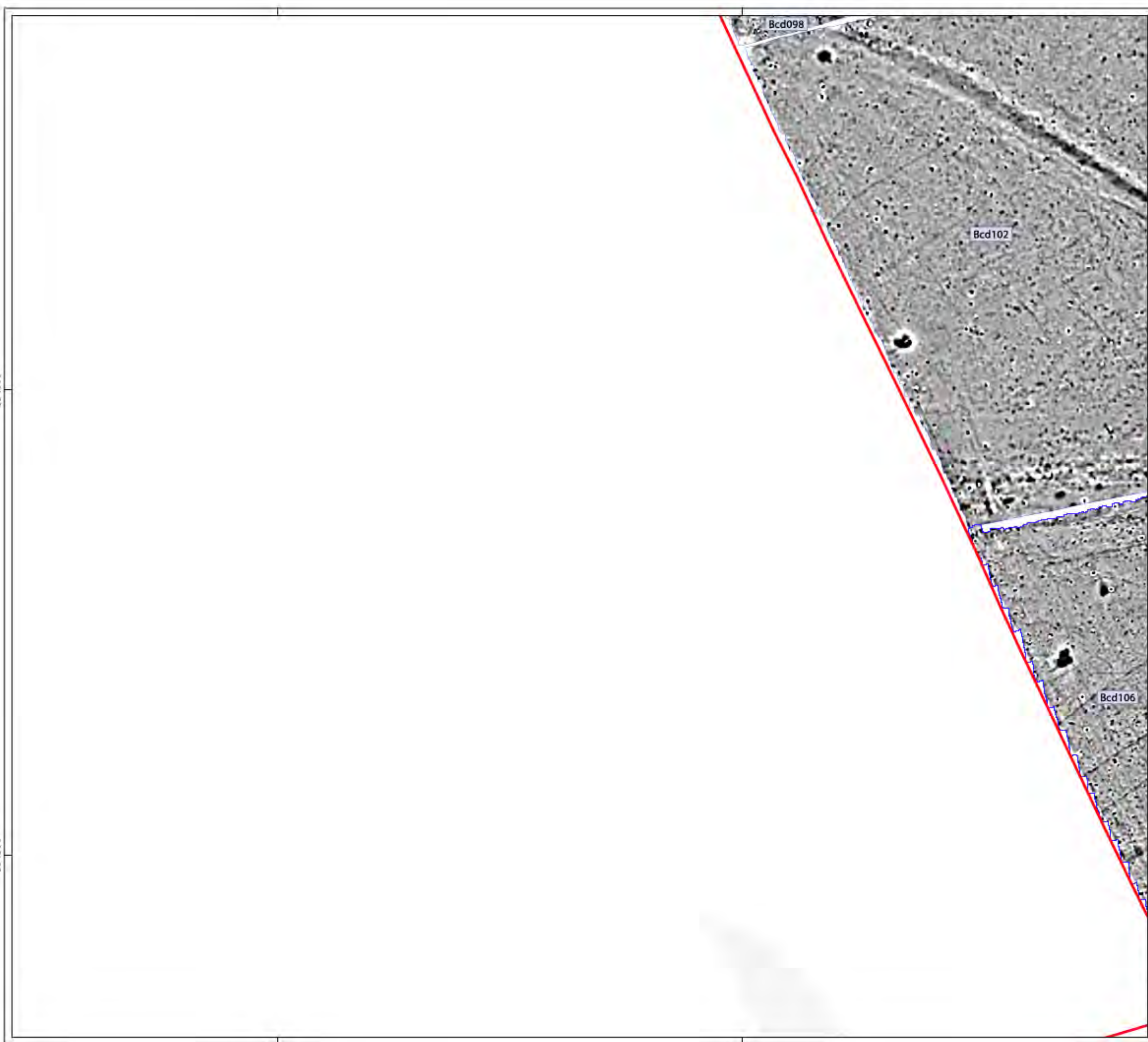


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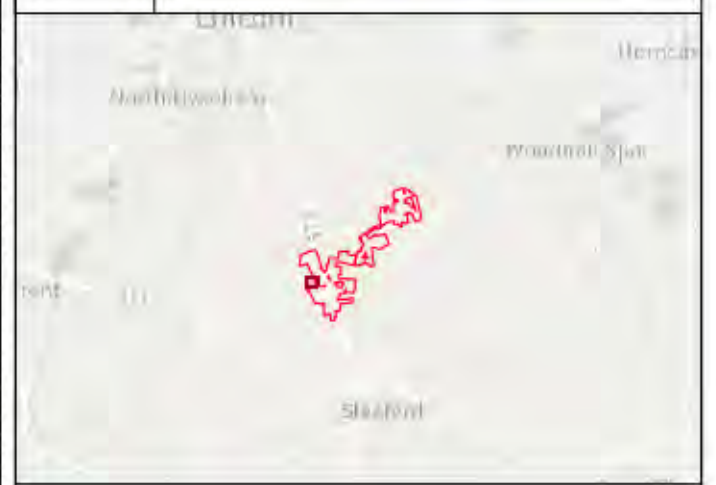
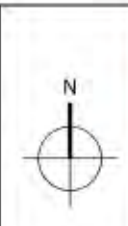


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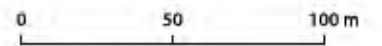
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Key

- Geophysical Survey Area
- Survey Extent



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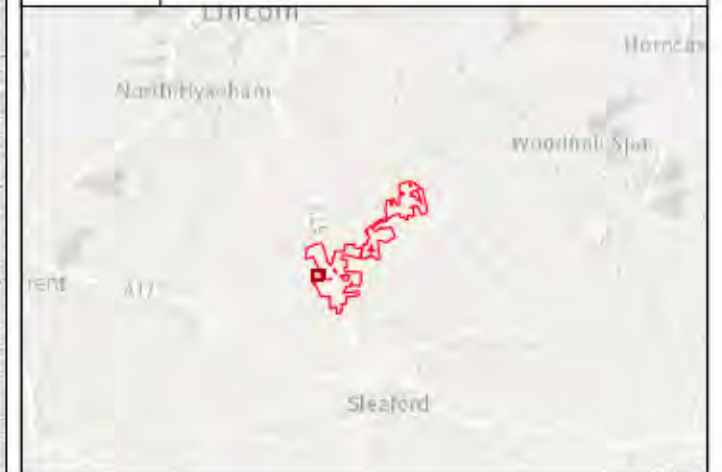
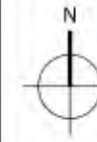
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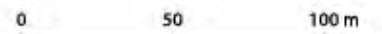
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Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)



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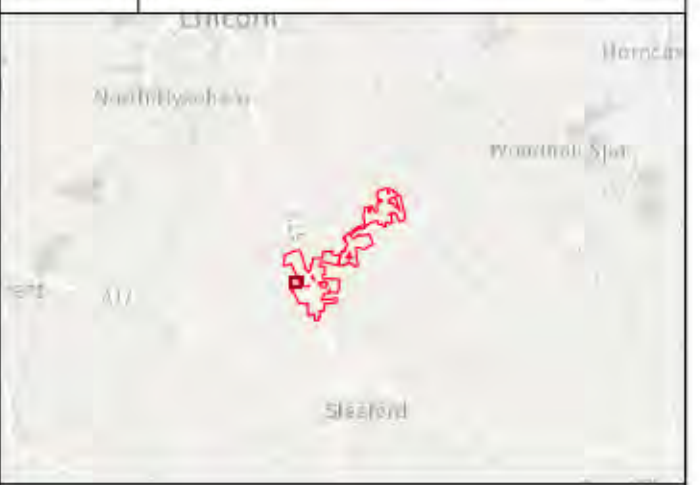
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Key

- Geophysical Survey Area
- Survey Extent

Interpretation

- Ferrous Objects
- Agriculture
- Natural
- Field System
- Magnetic Disturbance
- Uncertain

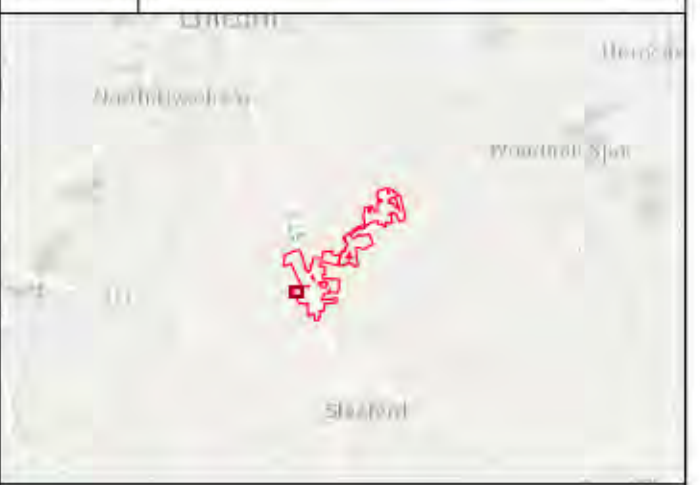
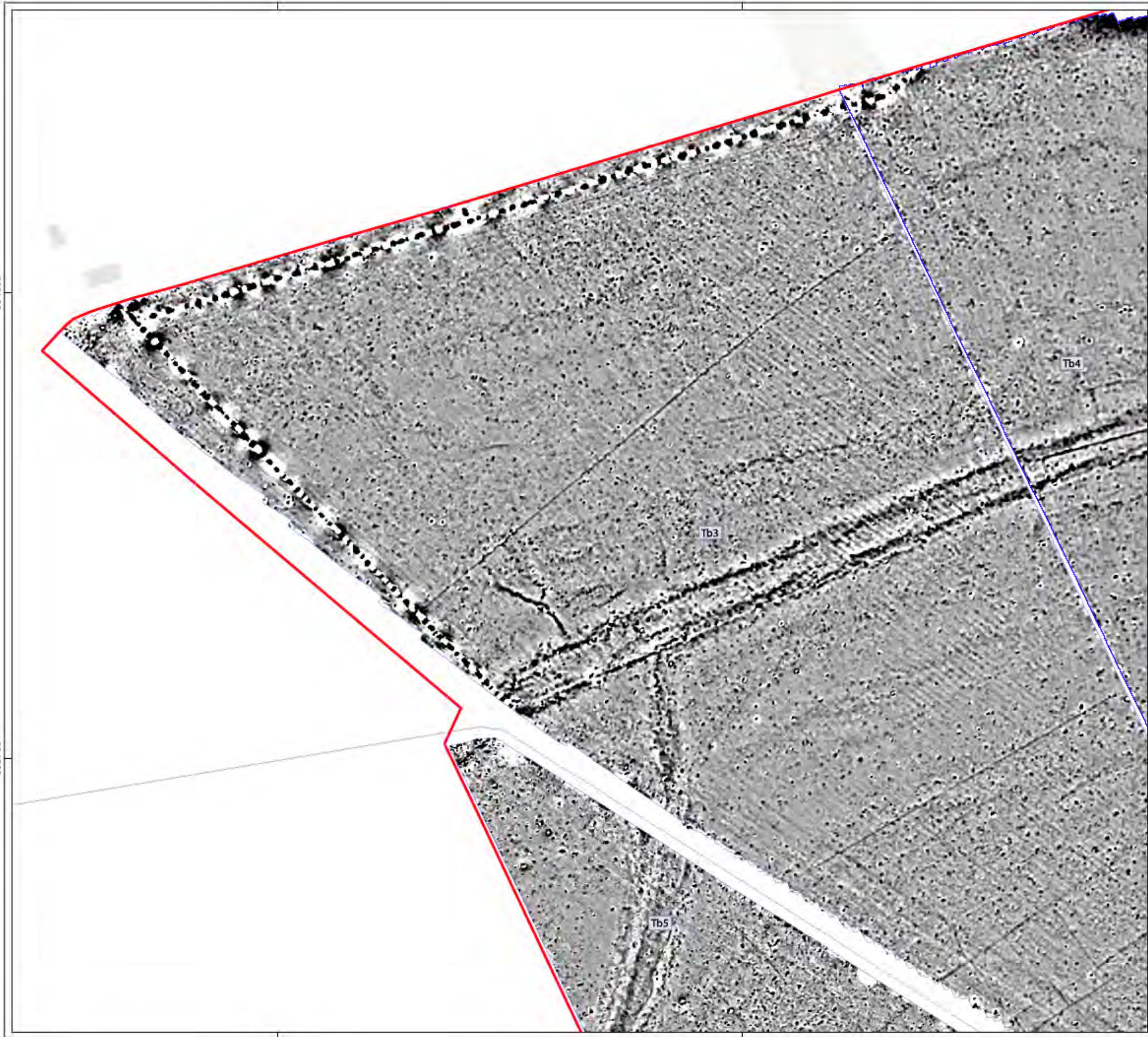
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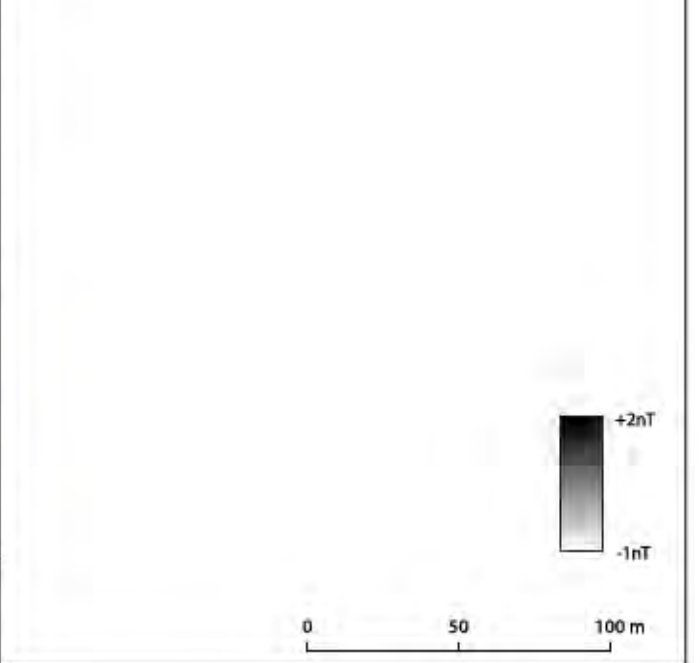
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Key

- Geophysical Survey Area
- Survey Extent

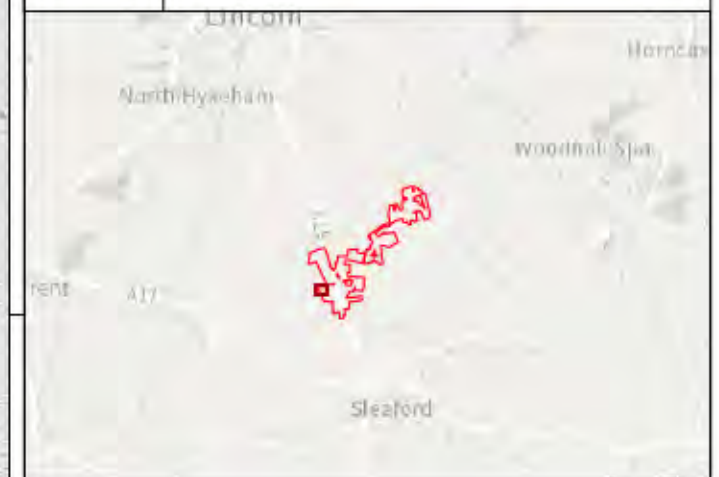
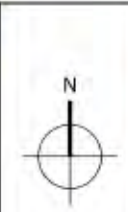
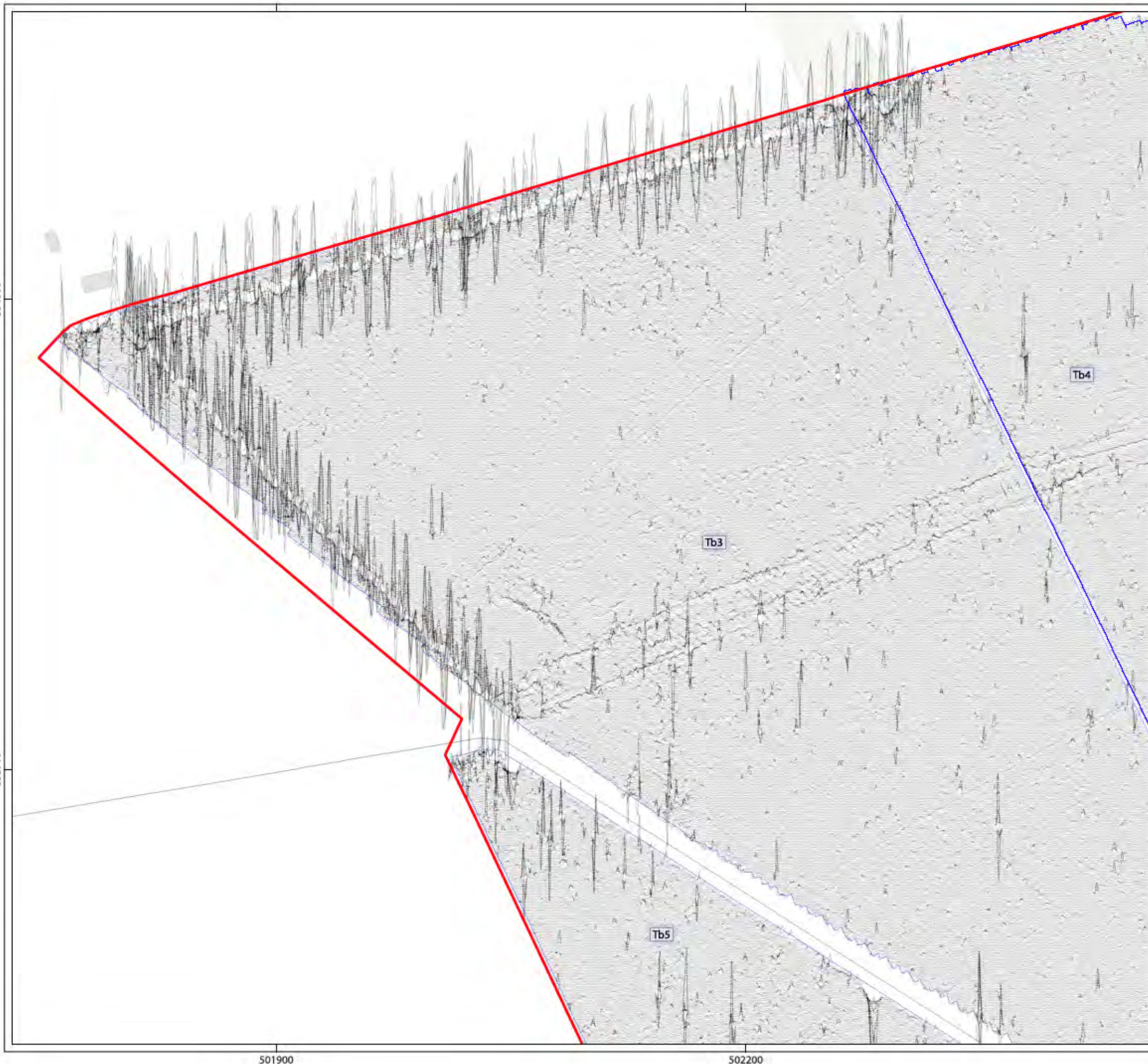


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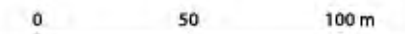
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Key

- ▭ Geophysical Survey Area
- ▭ Survey Extent
- XY Trace (25nT/cm)



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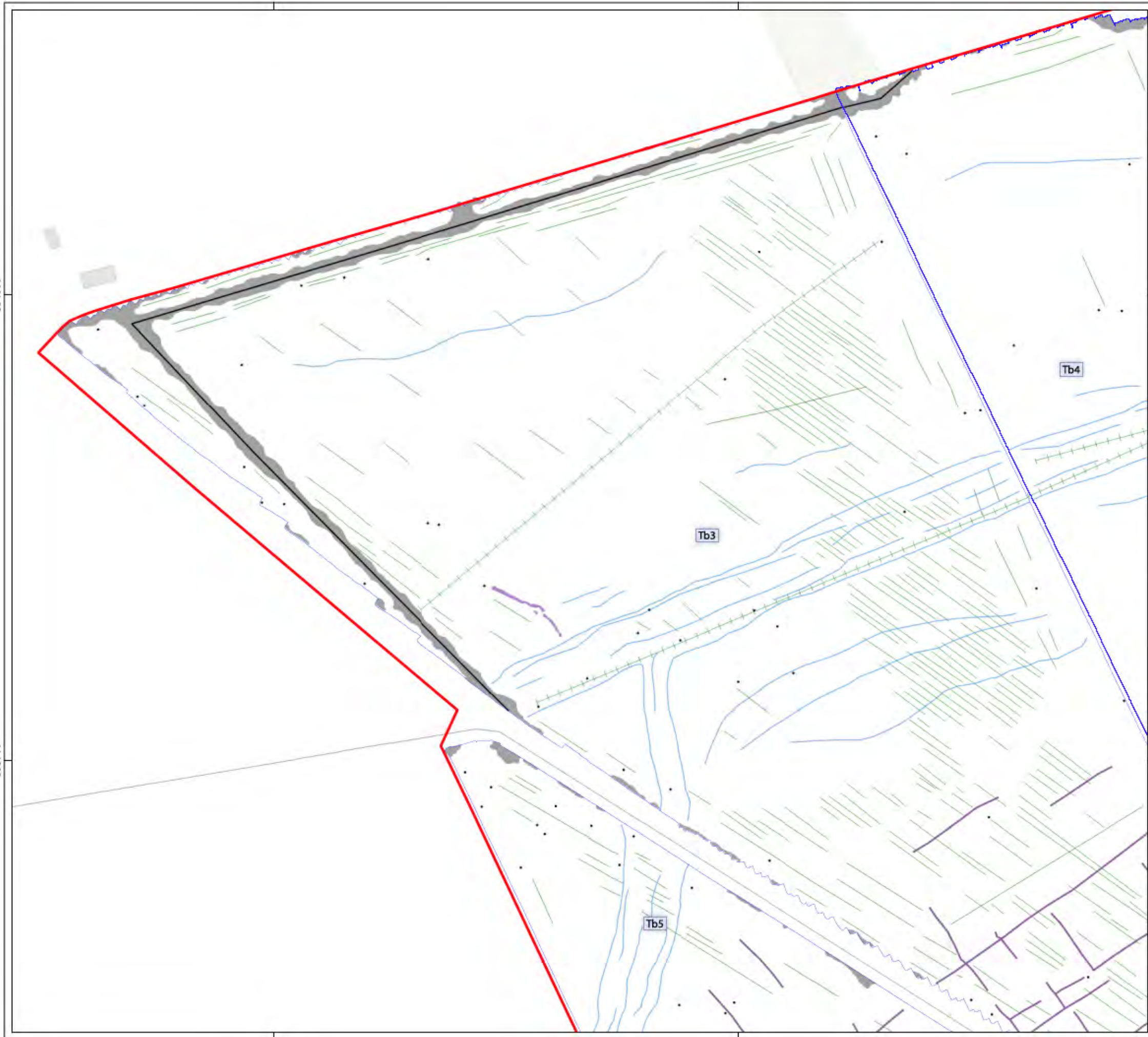
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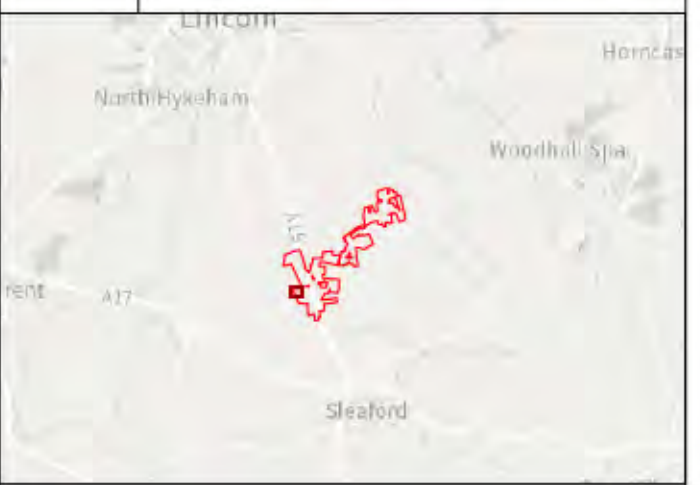
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Key

- Geophysical Survey Area
- Survey Extent

Interpretation

- Ferrous Objects
- Agriculture
- Field Drain
- Natural
- Pipe
- Field System
- Magnetic Disturbance
- Uncertain

0 50 100 m

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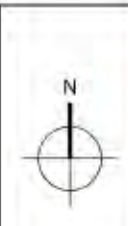
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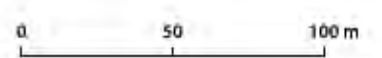
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- Key**
- Geophysical Survey Area
 - Survey Extent

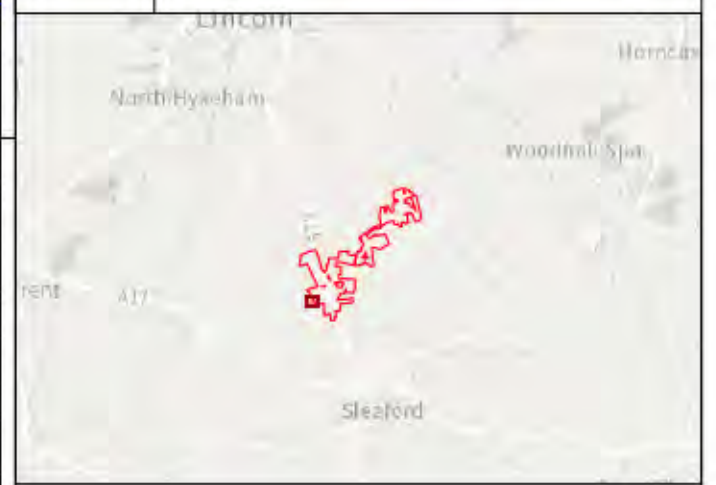
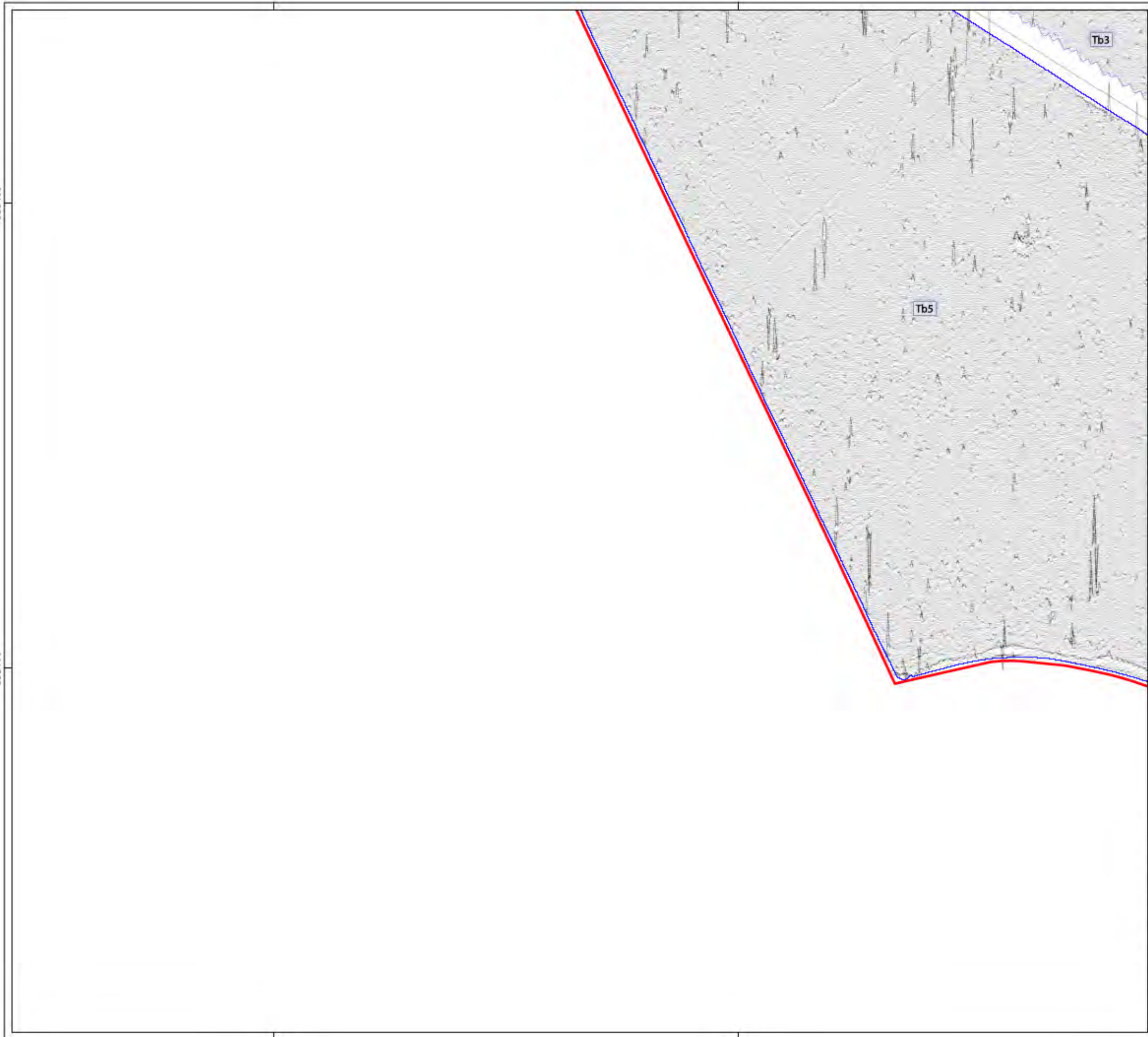


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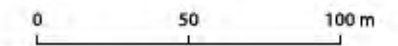
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502200



Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)



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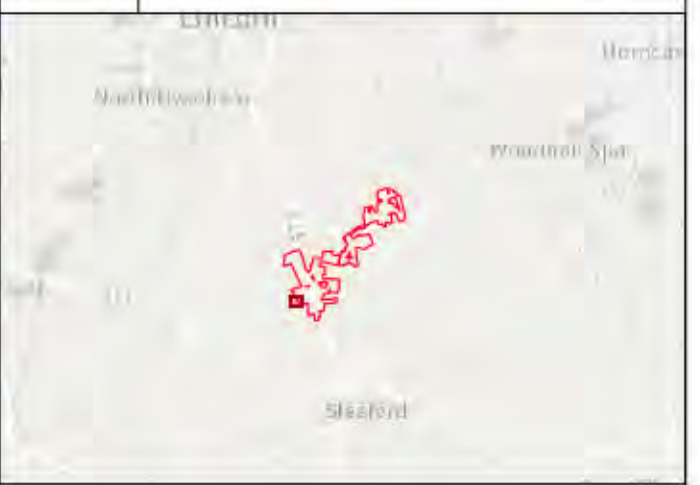
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Key

- Geophysical Survey Area
- Survey Extent

Interpretation

- Ferrous Objects
- Agriculture
- Field Drain
- Natural
- Field System
- Archaeology
- Magnetic Disturbance
- Uncertain

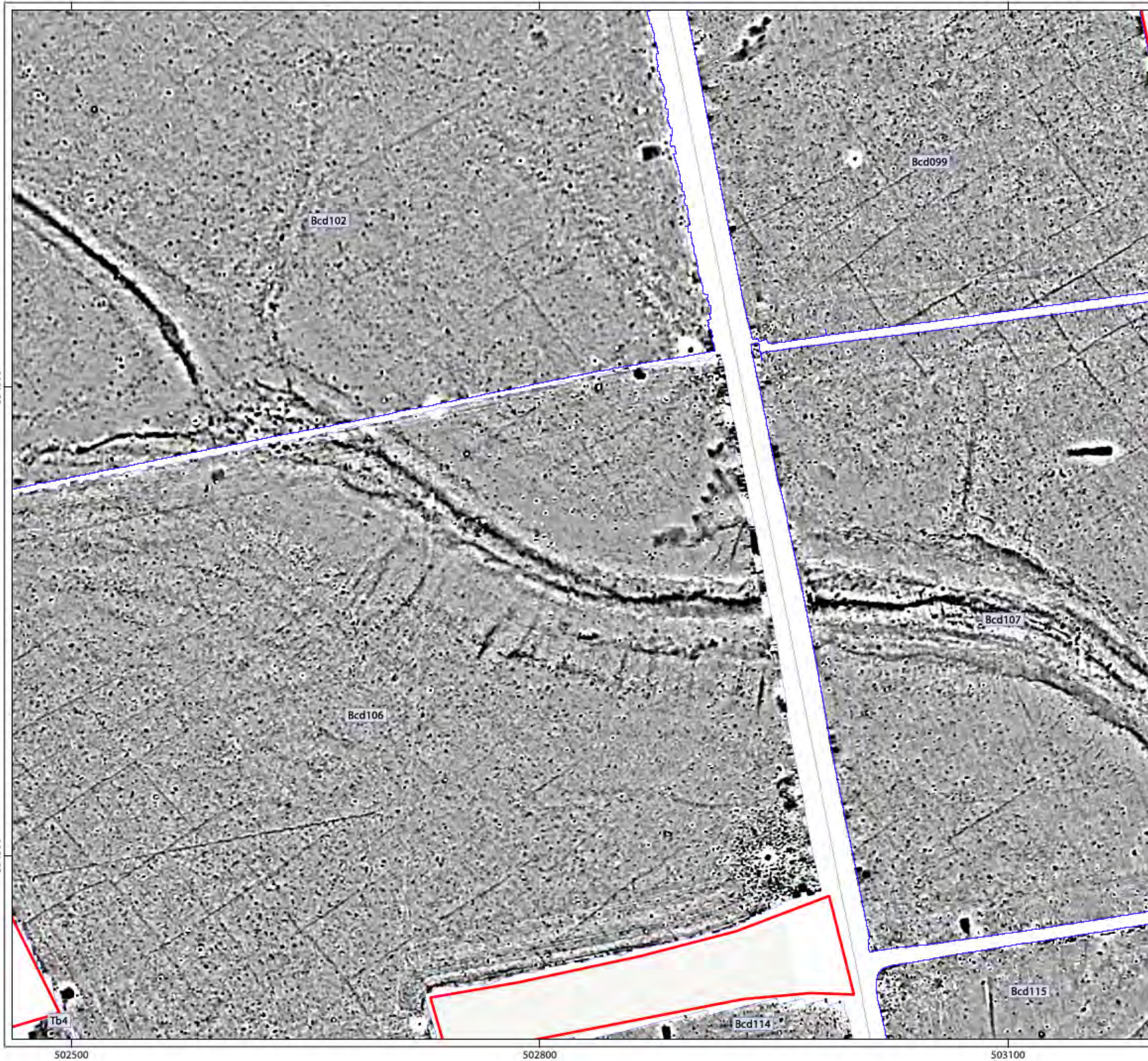
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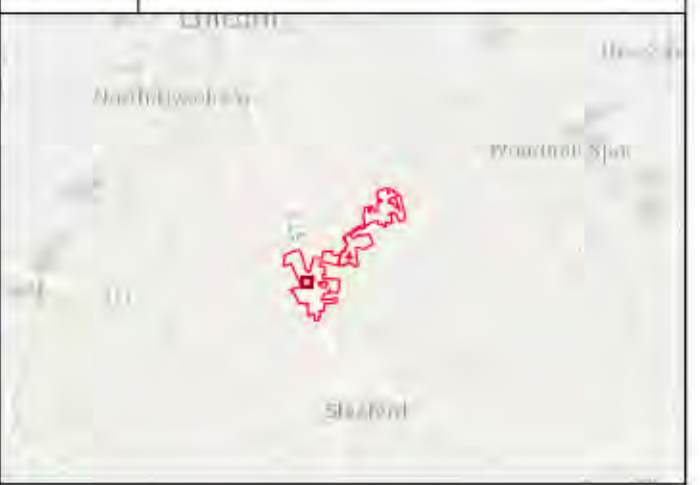
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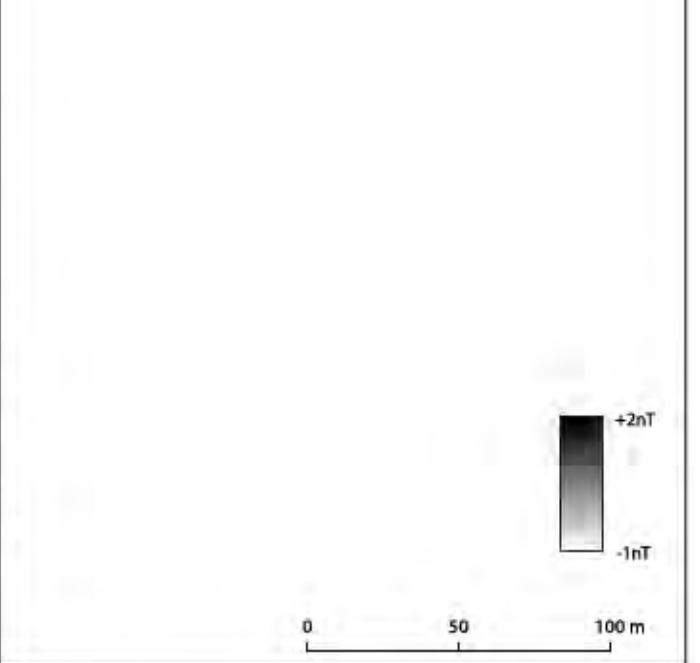



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Key

- Geophysical Survey Area
- Survey Extent



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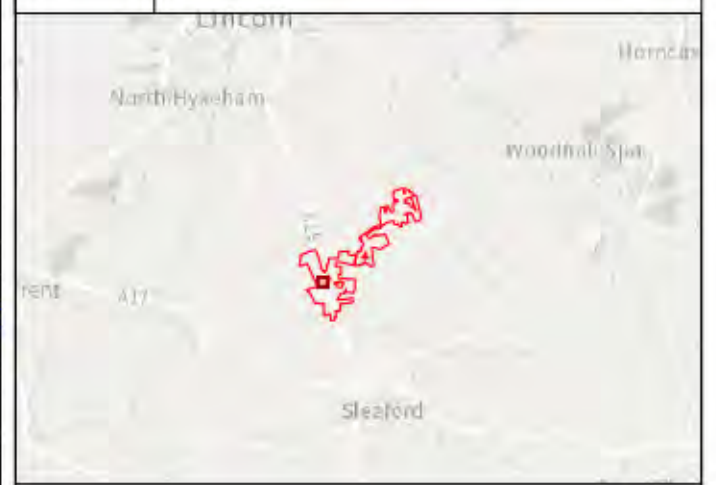
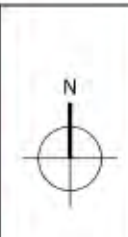
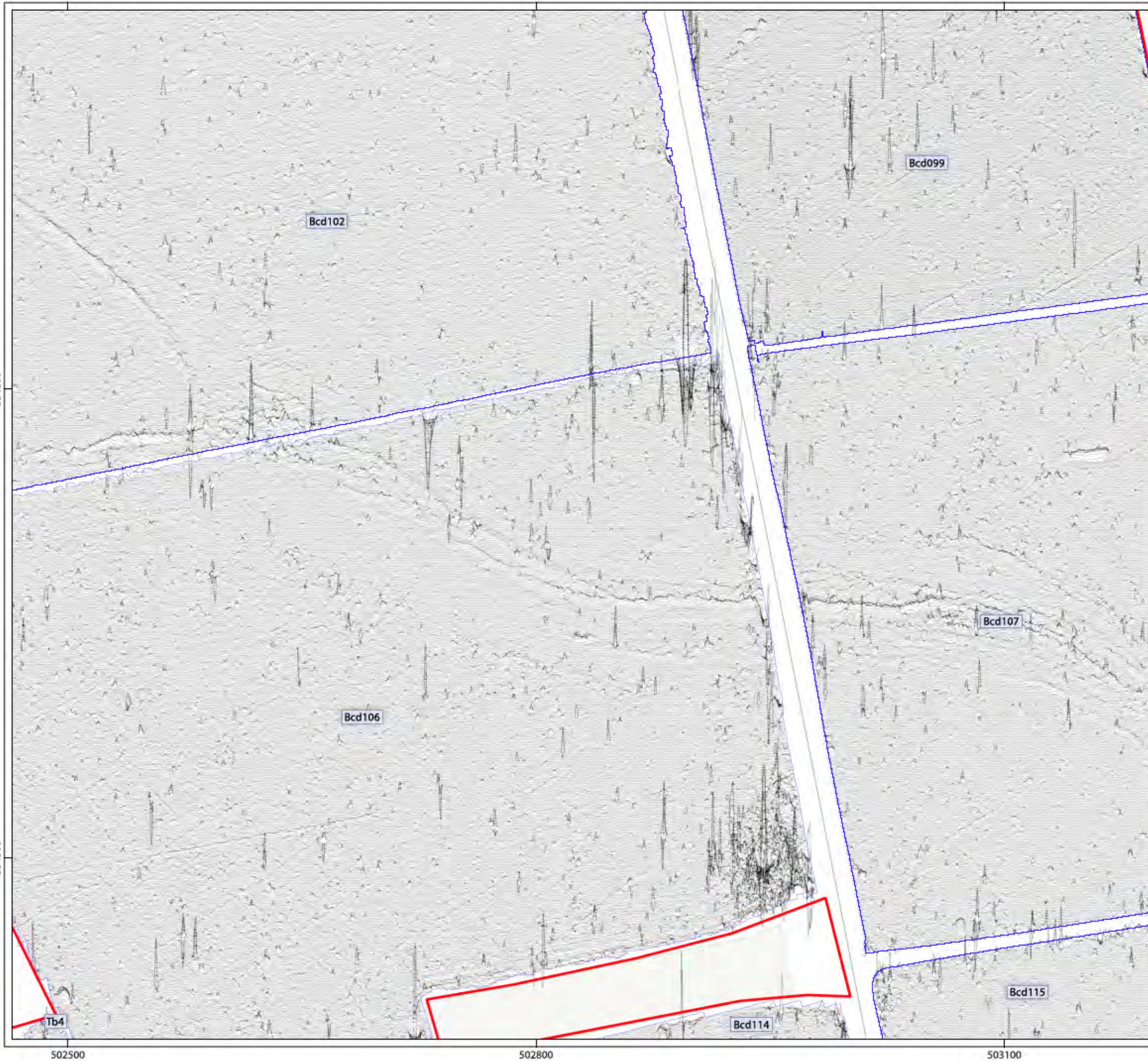
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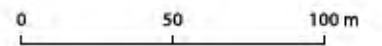
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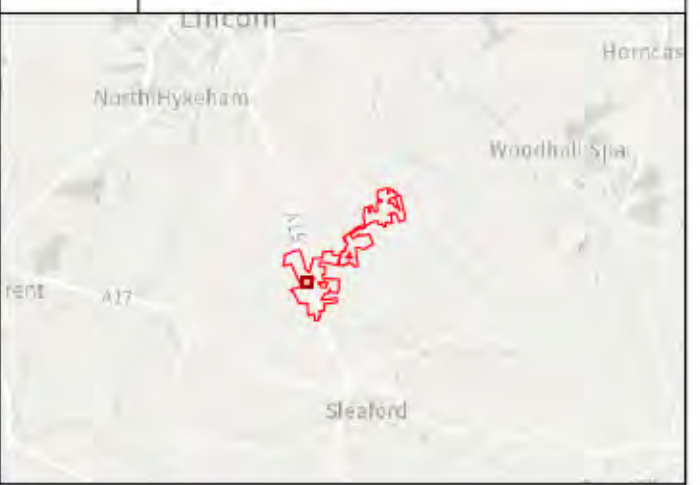
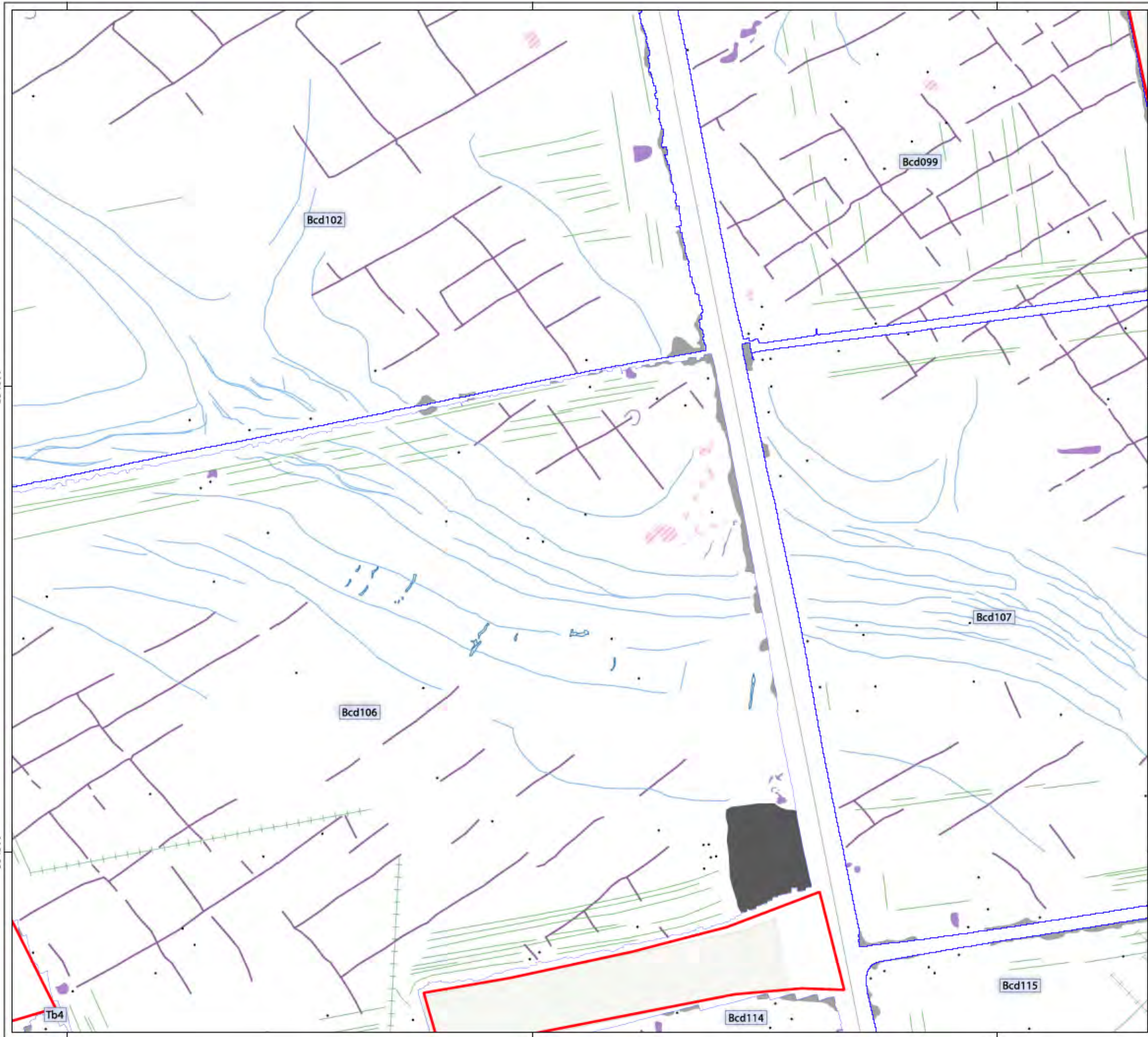
- Key**
- ▭ Geophysical Survey Area
 - ▭ Survey Extent
 - XY Trace (25nT/cm)



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Key

- Geophysical Survey Area
- Survey Extent

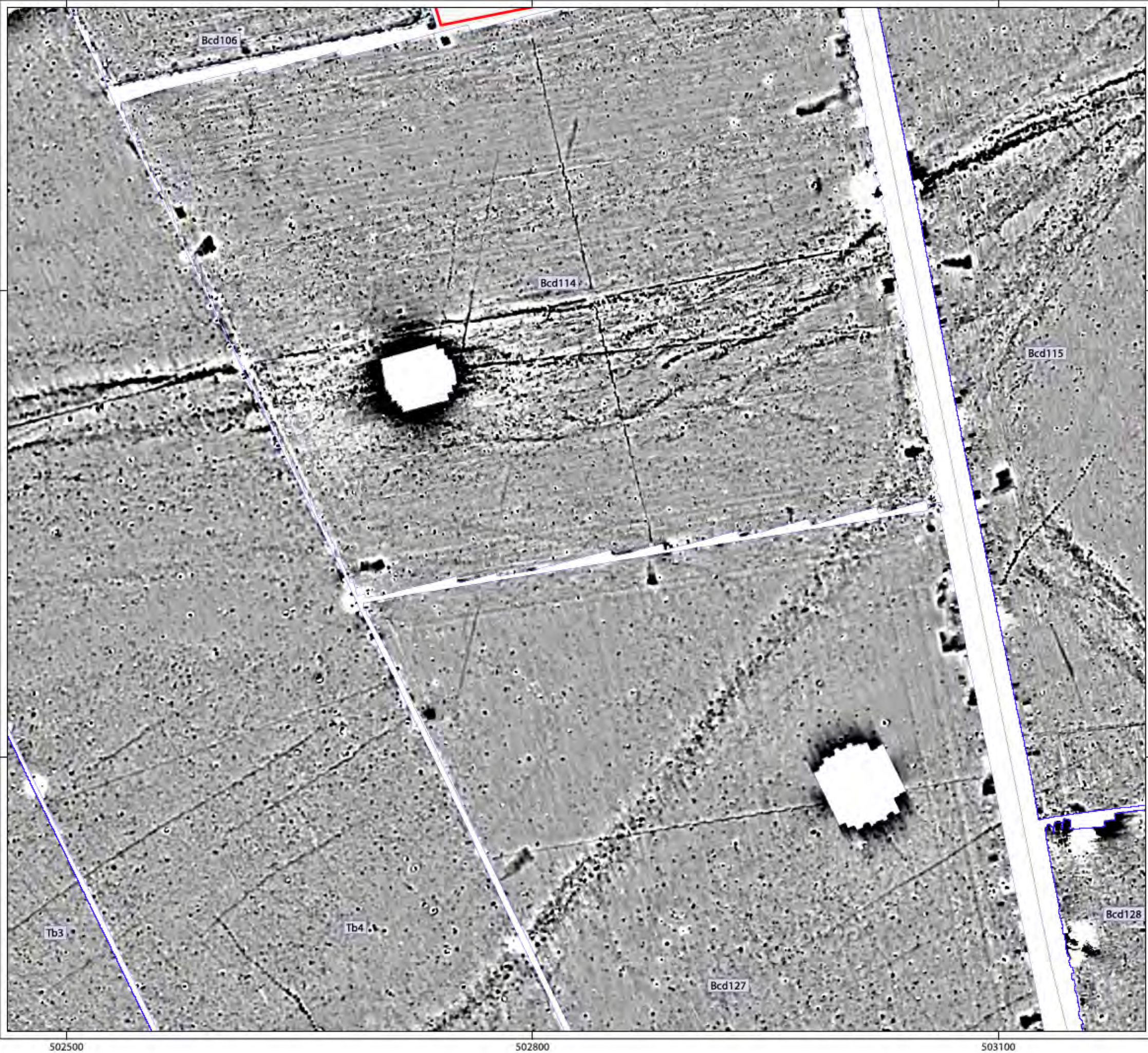
Interpretation

- Ferrous Objects
- Agriculture
- Field Drain
- Natural
- Uncertain
- Field System
- Magnetic Disturbance
- Quarry
- Uncertain
- Former Building
- Geology
- Burning

0 50 100 m

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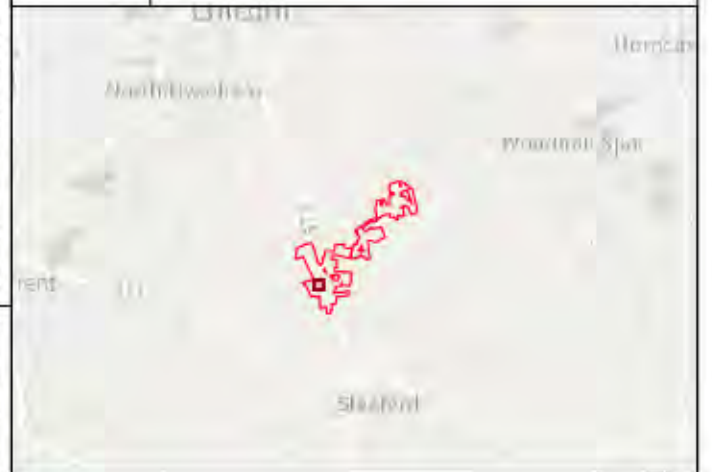
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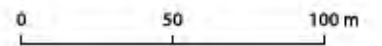
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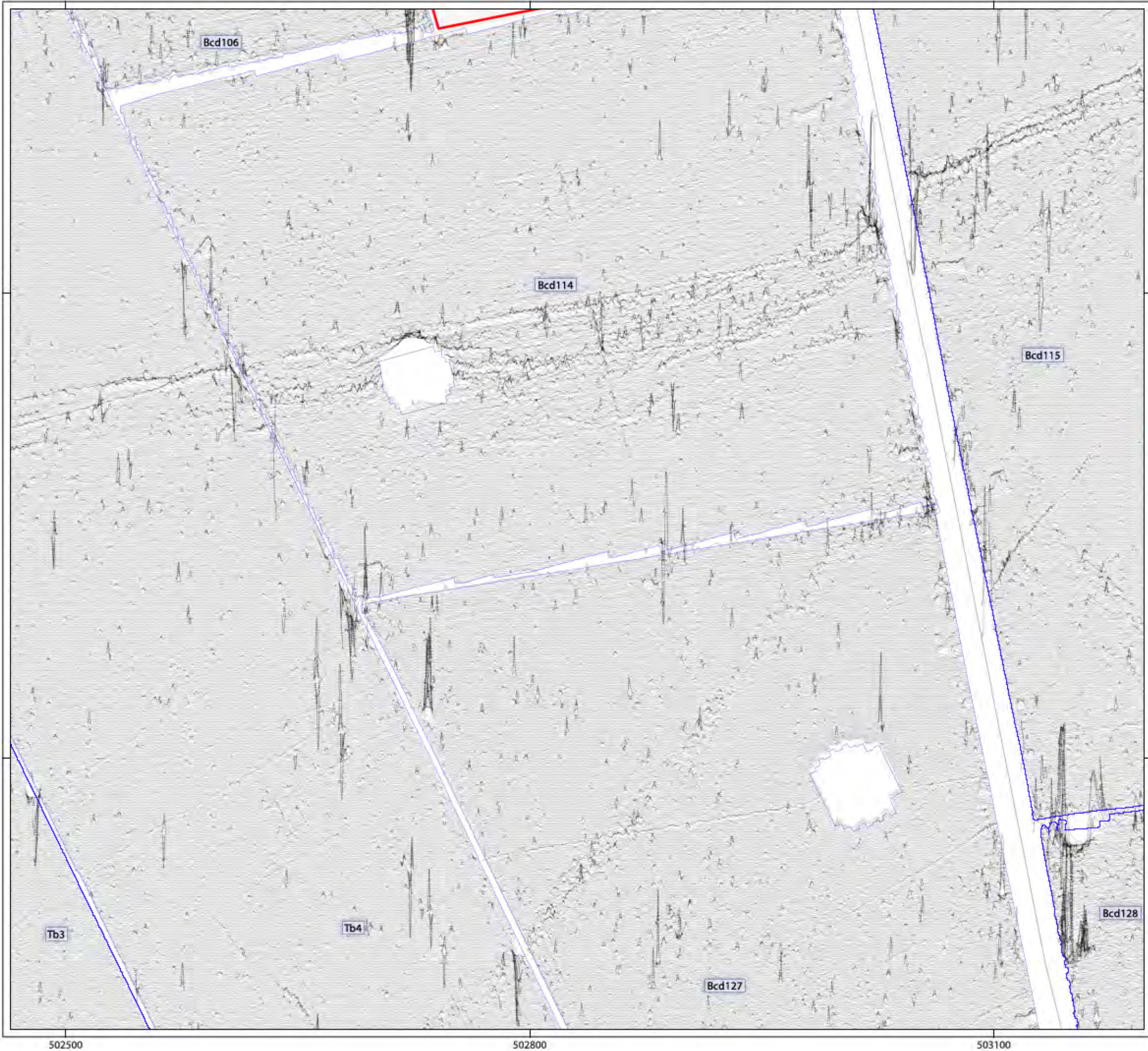
Key

- Geophysical Survey Area
- Survey Extent

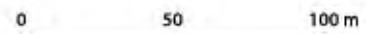


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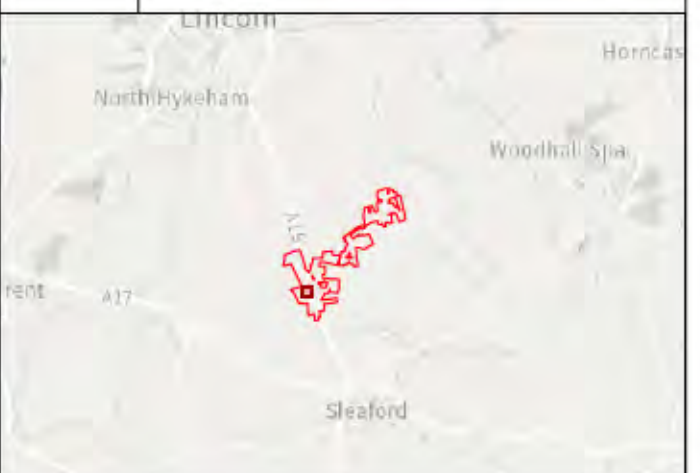
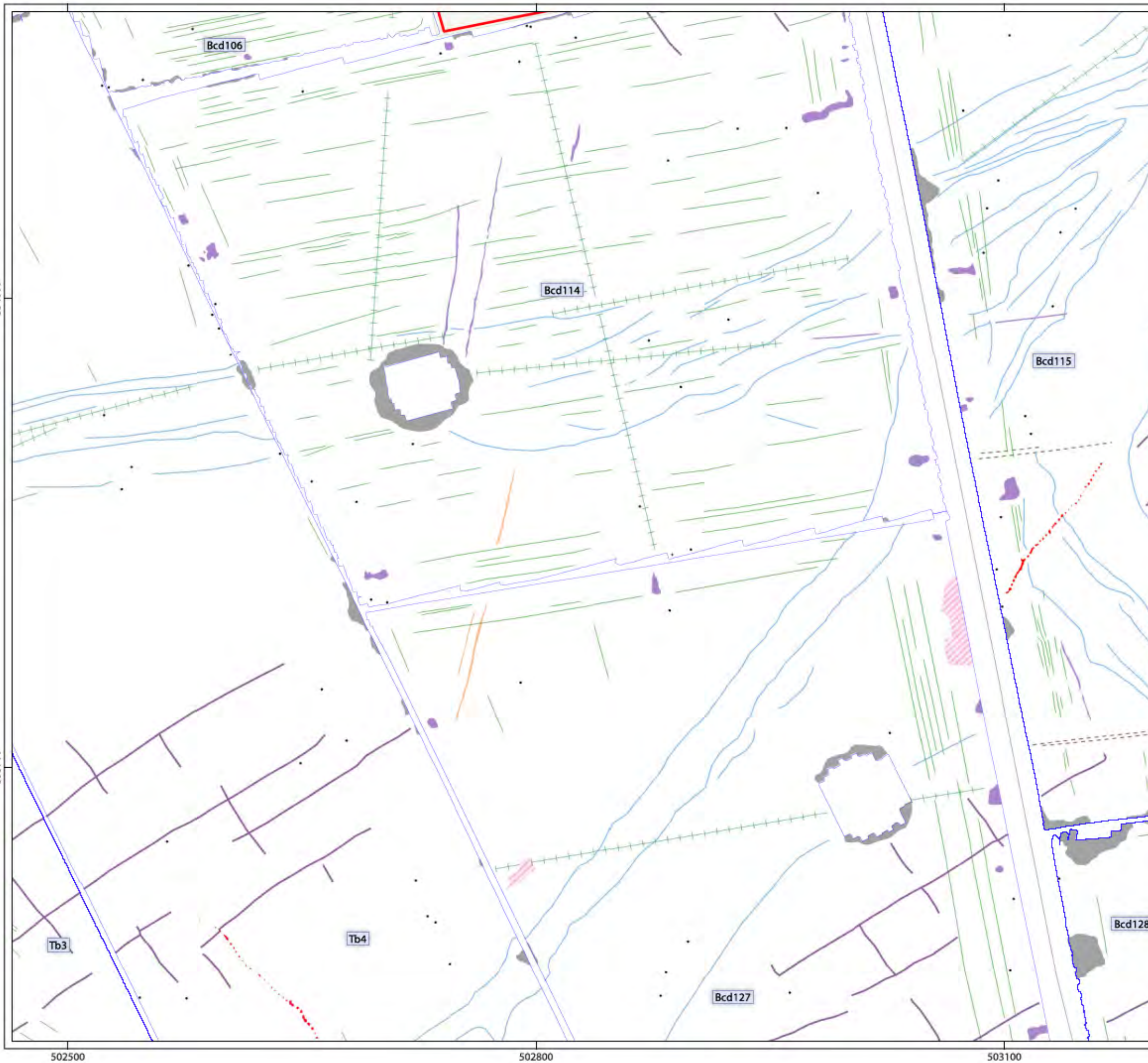
- Key**
- Geophysical Survey Area
 - Survey Extent
 - XY Trace (25nT/cm)



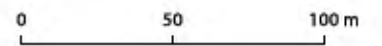
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502500 502800 503100



- Key**
- Geophysical Survey Area
 - Survey Extent
- Interpretation**
- Ferrous Objects
 - Agriculture
 - Possible Field Boundary
 - Field Drain
 - Natural
 - Uncertain
 - Field System
 - Archaeology
 - Magnetic Disturbance
 - Possible Archaeology
 - Quarry
 - Uncertain

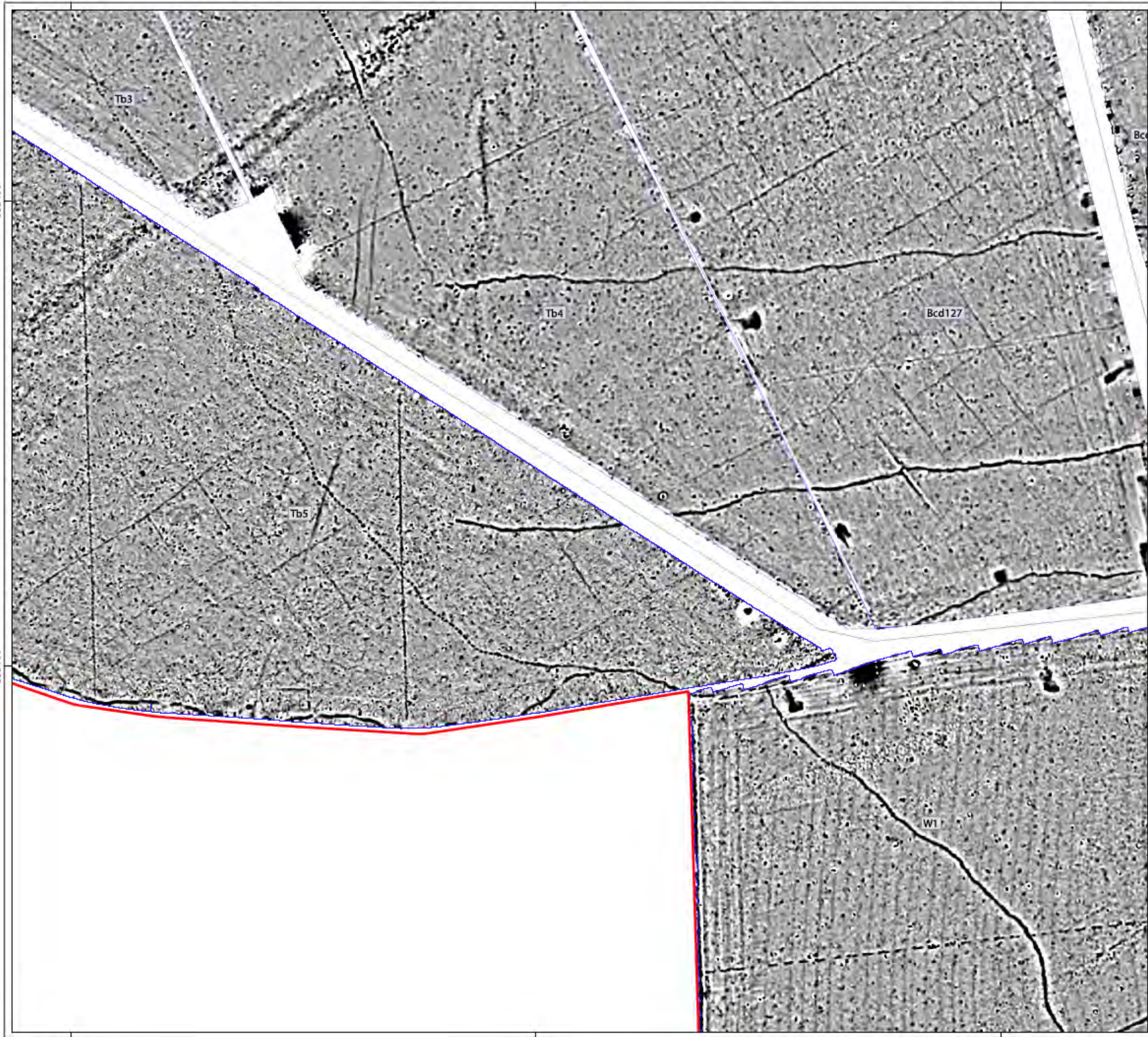


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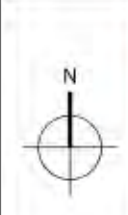
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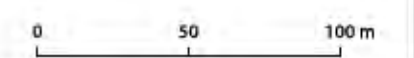
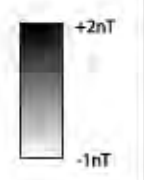
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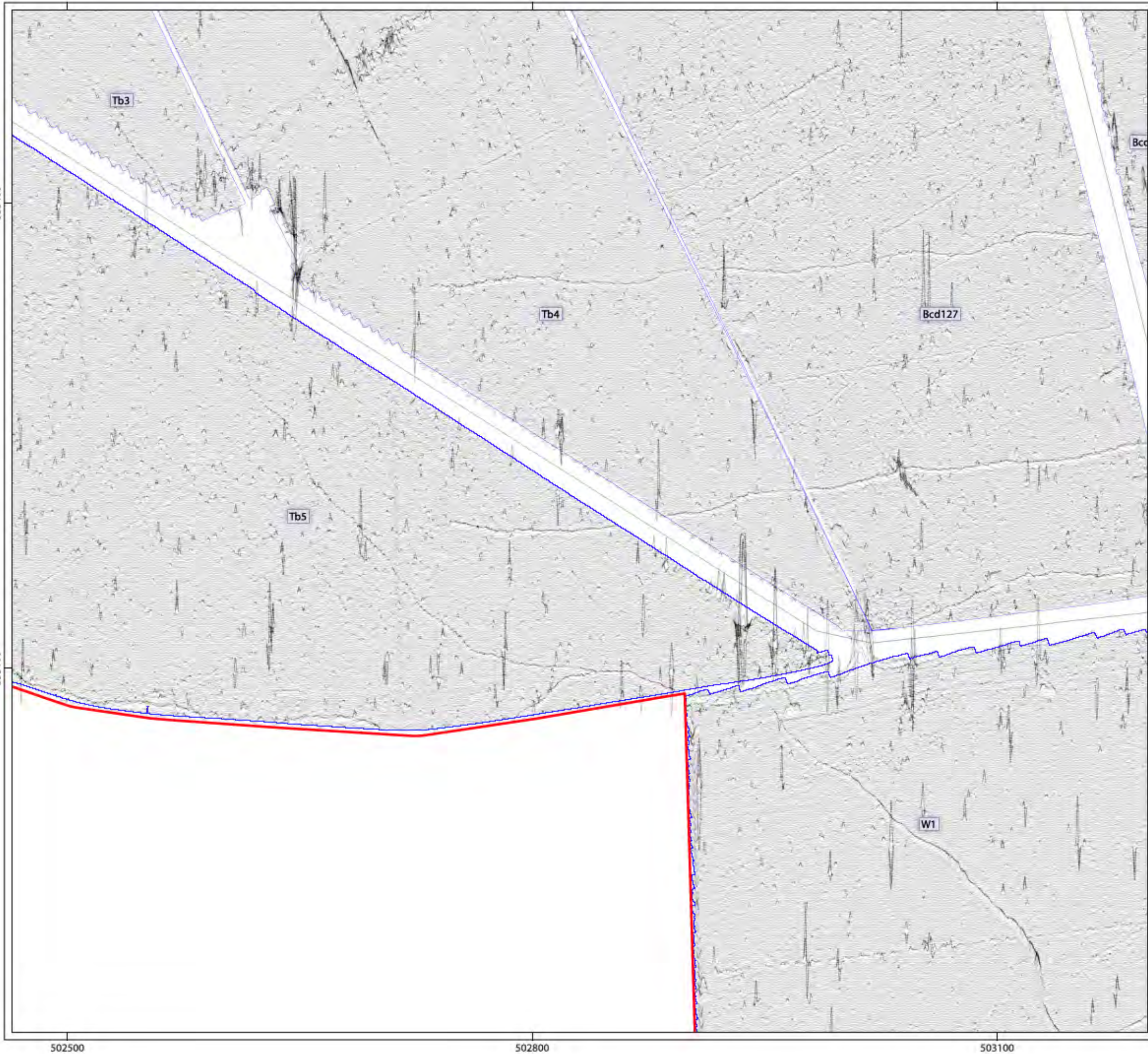
Key

- ▭ Geophysical Survey Area
- ▭ Survey Extent



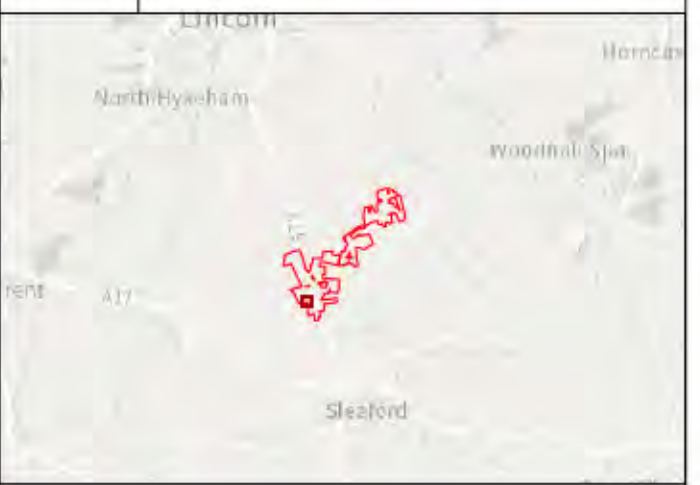
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Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)

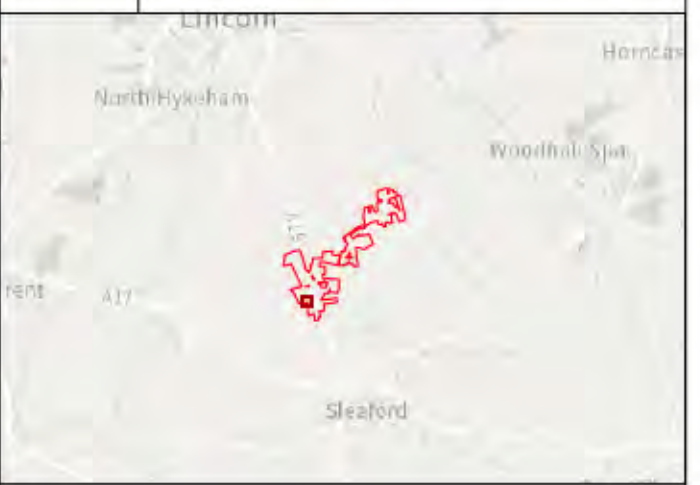
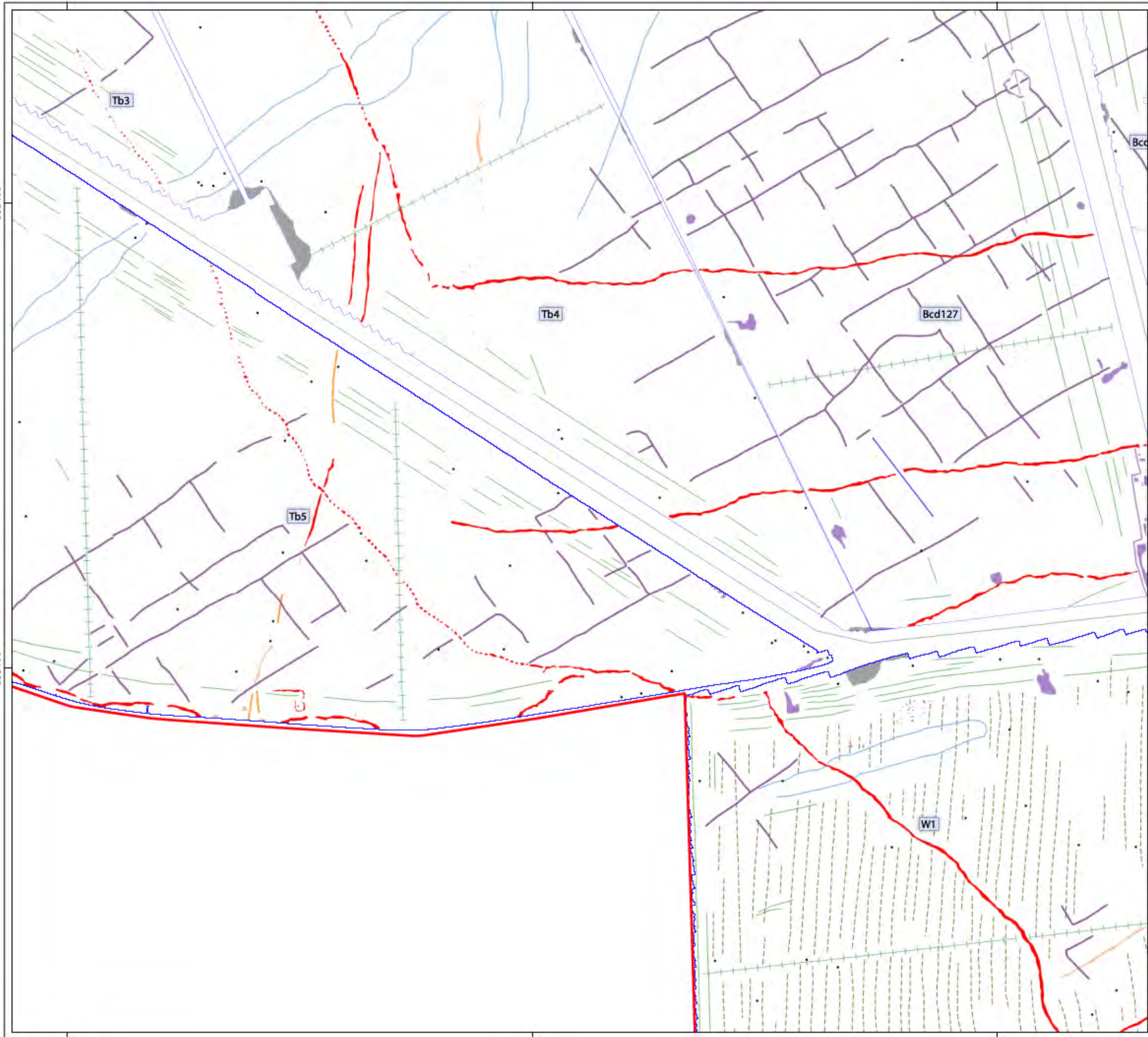
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Key

- Geophysical Survey Area
- Survey Extent

Interpretation

- Ferrous Objects
- Agriculture
- Field Drain
- Natural
- Uncertain
- Ridge and Furrow
- LIRM
- Field System
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Uncertain

0 50 100 m

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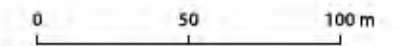
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Key

- Geophysical Survey Area
- Survey Extent

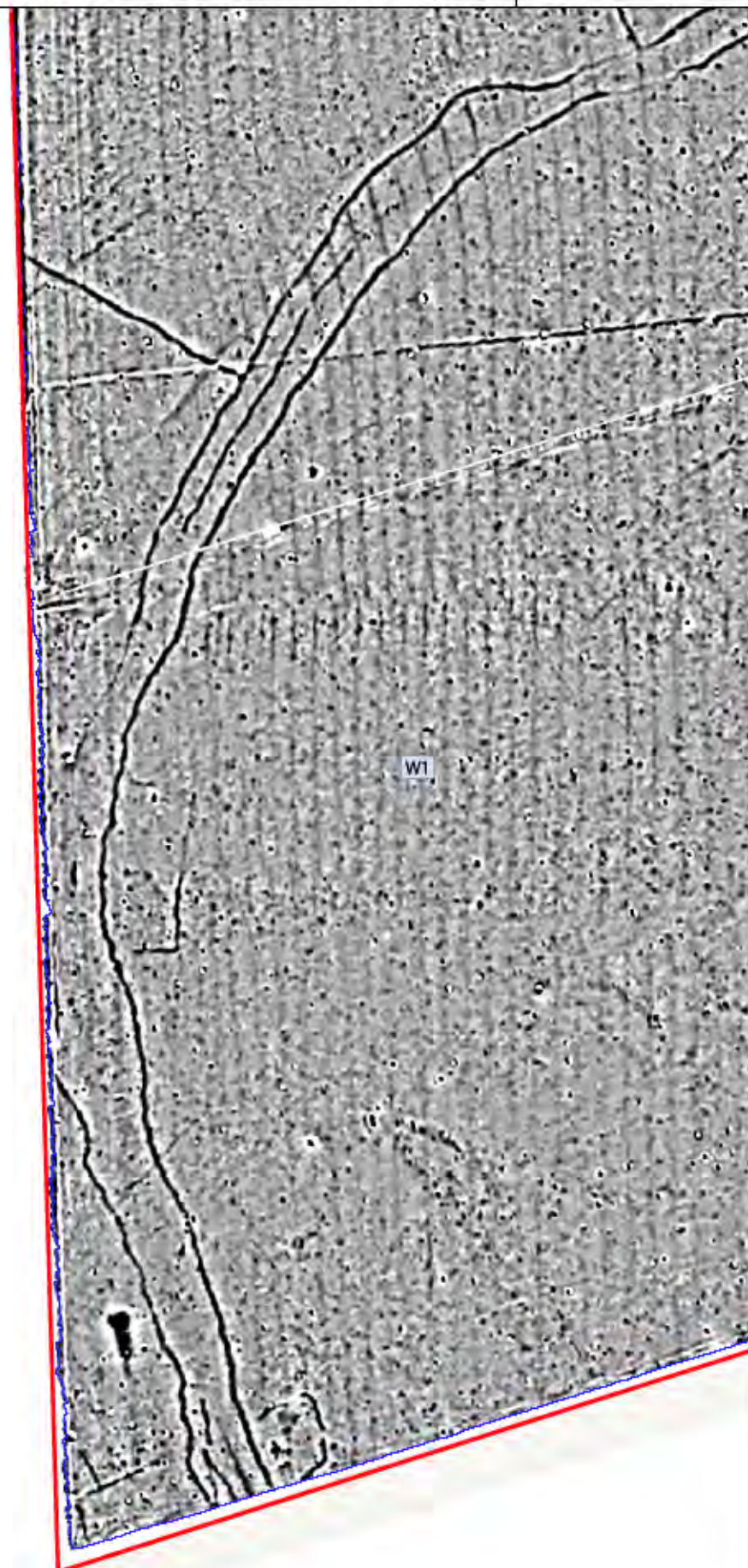


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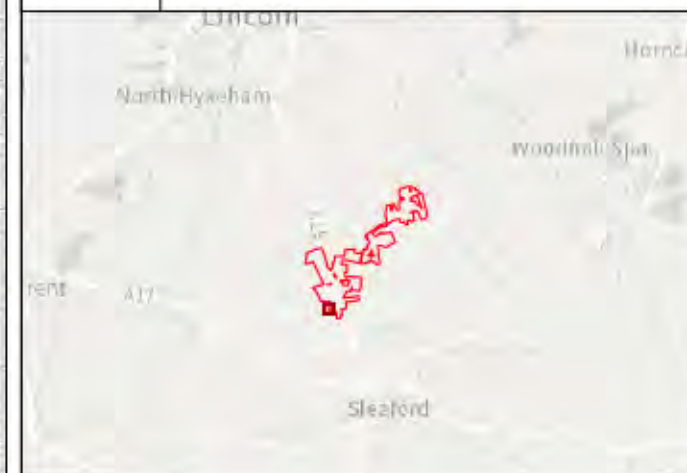
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Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)

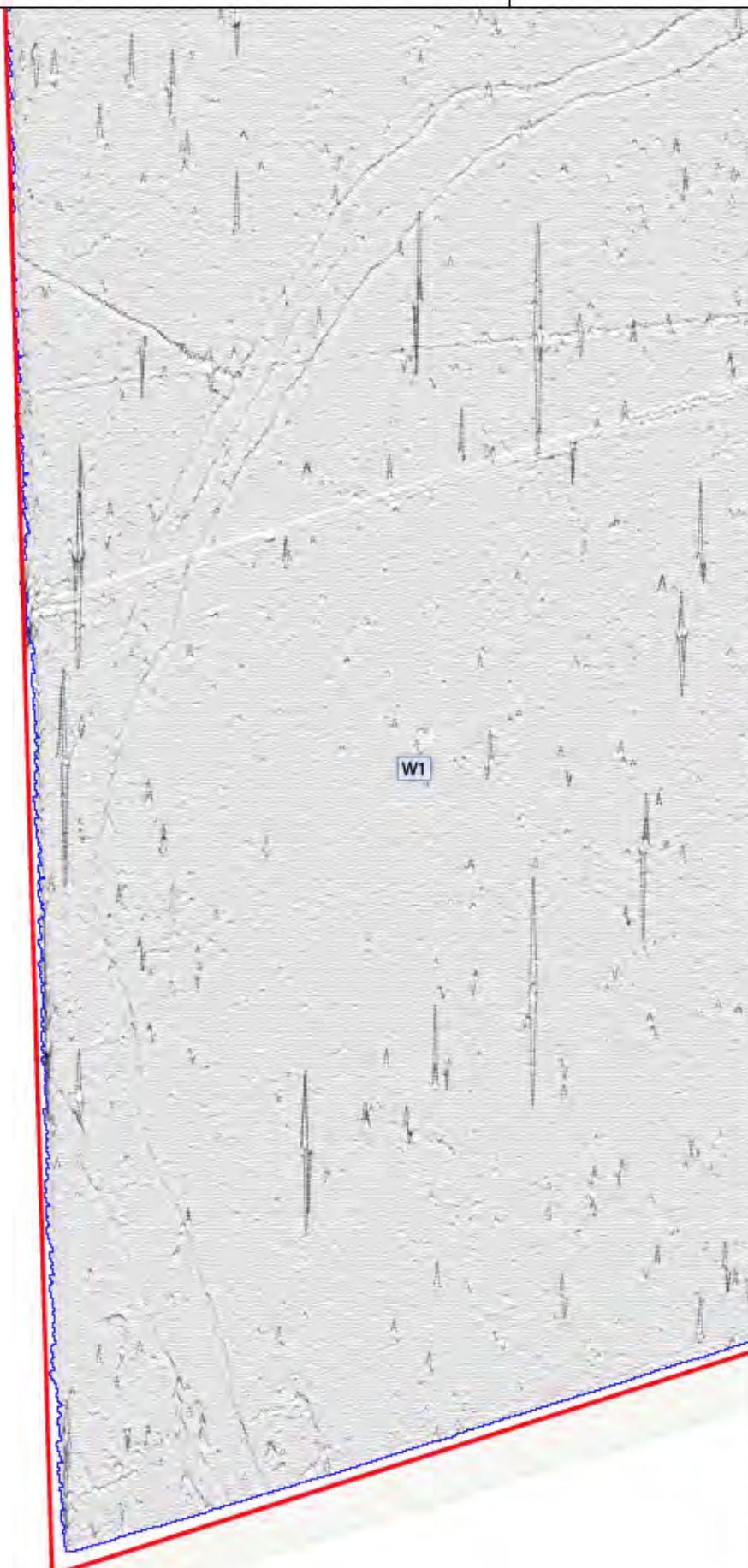
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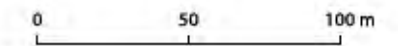


Key

- Geophysical Survey Area
- Survey Extent

Interpretation

- Ferrous Objects
- Agriculture
- Field Drain
- Natural
- Ridge and Furrow
- Field System
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Quarry
- Uncertain



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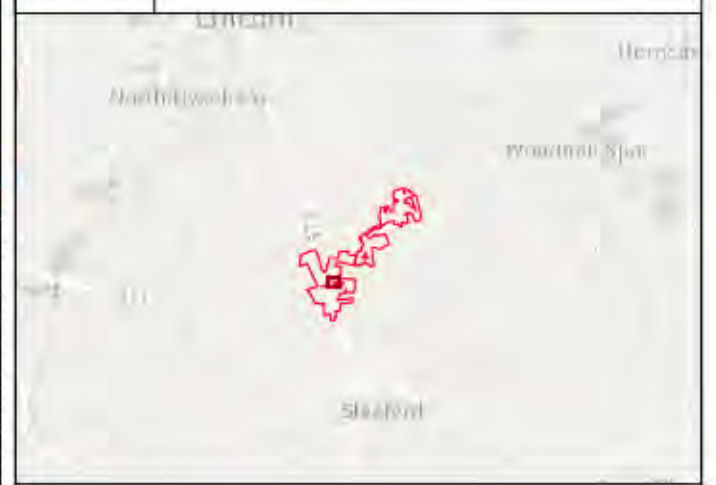
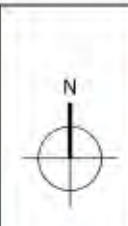


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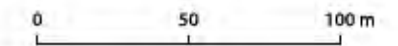
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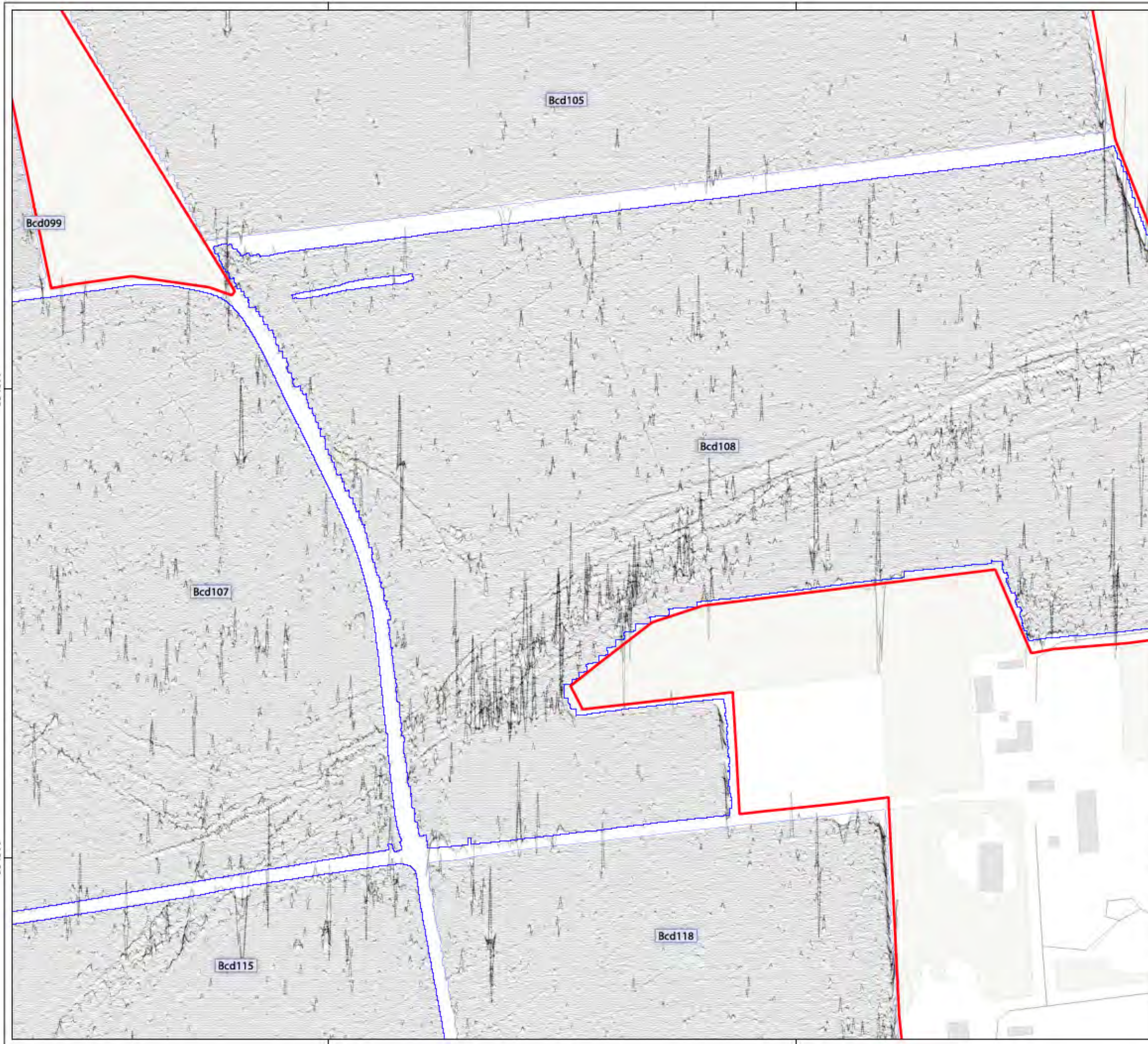


Key
 Geophysical Survey Area
 Survey Extent



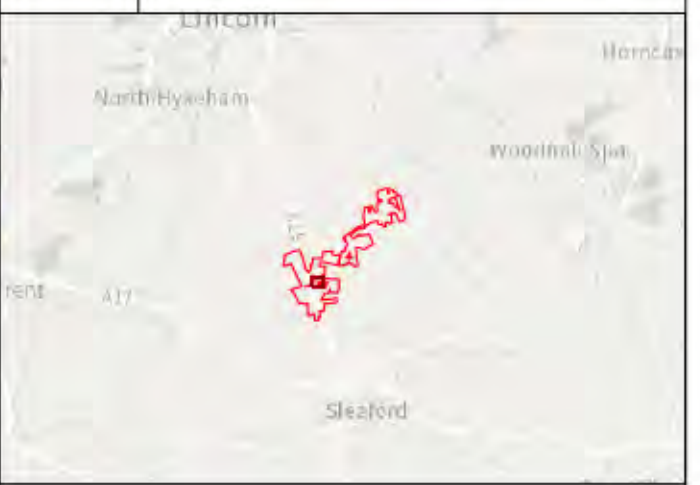
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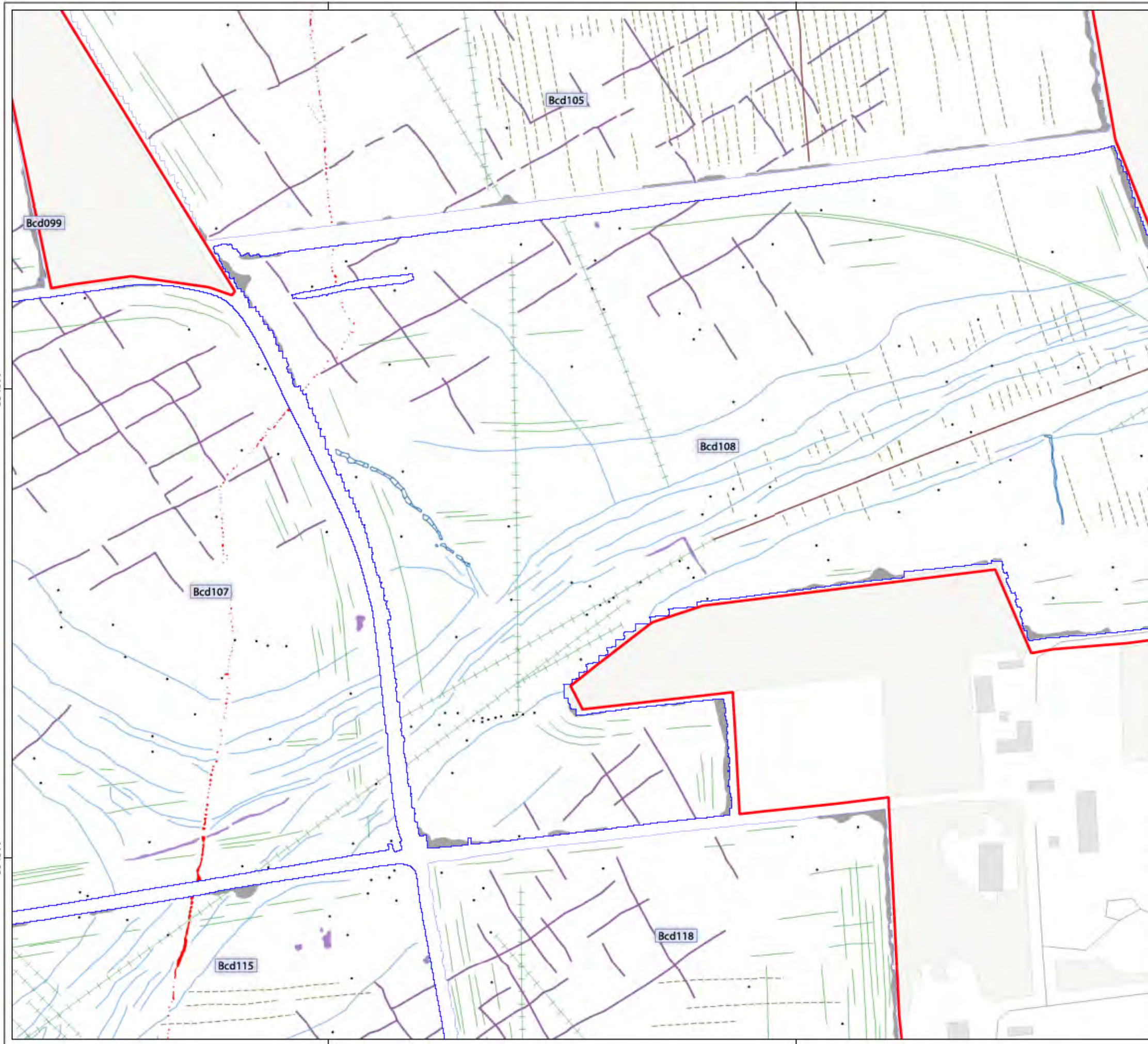
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- Survey Extent
- XY Trace (25nT/cm)

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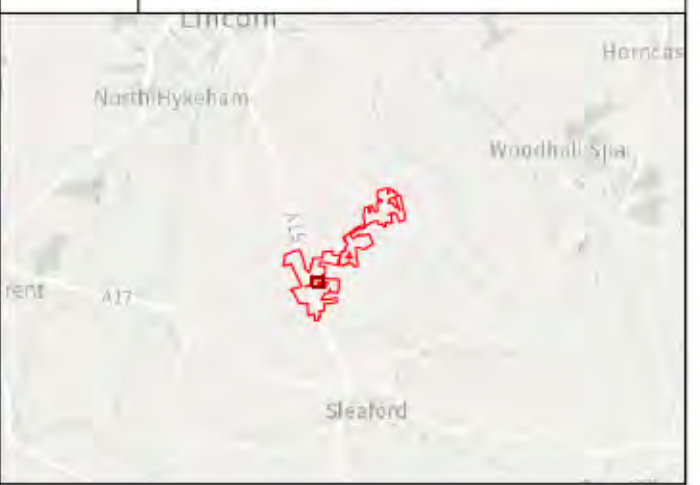
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Key

- Geophysical Survey Area
- Survey Extent

Interpretation

- Ferrous Objects
- Agriculture
- Field Boundary
- Field Drain
- Natural
- Ridge and Furrow
- Field System
- Archaeology
- Magnetic Disturbance
- Uncertain
- Geology

0 50 100 m

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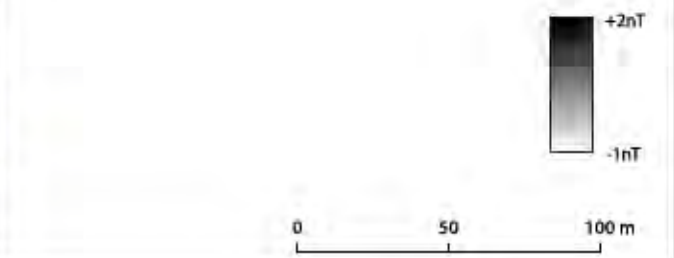


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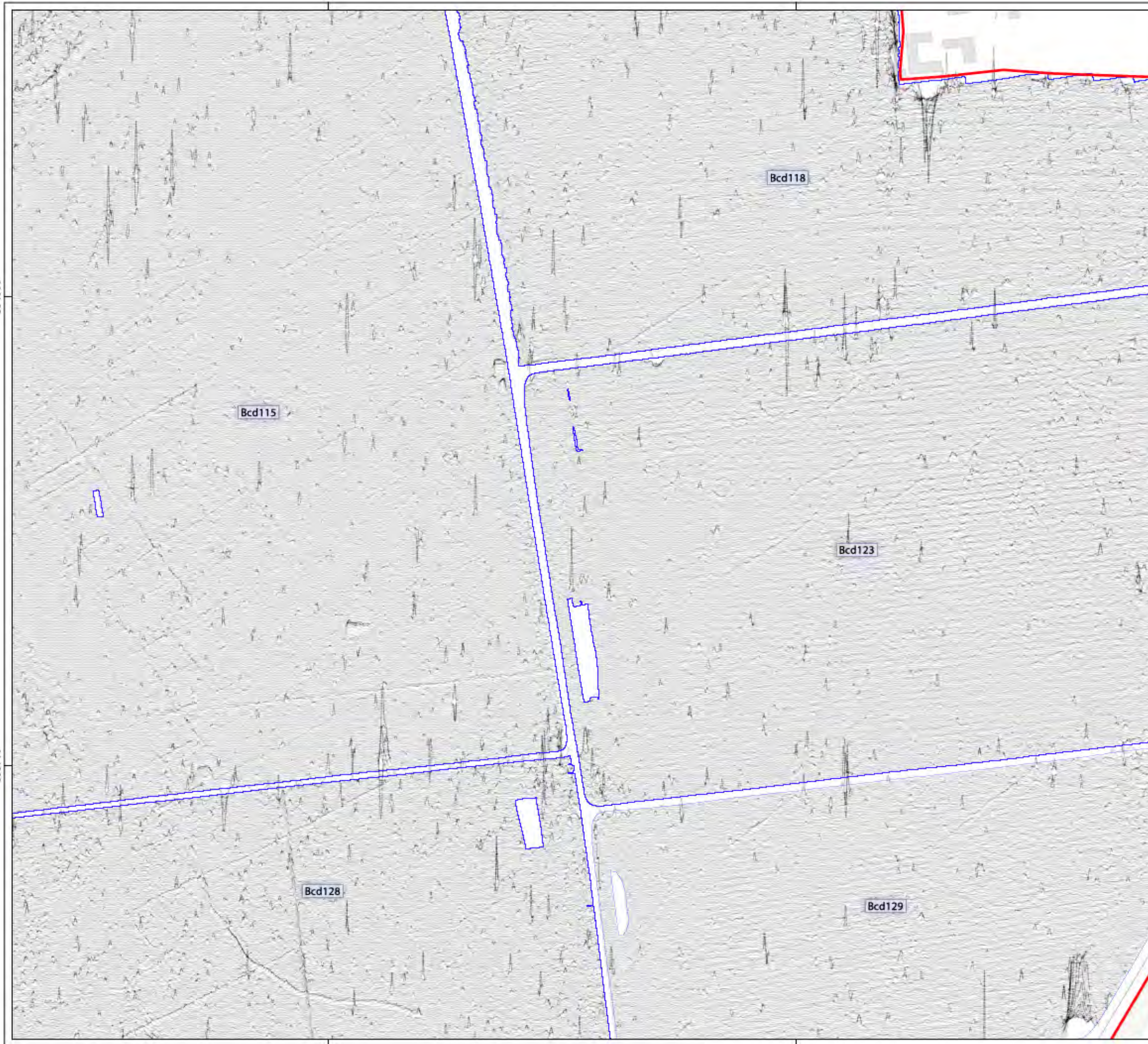
Key

- Geophysical Survey Area
- Survey Extent



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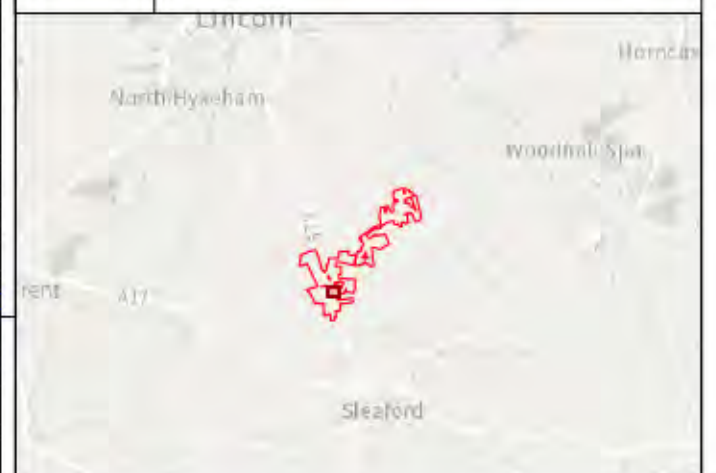
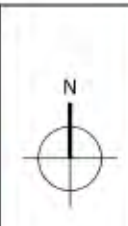


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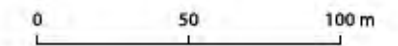
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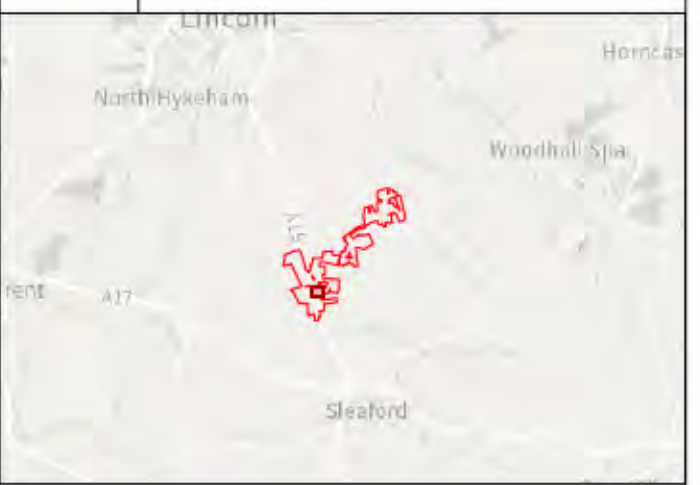
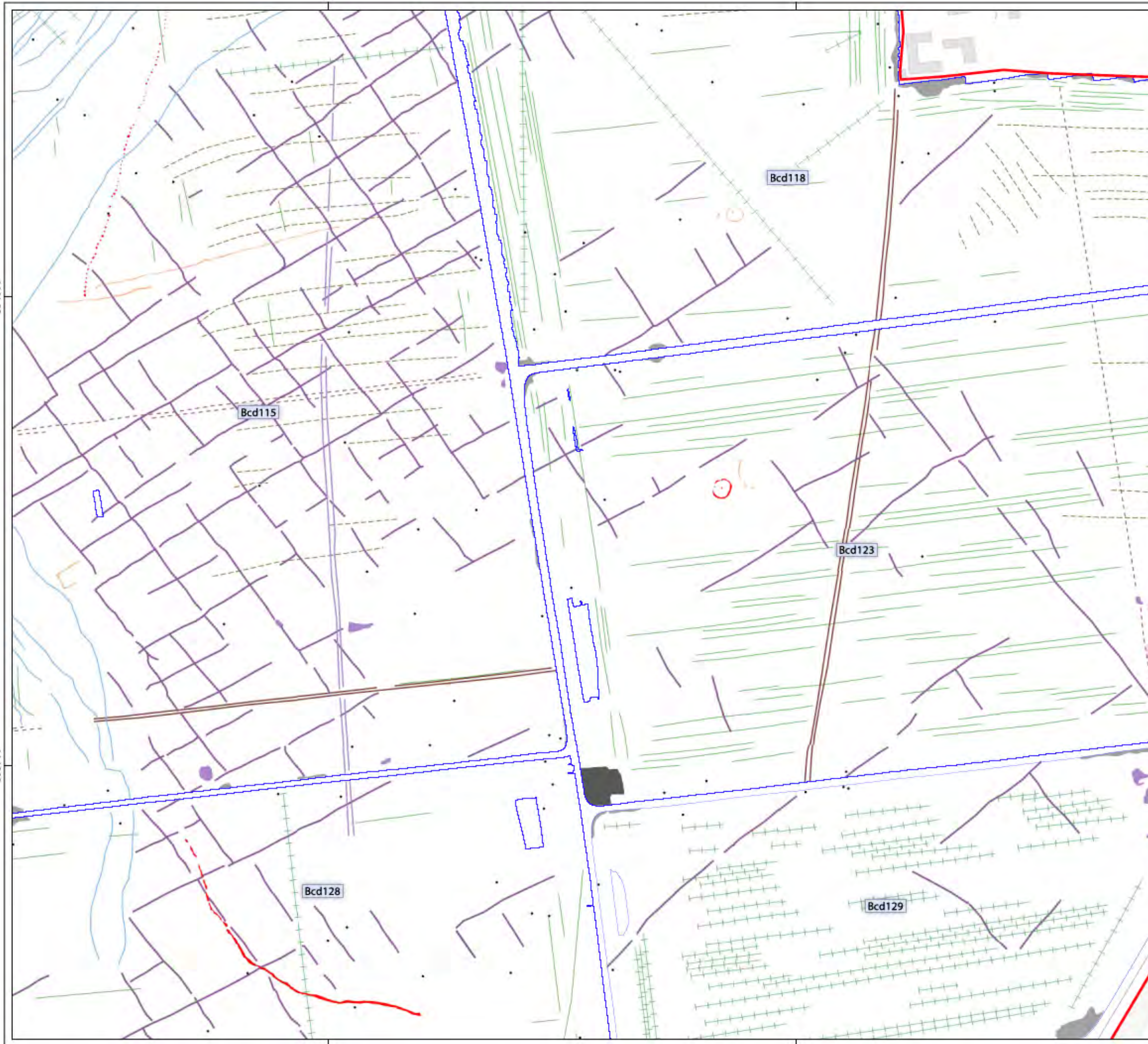
Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)



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Key

- Geophysical Survey Area
- Survey Extent

Interpretation

- Ferrous Objects
- Agriculture
- Field Boundary
- Possible Field Boundary
- Field Drain
- Natural
- Uncertain
- Ridge and Furrow
- Field System
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Quarry
- Uncertain
- Former Building

0 50 100 m

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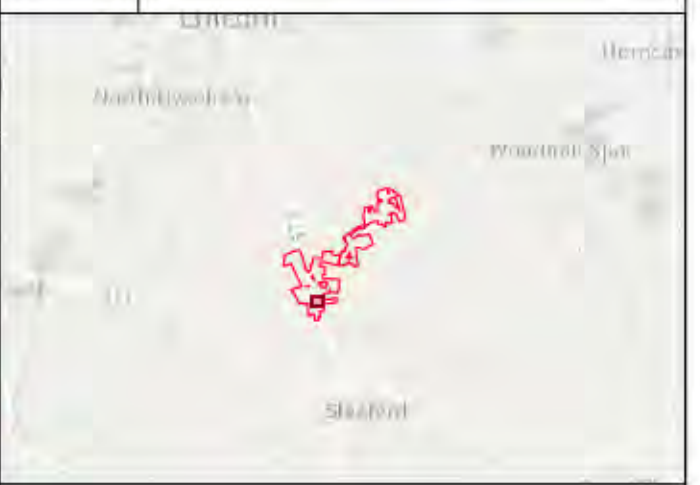
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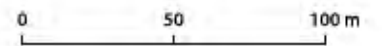


Key

- Geophysical Survey Area
- Survey Extent



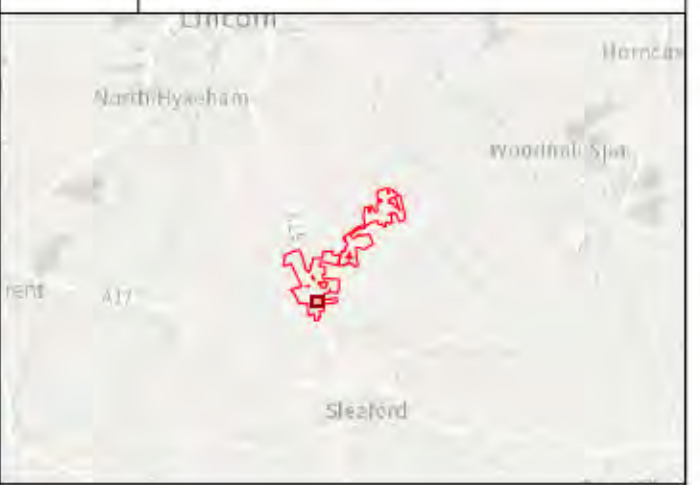
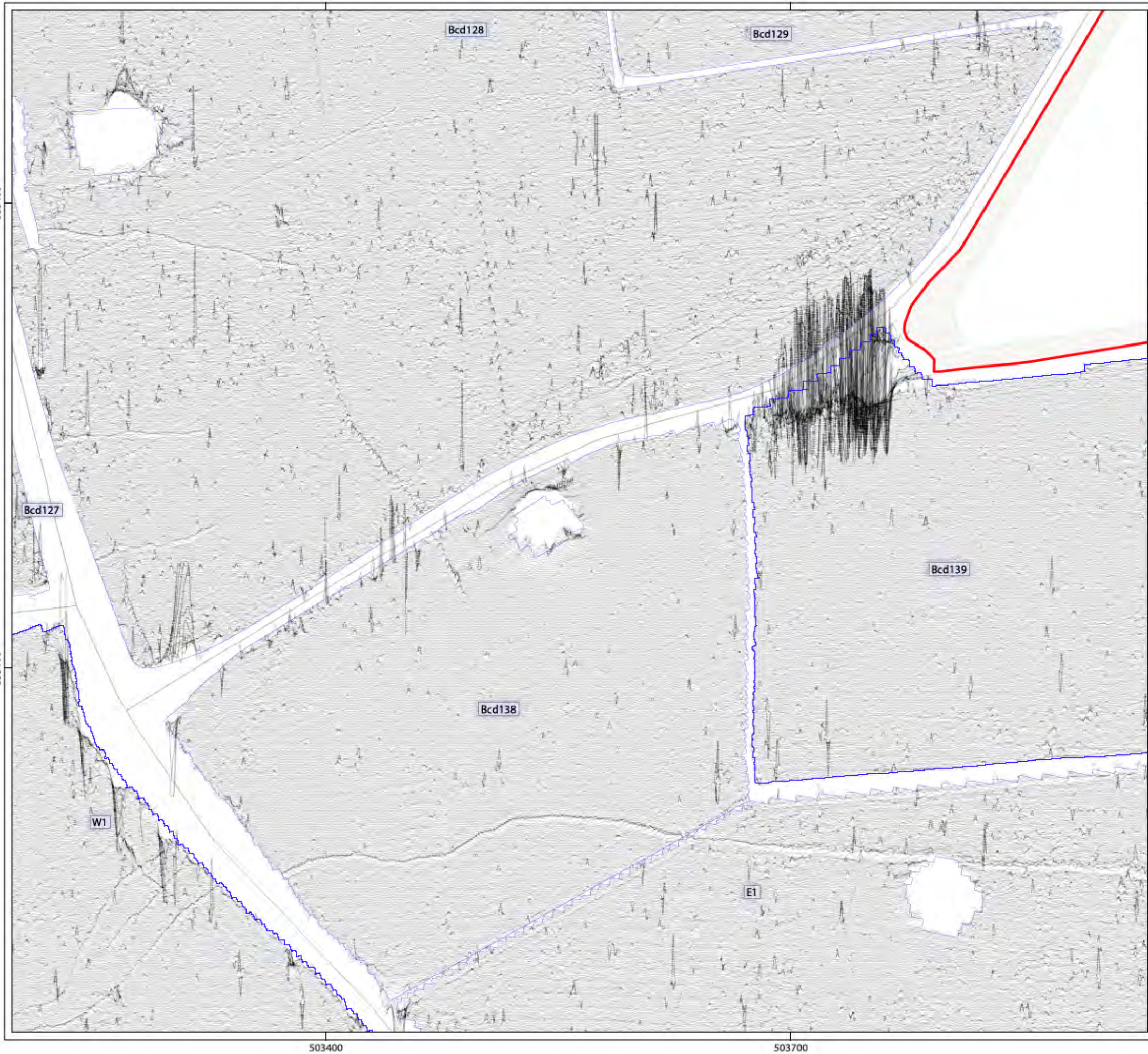
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Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)

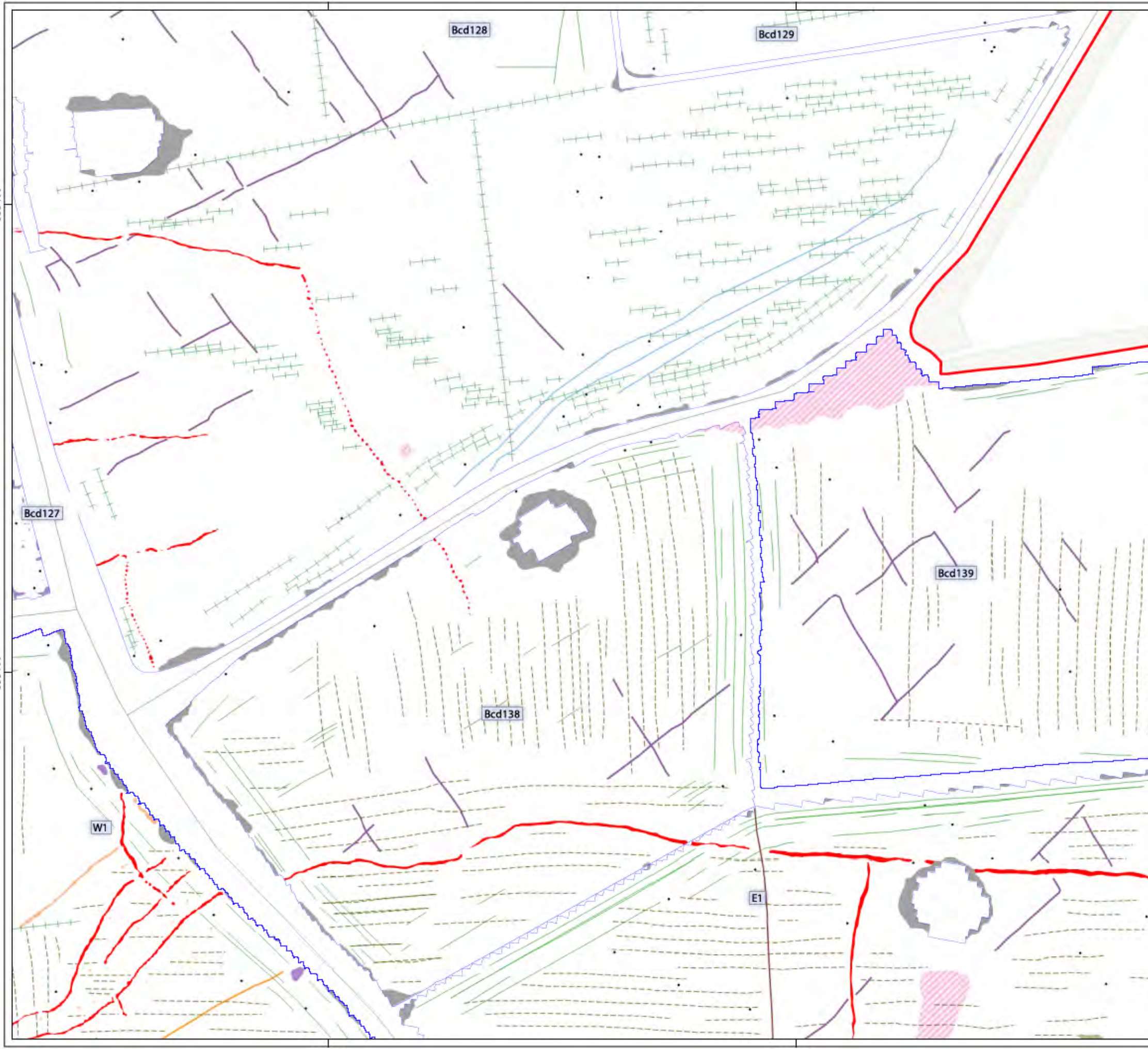
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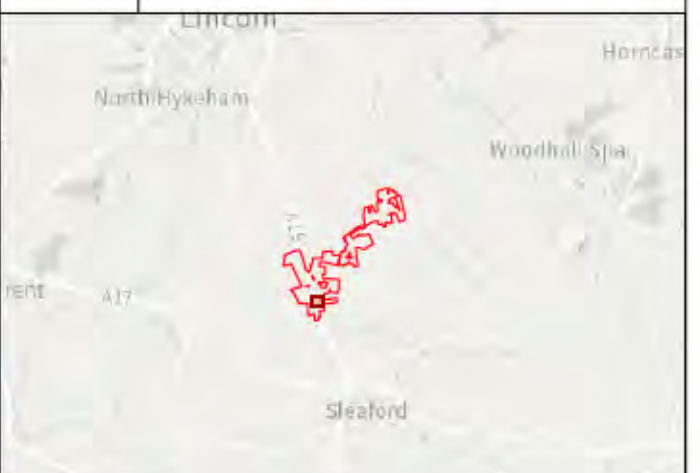
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Key

- Geophysical Survey Area
- Survey Extent

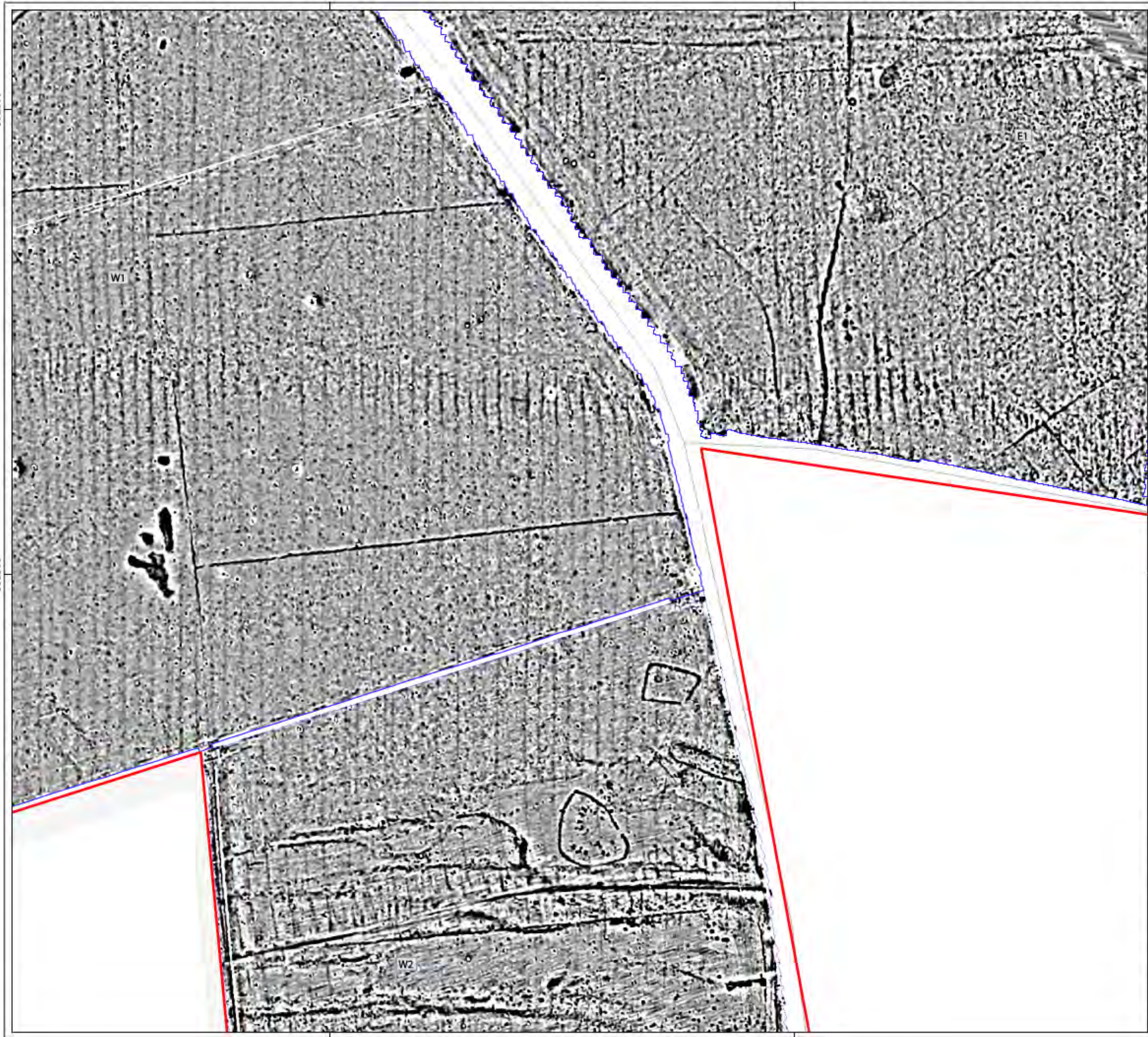
Interpretation

- Ferrous Objects
- Agriculture
- Field Boundary
- Possible Field Boundary
- Field Drain
- Natural
- Ridge and Furrow
- Field System
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Quarry
- Uncertain
- Null Value

0 50 100 m

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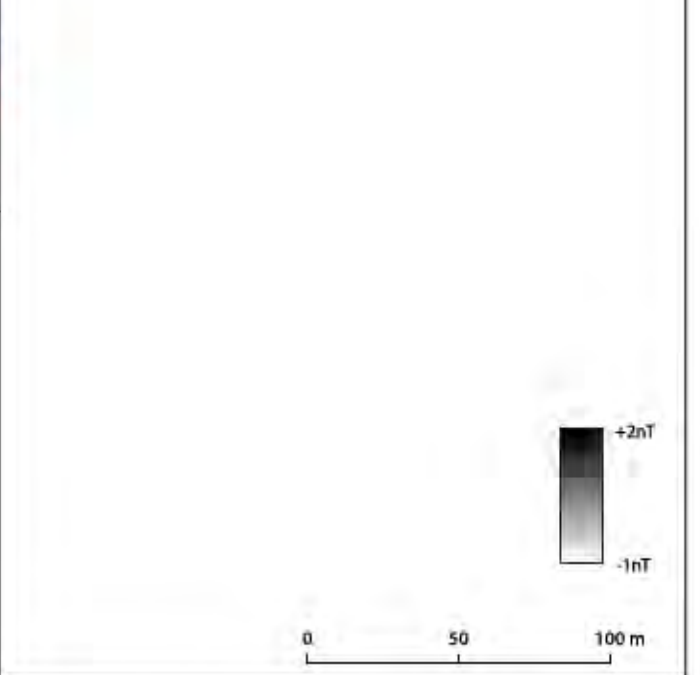



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Key

- ▭ Geophysical Survey Area
- ▭ Survey Extent



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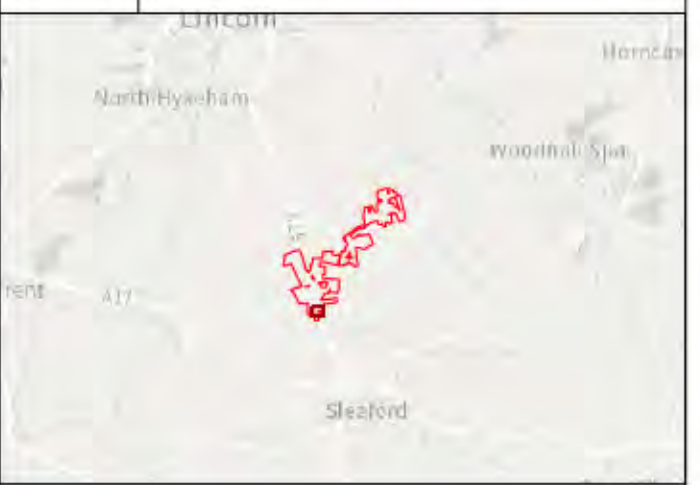
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503700



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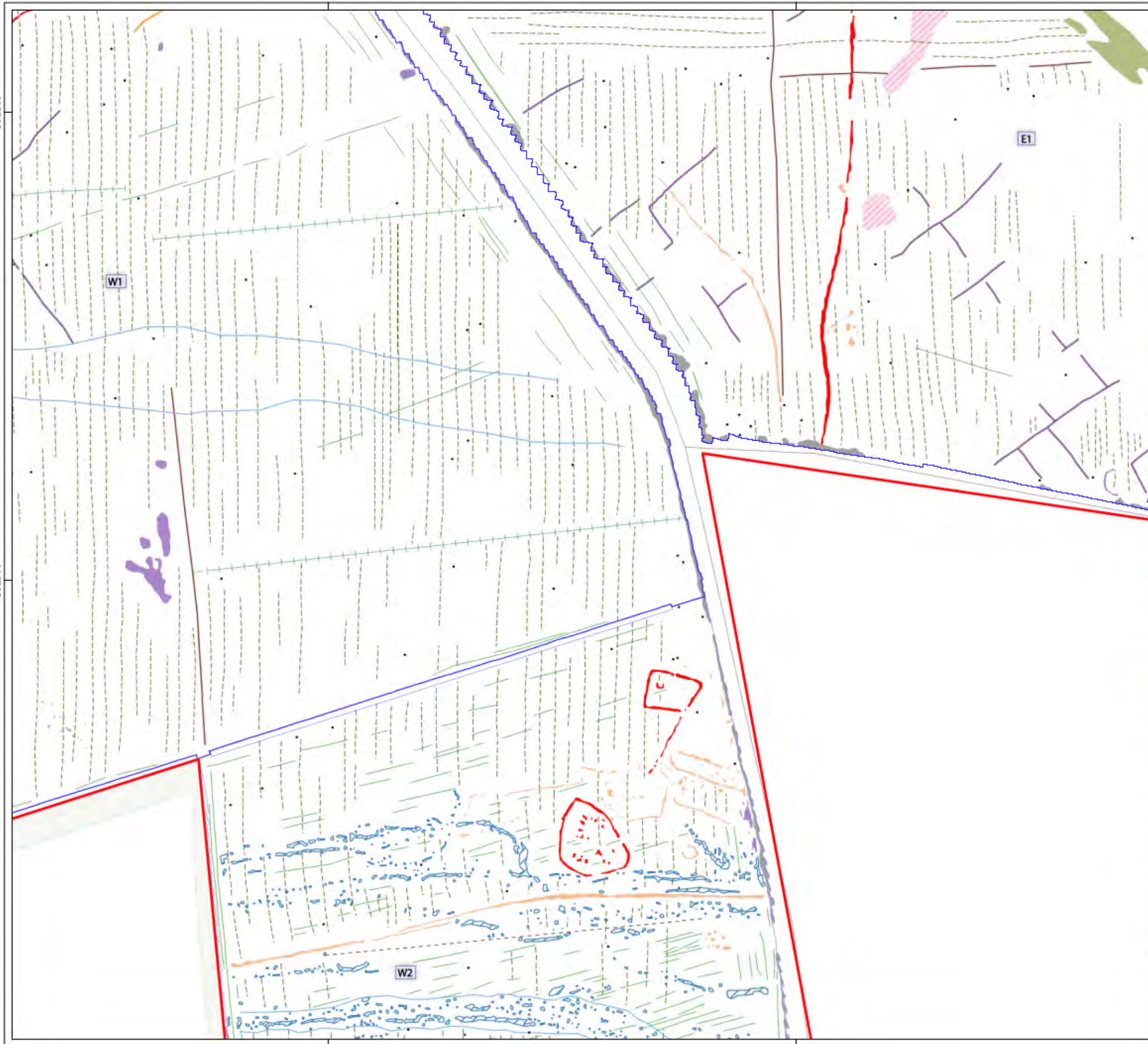
Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)

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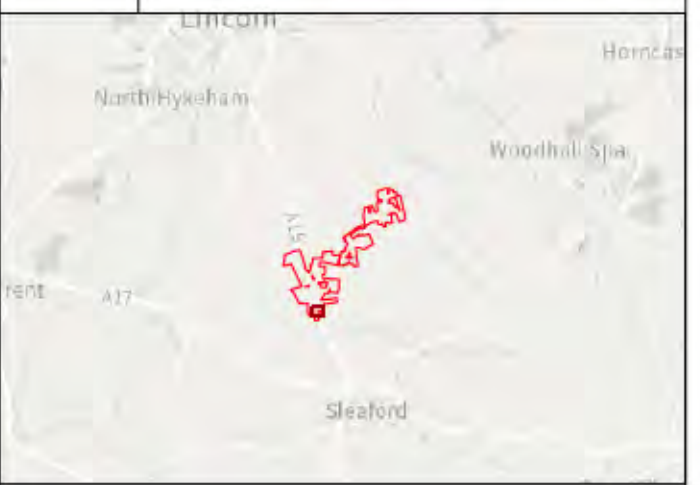
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Key

- Geophysical Survey Area
- Survey Extent

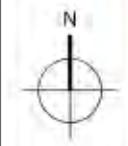
Interpretation

- Ferrous Objects
- Agriculture
- Field Boundary
- Possible Field Boundary
- Field Drain
- Natural
- Ridge and Furrow
- Field System
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Quarry
- Uncertain
- Geology
- Null Value

0 50 100 m

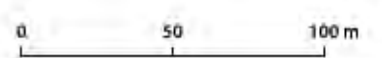
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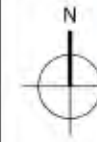
Key

- Geophysical Survey Area
- Survey Extent



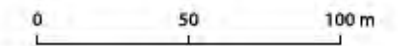
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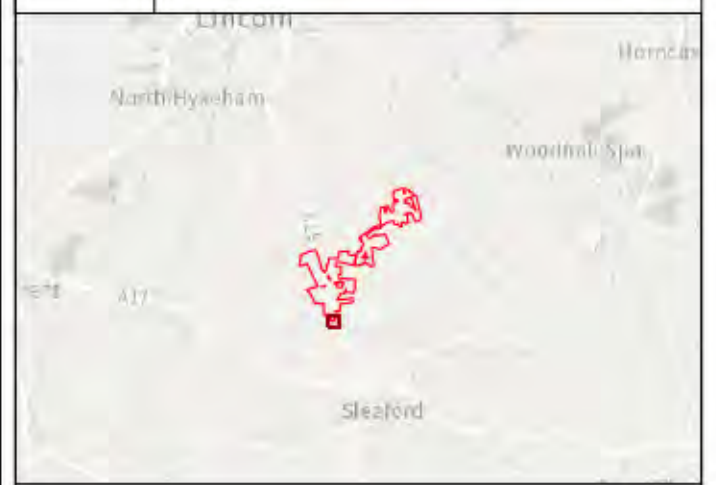
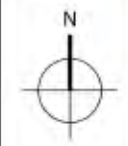
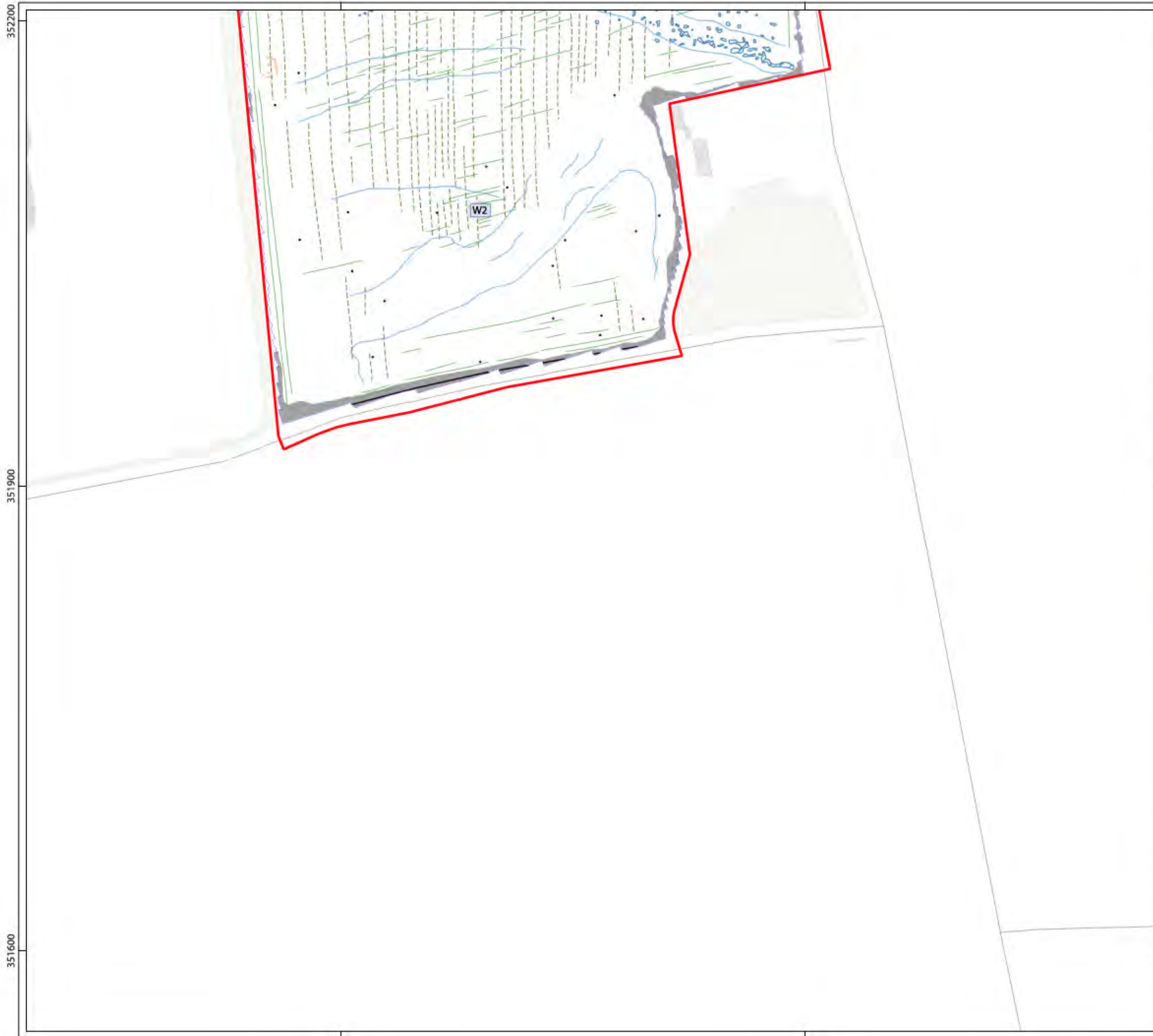
Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)



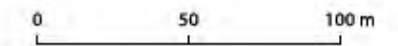
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Scale:	1:2,500 @ A3



Key

- Geophysical Survey Area
- Survey Extent
- Interpretation**
- Ferrous Objects
- Agriculture
- Natural
- Pipe
- Ridge and Furrow
- Magnetic Disturbance
- Possible Archaeology
- Geology



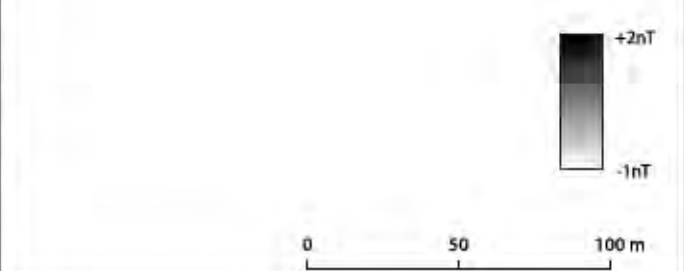
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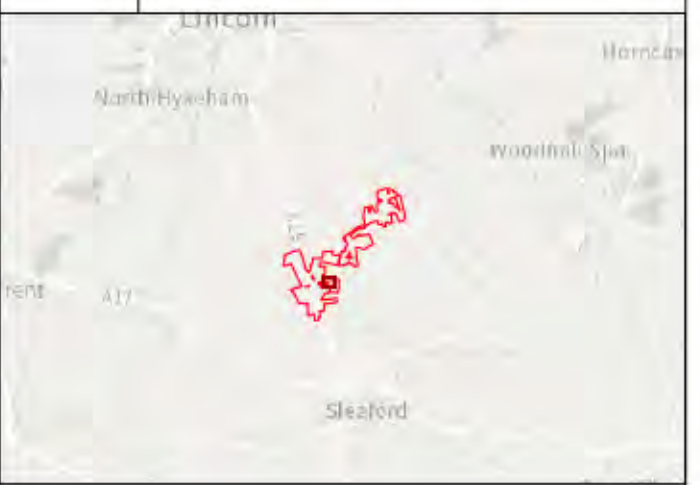
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504300

504600




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Key

- ▭ Geophysical Survey Area
- ▭ Survey Extent
- XY Trace (25nT/cm)

0 50 100 m

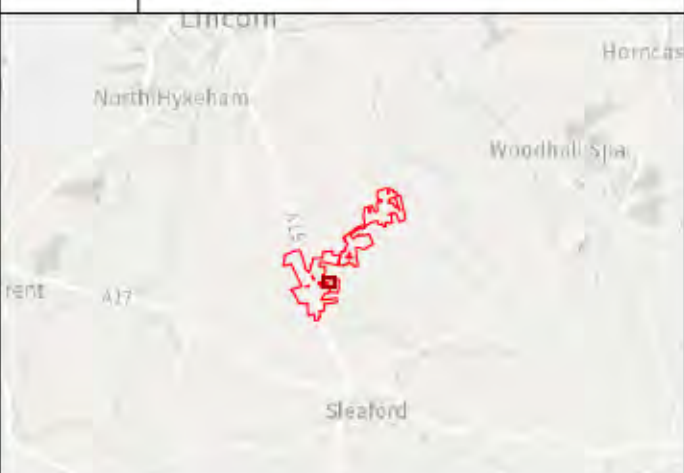
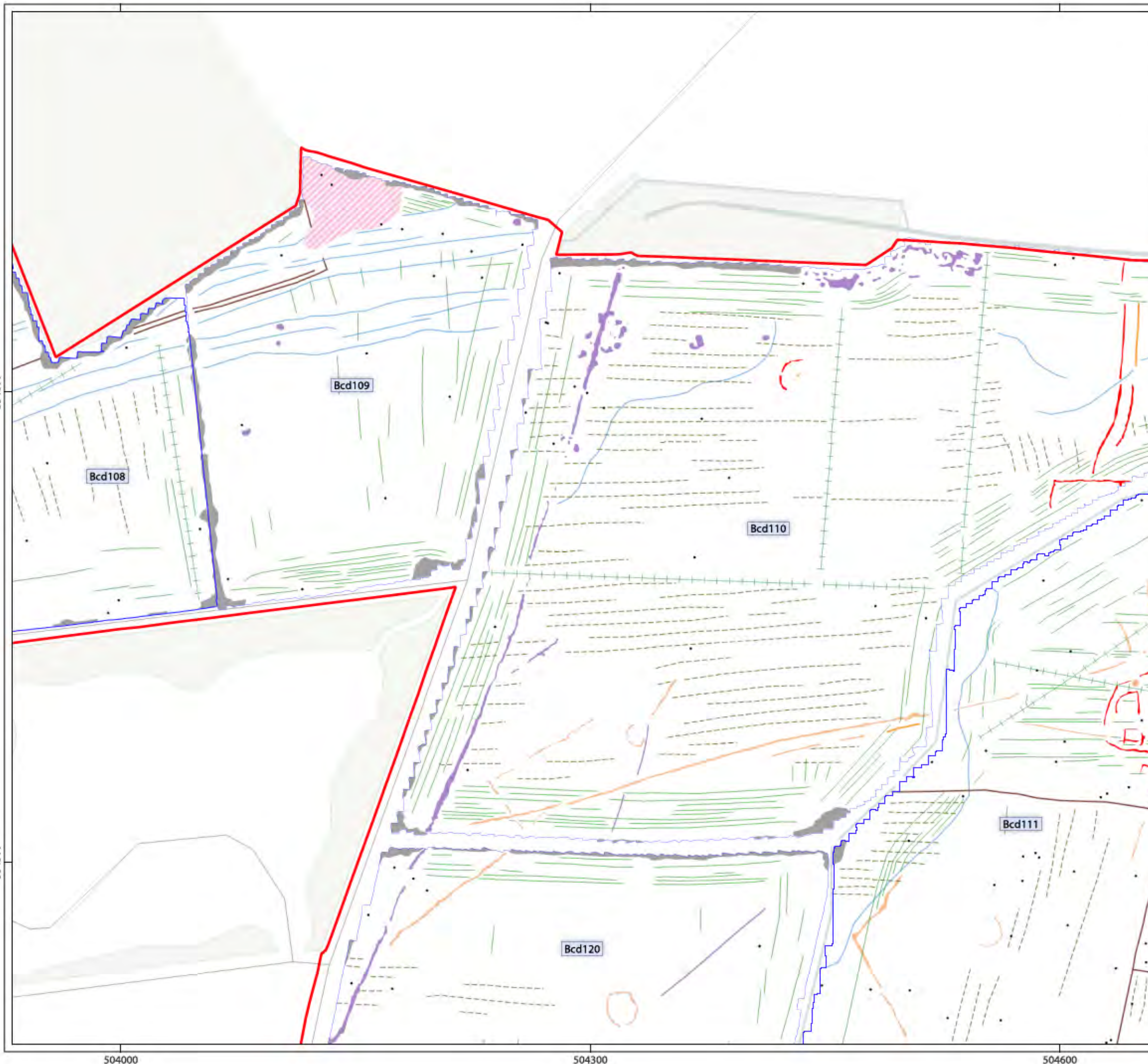
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504000

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Key

- Geophysical Survey Area
- Survey Extent

Interpretation

- Ferrous Objects
- Agriculture
- Field Boundary
- Field Drain
- Natural
- Uncertain
- Ridge and Furrow
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Quarry
- Uncertain

0 50 100 m

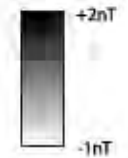
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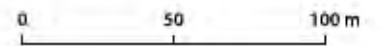
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Key

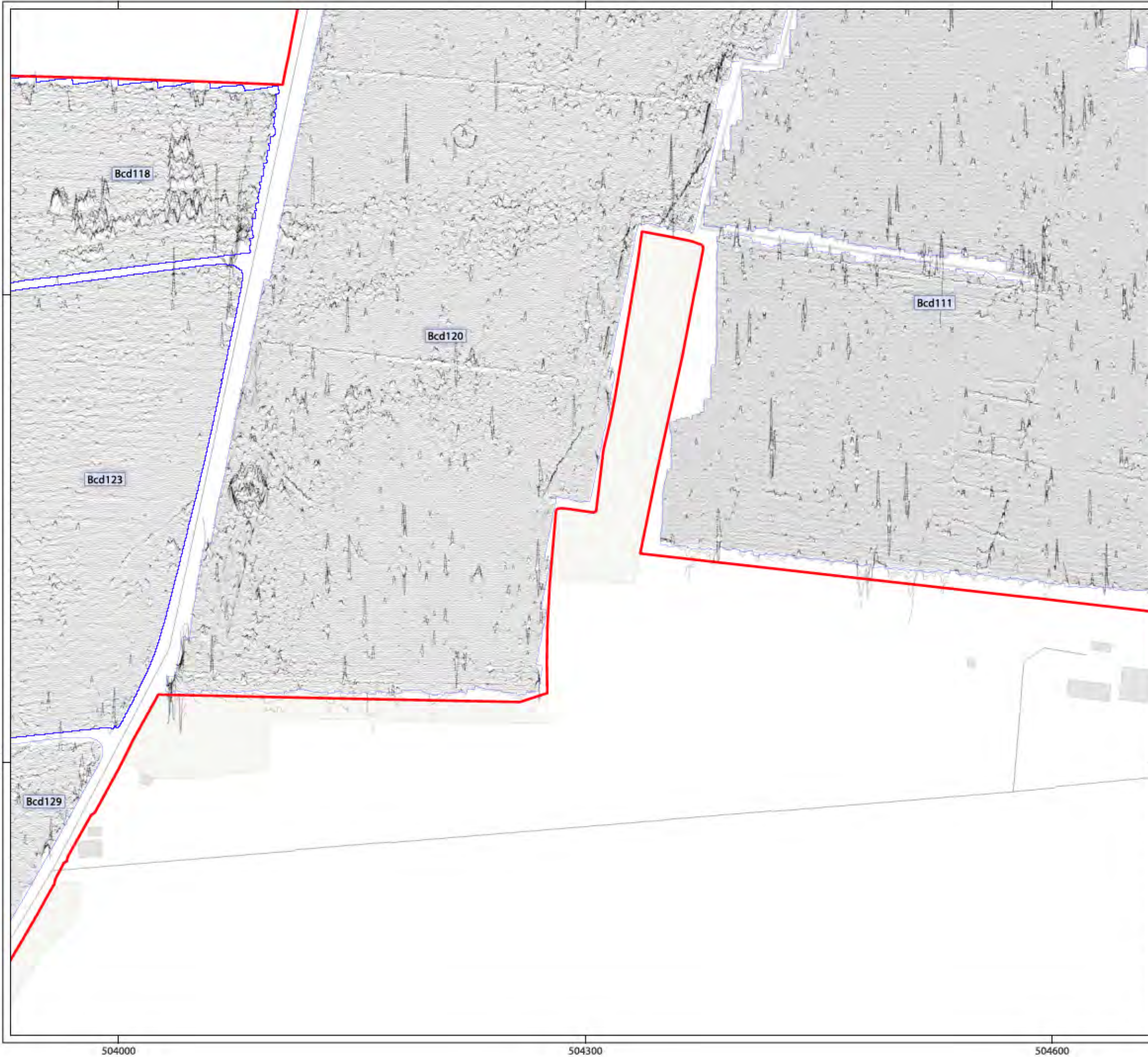
- Geophysical Survey Area
- Survey Extent





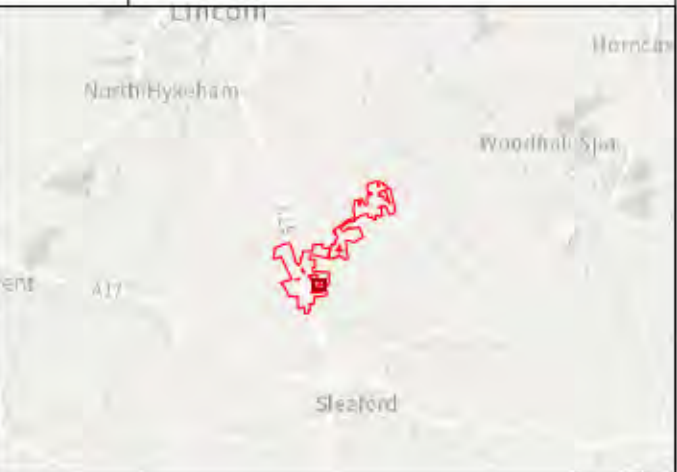
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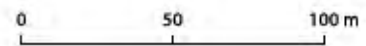



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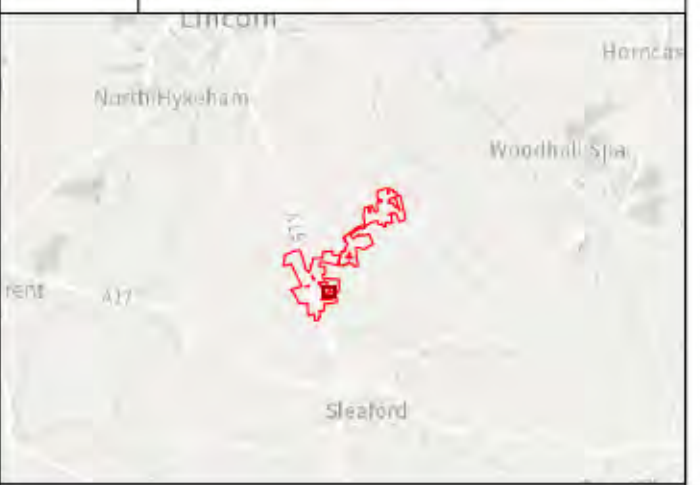
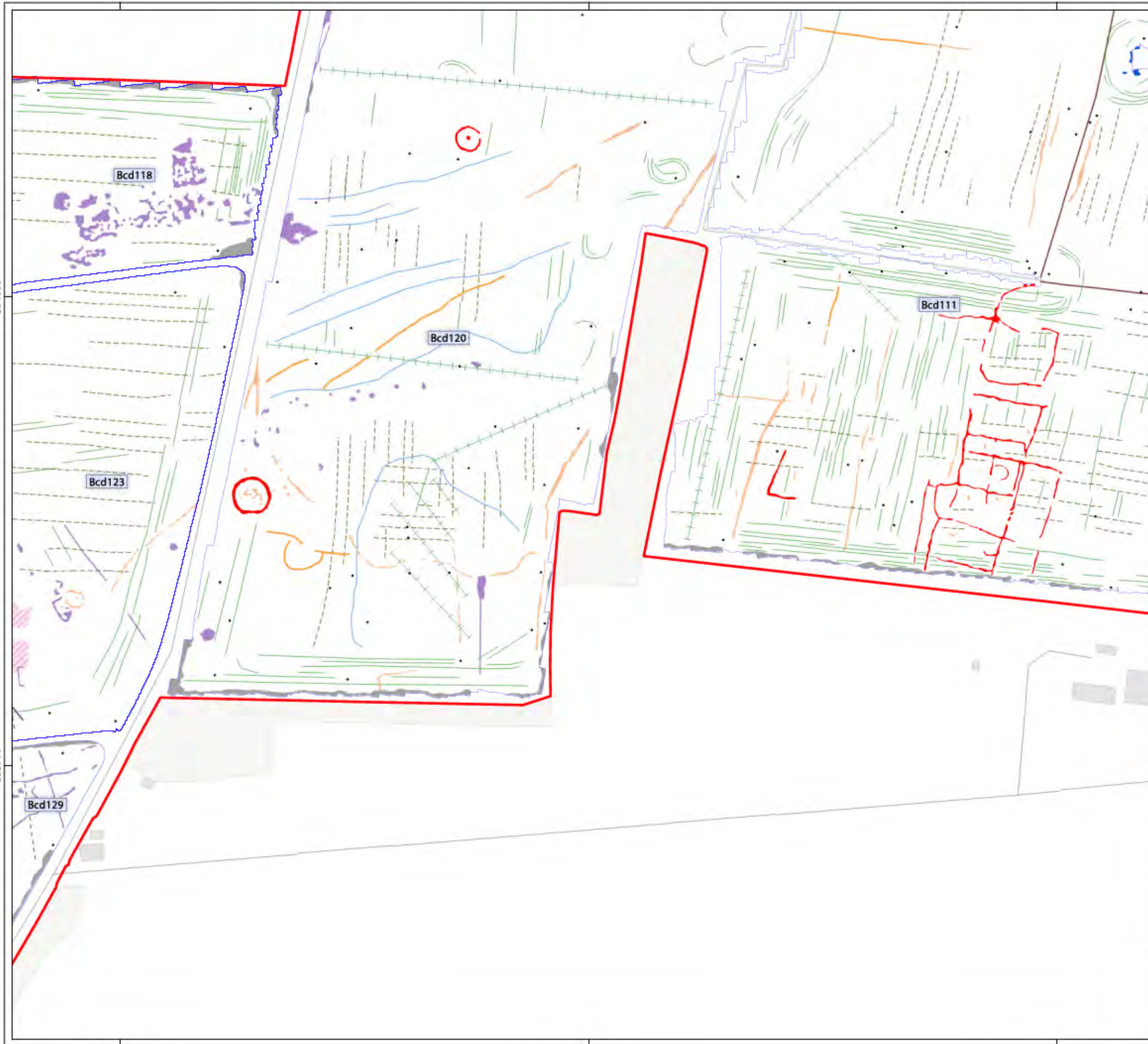
Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)



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Key

- Geophysical Survey Area
- Survey Extent

Interpretation

- Ferrous Objects
- Agriculture
- Field Boundary
- Possible Field Boundary
- Field Drain
- Natural
- Uncertain
- Ridge and Furrow
- Field System
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Quarry
- Uncertain
- Former Pond

0 50 100 m

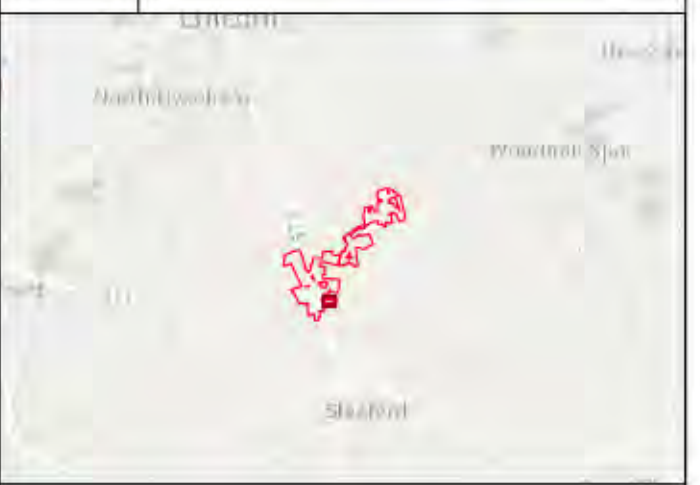
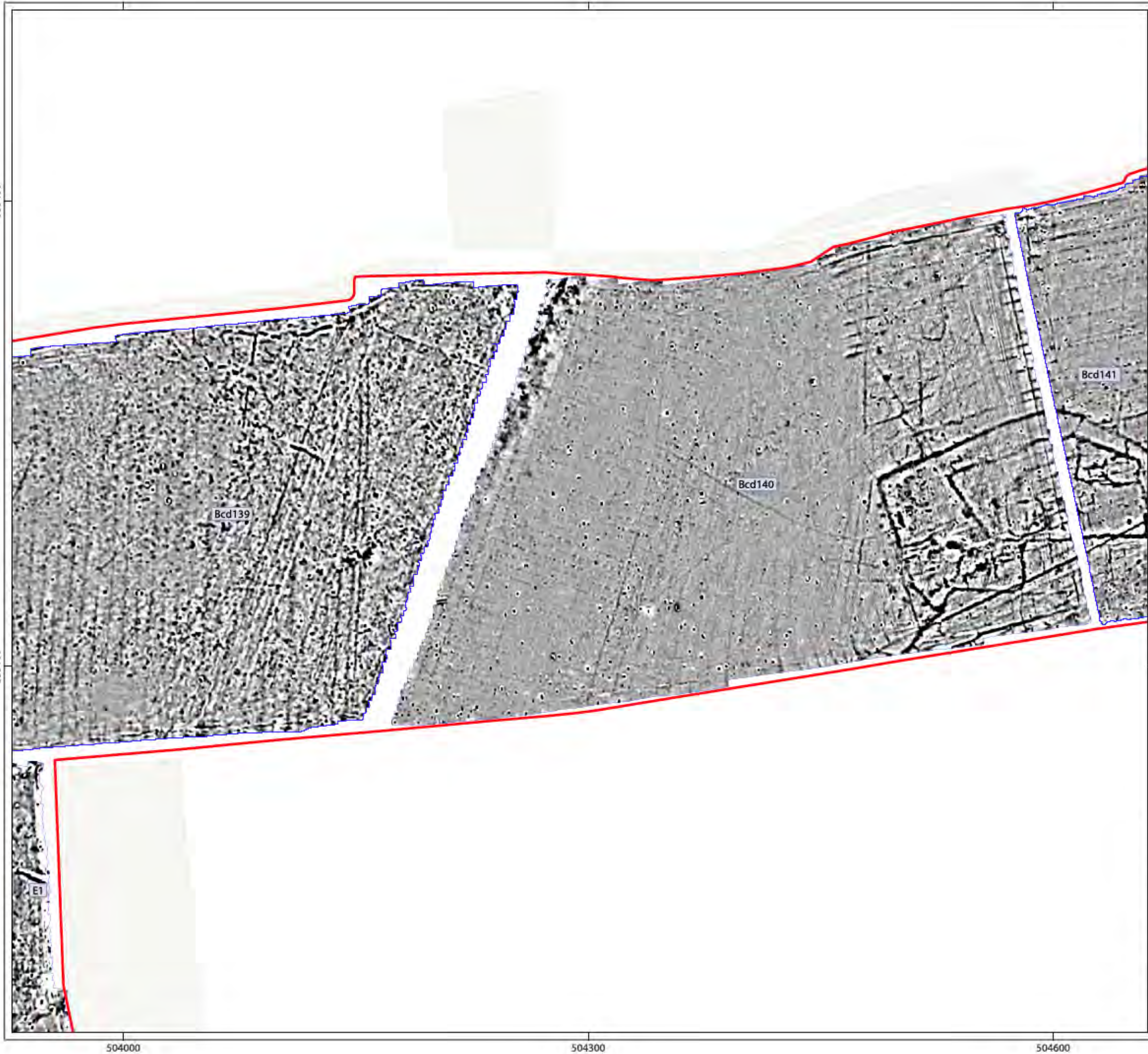
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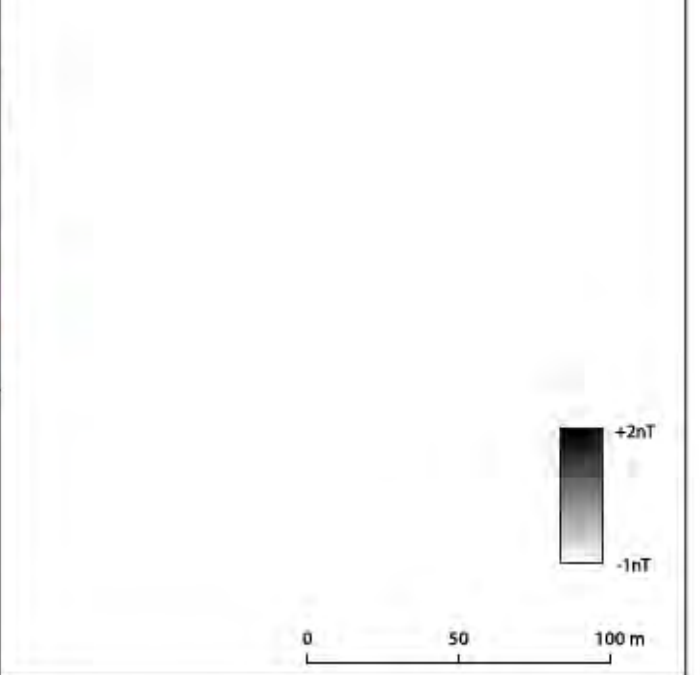
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Key

- Geophysical Survey Area
- Survey Extent



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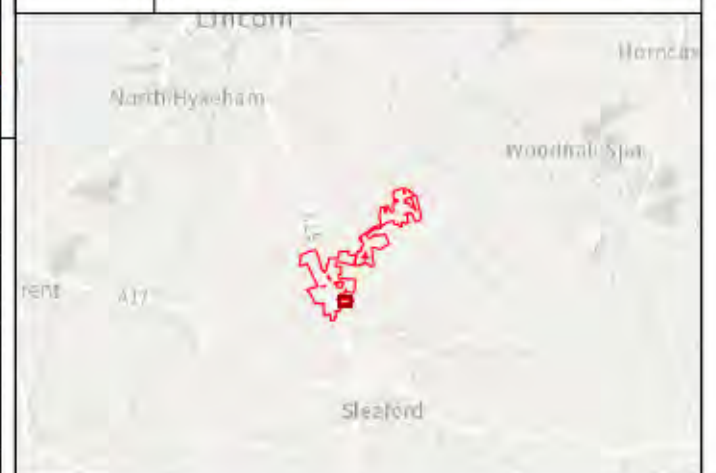
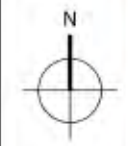
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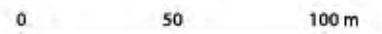
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Key

- ▭ Geophysical Survey Area
- ▭ Survey Extent
- XY Trace (25nT/cm)

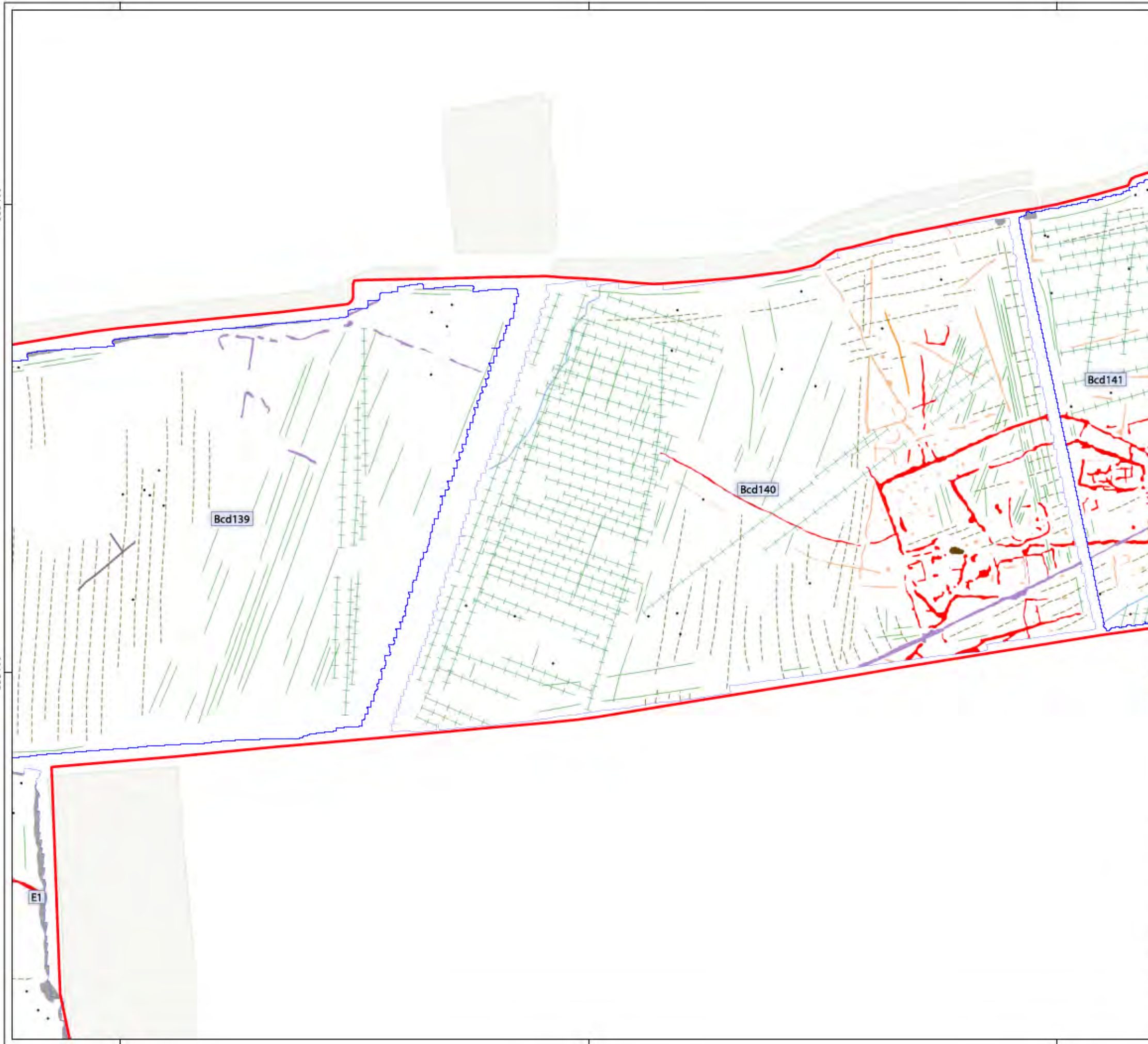


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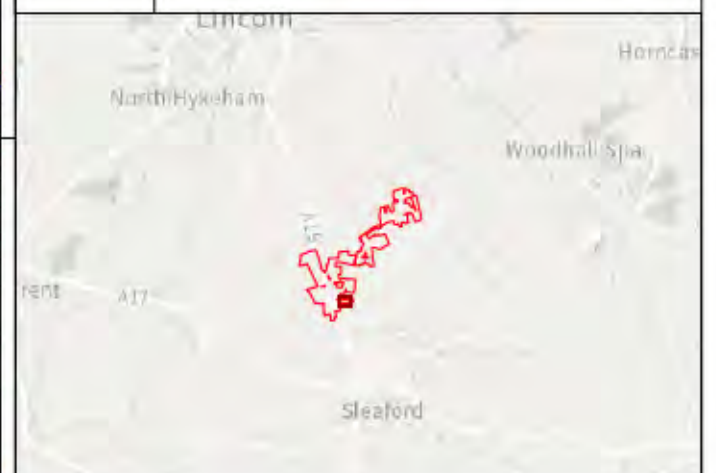
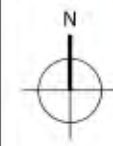
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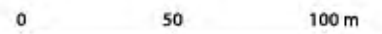
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Key

- Geophysical Survey Area
- Survey Extent
- Interpretation**
- Ferrous Objects
- Agriculture
- Field Drain
- Natural
- Ridge and Furrow
- Field System
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Uncertain
- Burning

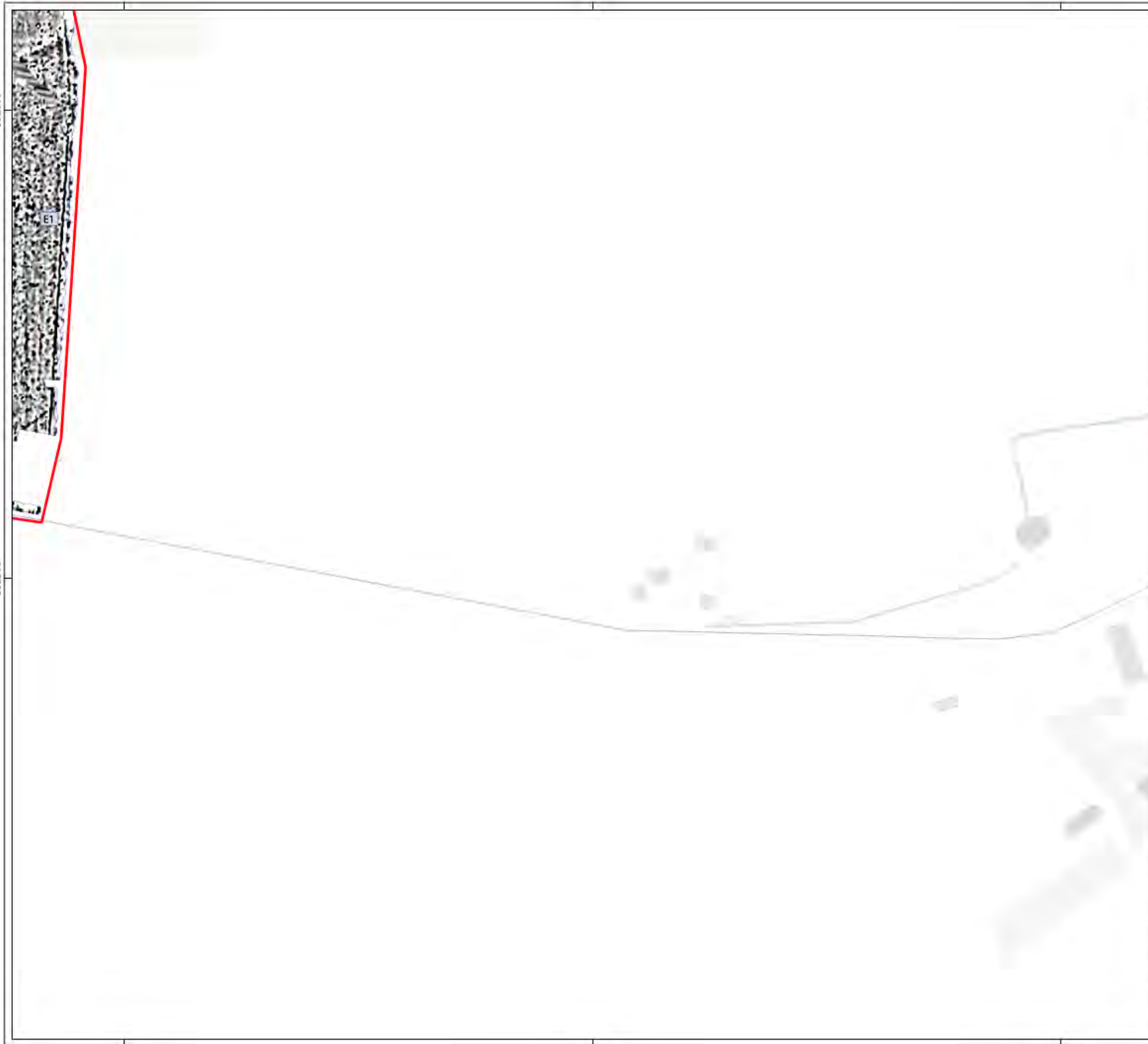


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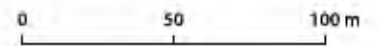


Key

- Geophysical Survey Area
- Survey Extent



+2nT
-1nT

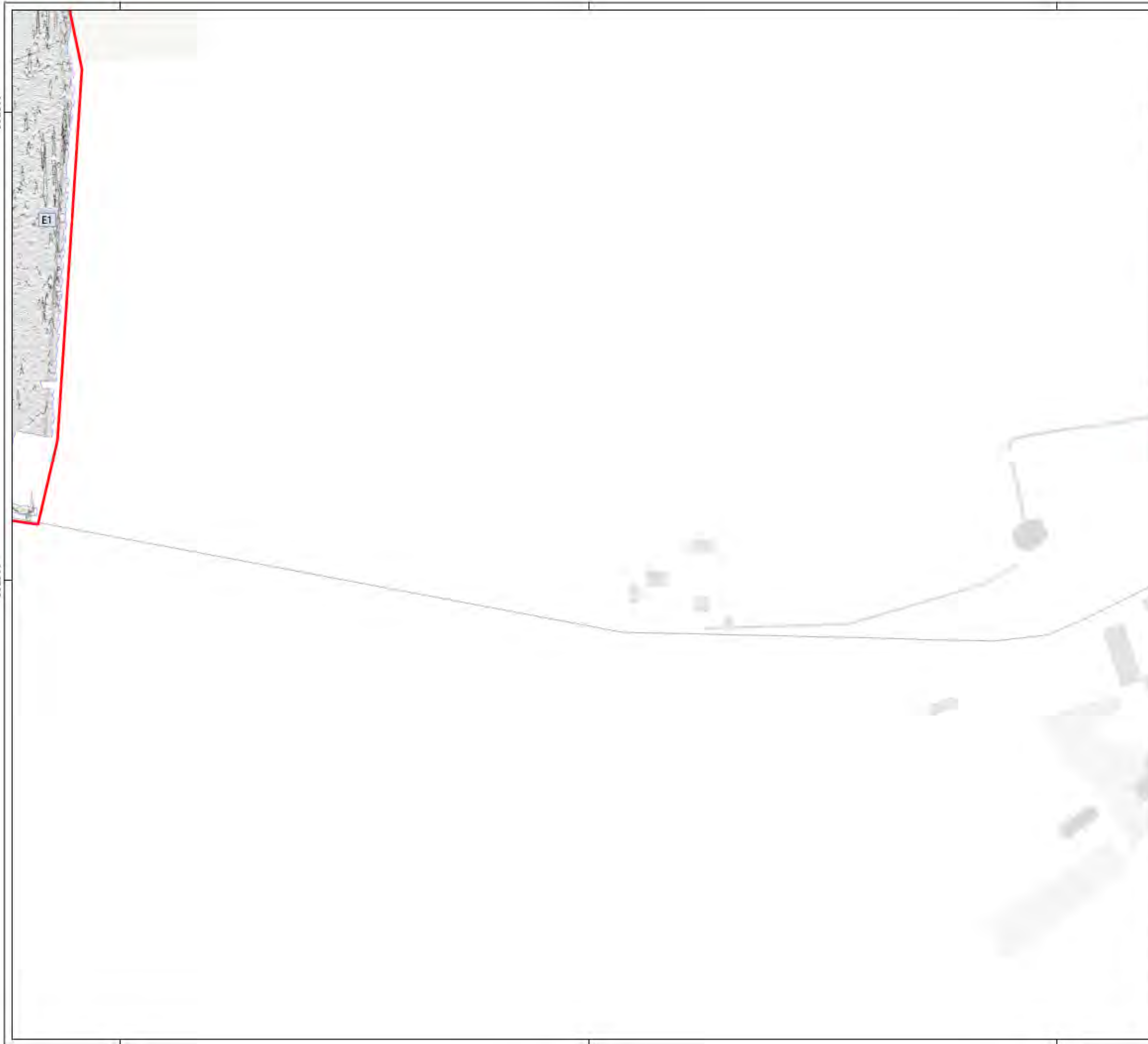


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Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)

0 50 100 m

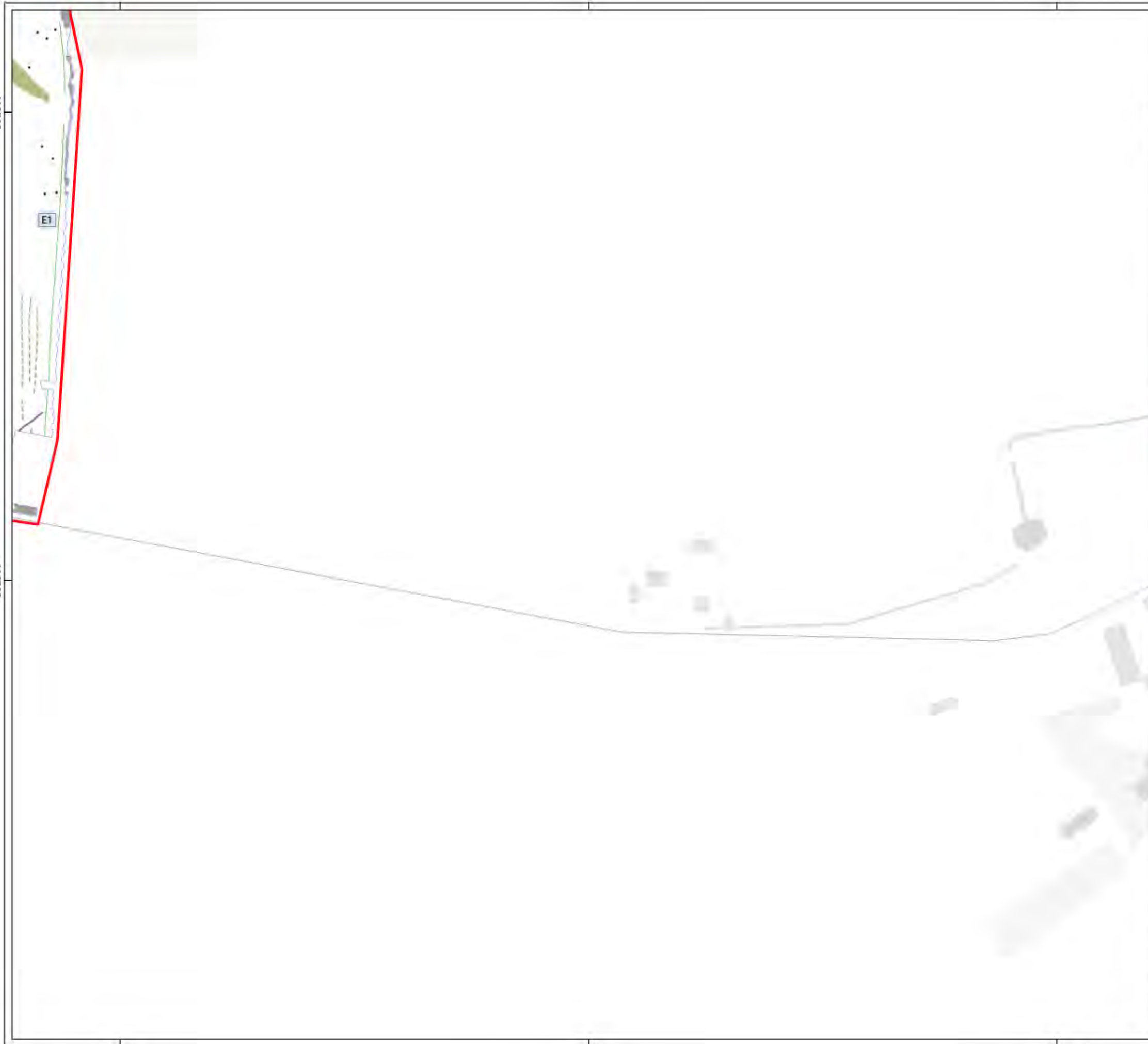
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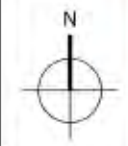
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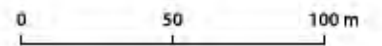
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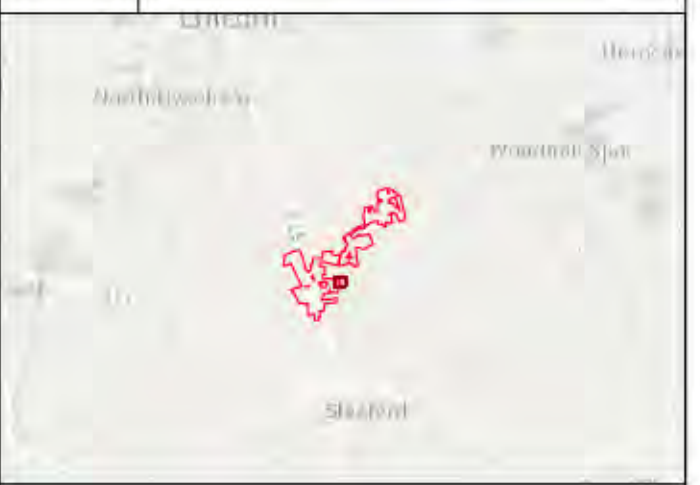
Key

- Geophysical Survey Area
- Survey Extent
- Interpretation**
- + Ferrous Objects
- Agriculture
- Ridge and Furrow
- Field System
- Magnetic Disturbance
- Null Value




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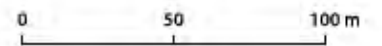


Key

- Geophysical Survey Area
- Survey Extent



+2nT
-1nT



0 50 100 m

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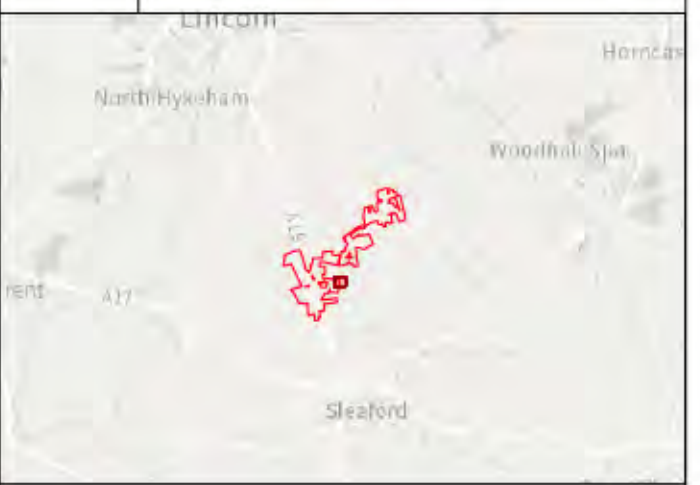
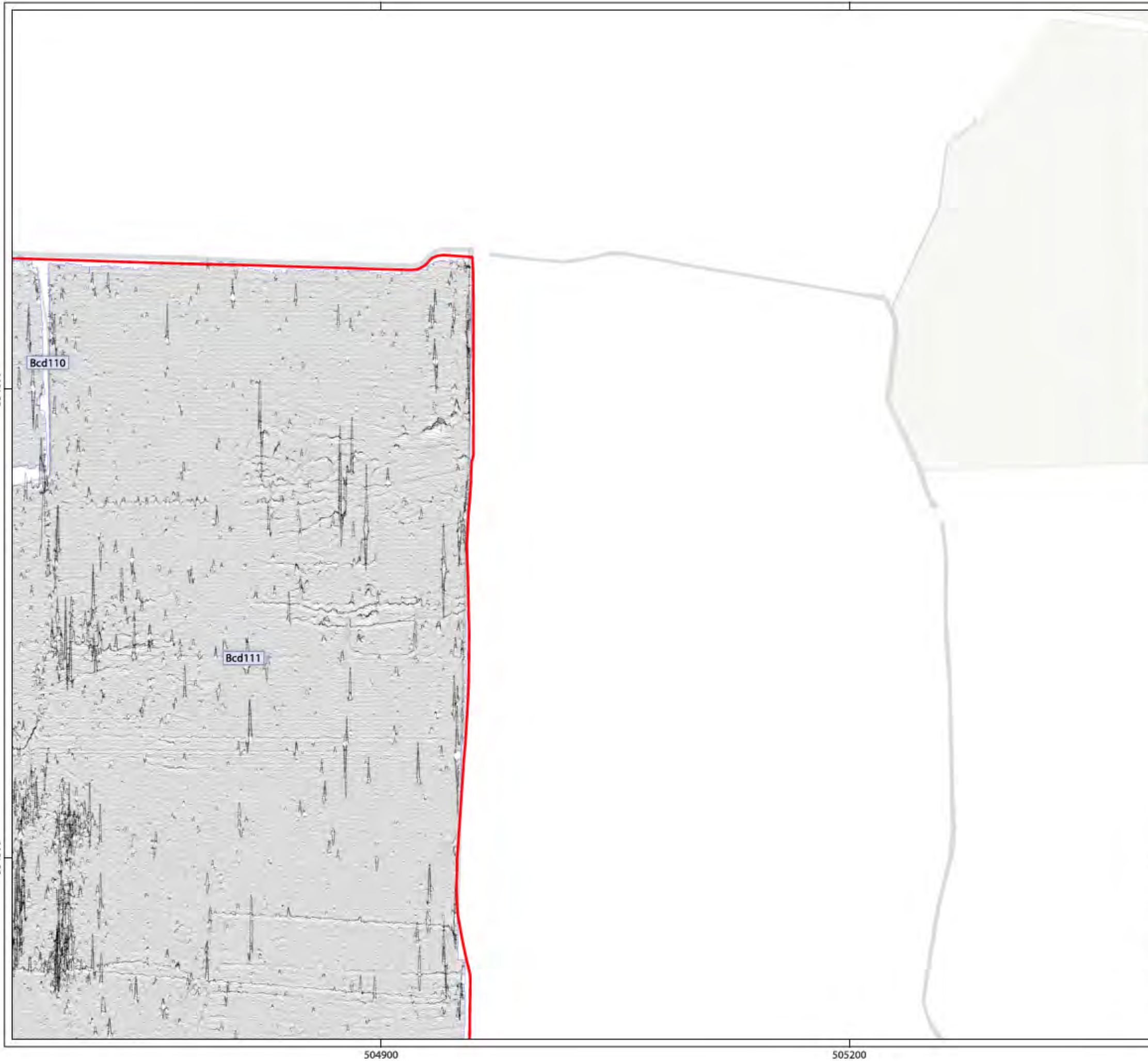
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505200



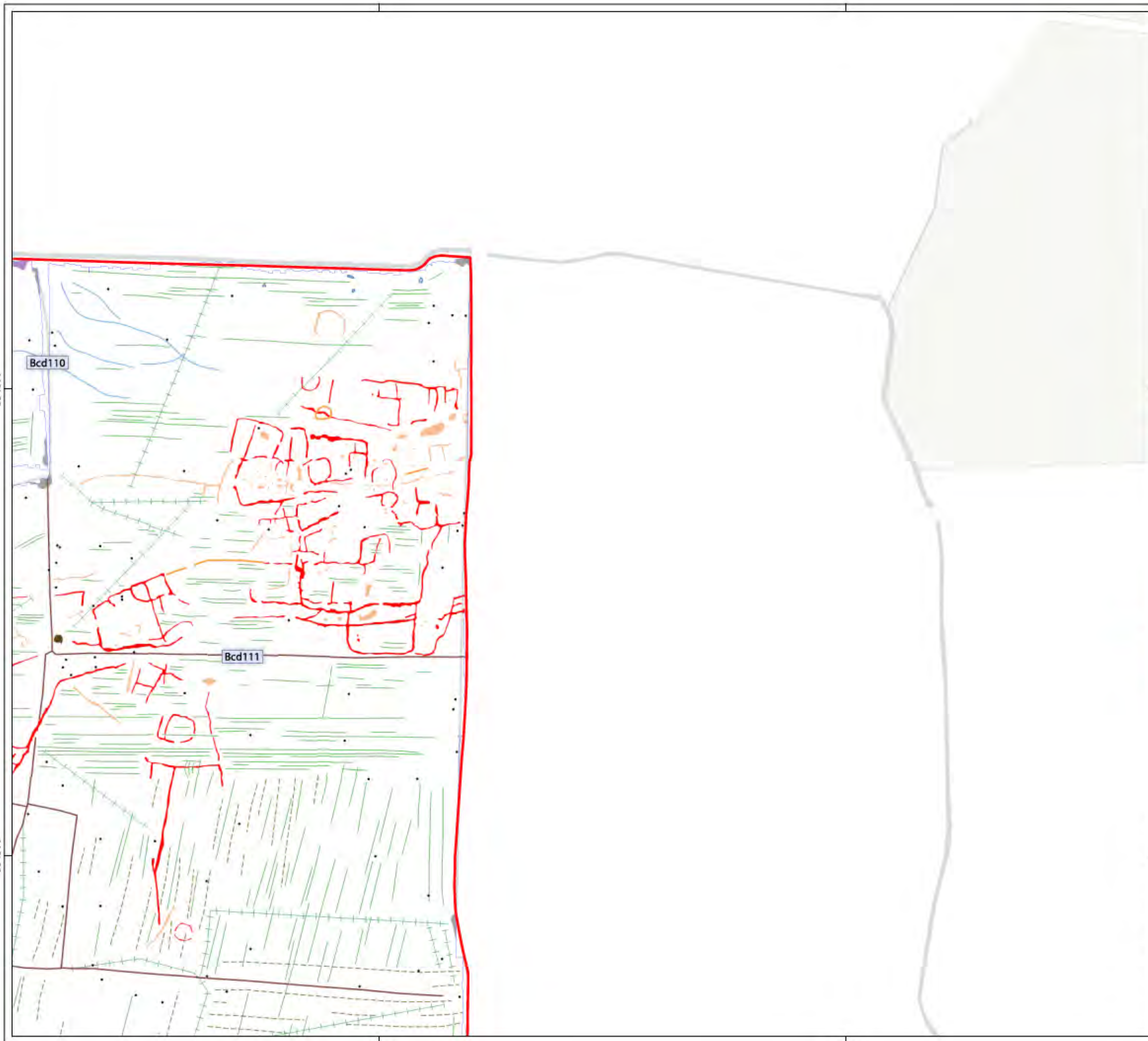
Key

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- Survey Extent
- XY Trace (25nT/cm)

0 50 100 m

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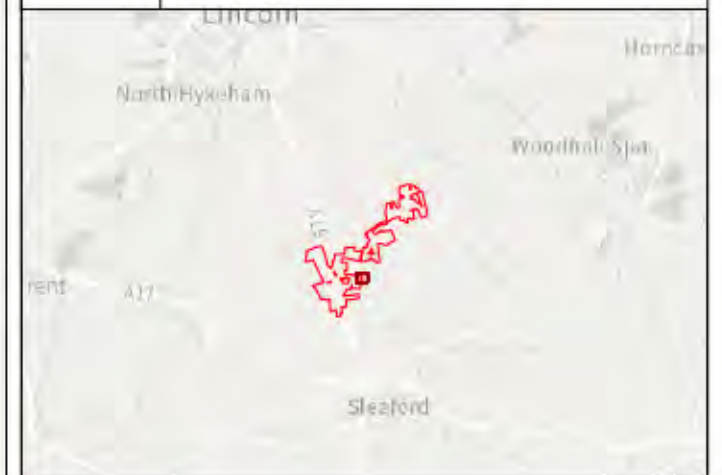
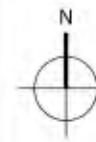


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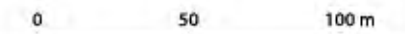
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Key

- Geophysical Survey Area
- Survey Extent
- Interpretation**
- Ferrous Objects
- Agriculture
- Field Boundary
- Field Drain
- Natural
- Ridge and Furrow
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Uncertain
- Geology
- Burning

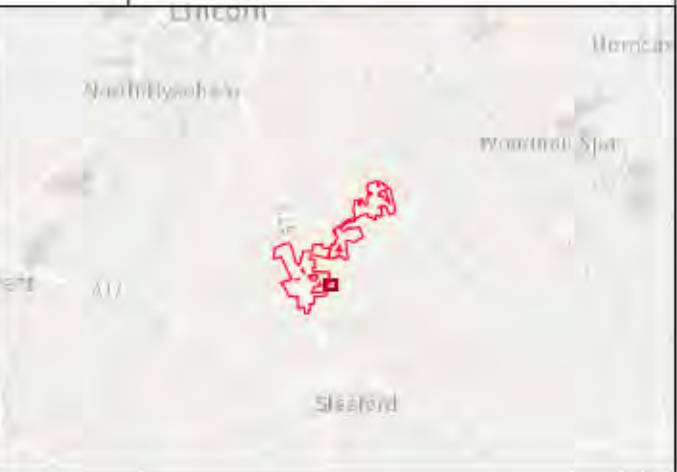


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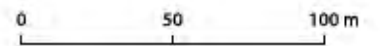
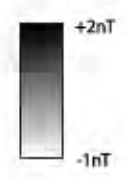
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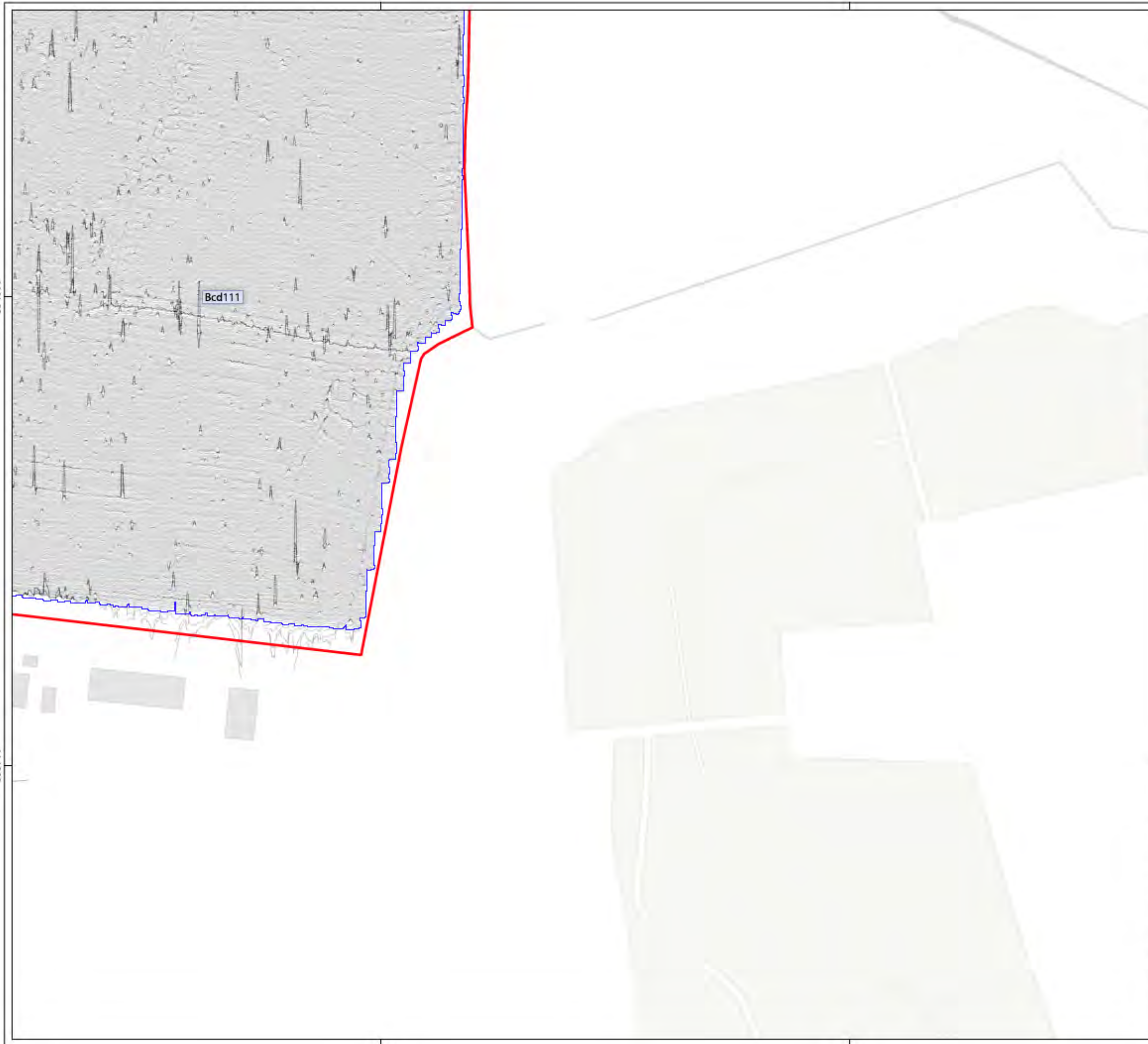
Key

- Geophysical Survey Area
- Survey Extent



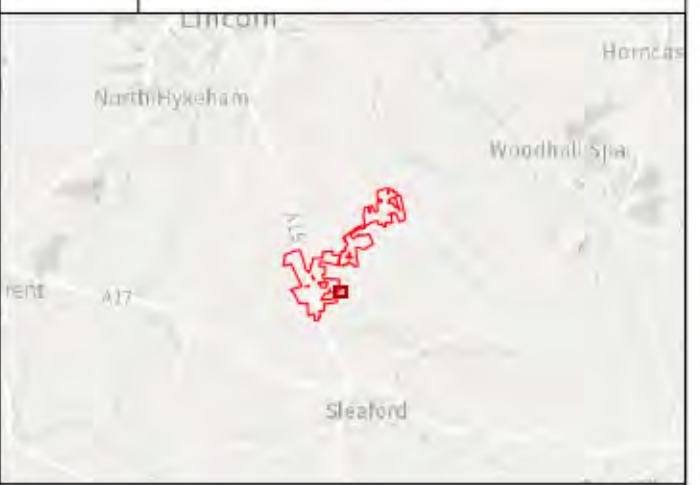
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Scale:	1:2,500 @ A3






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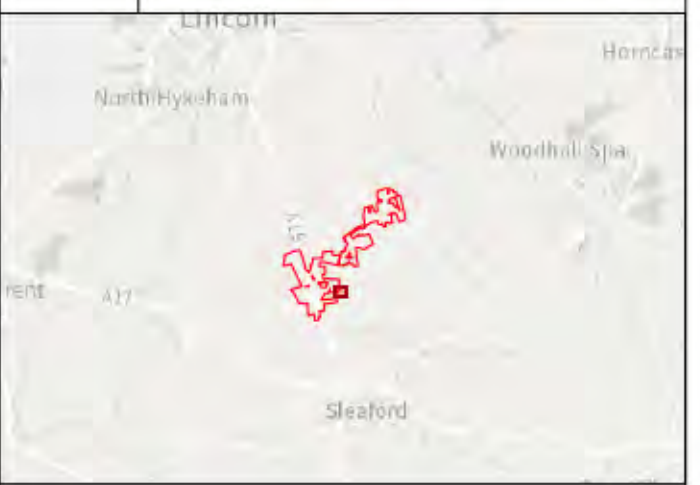
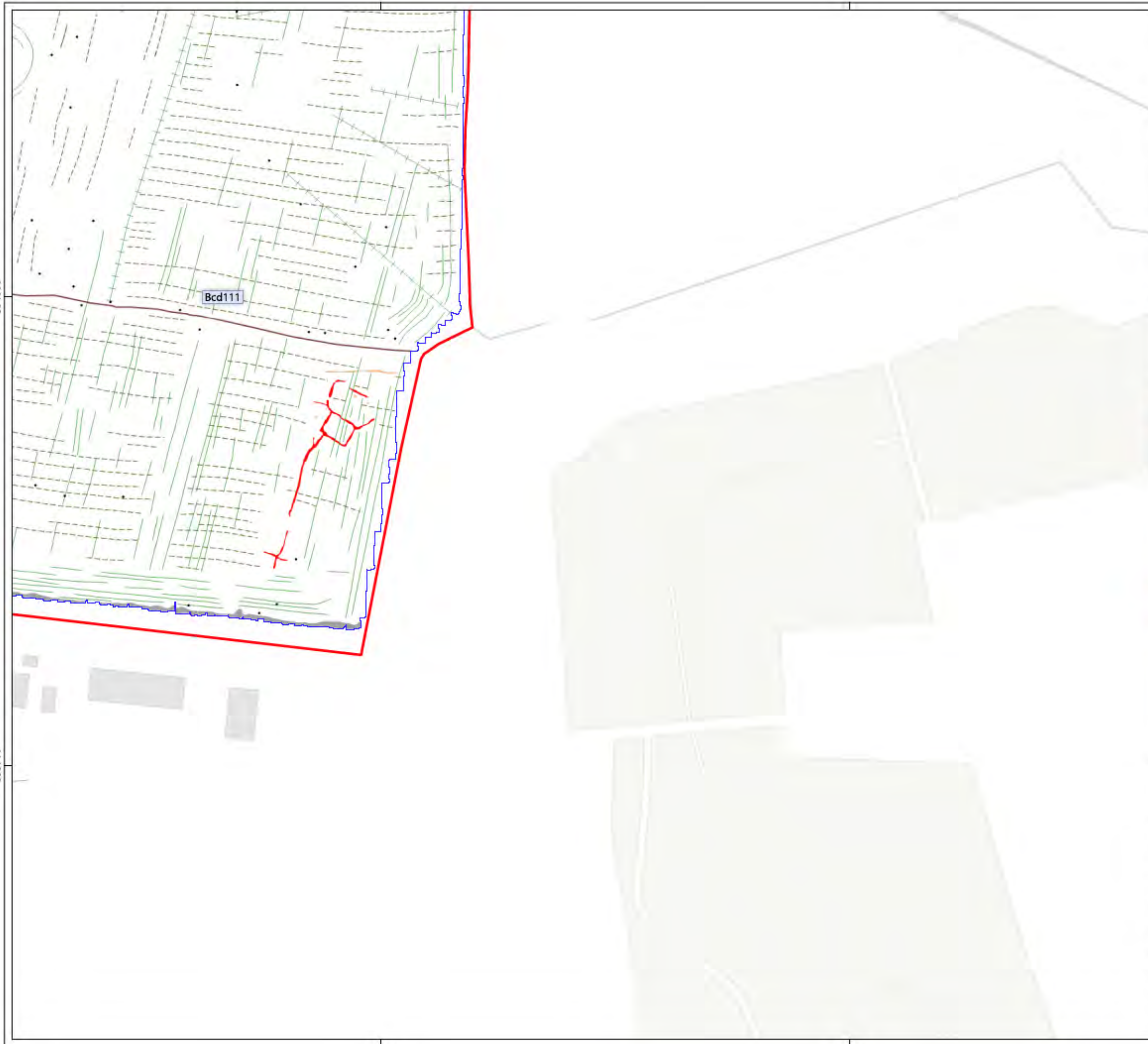
Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)

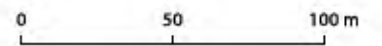
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- Key**
- Geophysical Survey Area
 - Survey Extent
- Interpretation**
- Ferrous Objects
 - Agriculture
 - Field Boundary
 - Field Drain
 - Ridge and Furrow
 - Archaeology
 - Magnetic Disturbance
 - Possible Archaeology



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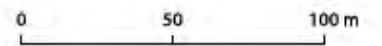
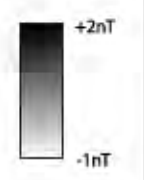
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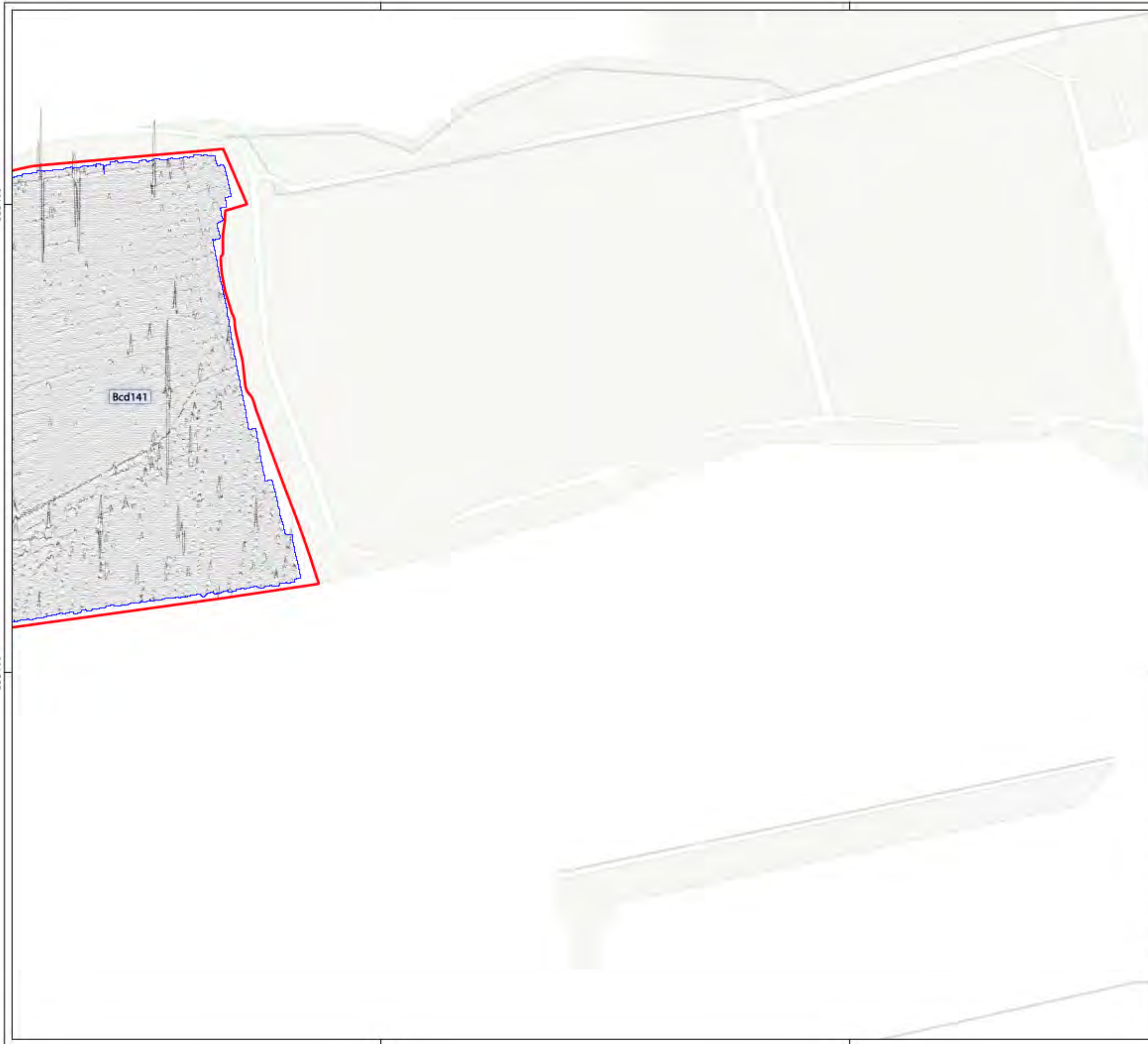


- Key**
- Geophysical Survey Area
 - Survey Extent



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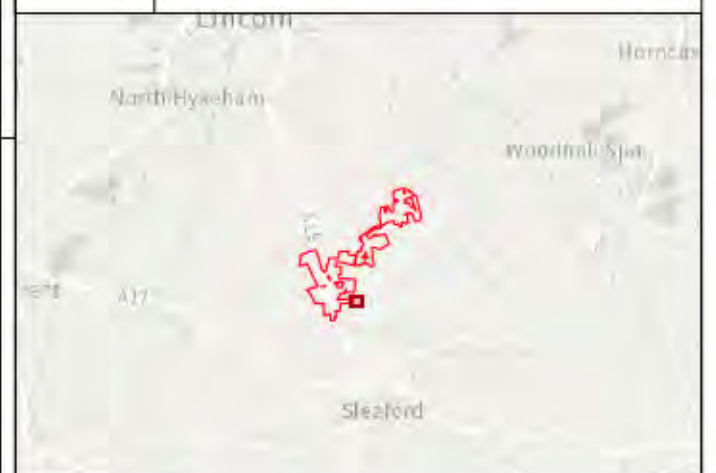
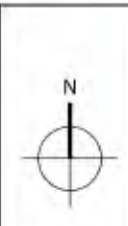


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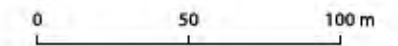
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Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)

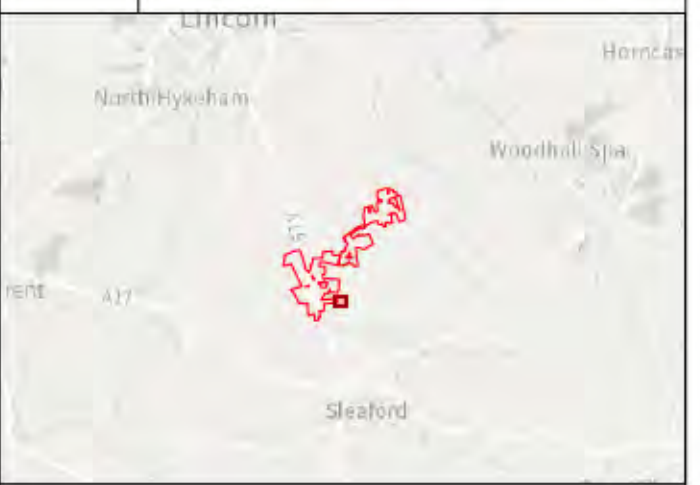


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Key

- Geophysical Survey Area
- Survey Extent

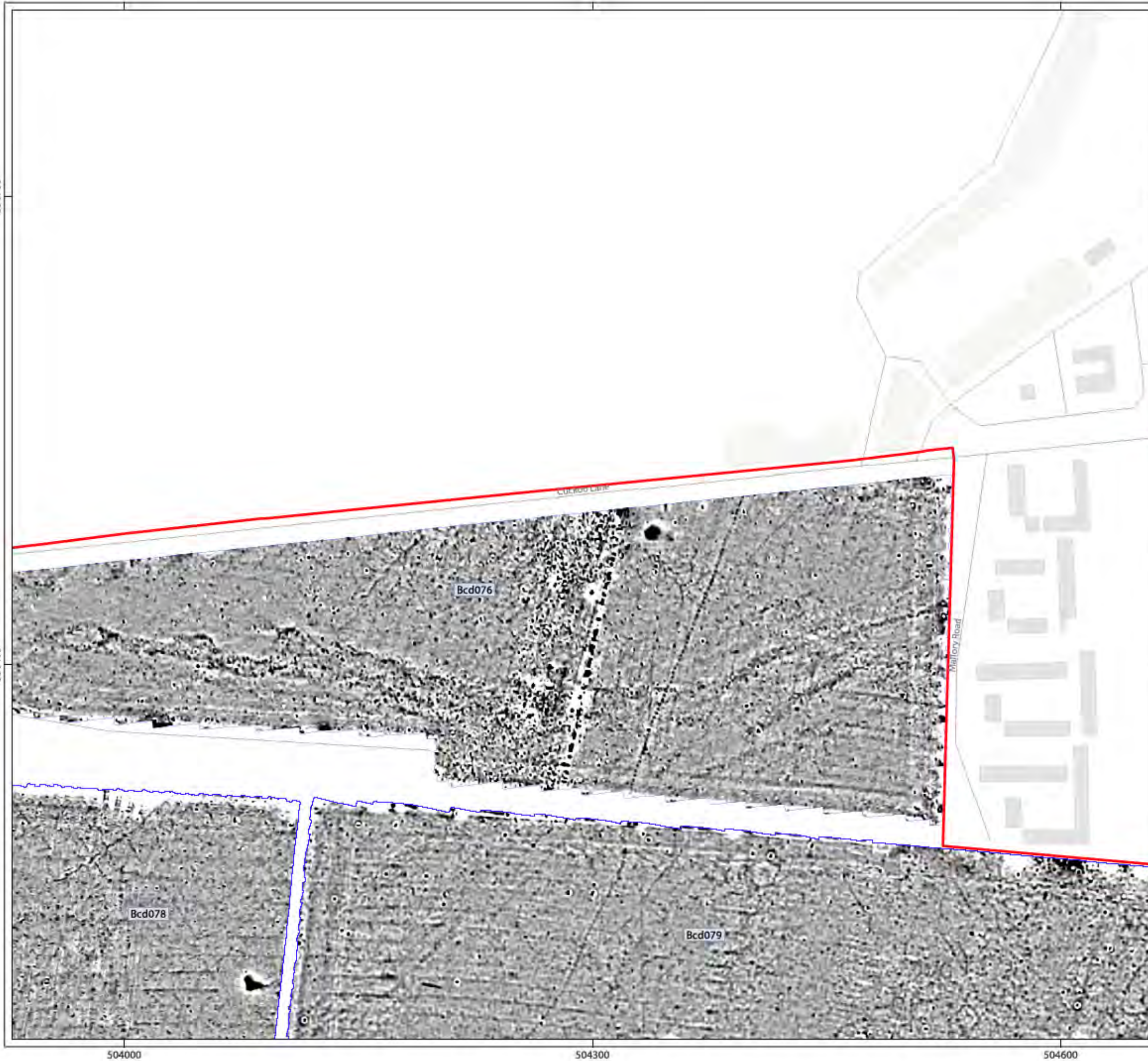
Interpretation

- Ferrous Objects
- Agriculture
- Field Drain
- Natural
- Ridge and Furrow
- Archaeology
- Possible Archaeology
- Uncertain

0 50 100 m

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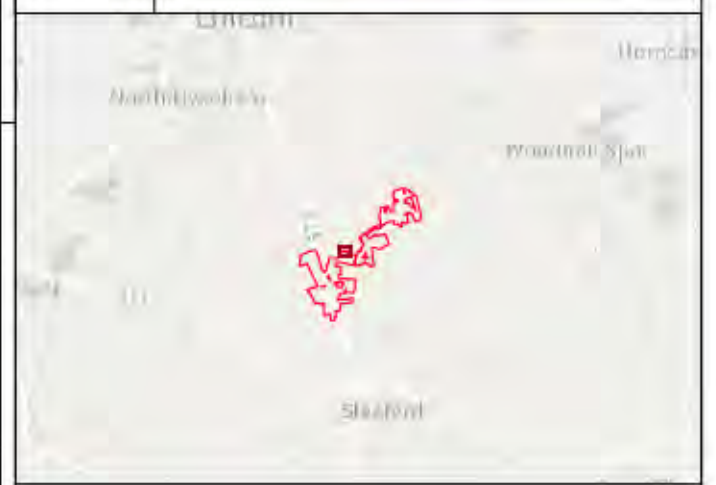
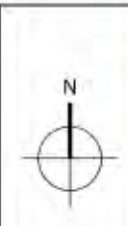
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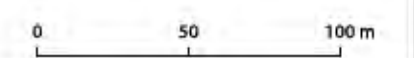
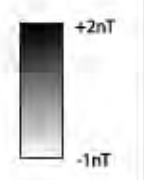
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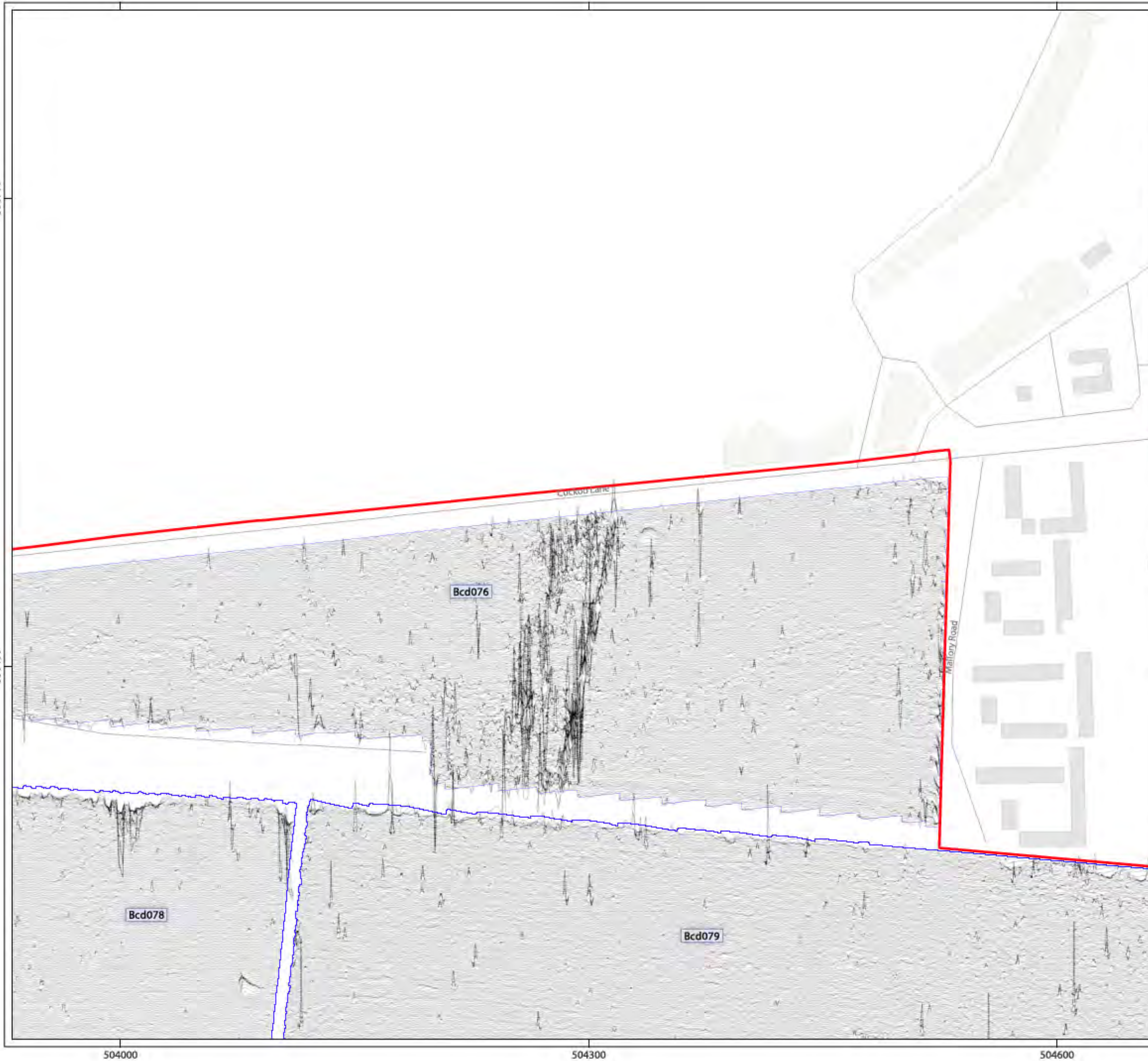
Key

- Geophysical Survey Area
- Survey Extent



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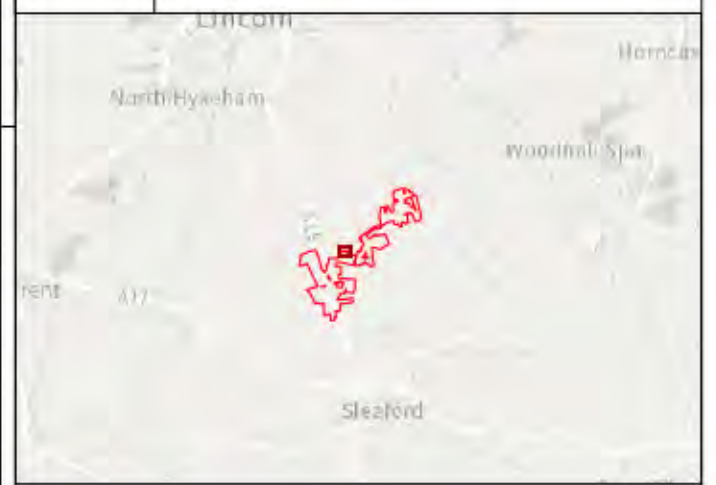
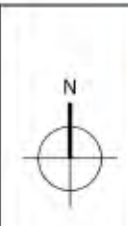
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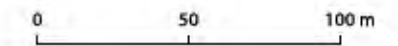
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Key

- ▭ Geophysical Survey Area
- ▭ Survey Extent
- XY Trace (25nT/cm)

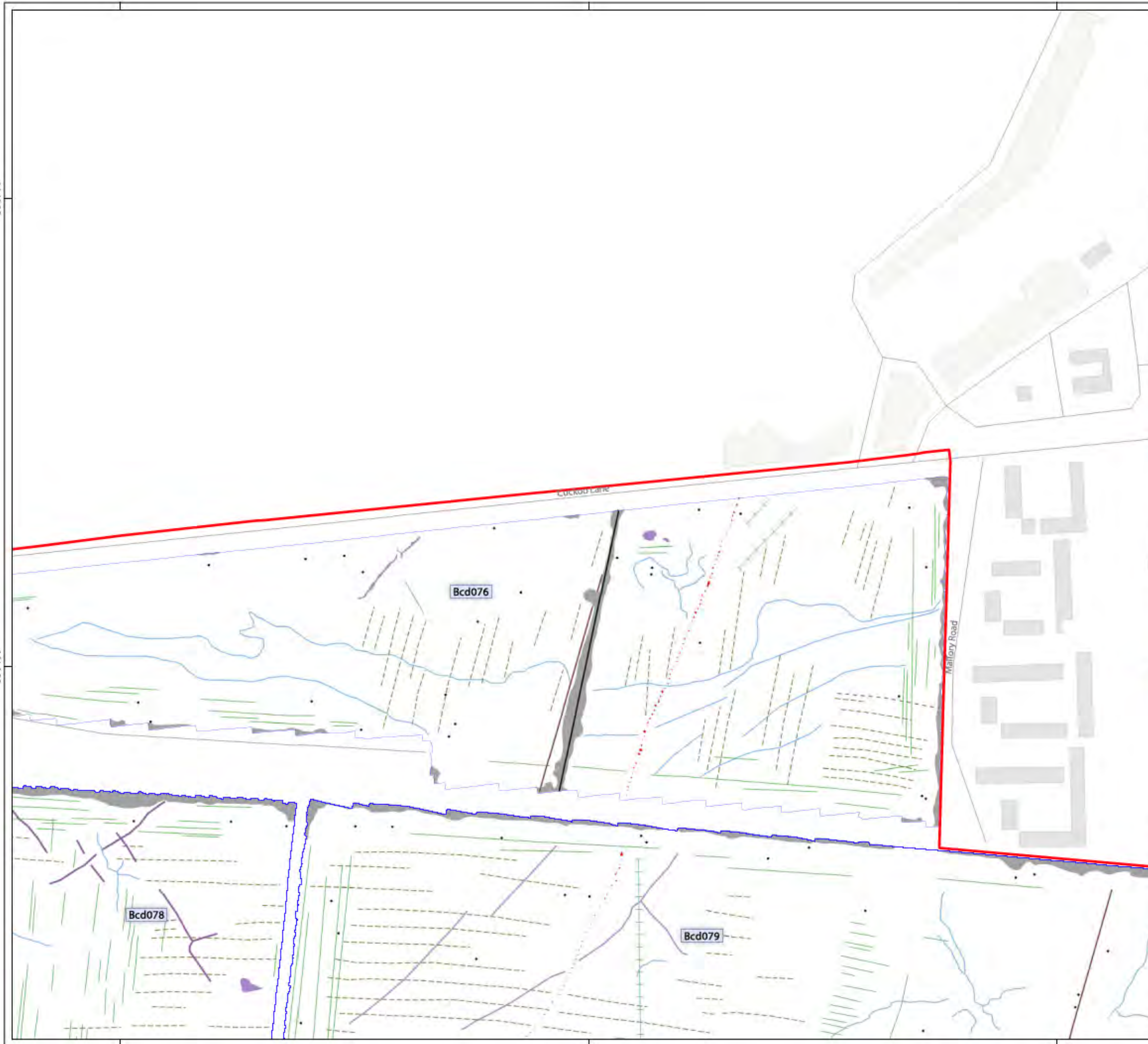


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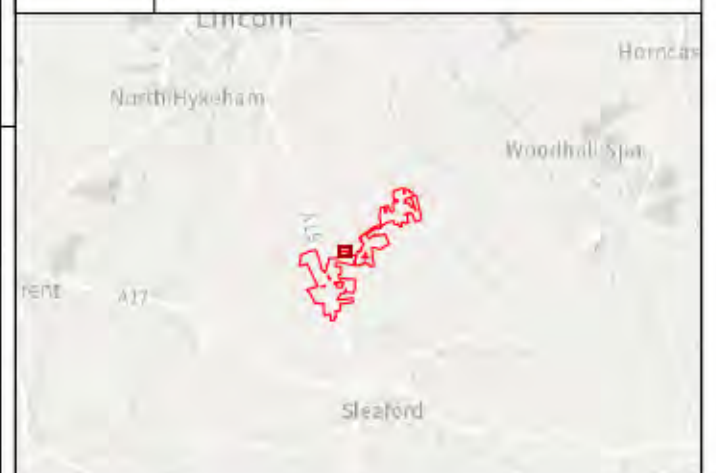
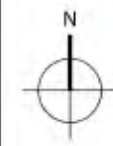
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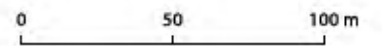
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Key

- Geophysical Survey Area
- Survey Extent
- Interpretation**
- Ferrous Objects
- Agriculture
- Field Boundary
- - - Possible Field Boundary
- + + + Field Drain
- Natural
- Pipe
- Uncertain
- - - Ridge and Furrow
- Field System
- Archaeology
- Magnetic Disturbance
- Uncertain

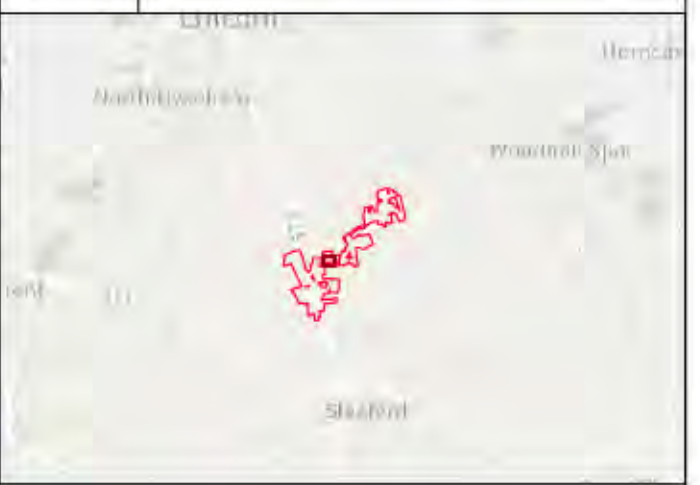


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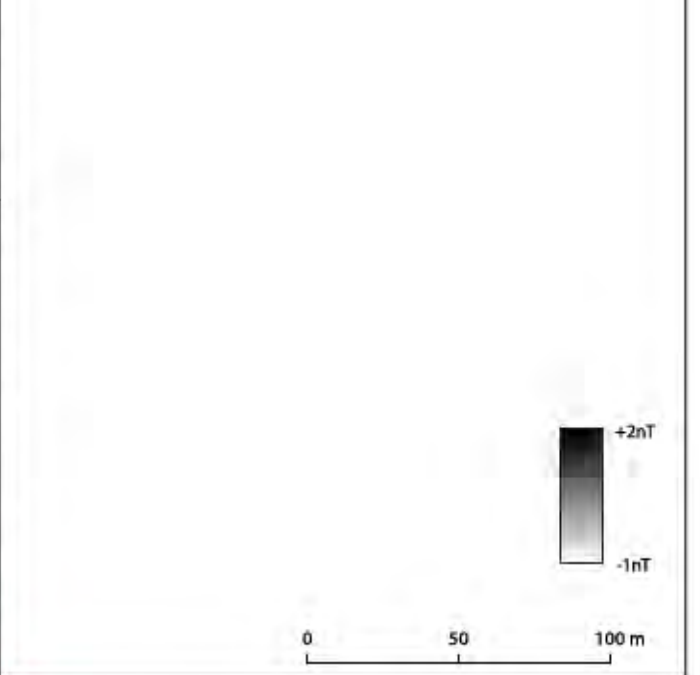
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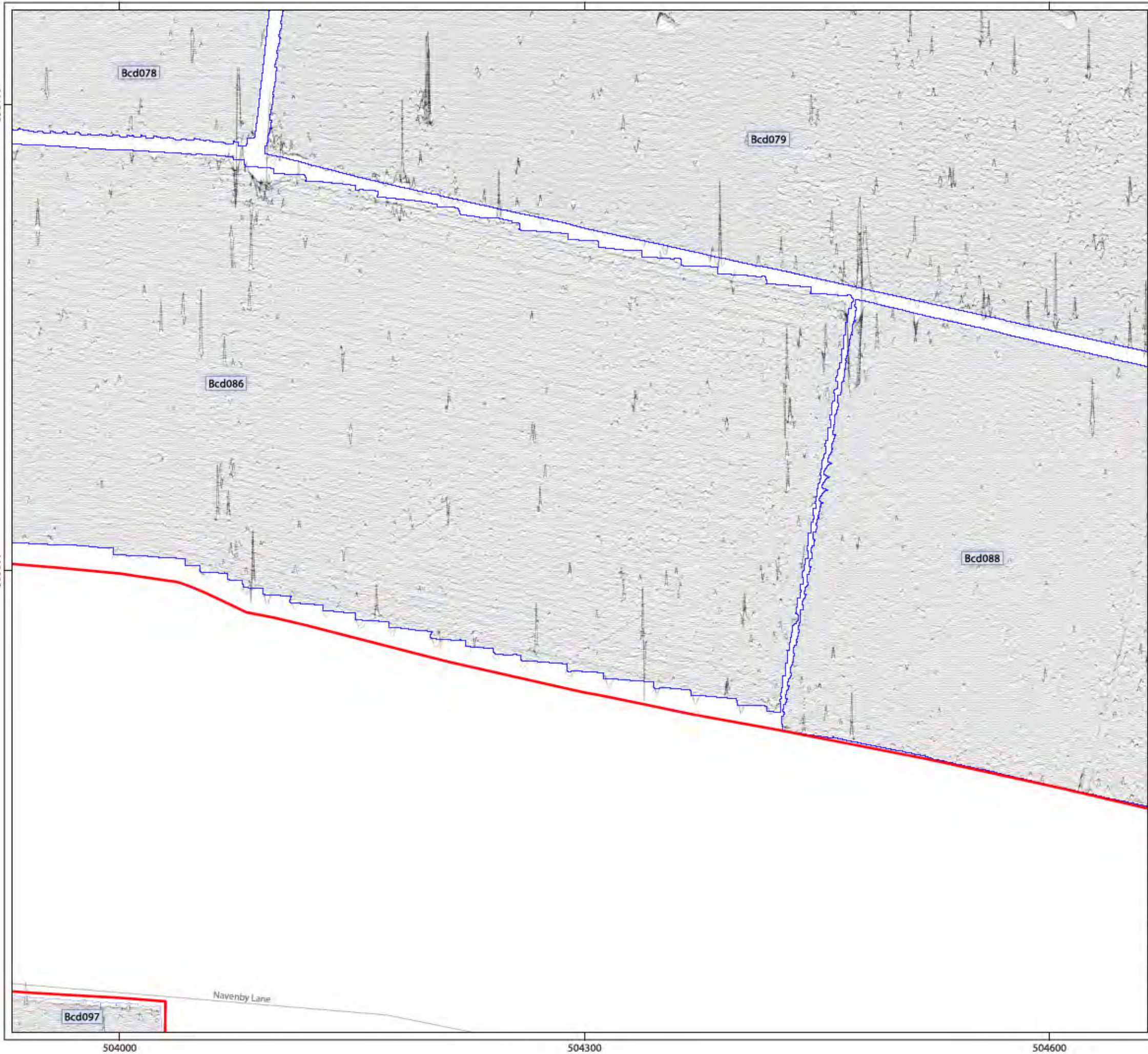


Key
■ Geophysical Survey Area
■ Survey Extent

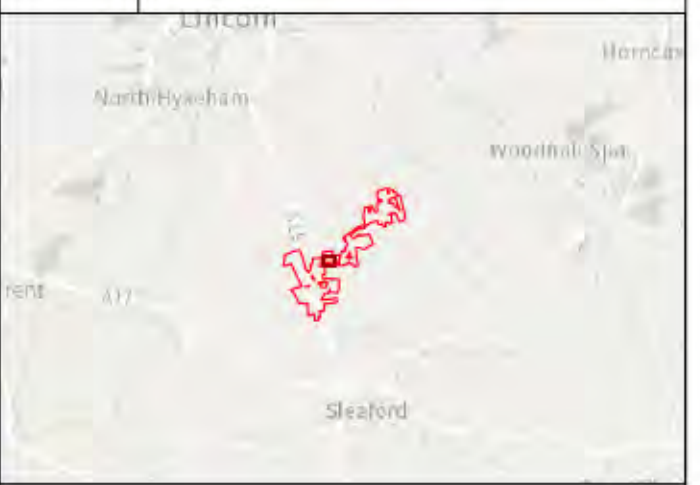


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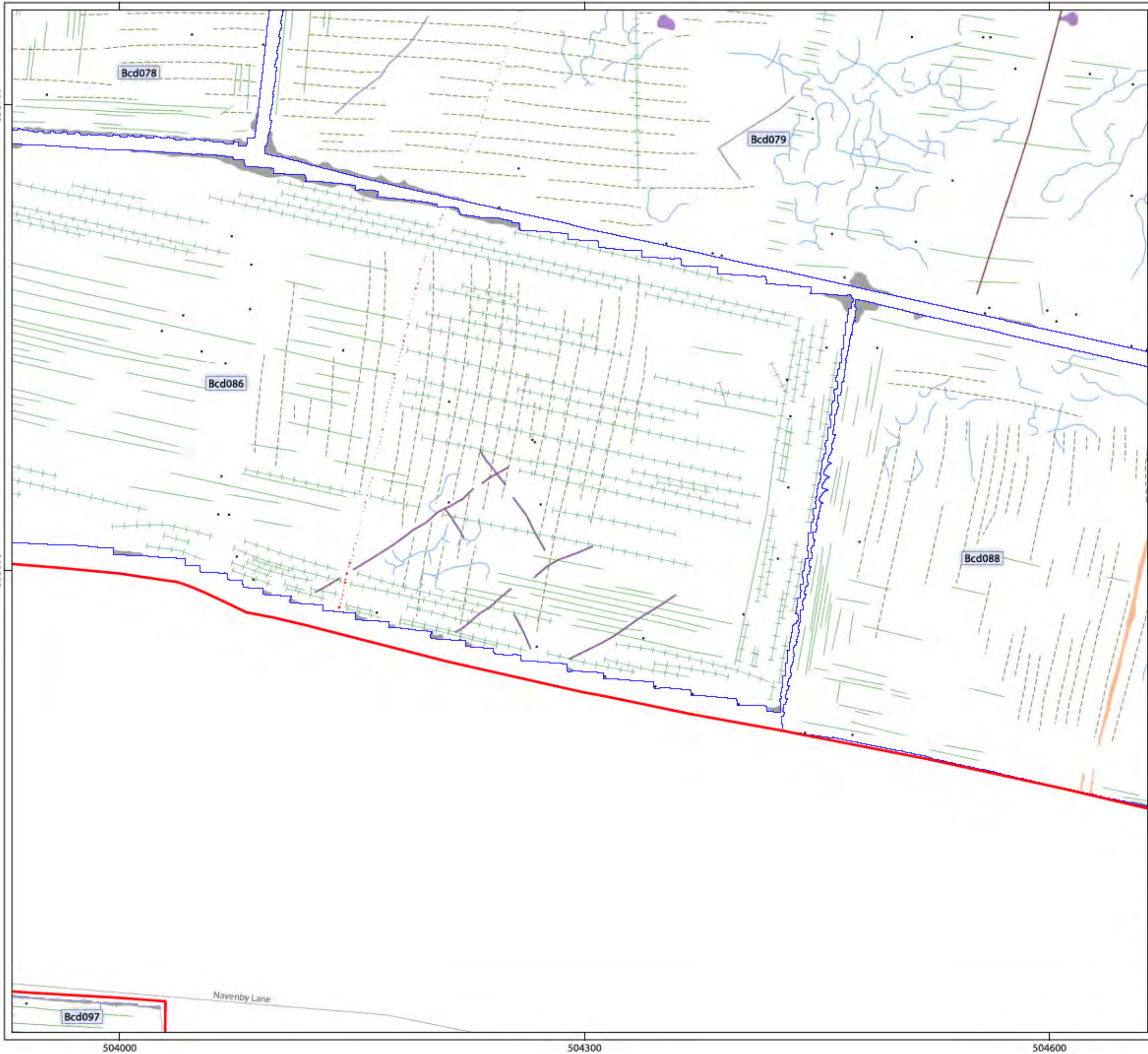
Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)

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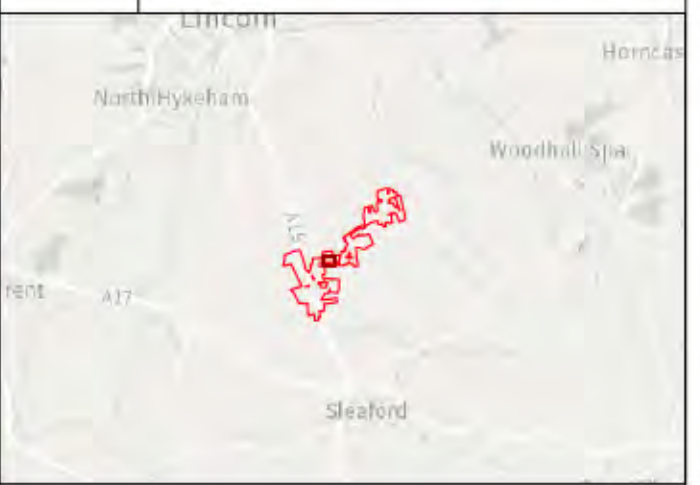
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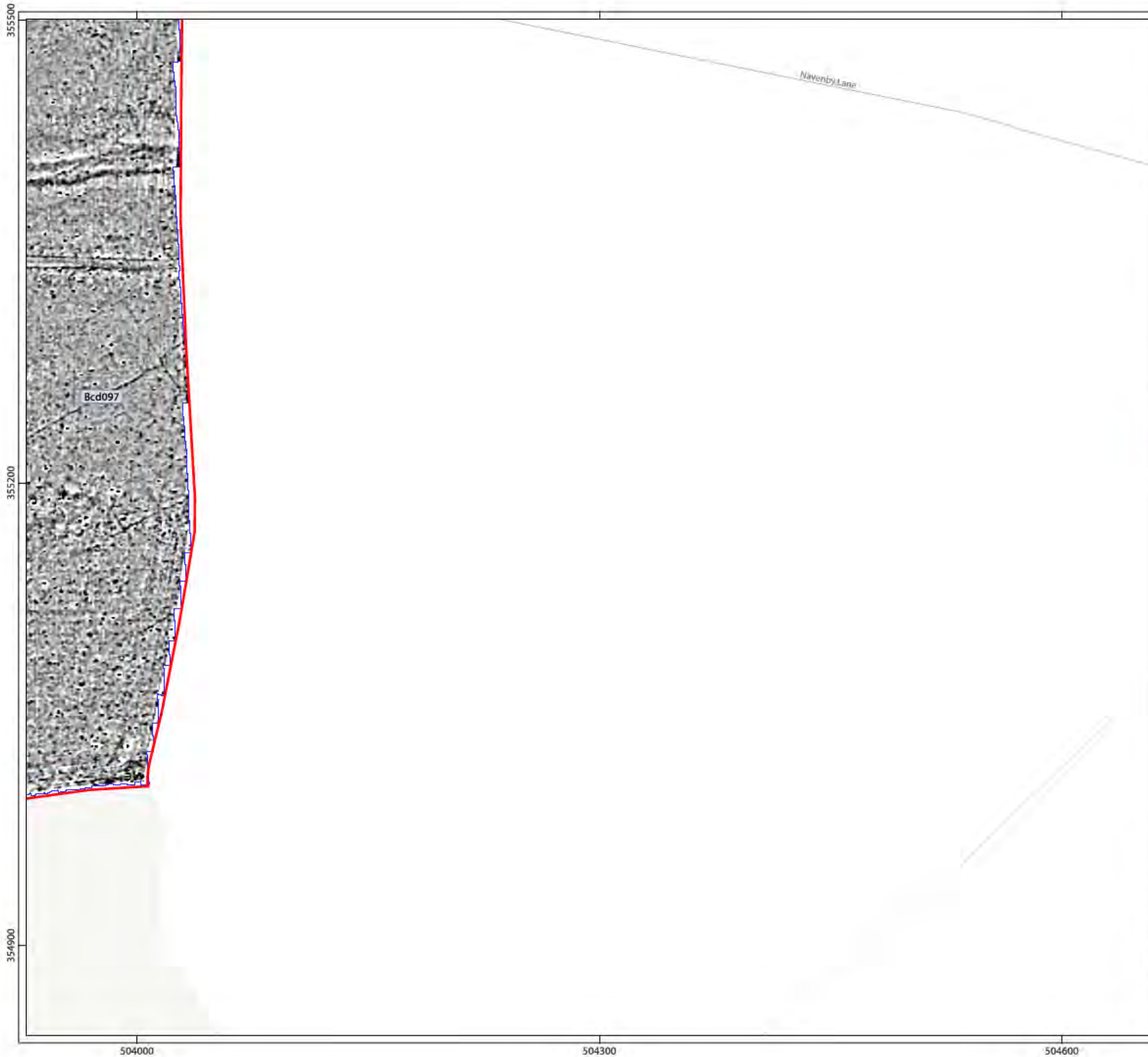
- ▭ Geophysical Survey Area
- ▭ Survey Extent

Interpretation

- Ferrous Objects
- Agriculture
- Field Boundary
- +— Field Drain
- Natural
- Uncertain
- - - Ridge and Furrow
- Field System
- ▭ Archaeology
- ▭ Magnetic Disturbance
- ▭ Possible Archaeology
- ▭ Uncertain

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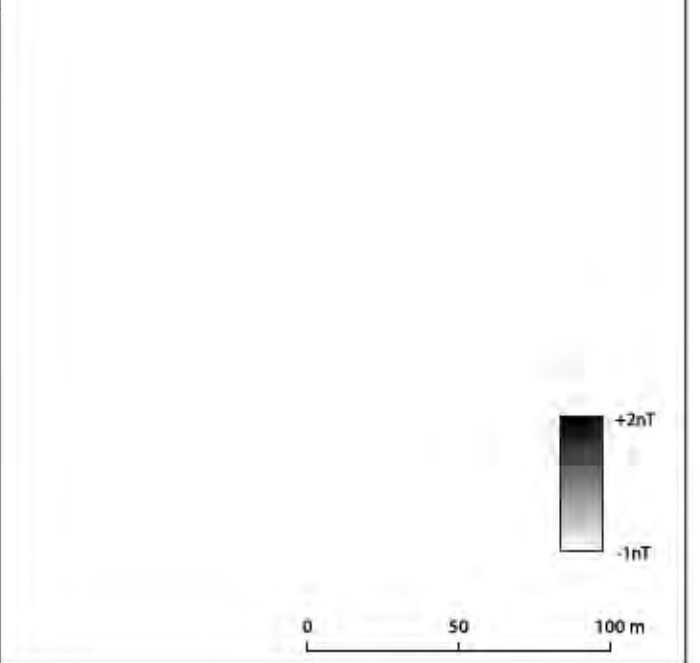



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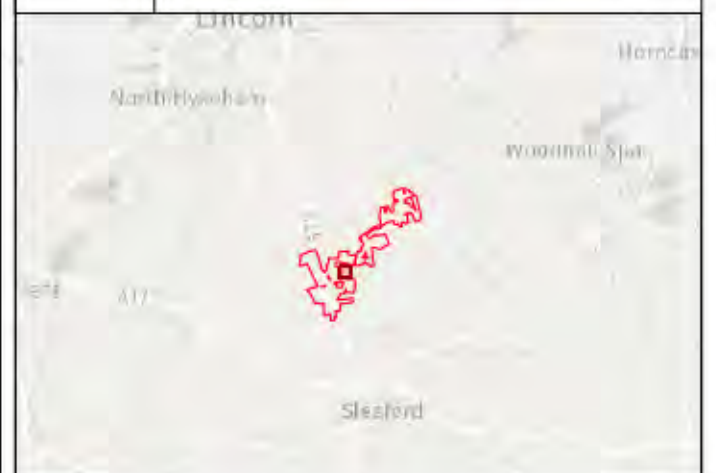
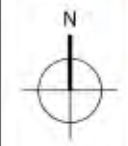
Key

- Geophysical Survey Area
- Survey Extent



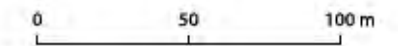
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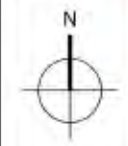
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- Survey Extent
- XY Trace (25nT/cm)



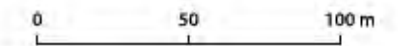
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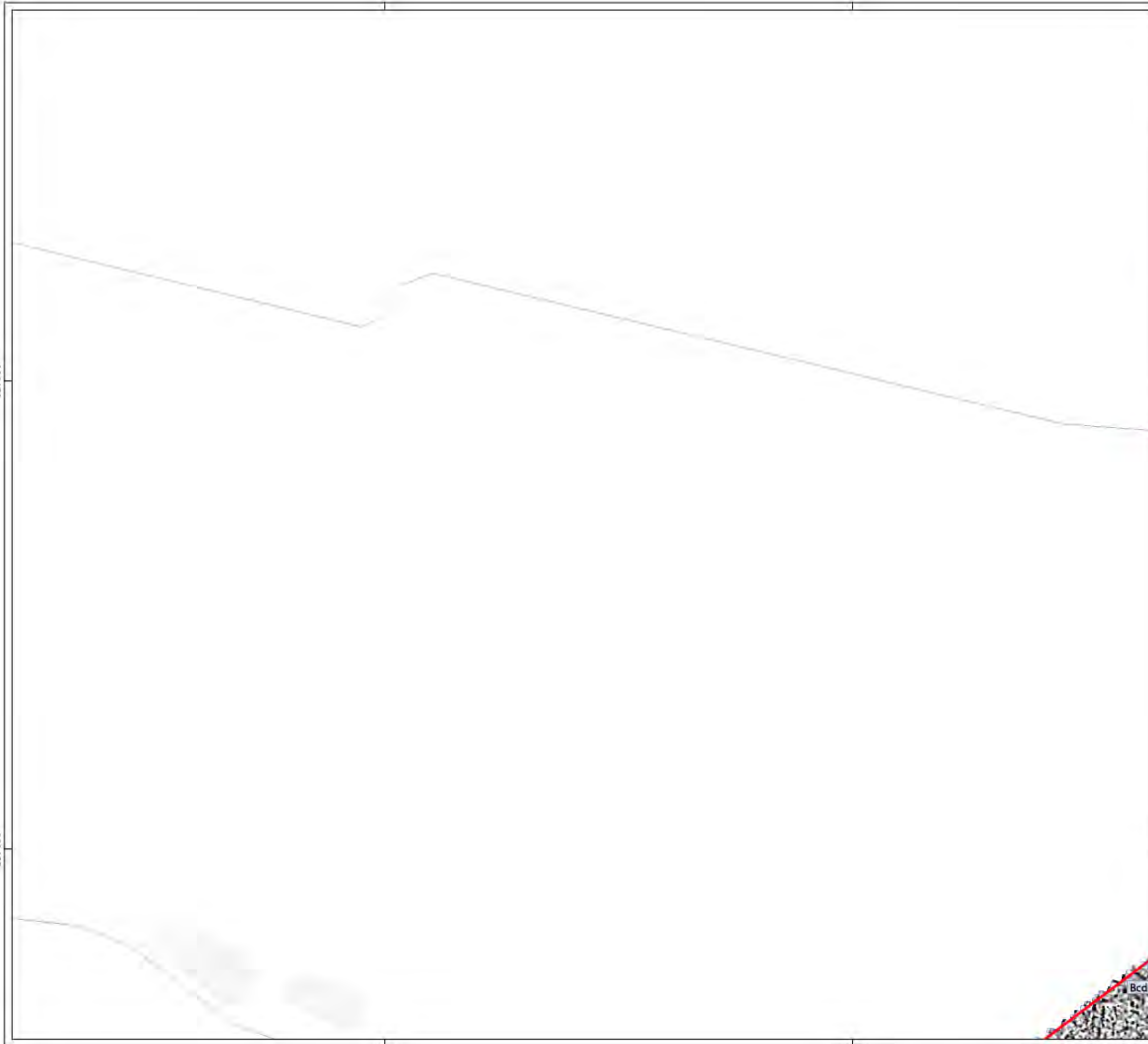
Key

- Geophysical Survey Area
- Survey Extent
- Interpretation**
- + Ferrous Objects
- Agriculture
- Field Boundary
- Natural
- - - Ridge and Furrow
- Field System
- Magnetic Disturbance
- Uncertain



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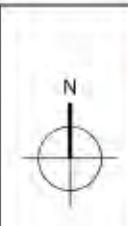


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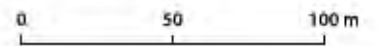
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Key

- Geophysical Survey Area
- Survey Extent

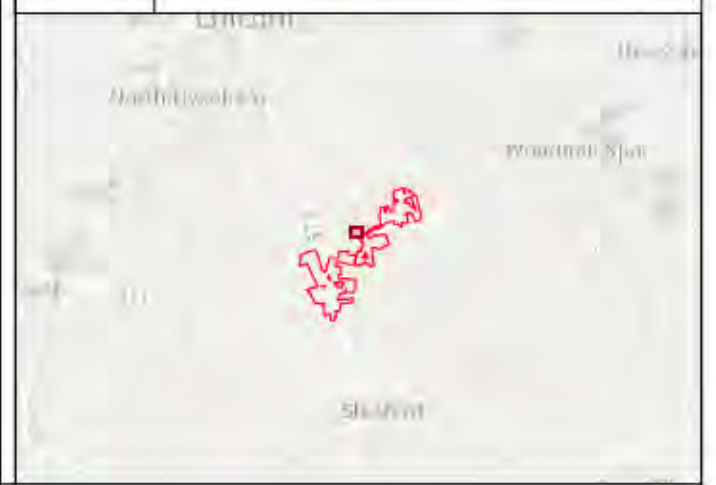
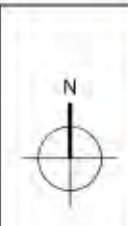


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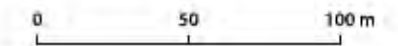
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- Key**
- Geophysical Survey Area
 - Survey Extent
 - XY Trace (25nT/cm)



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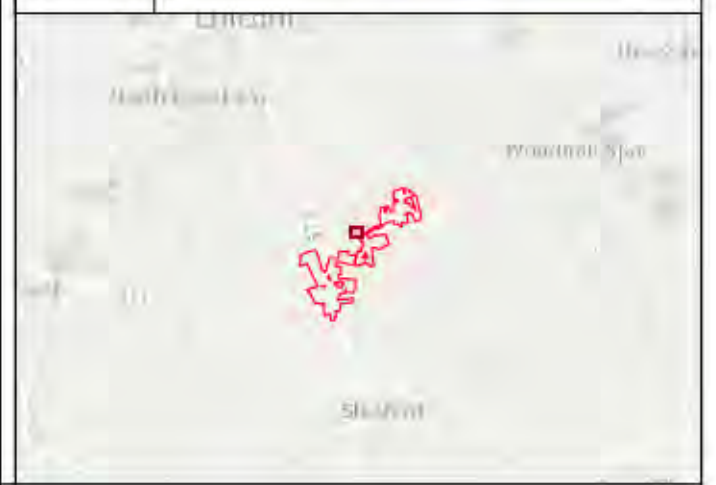
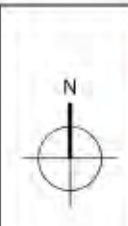


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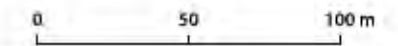
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Key

- Geophysical Survey Area
- Survey Extent
- Interpretation**
- Agriculture
- Natural
- Ridge and Furrow



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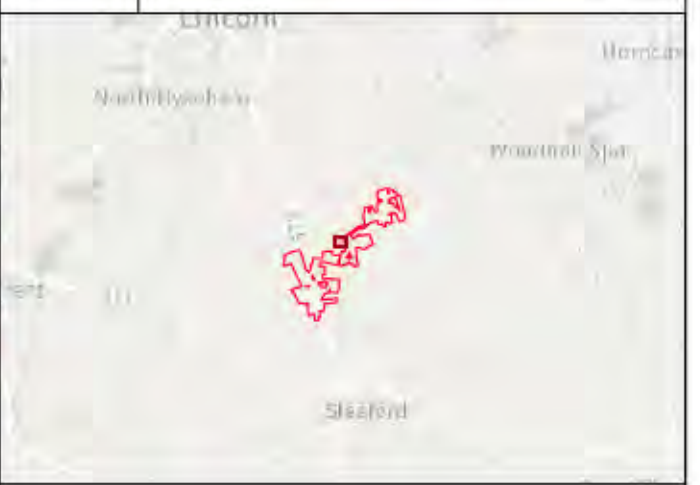
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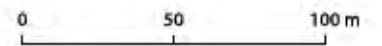


Key

- Geophysical Survey Area
- Survey Extent



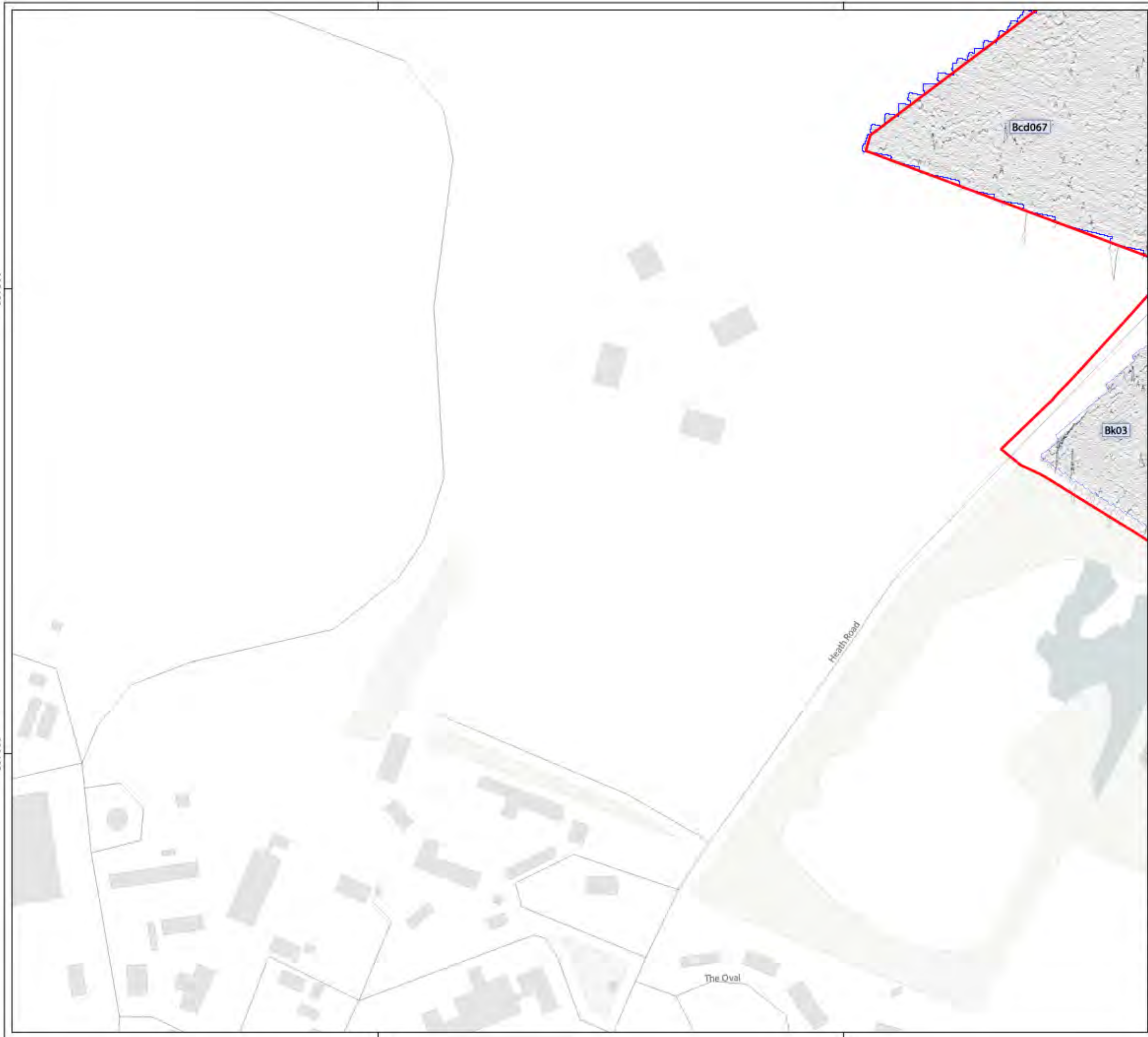
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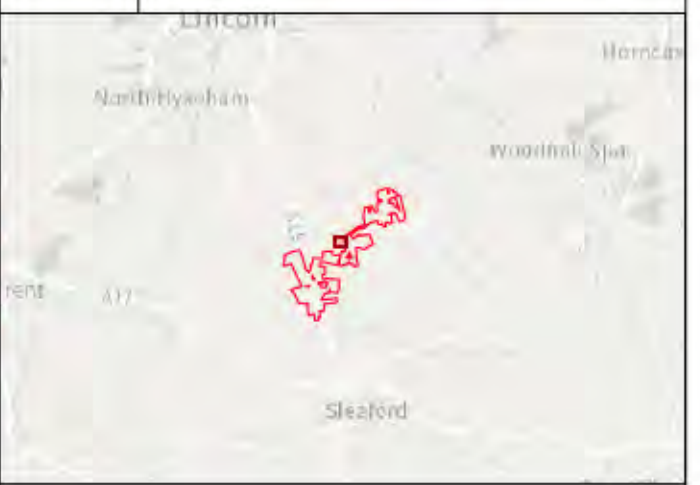
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Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)

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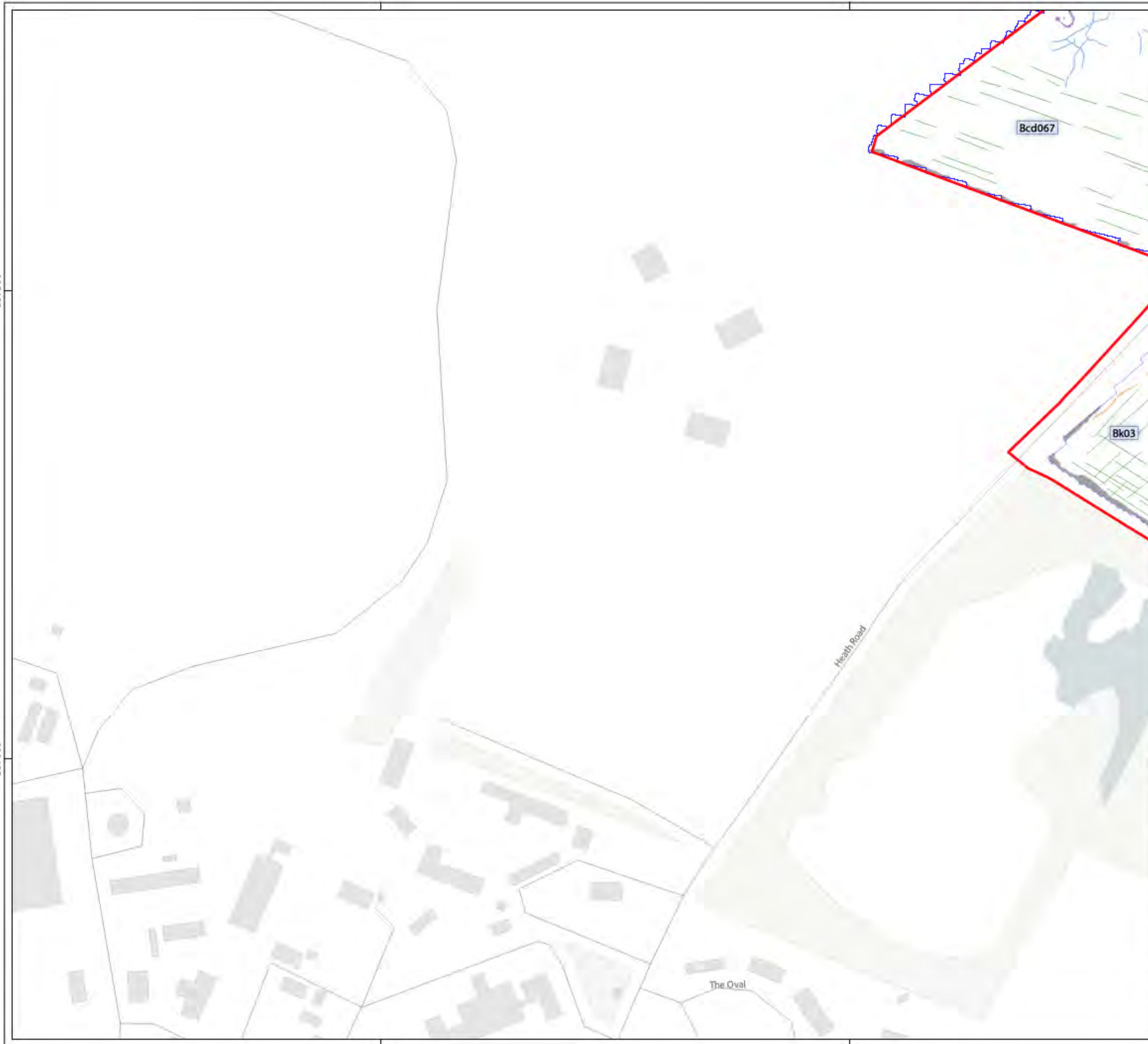
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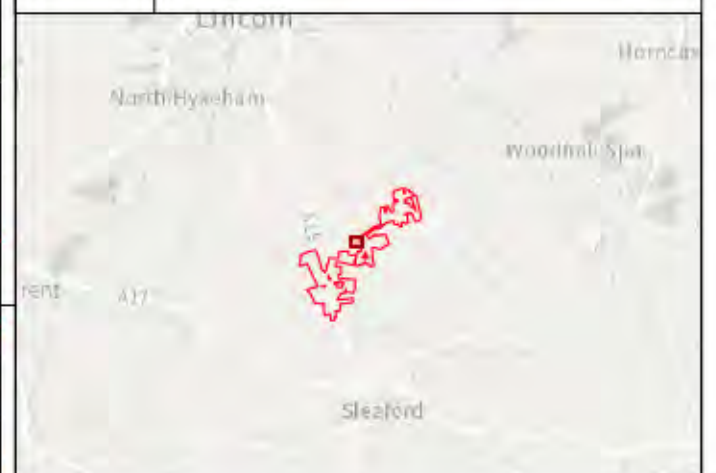
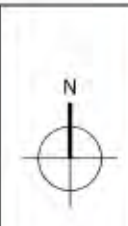


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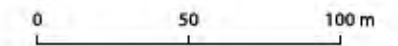
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Key

- Geophysical Survey Area
- Survey Extent
- Interpretation**
- Agriculture
- Natural
- Magnetic Disturbance
- Possible Archaeology
- Uncertain



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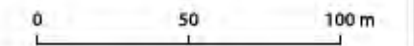
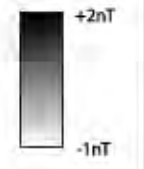
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Key

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- Survey Extent



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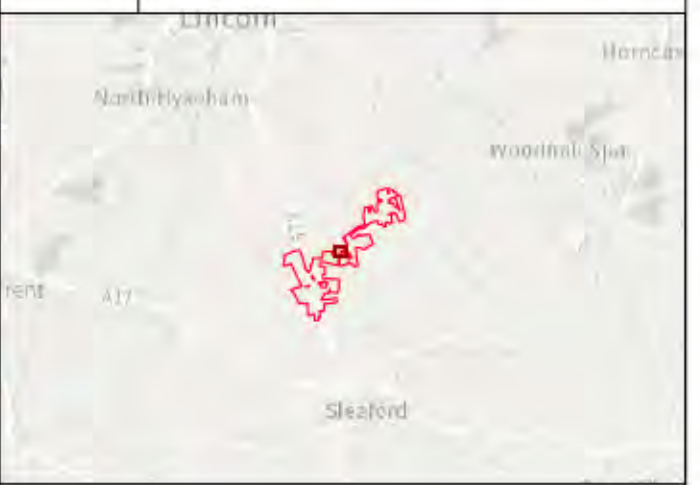
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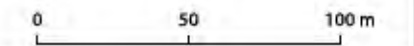


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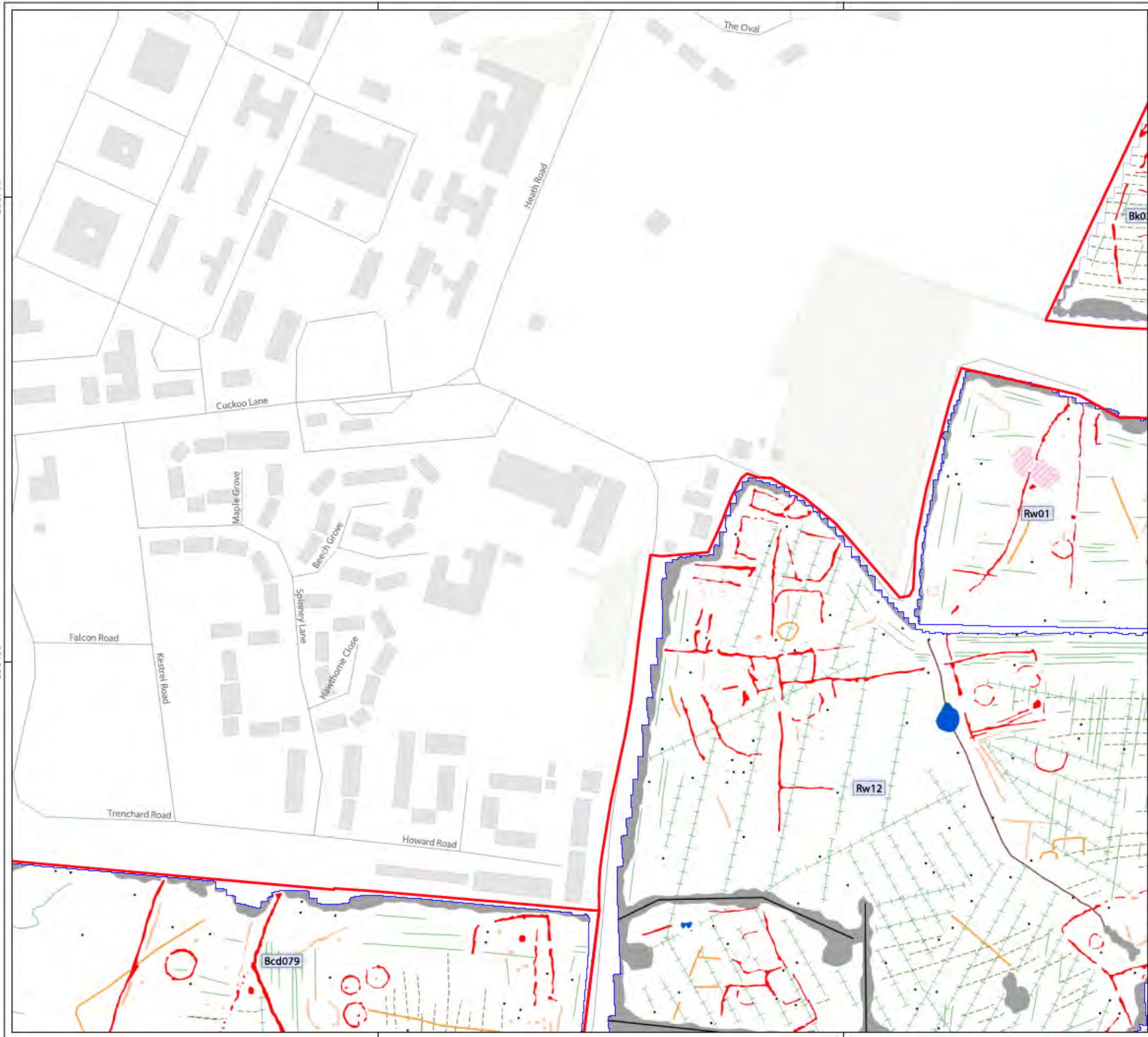
Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)



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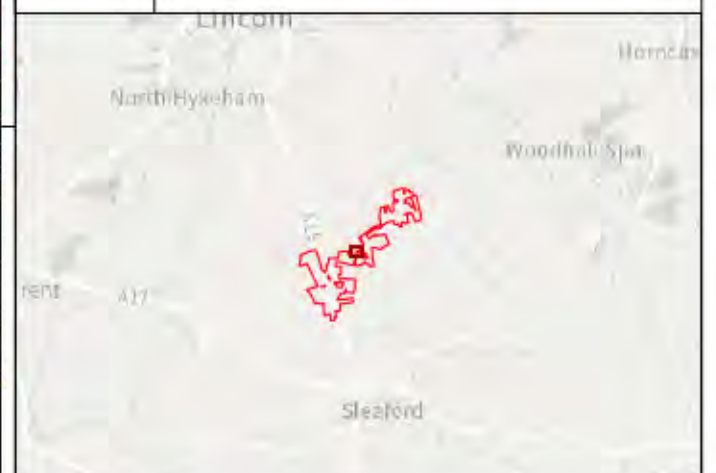
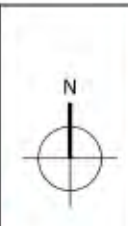


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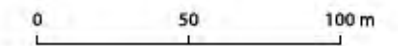
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Key

- Geophysical Survey Area
- Survey Extent
- Interpretation**
- Ferrous Objects
- Agriculture
- Field Boundary
- Field Drain
- Natural
- Pipe
- Ridge and Furrow
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Quarry
- Former Pond

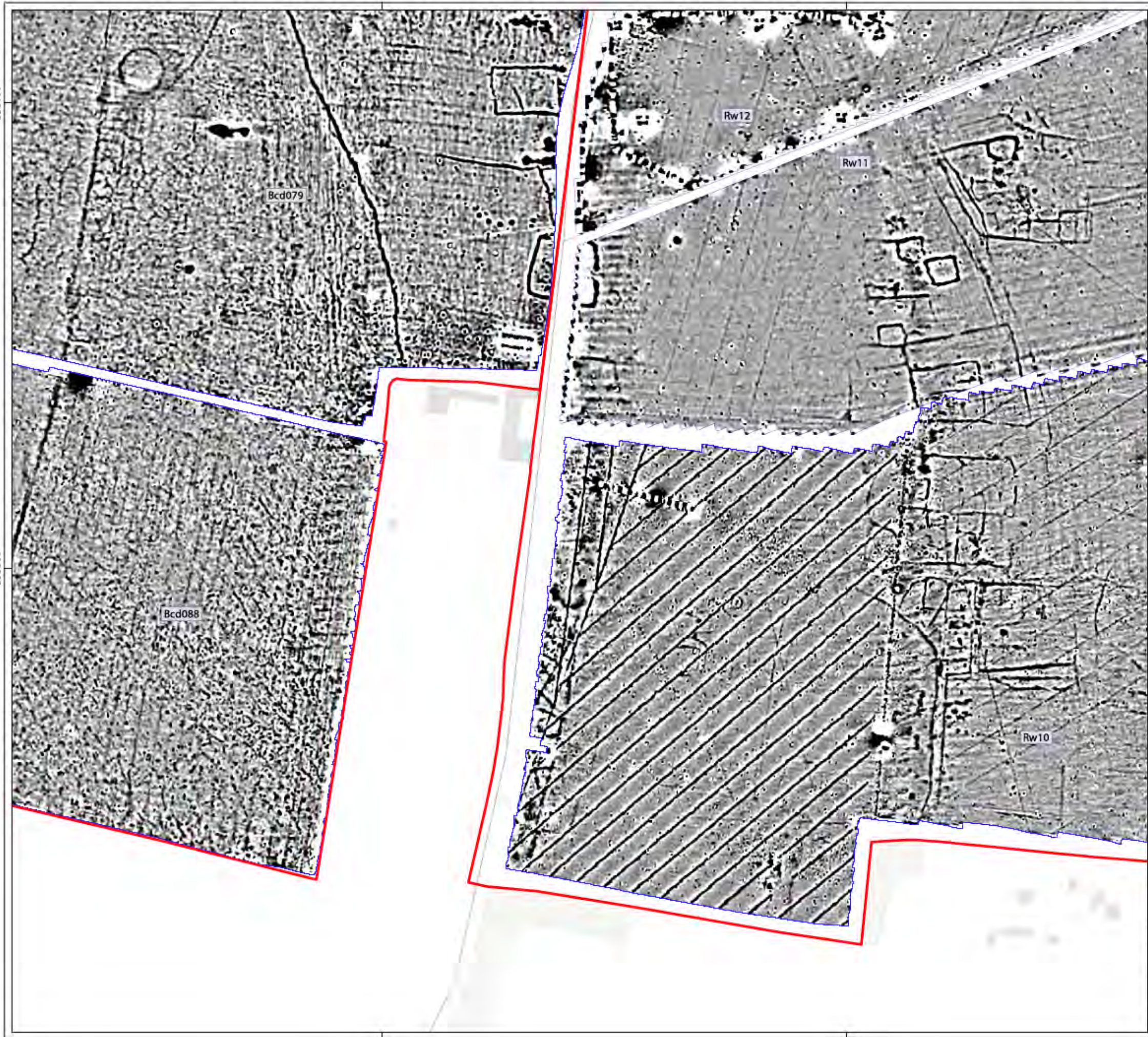


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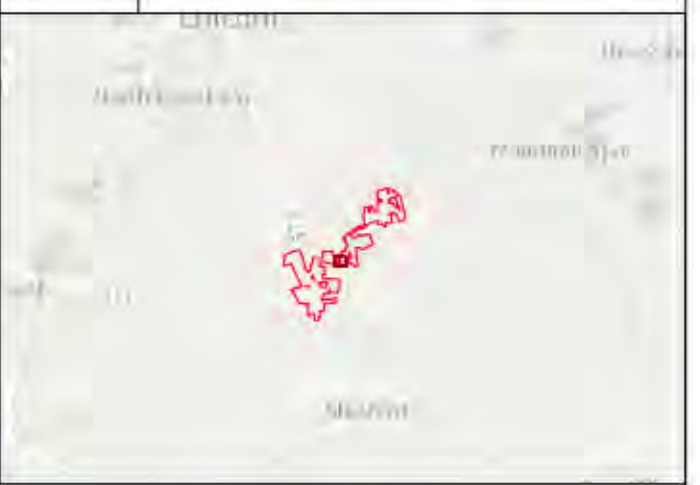
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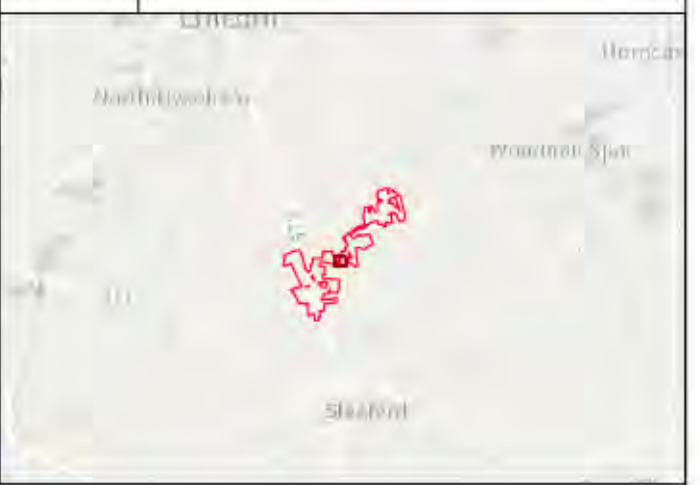
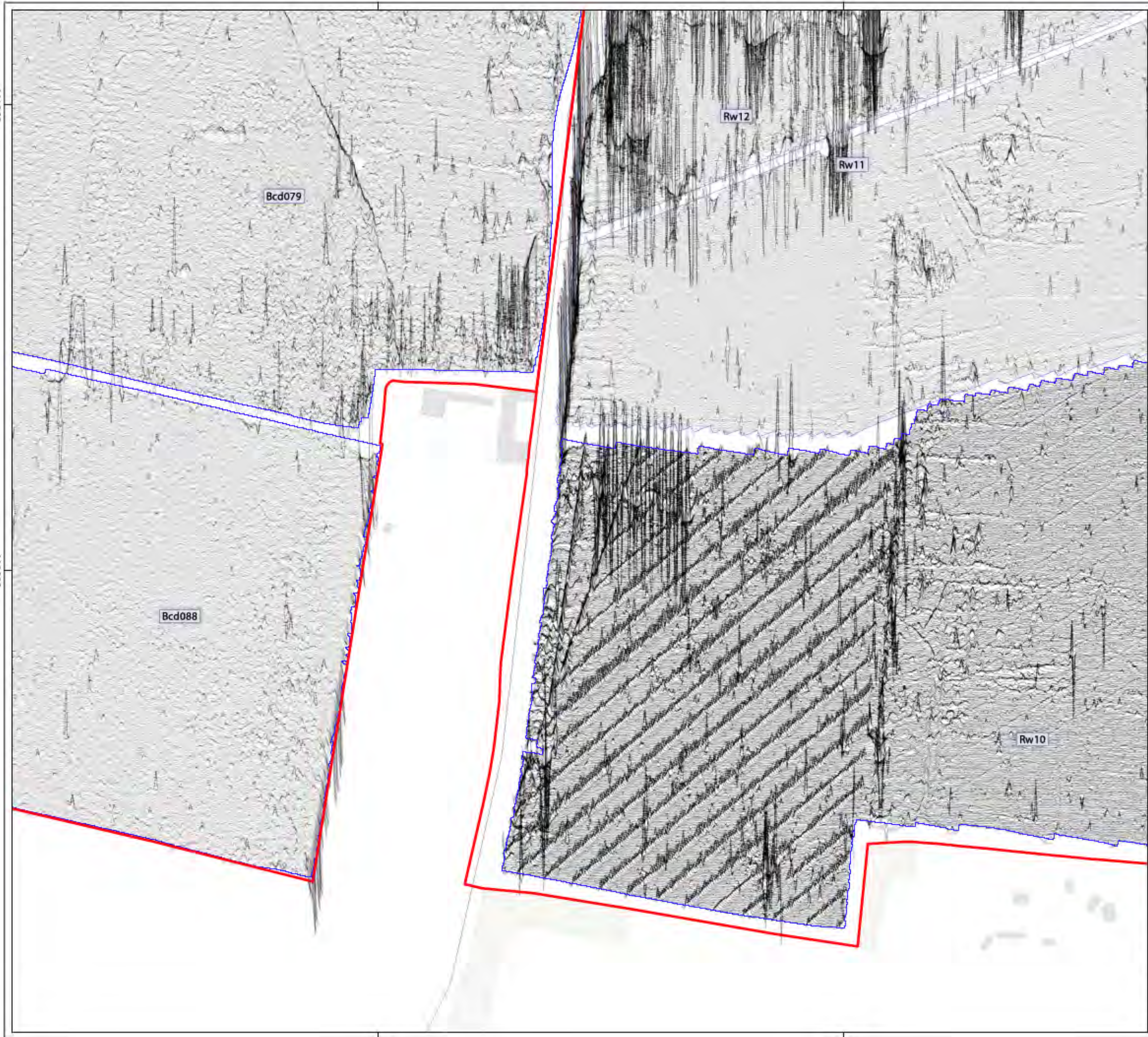


Key

- Geophysical Survey Area
- Survey Extent

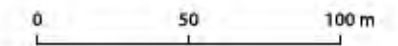
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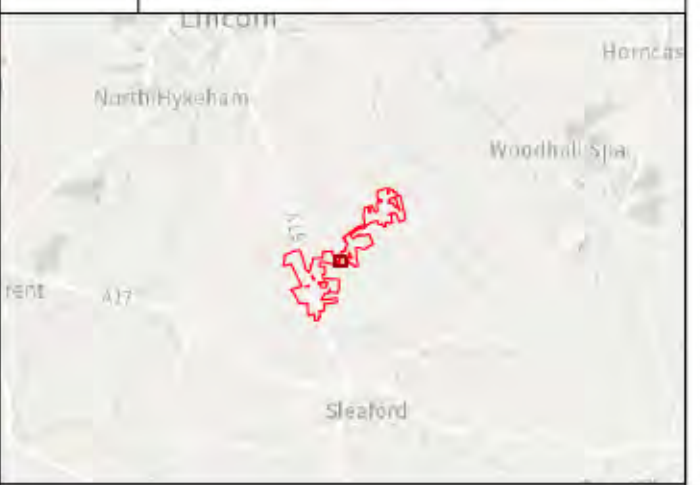
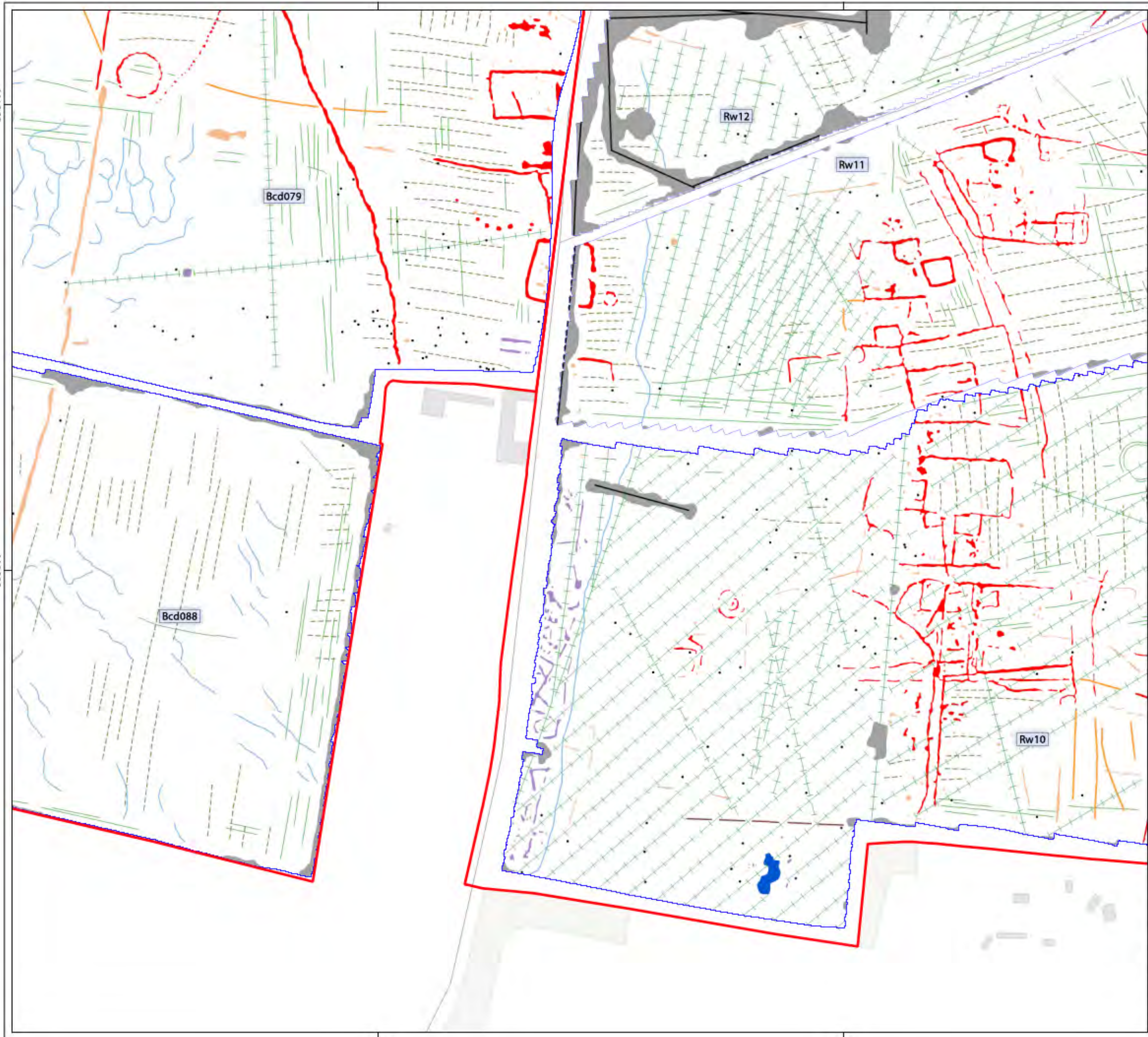
Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)



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Key

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- Survey Extent

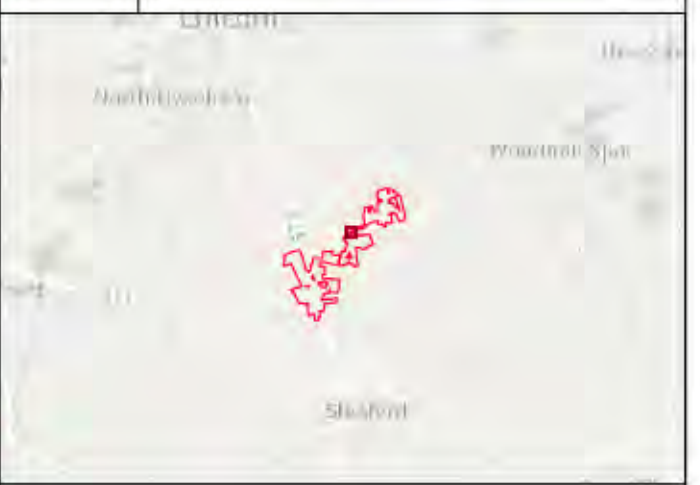
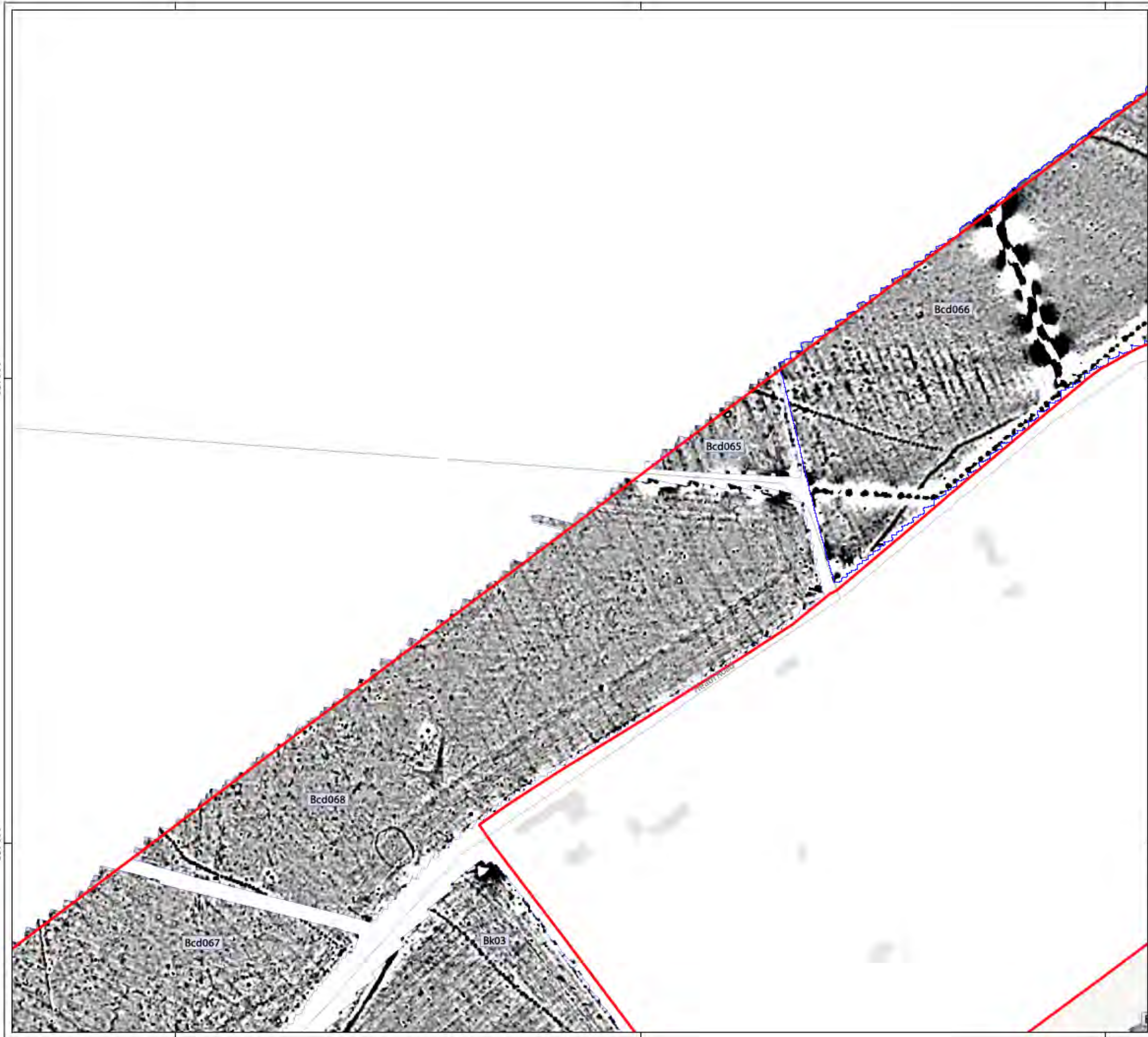
Interpretation

- Ferrous Objects
- Agriculture
- Field Boundary
- Field Drain
- Natural
- Pipe
- Ridge and Furrow
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Uncertain
- Former Pond

0 50 100 m


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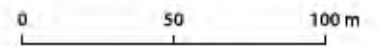
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- Survey Extent

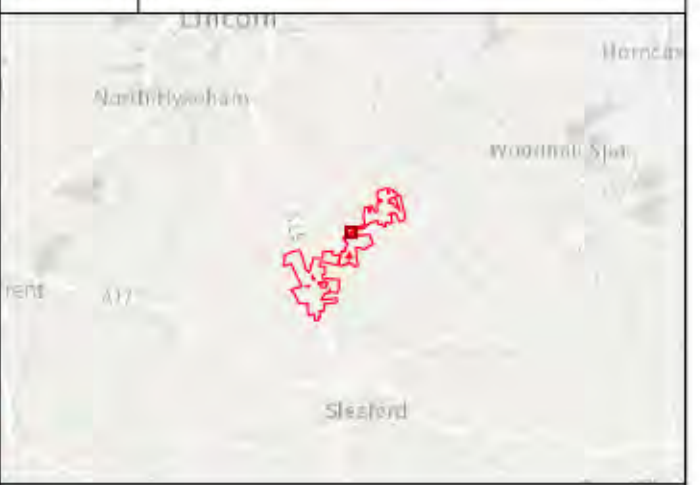
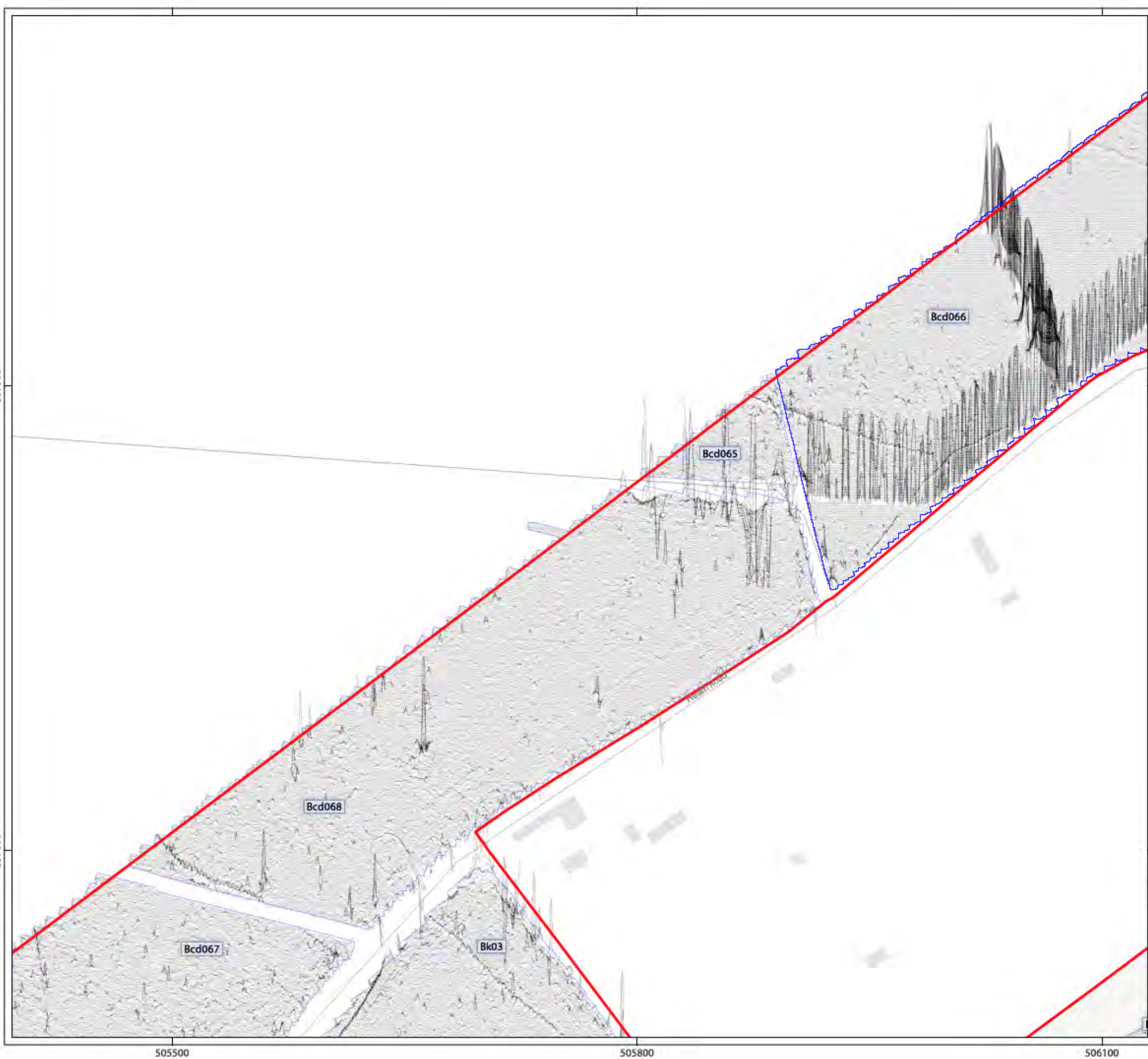




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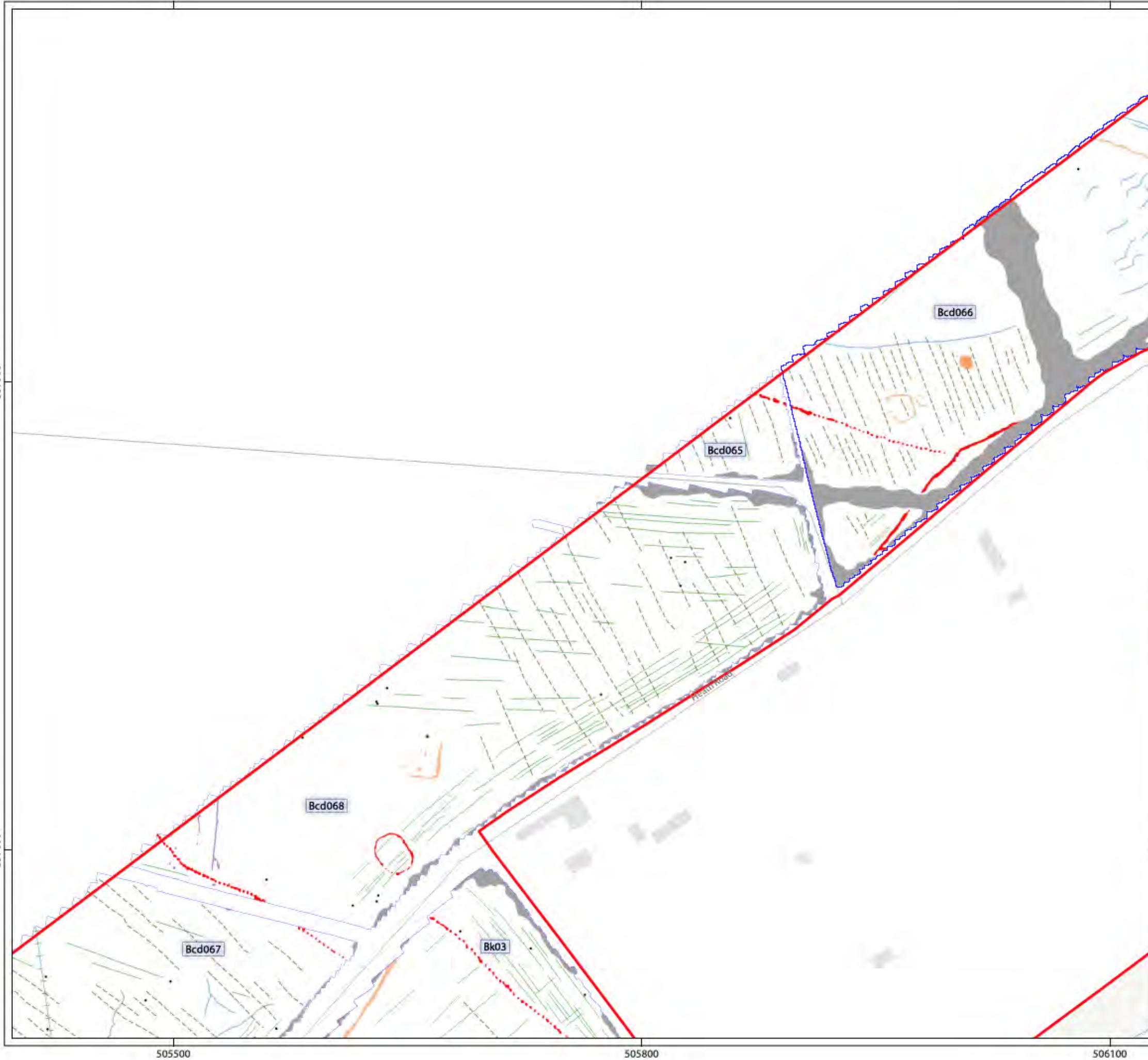
Key

- ▭ Geophysical Survey Area
- ▭ Survey Extent
- XY Trace (25nT/cm)

0 50 100 m

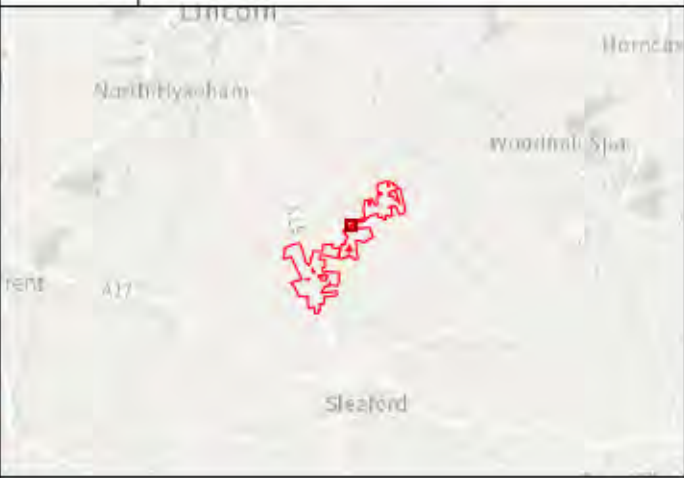
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Key

- Geophysical Survey Area
- Survey Extent

Interpretation

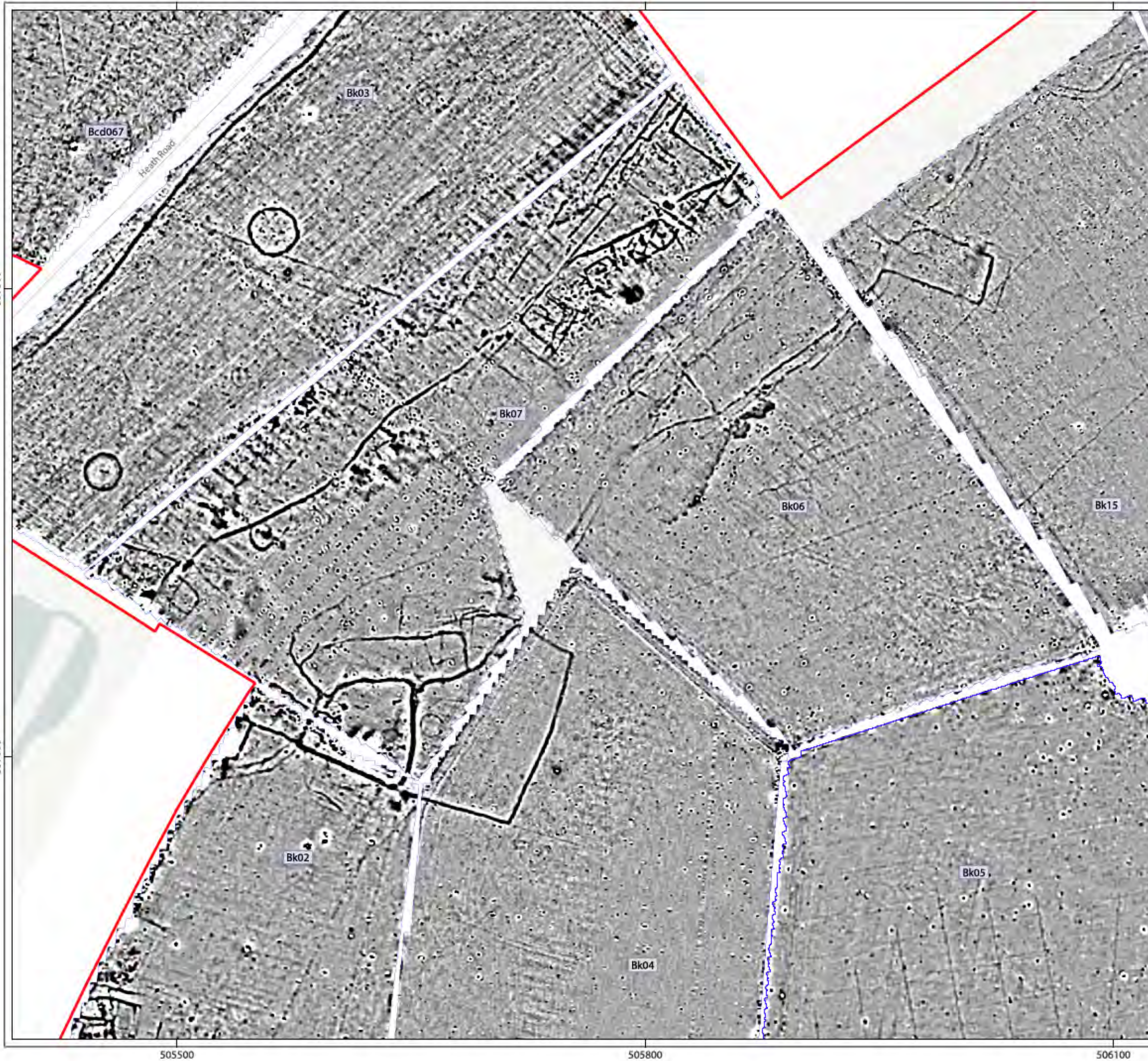
- Ferrous Objects
- Agriculture
- Field Drain
- Natural
- Uncertain
- Ridge and Furrow
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Uncertain
- Burning

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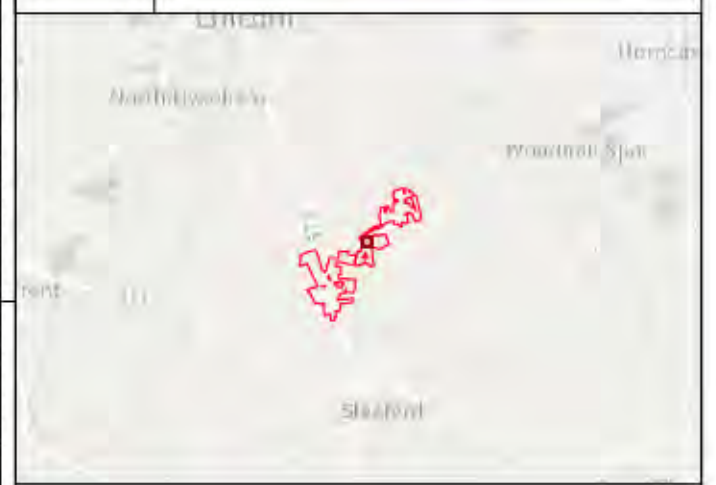
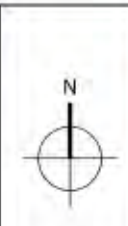
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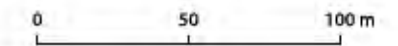
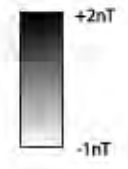
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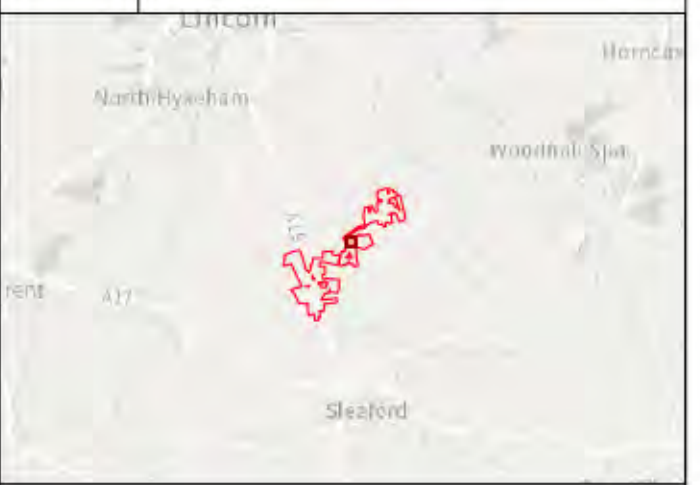
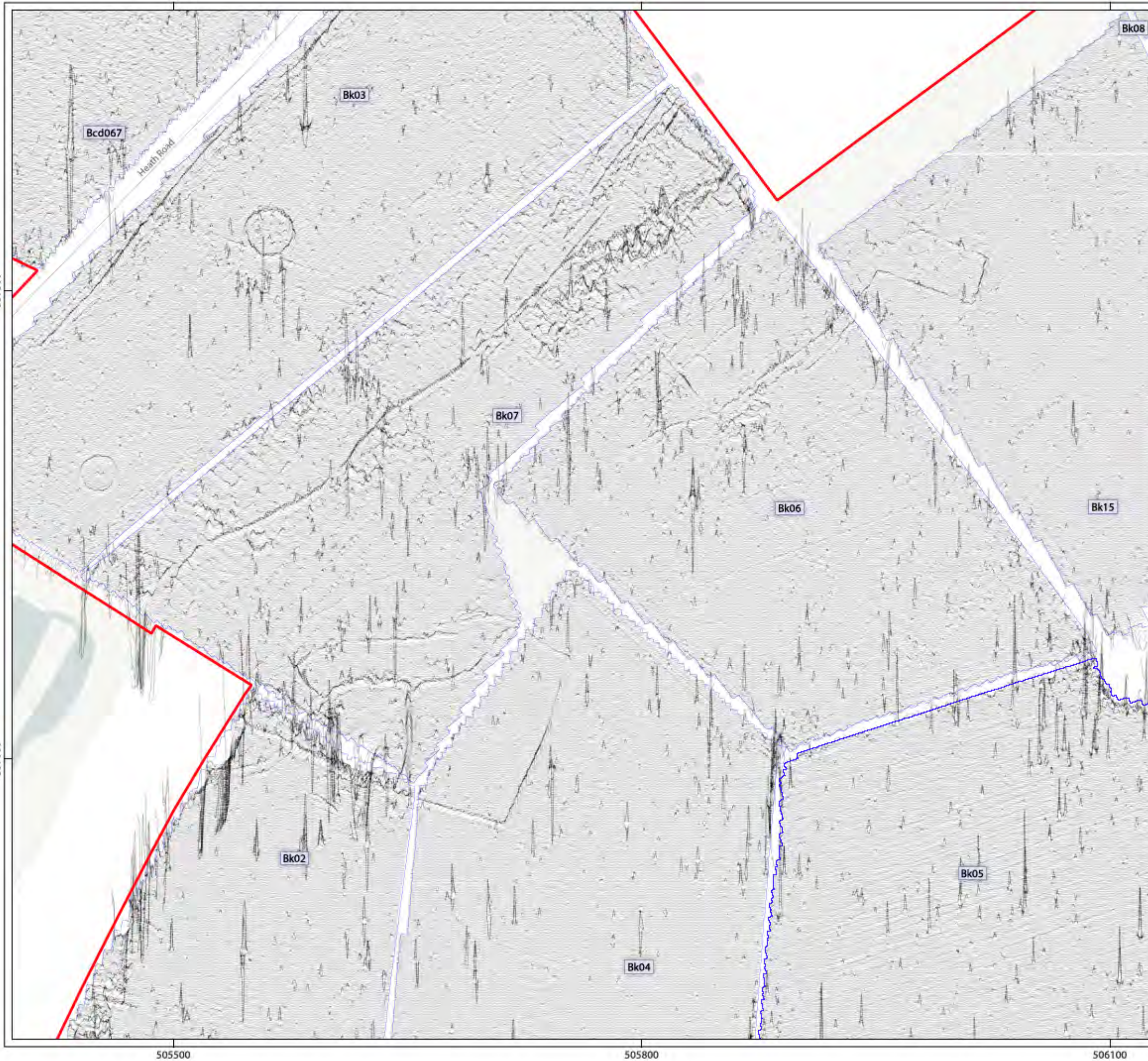
Key

- ▭ Geophysical Survey Area
- ▭ Survey Extent



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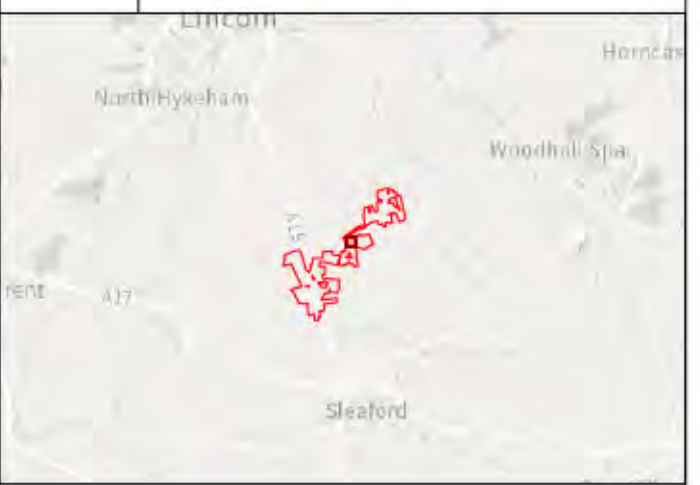
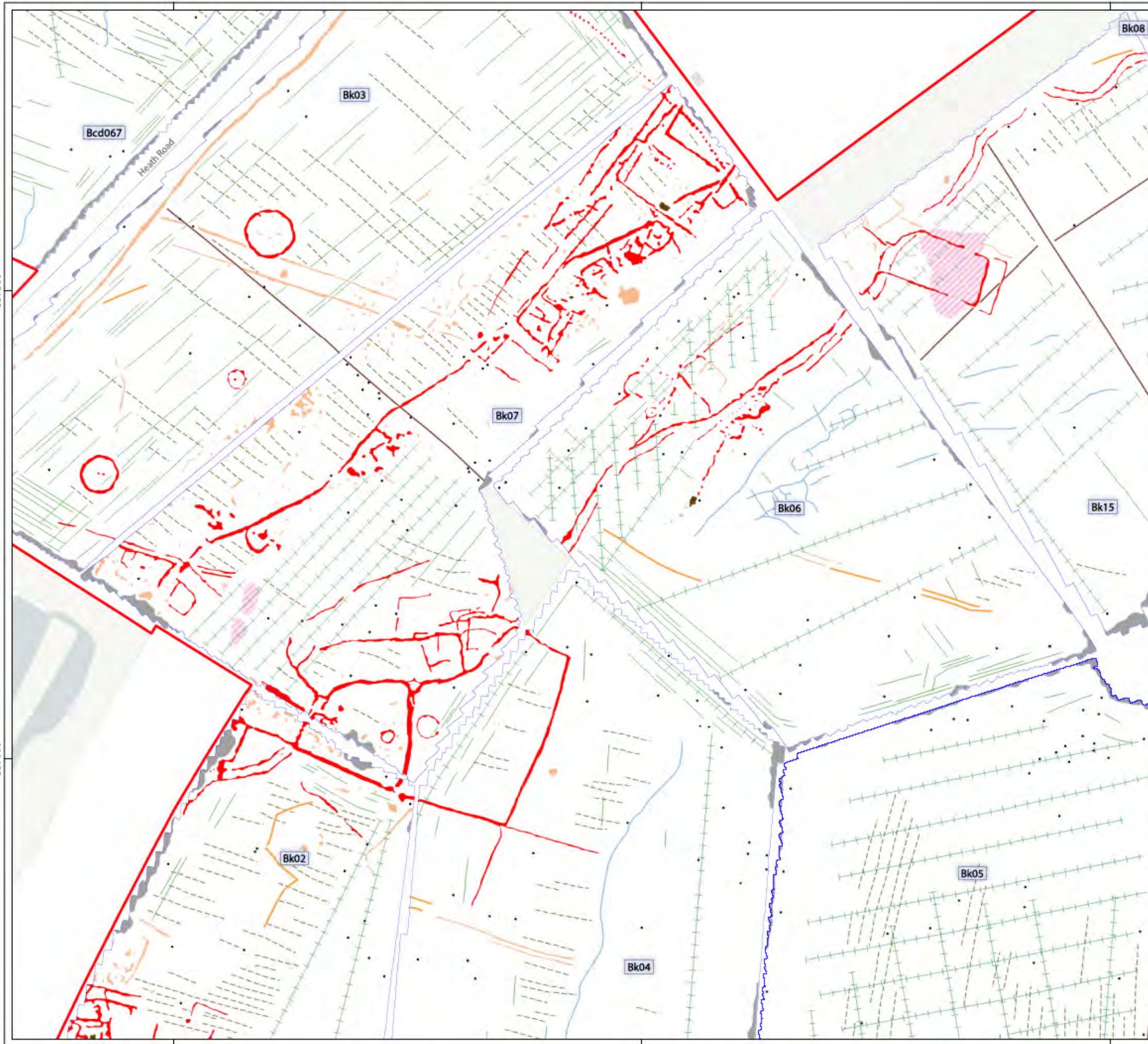
Key

- ▭ Geophysical Survey Area
- ▭ Survey Extent
- XY Trace (25nT/cm)

0 50 100 m

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Key

- Geophysical Survey Area
- Survey Extent

Interpretation

- Ferrous Objects
- Agriculture
- Field Boundary
- Field Drain
- Natural
- Ridge and Furrow
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Quarry
- Burning

0 50 100 m

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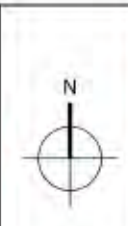
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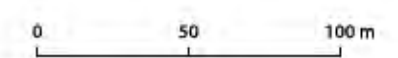
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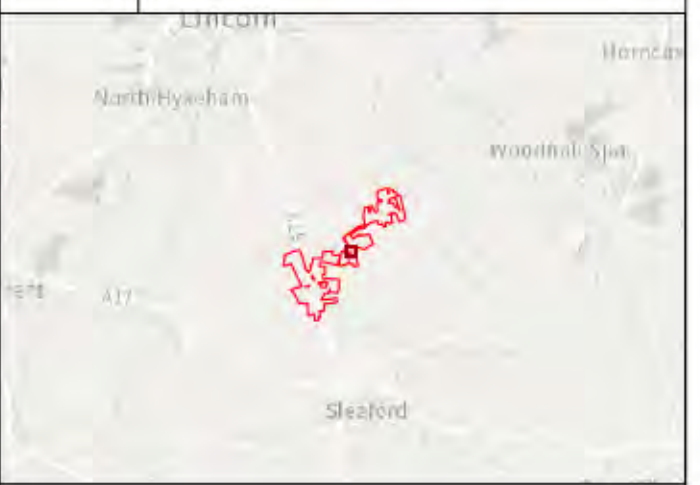
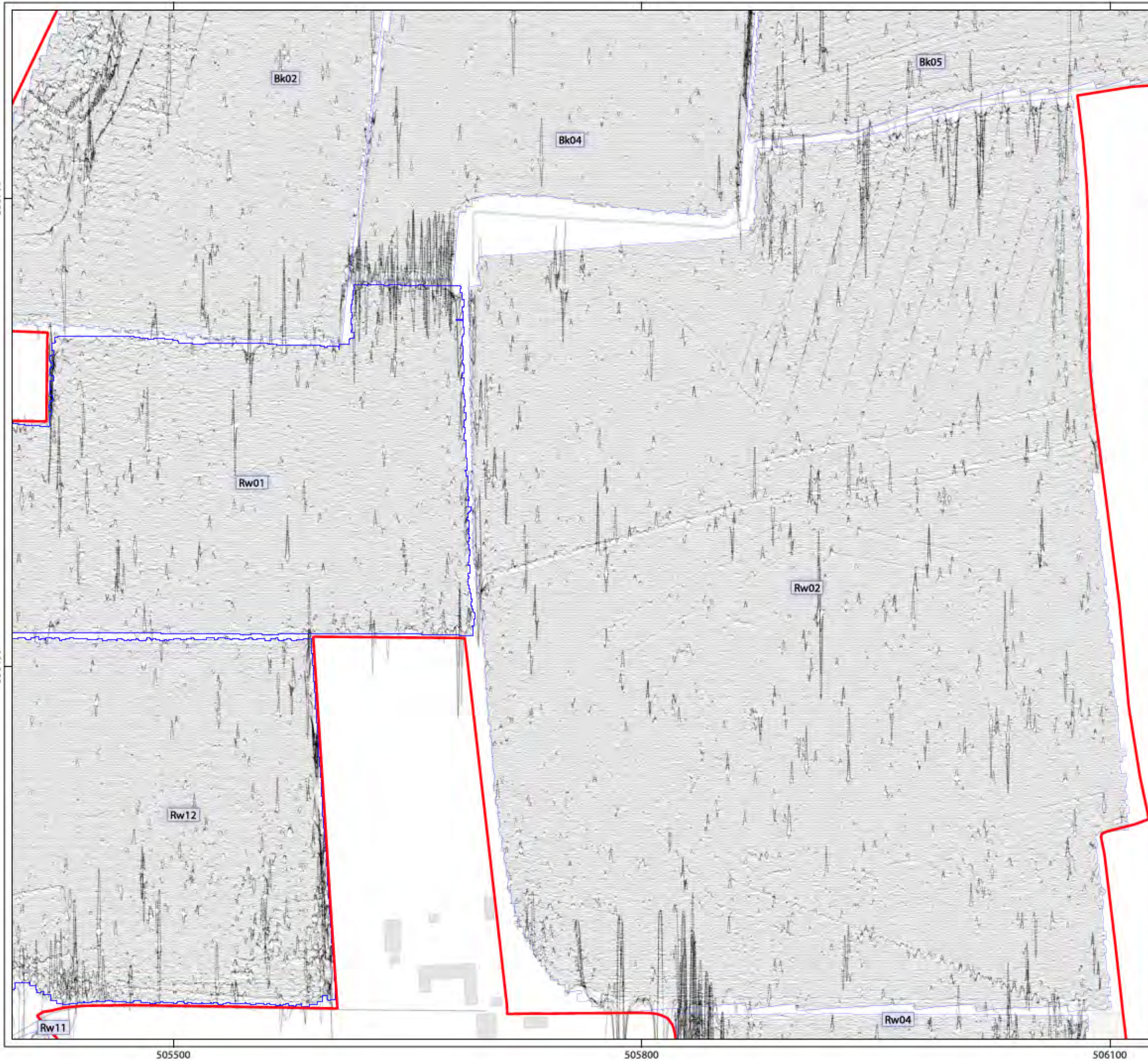


- Key**
- Geophysical Survey Area
 - Survey Extent



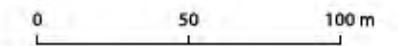
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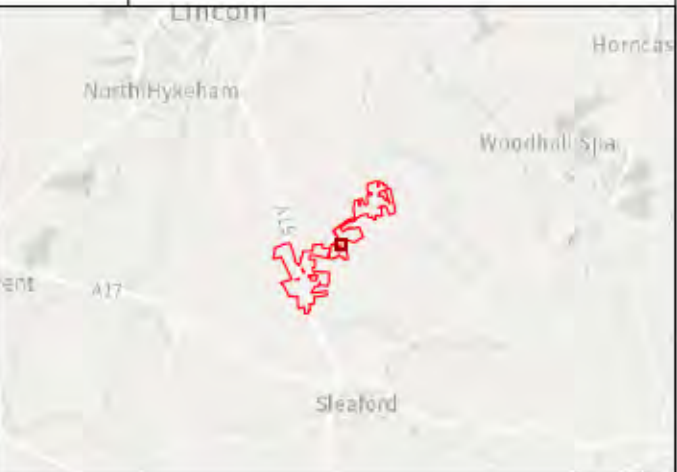
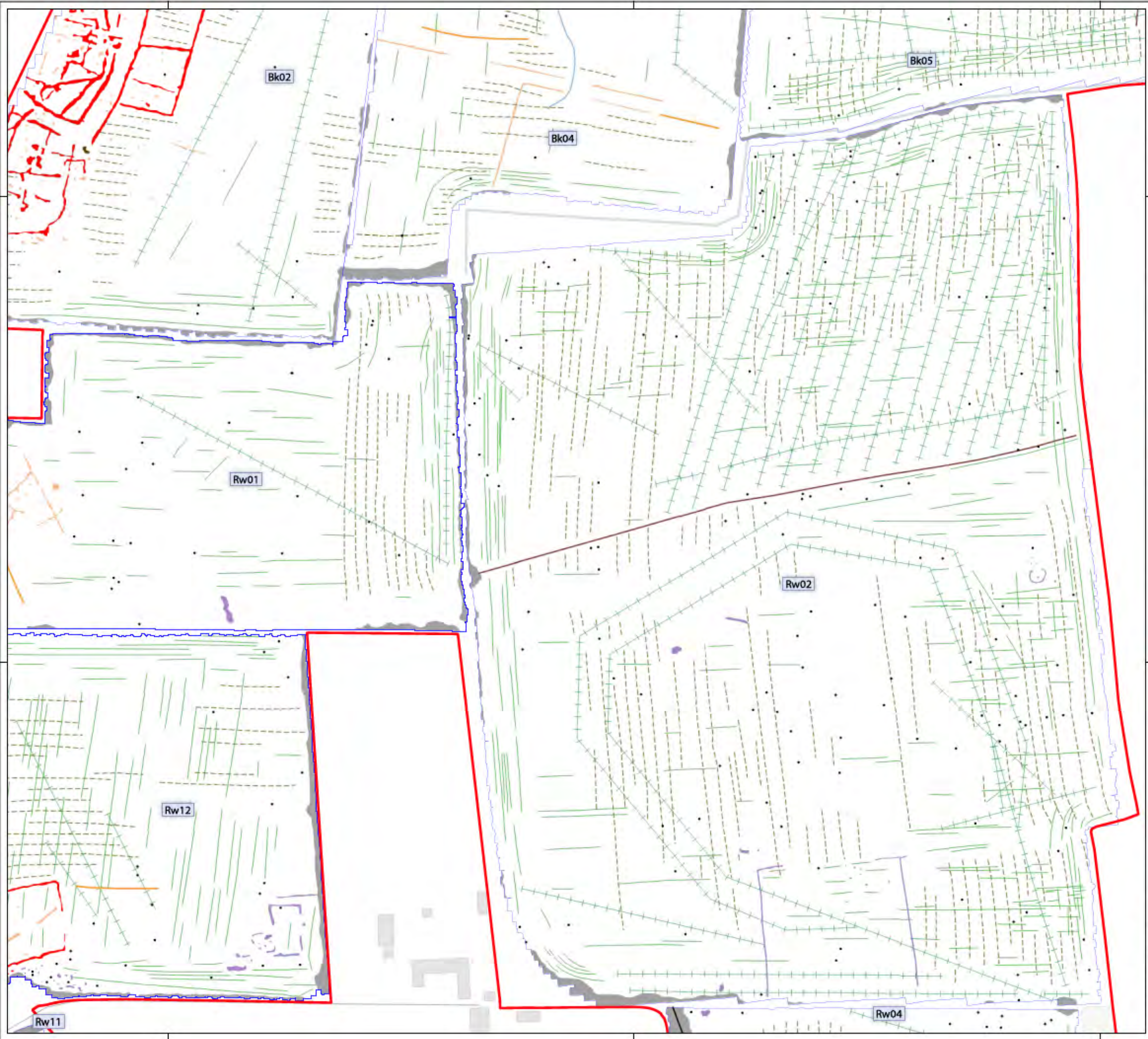
- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)



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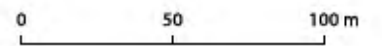
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Key

- ▭ Geophysical Survey Area
- ▭ Survey Extent
- Interpretation**
- Ferrous Objects
- Agriculture
- Field Boundary
- + Field Drain
- Natural
- Pipe
- Uncertain
- - - Ridge and Furrow
- Possible Archaeology
- ▭ Archaeology
- ▭ Magnetic Disturbance
- ▭ Possible Archaeology
- ▭ Uncertain
- ▭ Burning



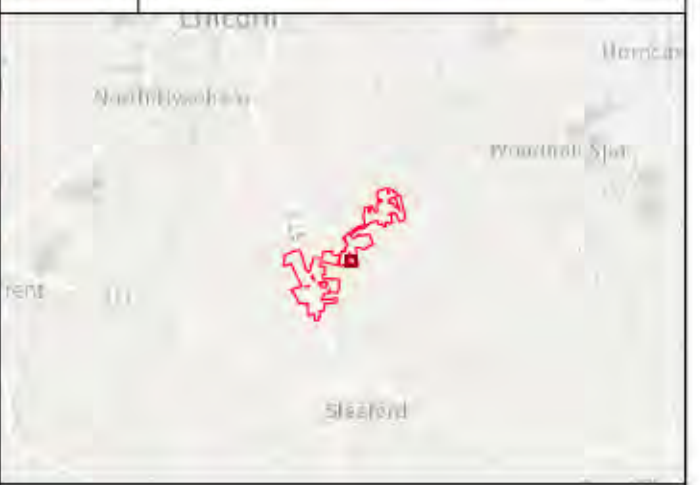
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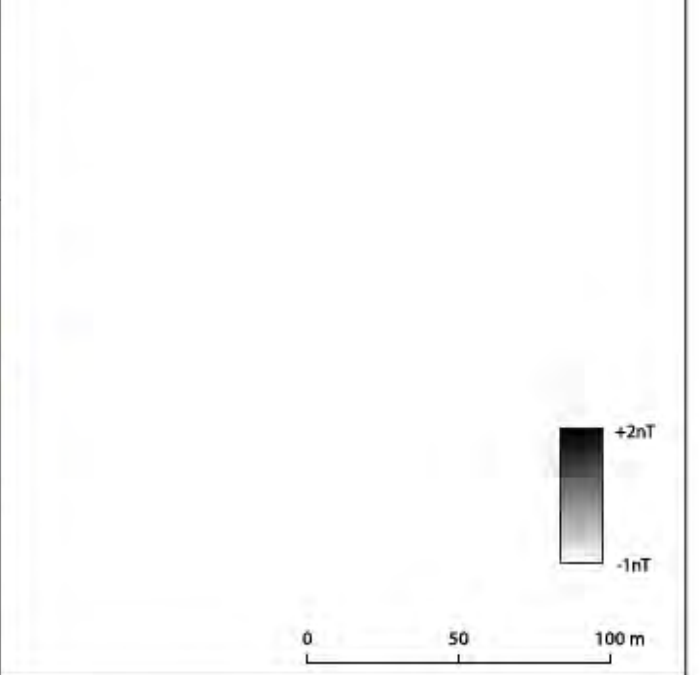



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Key

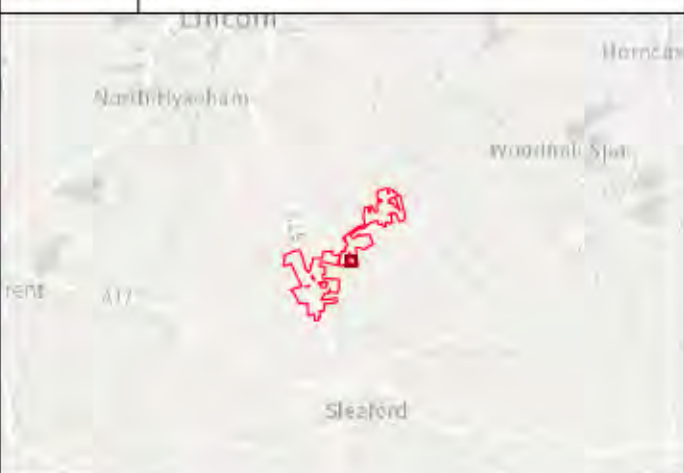
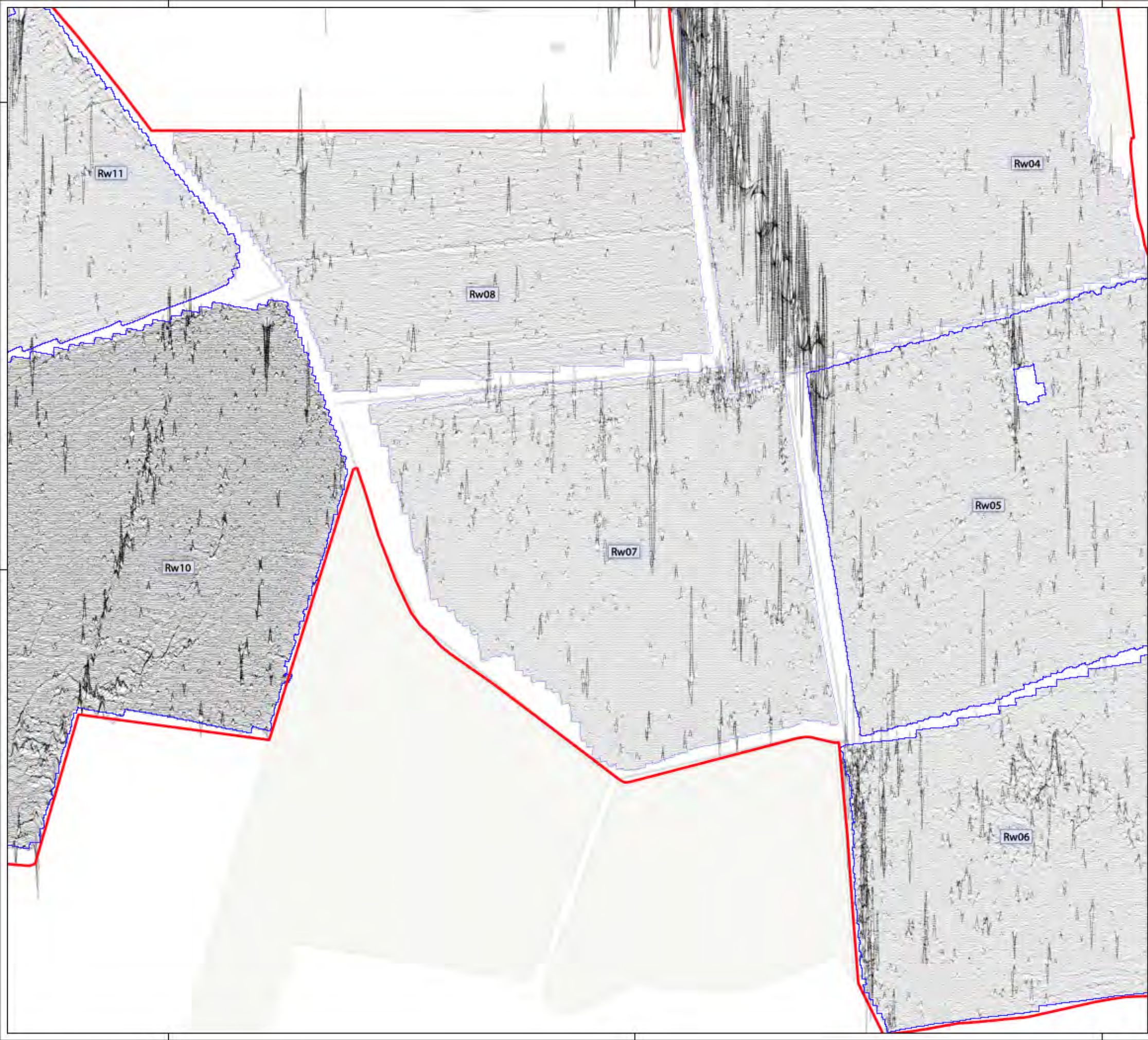
- Geophysical Survey Area
- Survey Extent



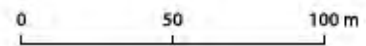
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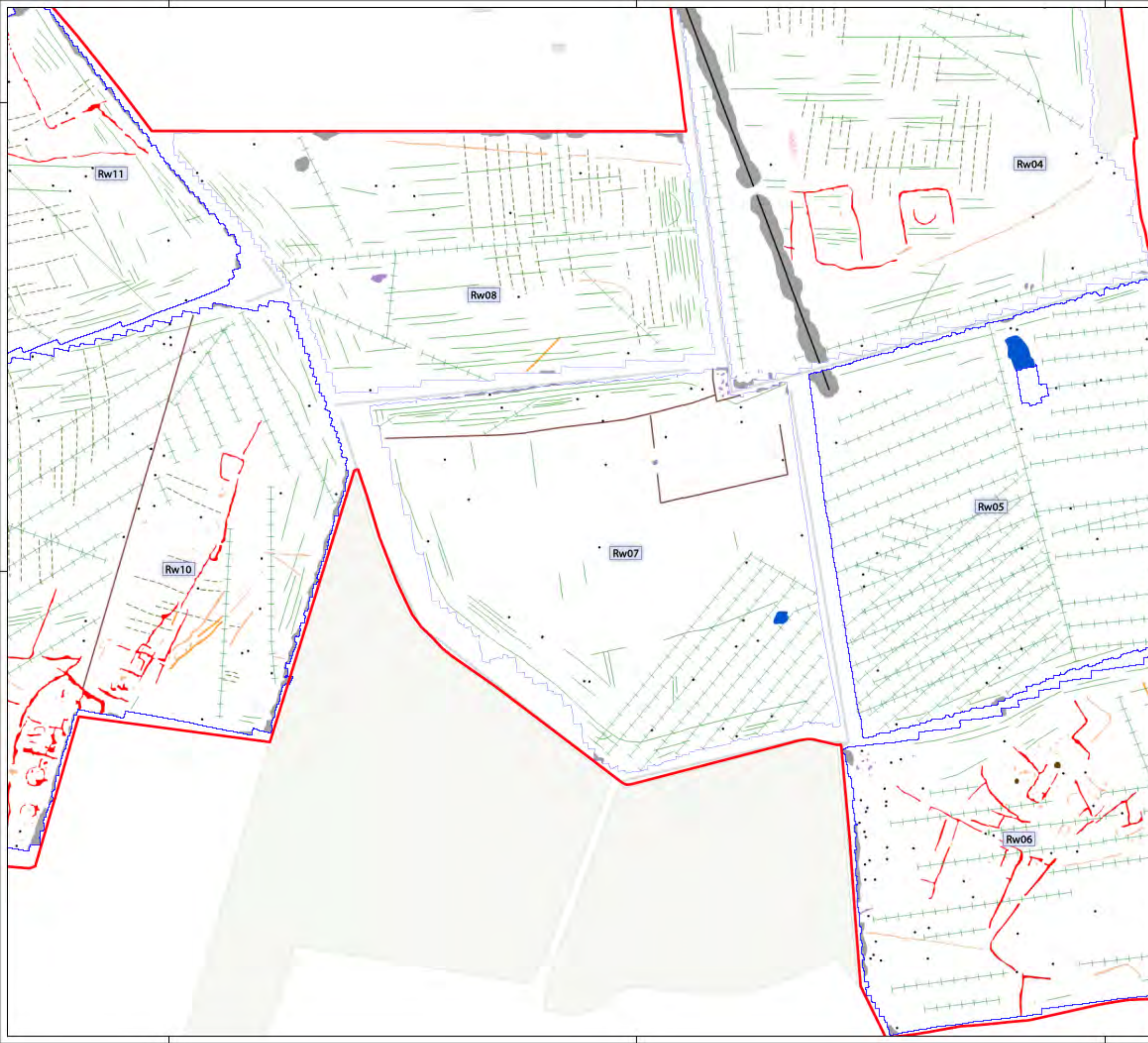
- Key**
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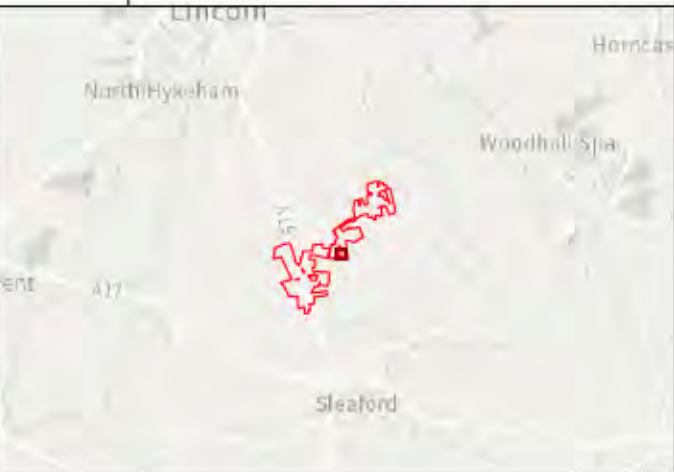
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Key

- Geophysical Survey Area
- Survey Extent

Interpretation

- Ferrous Objects
- Agriculture
- Field Boundary
- Field Drain
- Pipe
- Ridge and Furrow
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Quarry
- Uncertain
- Former Pond
- Burning

0 50 100 m

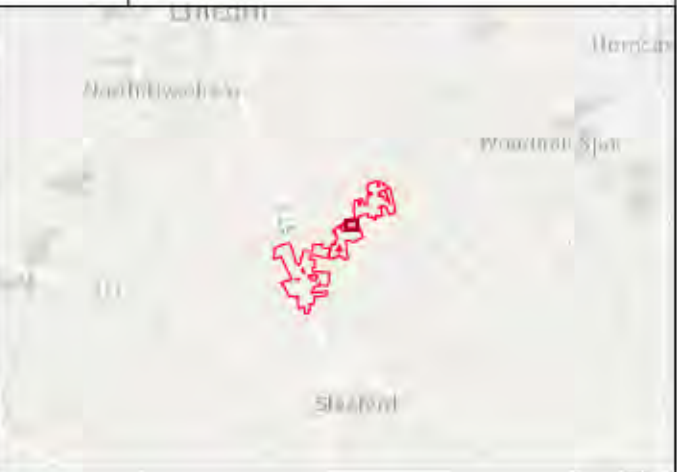
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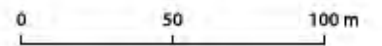




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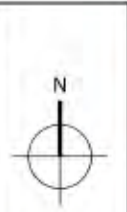


- Key**
- Geophysical Survey Area
 - Survey Extent

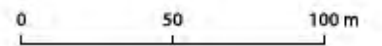


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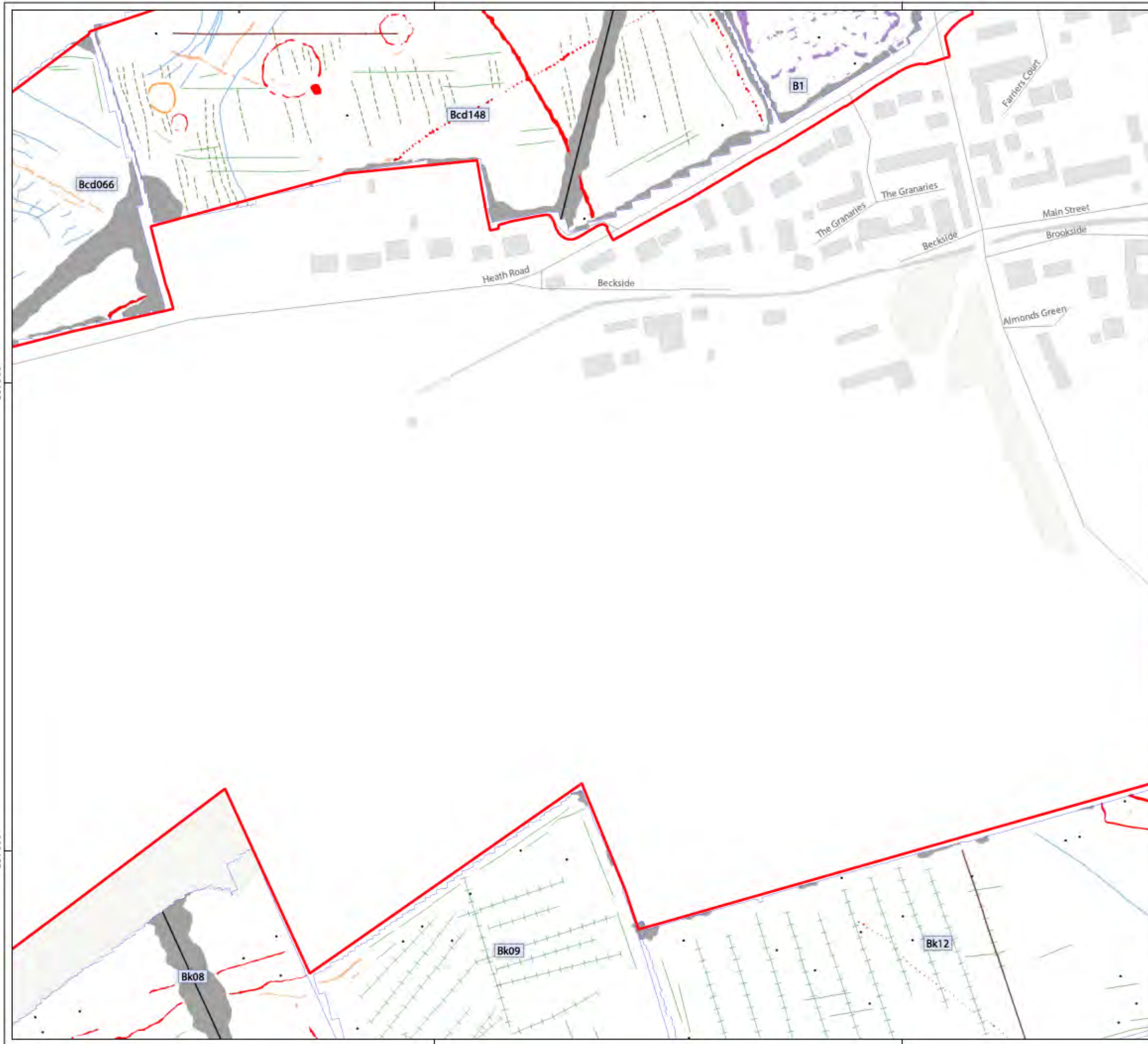


- Key**
- Geophysical Survey Area
 - Survey Extent
 - XY Trace (25nT/cm)

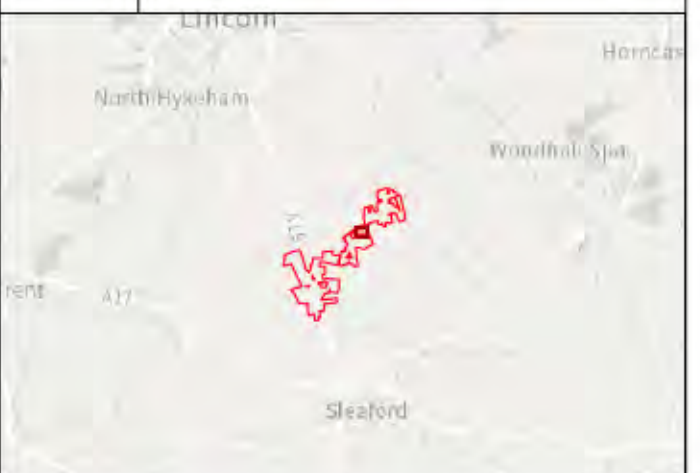


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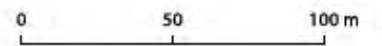
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- Key**
- Geophysical Survey Area
 - Survey Extent
- Interpretation**
- Ferrous Objects
 - Agriculture
 - Field Boundary
 - + Field Drain
 - Natural
 - Pipe
 - - - Ridge and Furrow
 - Possible Archaeology
 - Archaeology
 - Magnetic Disturbance
 - Possible Archaeology
 - Quarry
 - Uncertain



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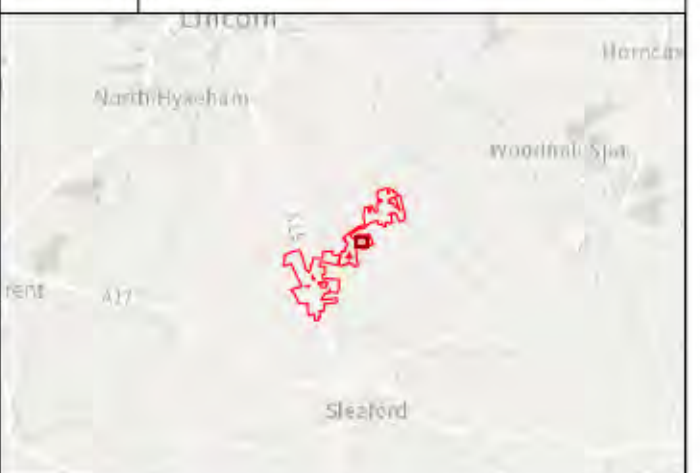
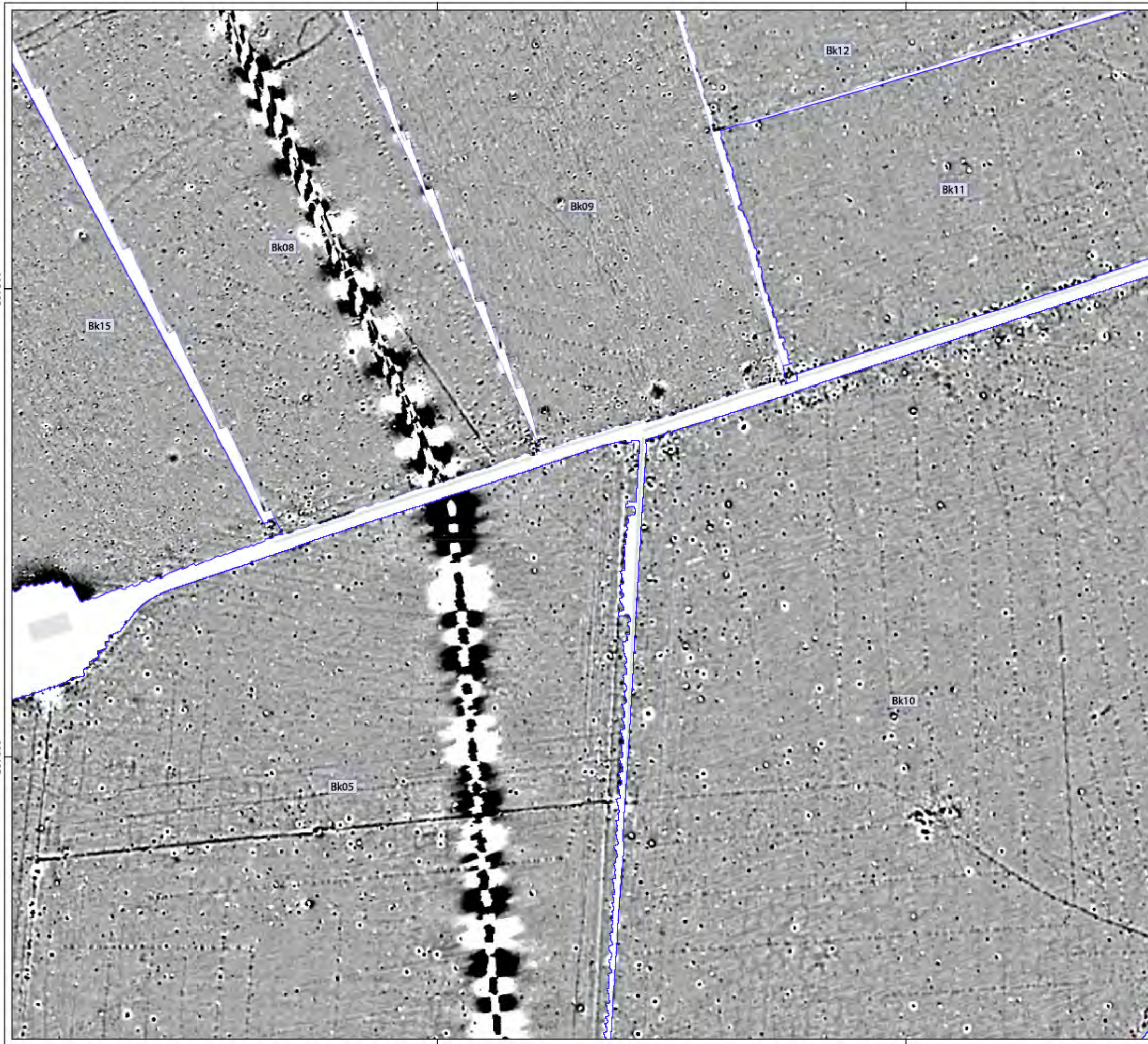
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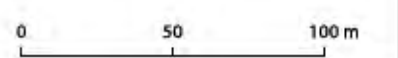
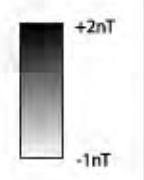
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Key

▭ Geophysical Survey Area

▭ Survey Extent

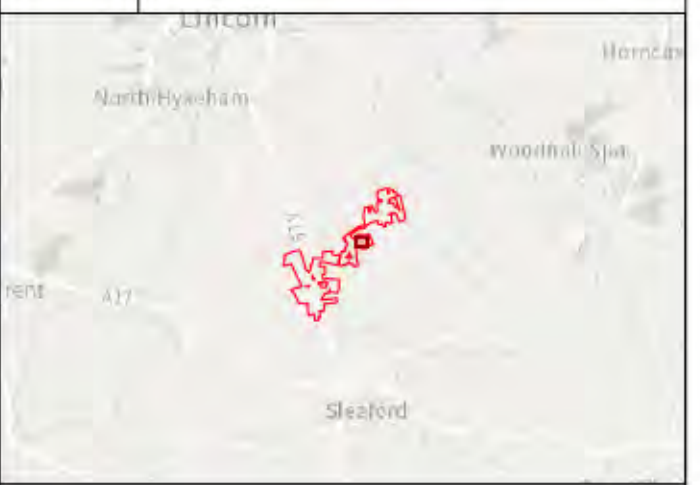
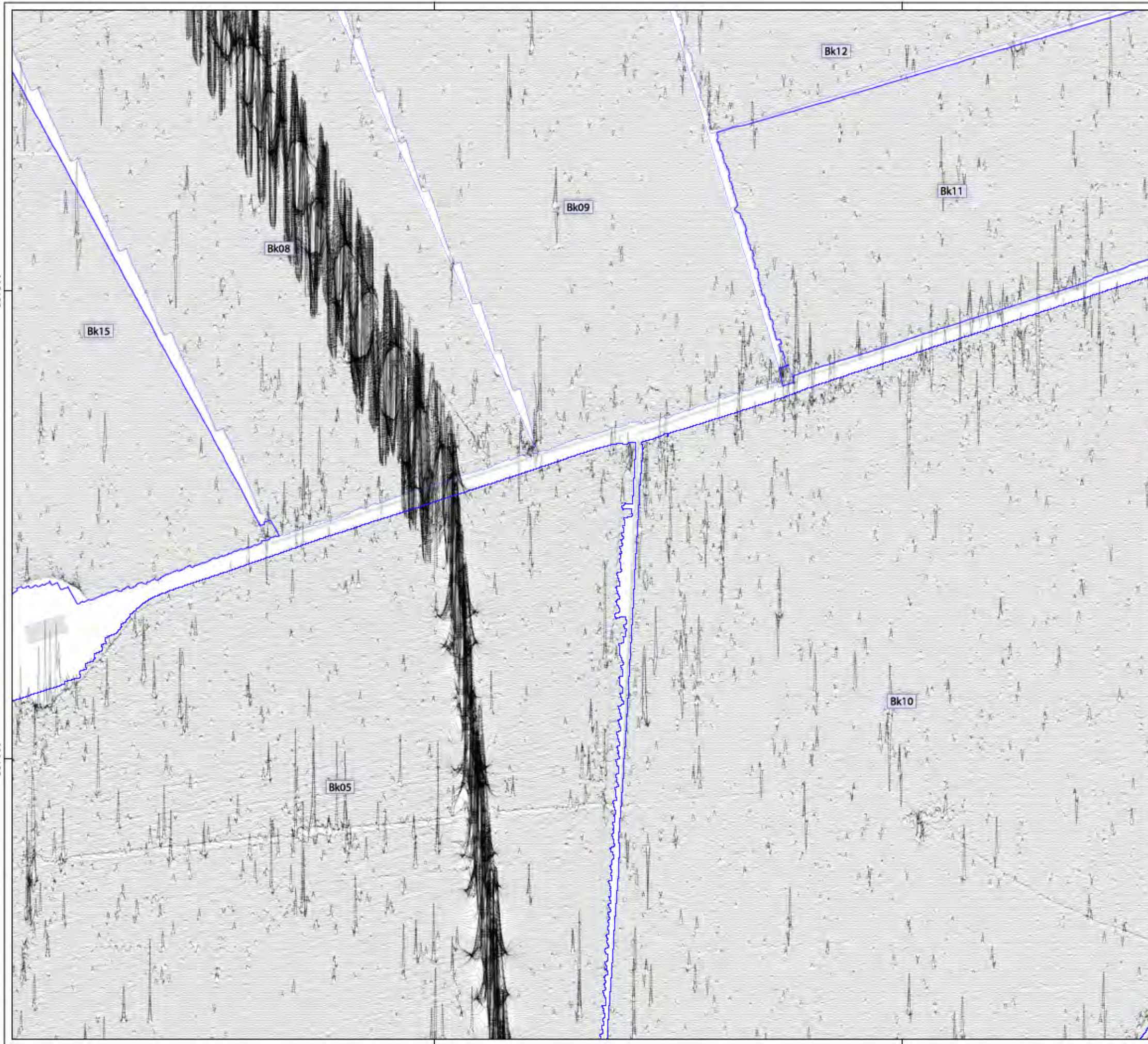


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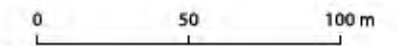
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Key

- ▭ Geophysical Survey Area
- ▭ Survey Extent
- XY Trace (25nT/cm)



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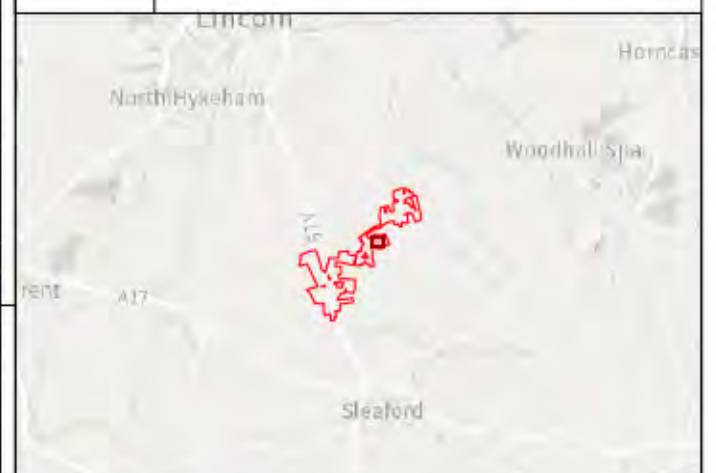
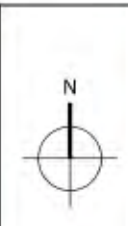


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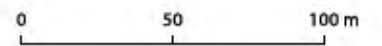
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Key

- Geophysical Survey Area
- Survey Extent
- Interpretation**
- Ferrous Objects
- Agriculture
- Field Boundary
- Possible Field Boundary
- Field Drain
- Natural
- Pipe
- Uncertain
- Ridge and Furrow
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Quarry
- Uncertain
- Burning

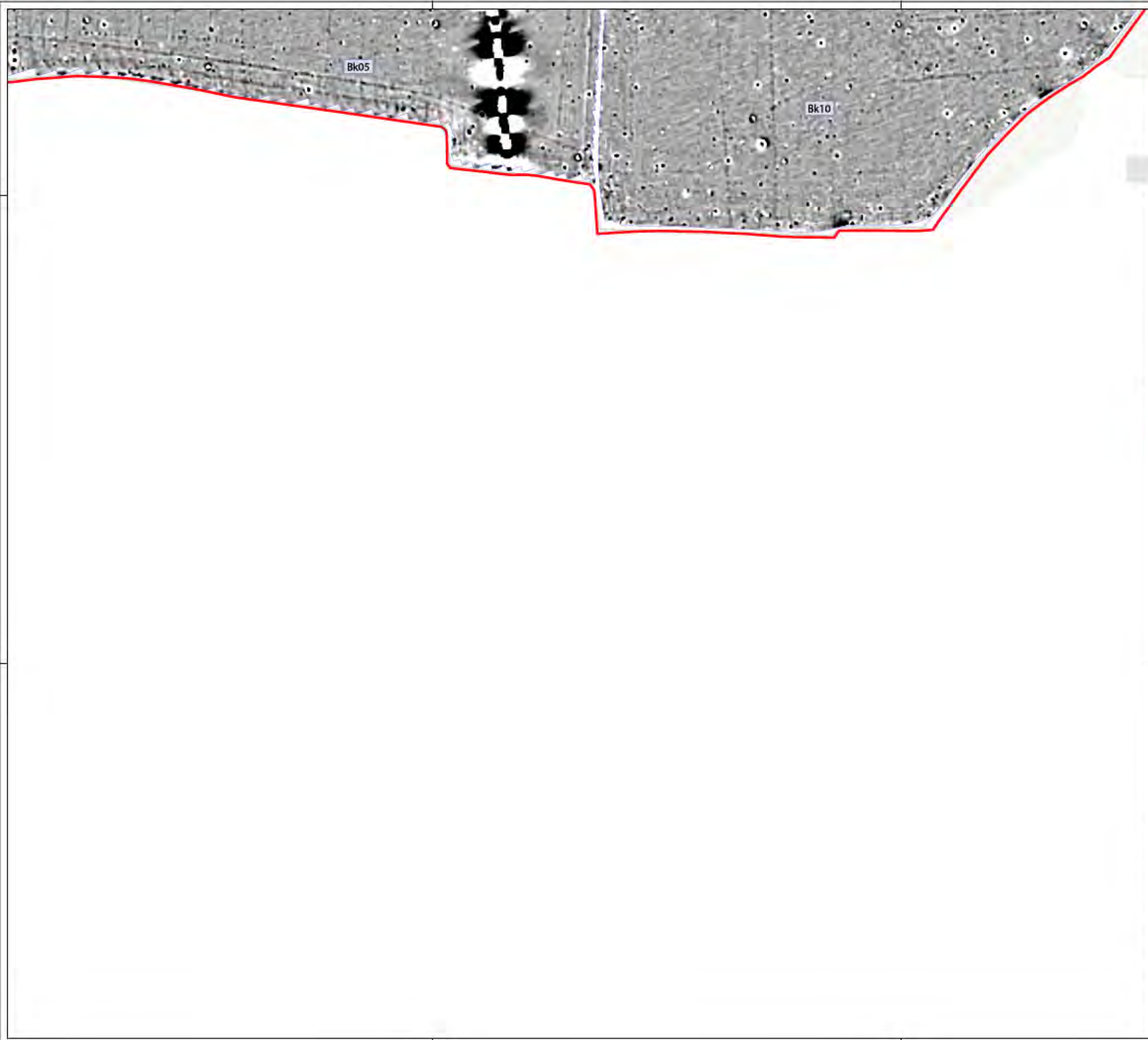


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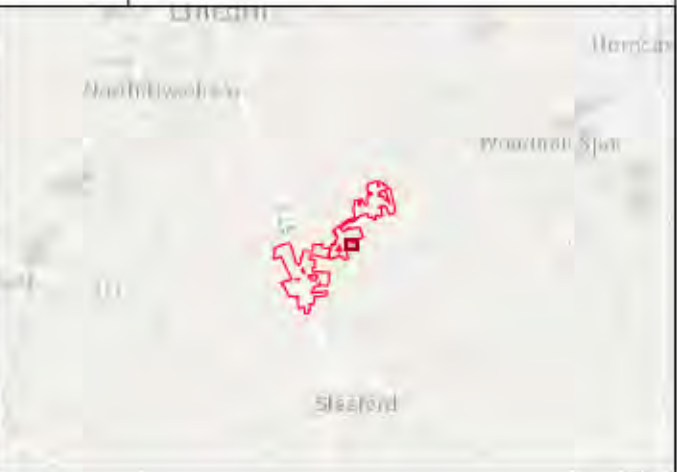
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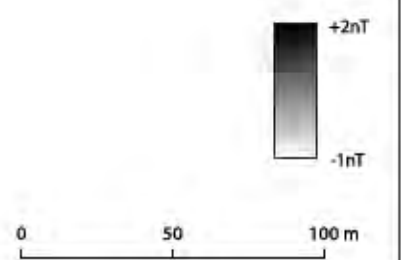



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Key

- Geophysical Survey Area
- Survey Extent



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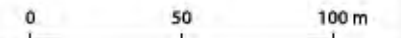
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Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)



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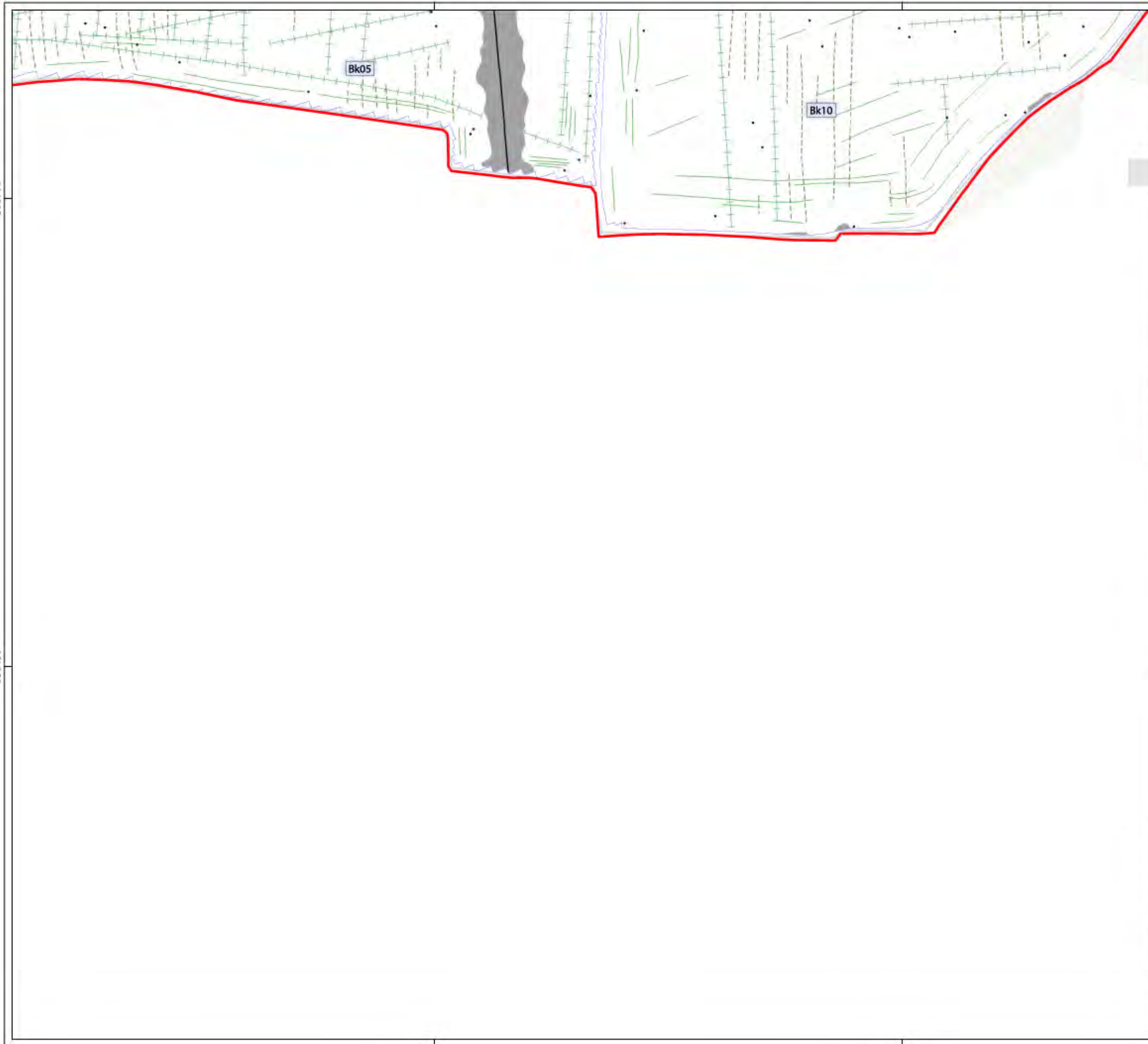
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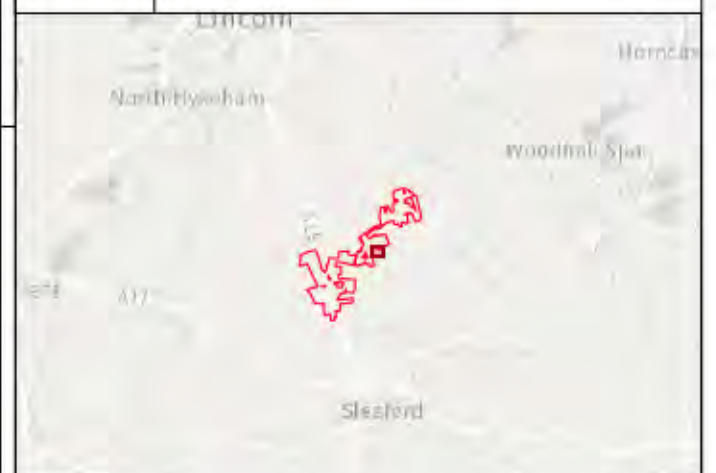
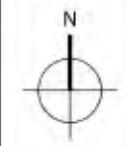


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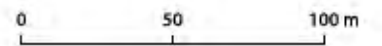
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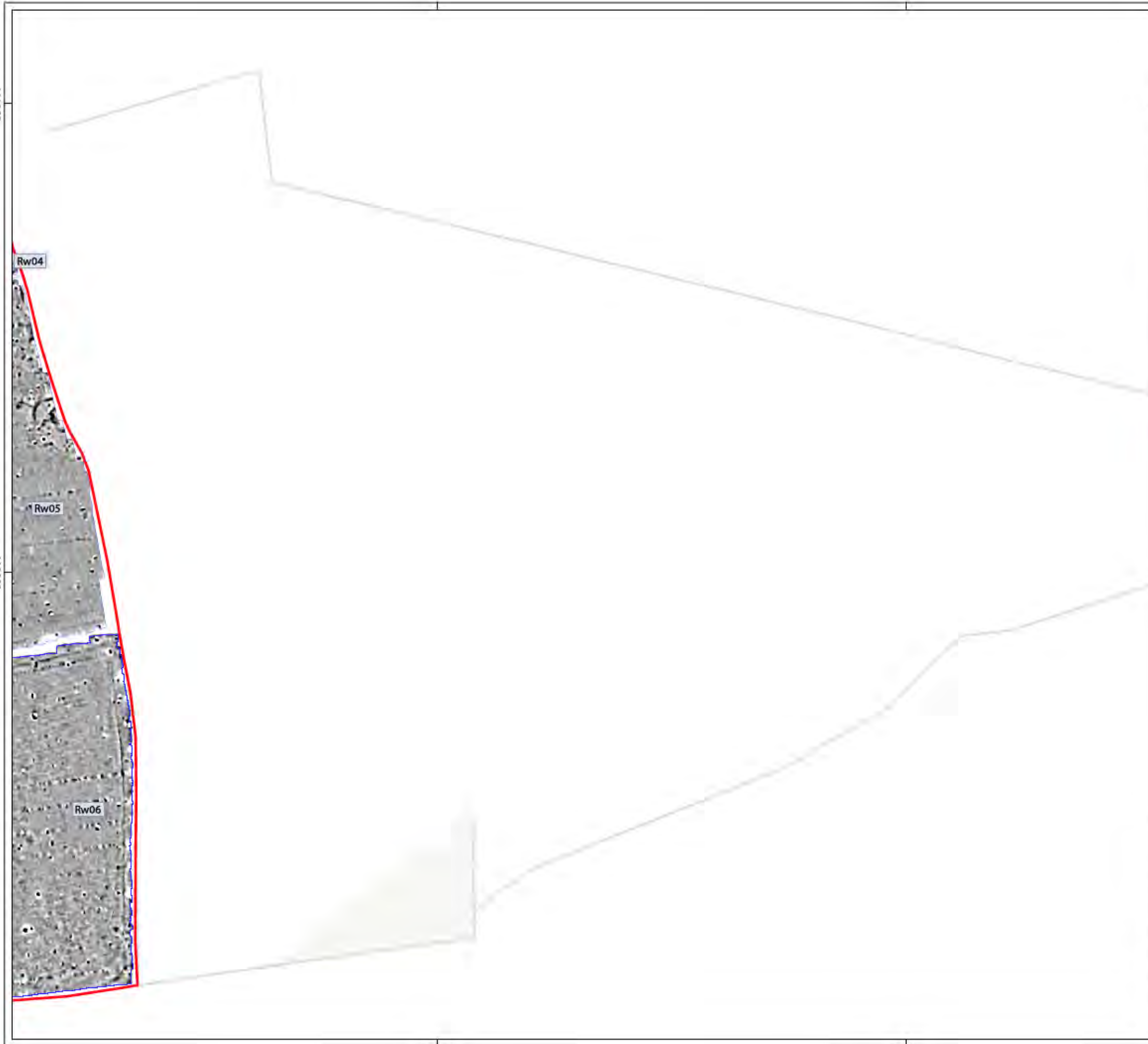
Key

- Geophysical Survey Area
- Survey Extent
- Interpretation**
- Ferrous Objects
- Agriculture
- +— Field Drain
- Pipe
- - - Ridge and Furrow
- Magnetic Disturbance



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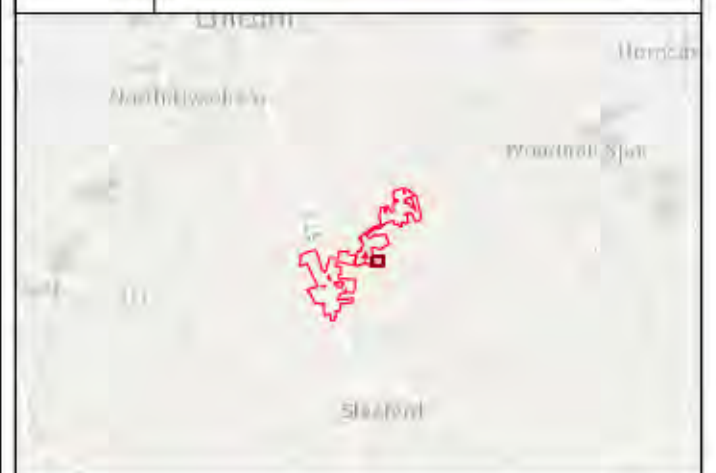
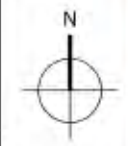


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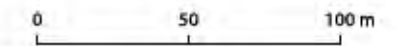
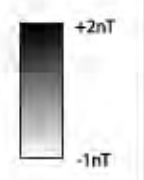
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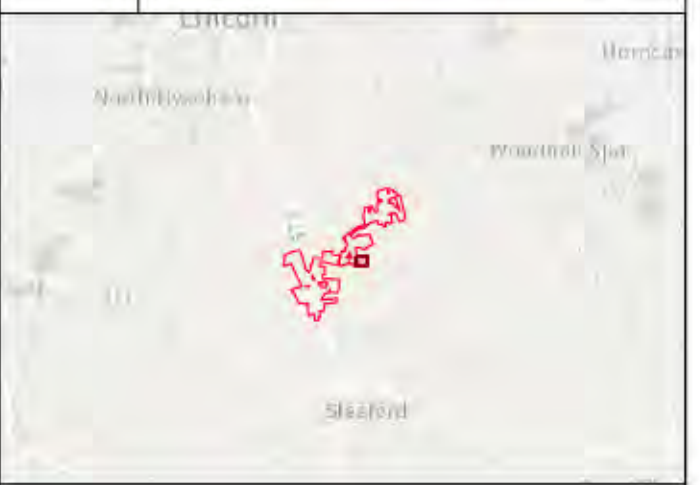
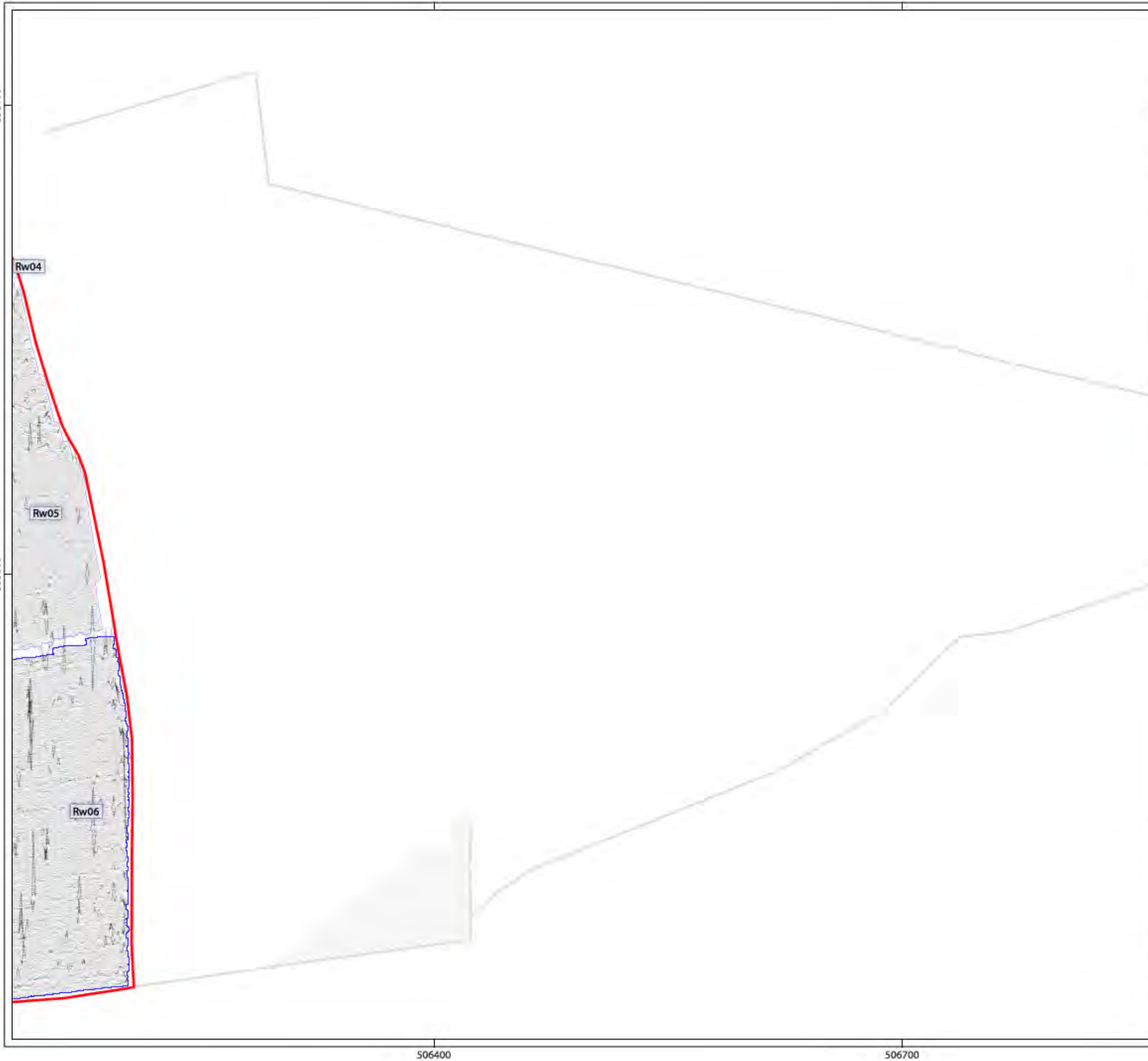
Key

- Geophysical Survey Area
- Survey Extent



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Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)

0 50 100 m

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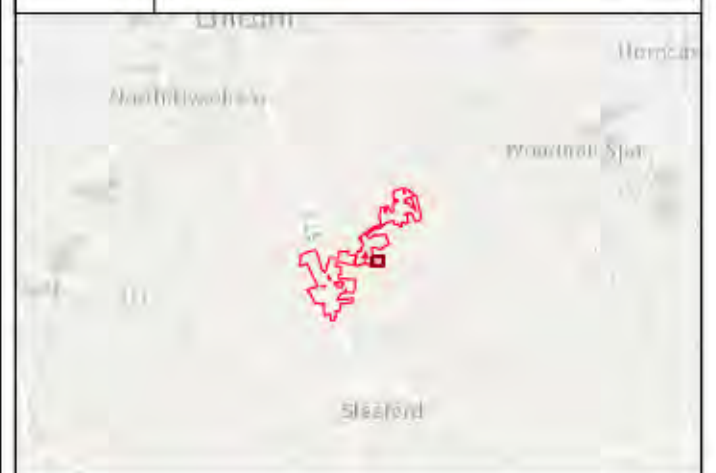
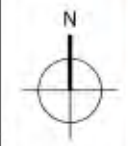


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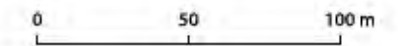
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Key

- Geophysical Survey Area
- Survey Extent
- Interpretation**
- + Ferrous Objects
- Agriculture
- + Field Drain
- Possible Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Quarry



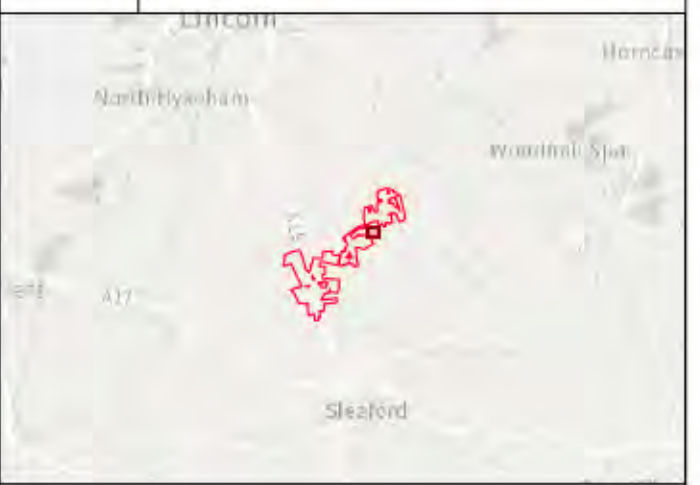
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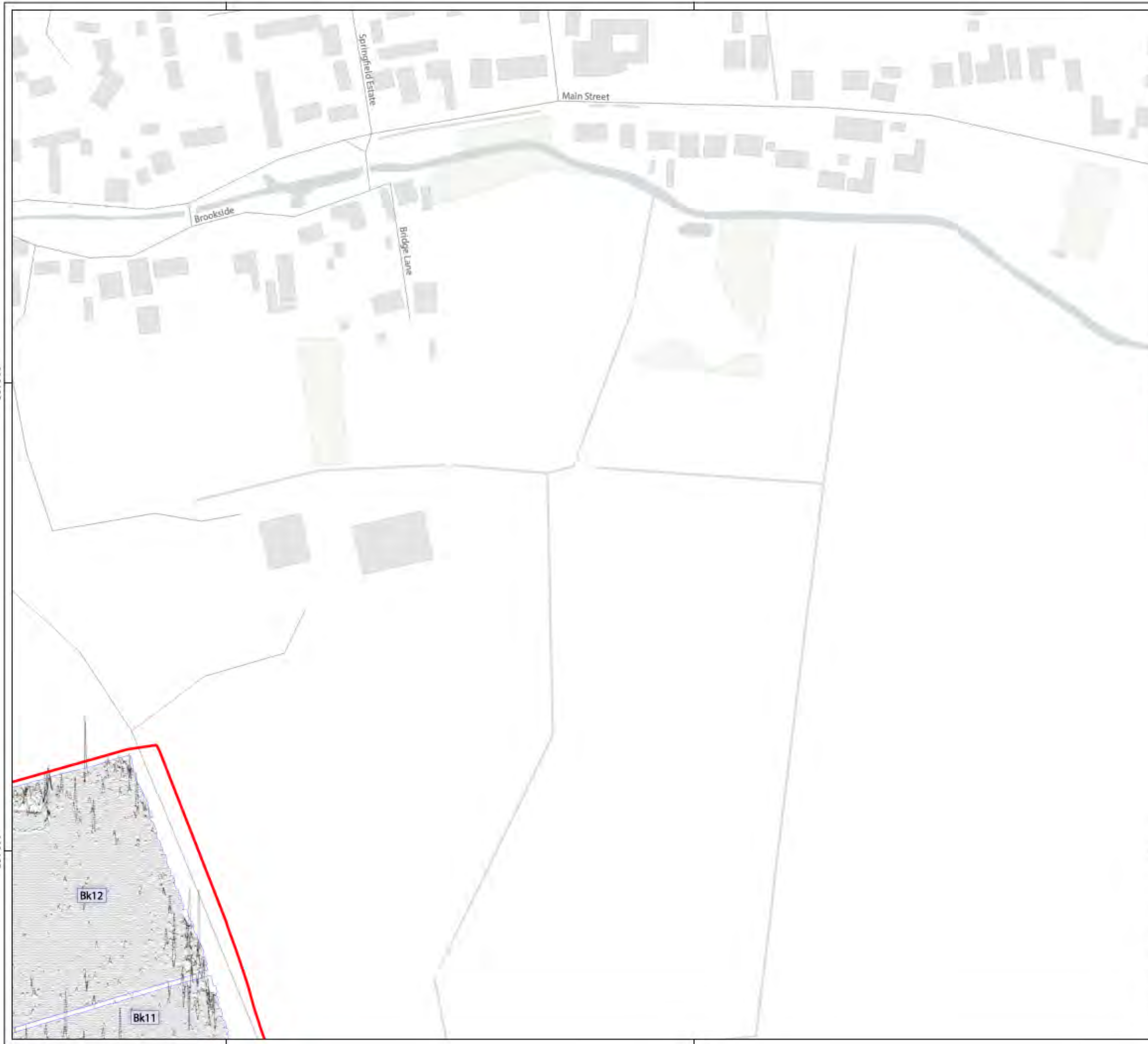


Key

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- Survey Extent

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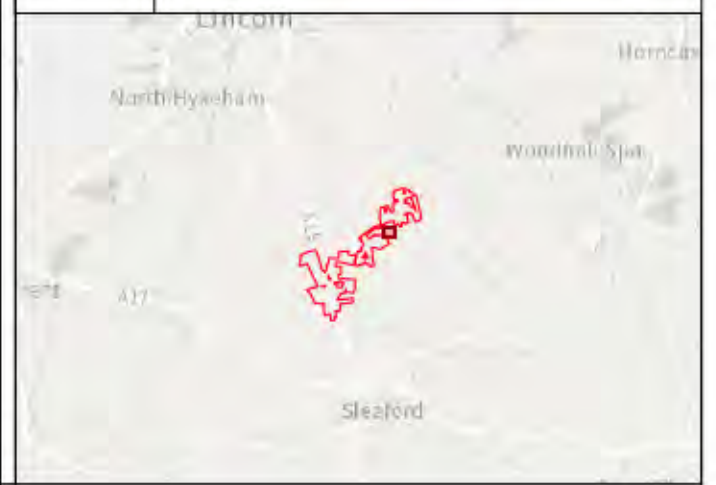
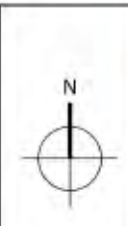


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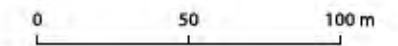
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Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)



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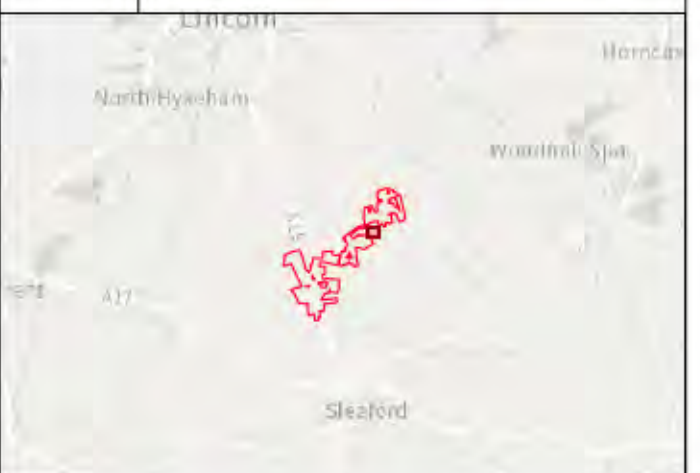
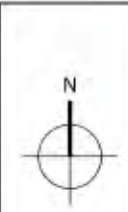


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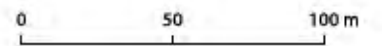
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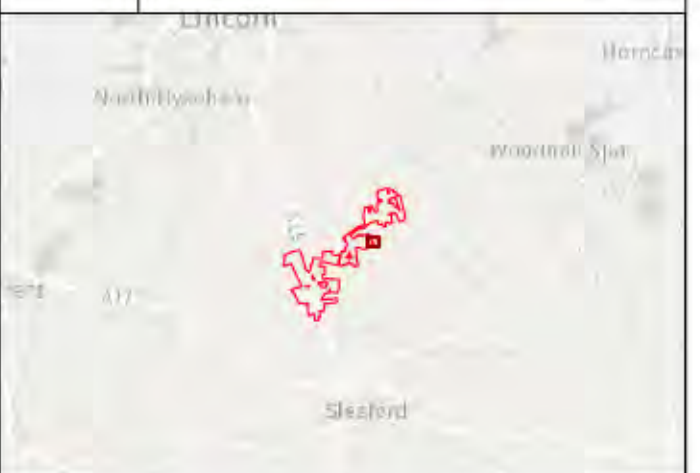
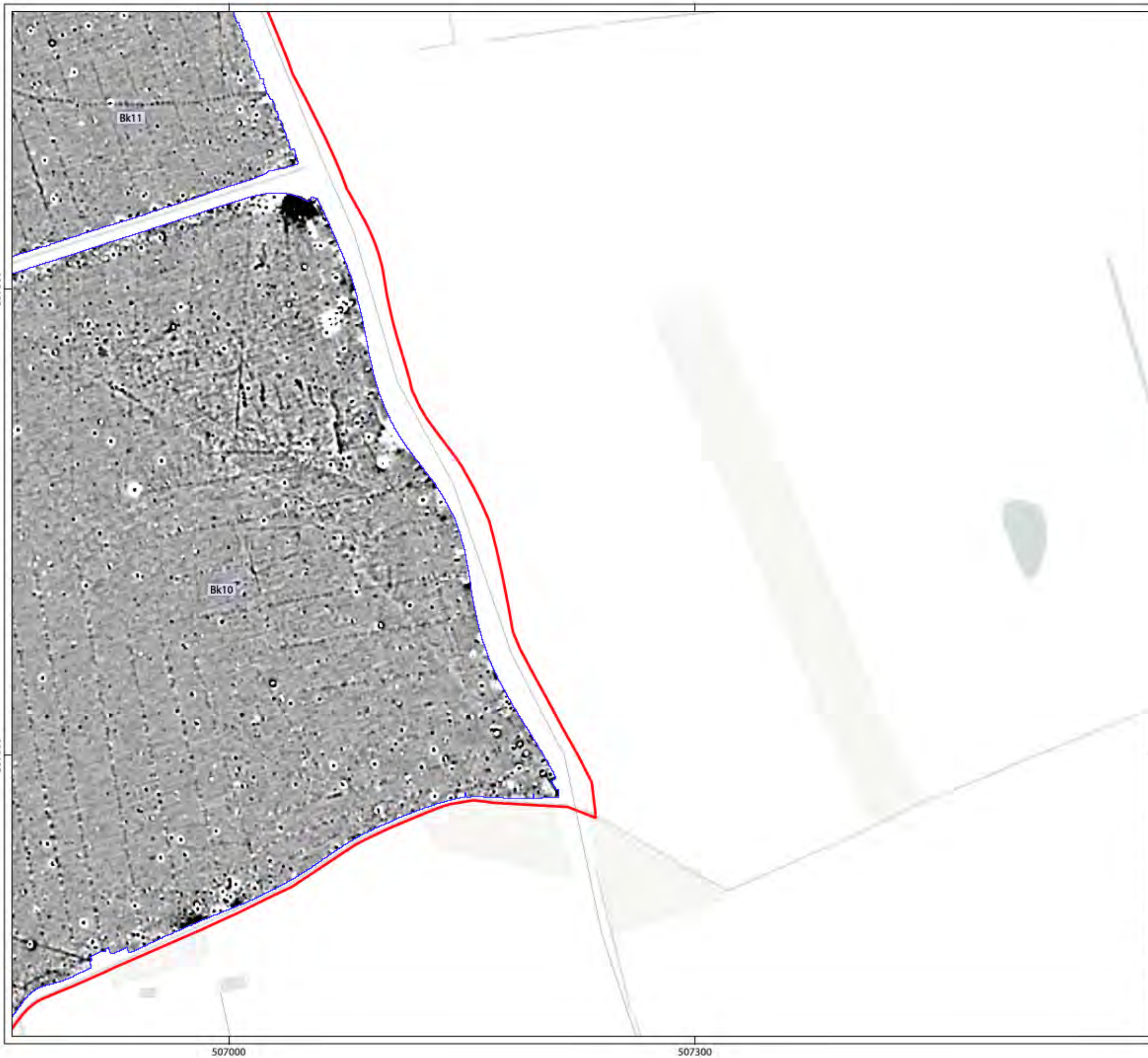
Key



- Geophysical Survey Area
- Survey Extent
- Interpretation**
- Ferrous Objects
- Agriculture
- Field Drain
- Natural
- Archaeology
- Magnetic Disturbance
- Possible Archaeology

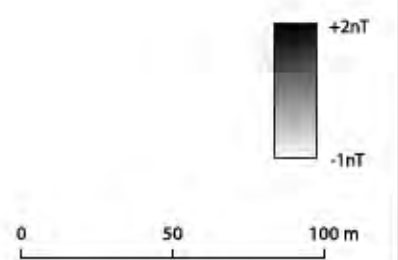


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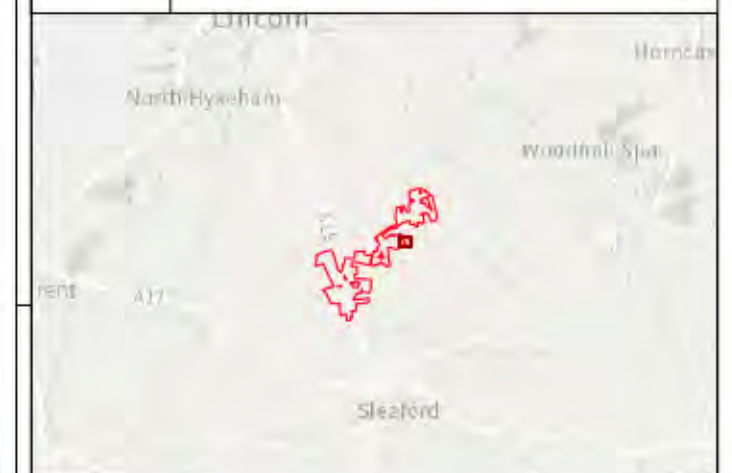
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 Geophysical Survey Area
 Survey Extent



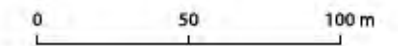
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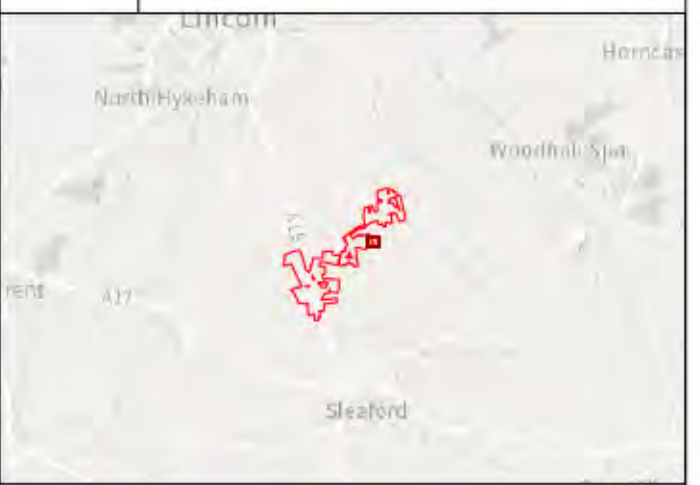
- Key**
- Geophysical Survey Area
 - Survey Extent
 - XY Trace (25nT/cm)



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Key

- Geophysical Survey Area
- Survey Extent

Interpretation

- Ferrous Objects
- Agriculture
- Field Drain
- Natural
- Uncertain
- Ridge and Furrow
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Uncertain

0 50 100 m

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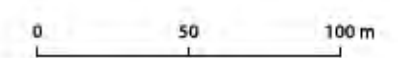
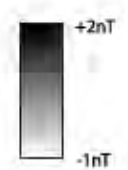
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Key

- Geophysical Survey Area
- Survey Extent



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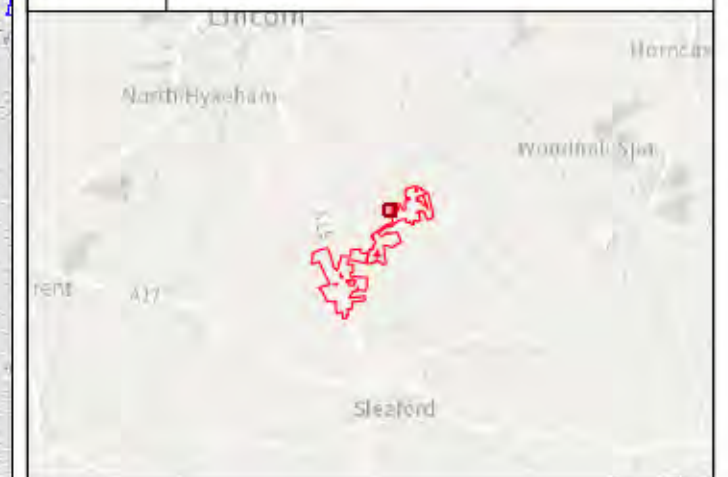
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Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)

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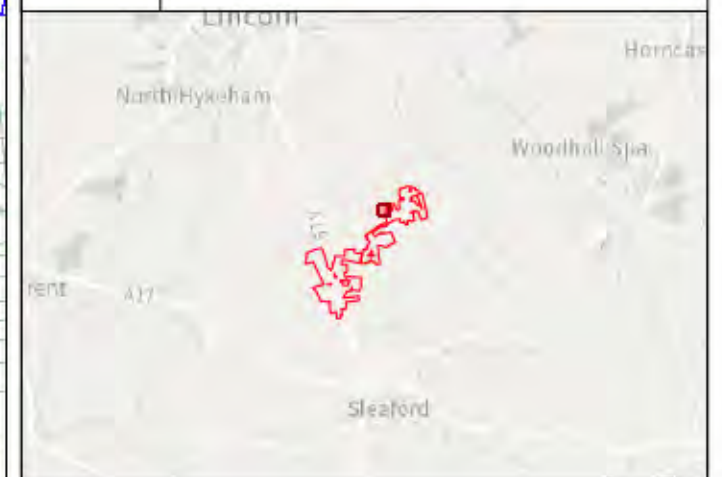
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Key

- Geophysical Survey Area
- Survey Extent
- Interpretation**
- Ferrous Objects
- Agriculture
- +— Field Drain
- Natural
- Pipe
- - - Ridge and Furrow
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology

0 50 100 m

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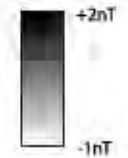


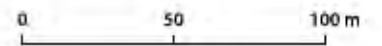

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Key

- Geophysical Survey Area
- Survey Extent





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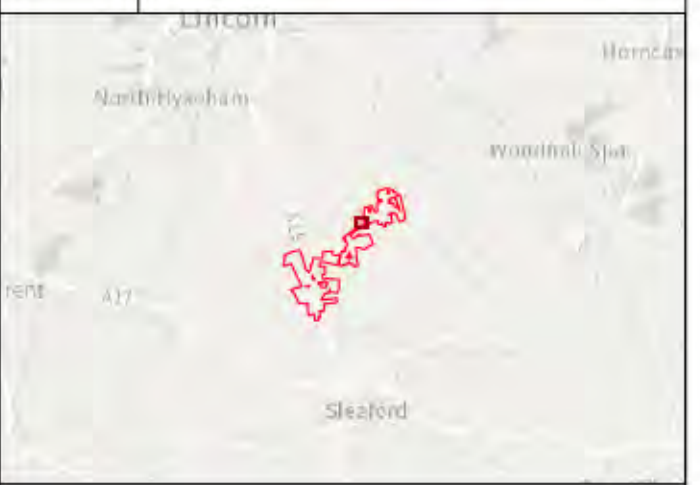
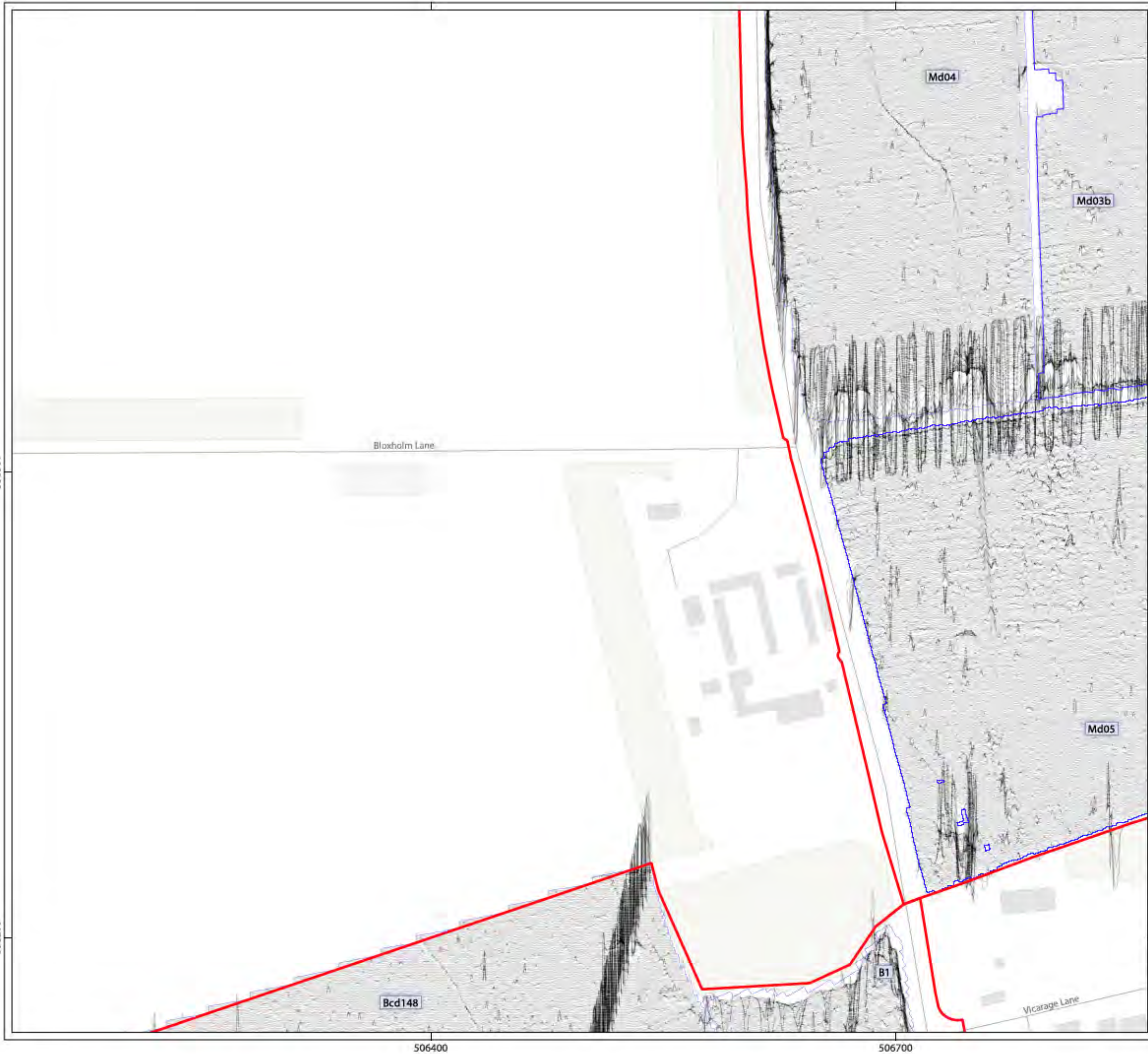
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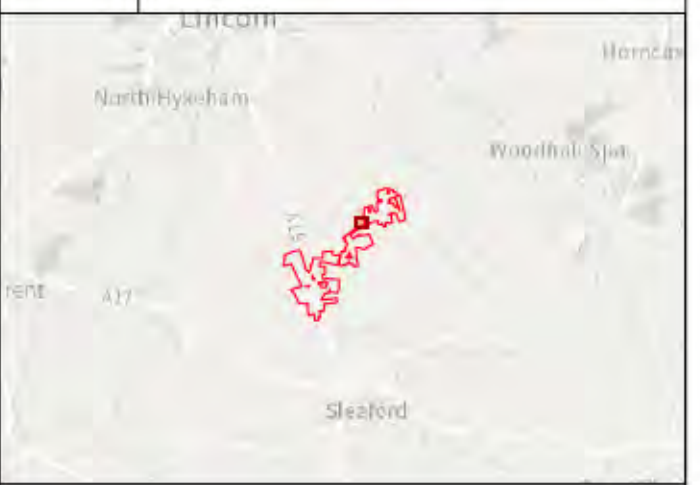
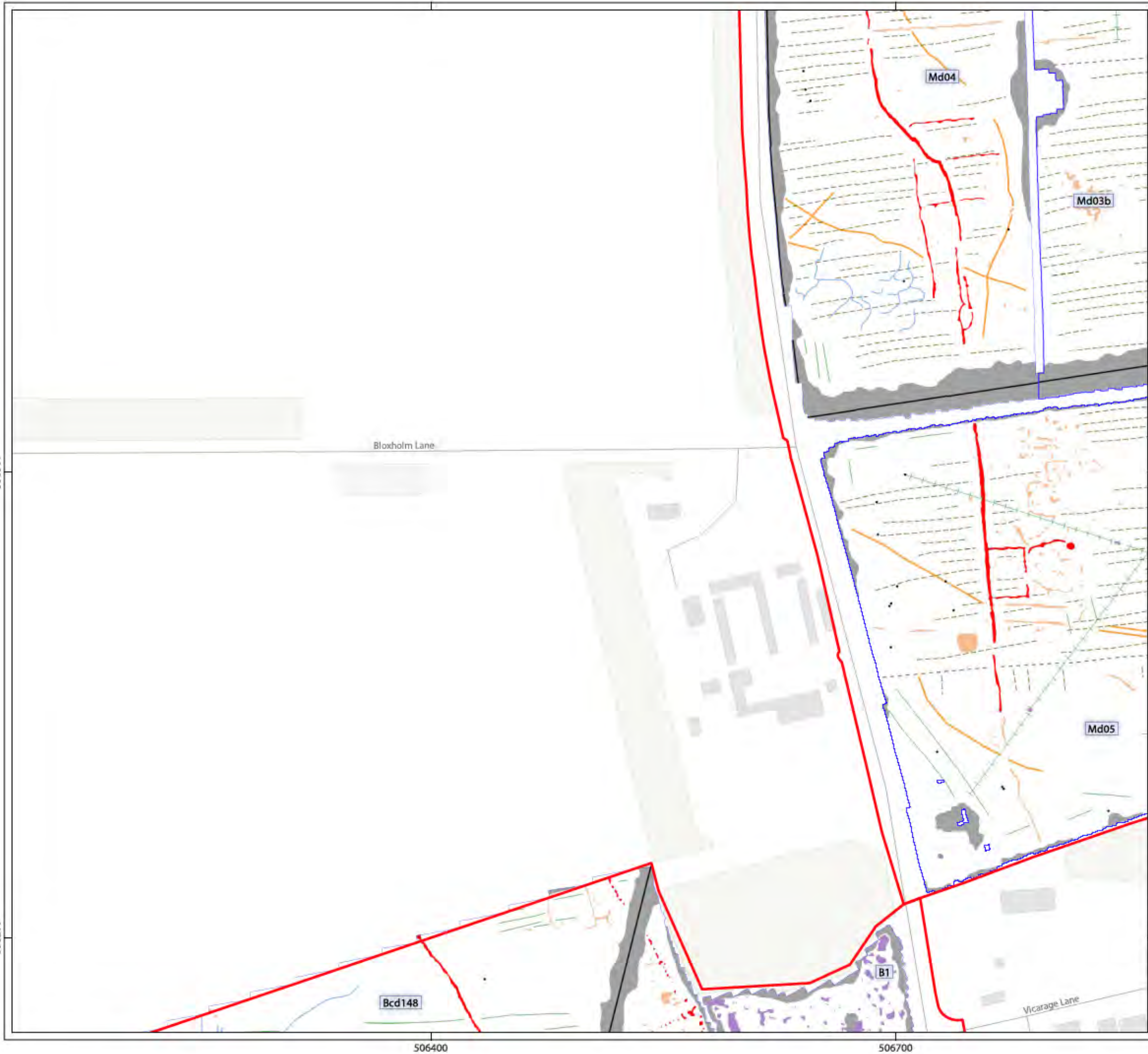
Key

- ▭ Geophysical Survey Area
- ▭ Survey Extent
- XY Trace (25nT/cm)

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Key

- Geophysical Survey Area
- Survey Extent

Interpretation

- Ferrous Objects
- Agriculture
- - - Possible Field Boundary
- + Field Drain
- Natural
- Pipe
- - - Ridge and Furrow
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Uncertain

0 50 100 m

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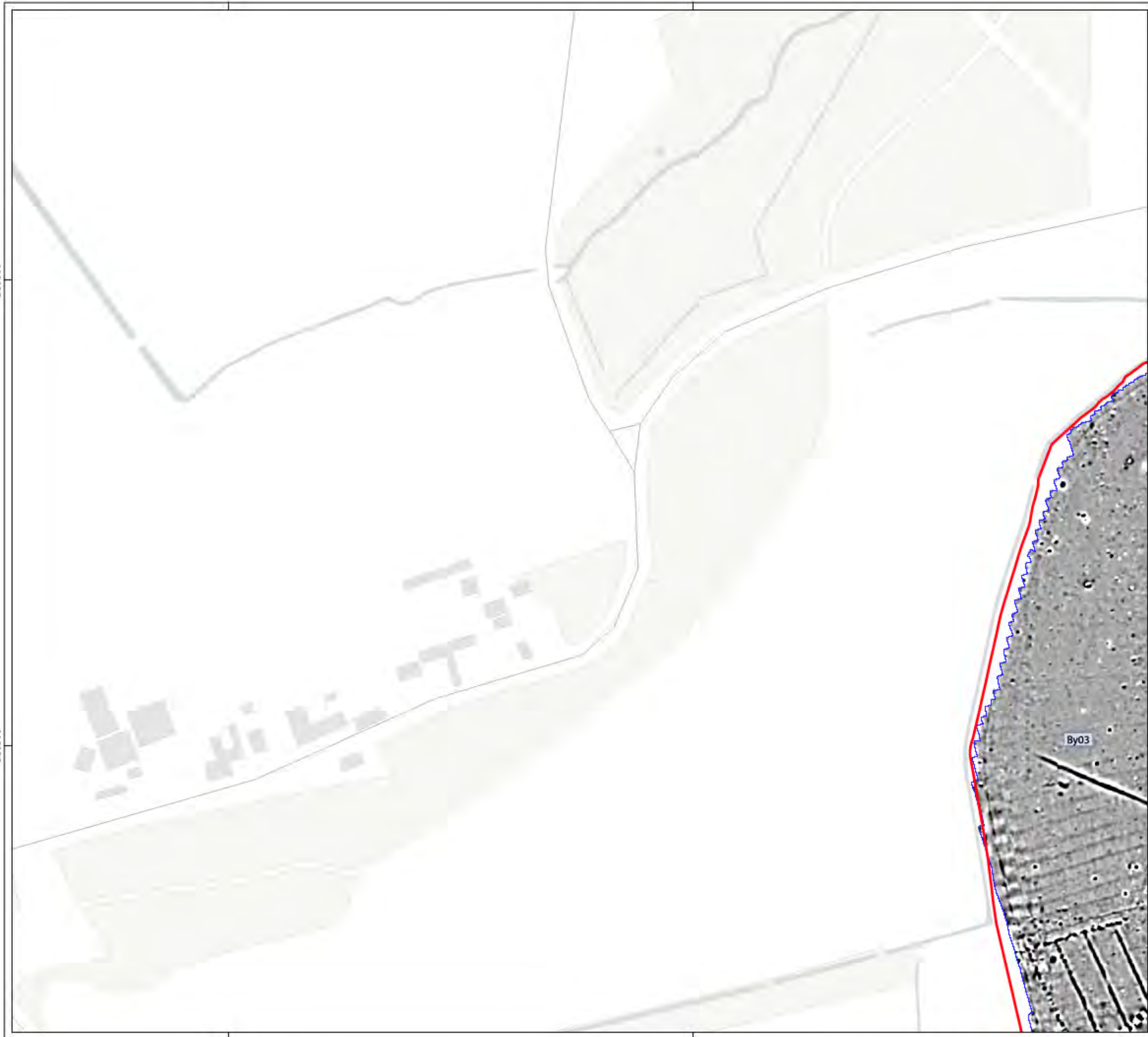
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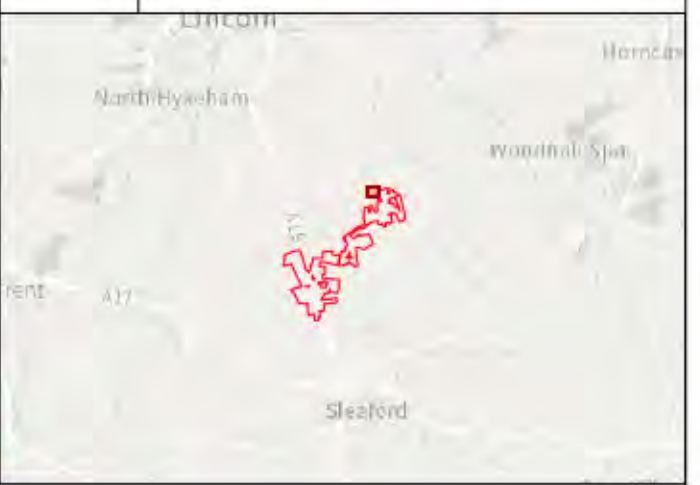






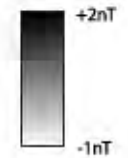
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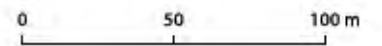
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Key

- Geophysical Survey Area
- Survey Extent

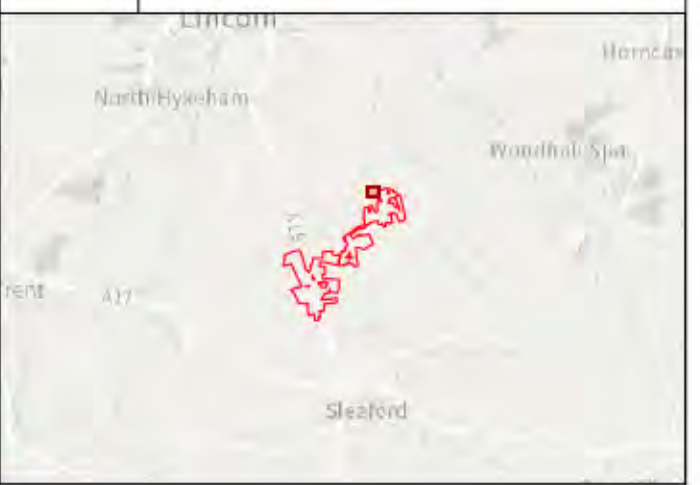
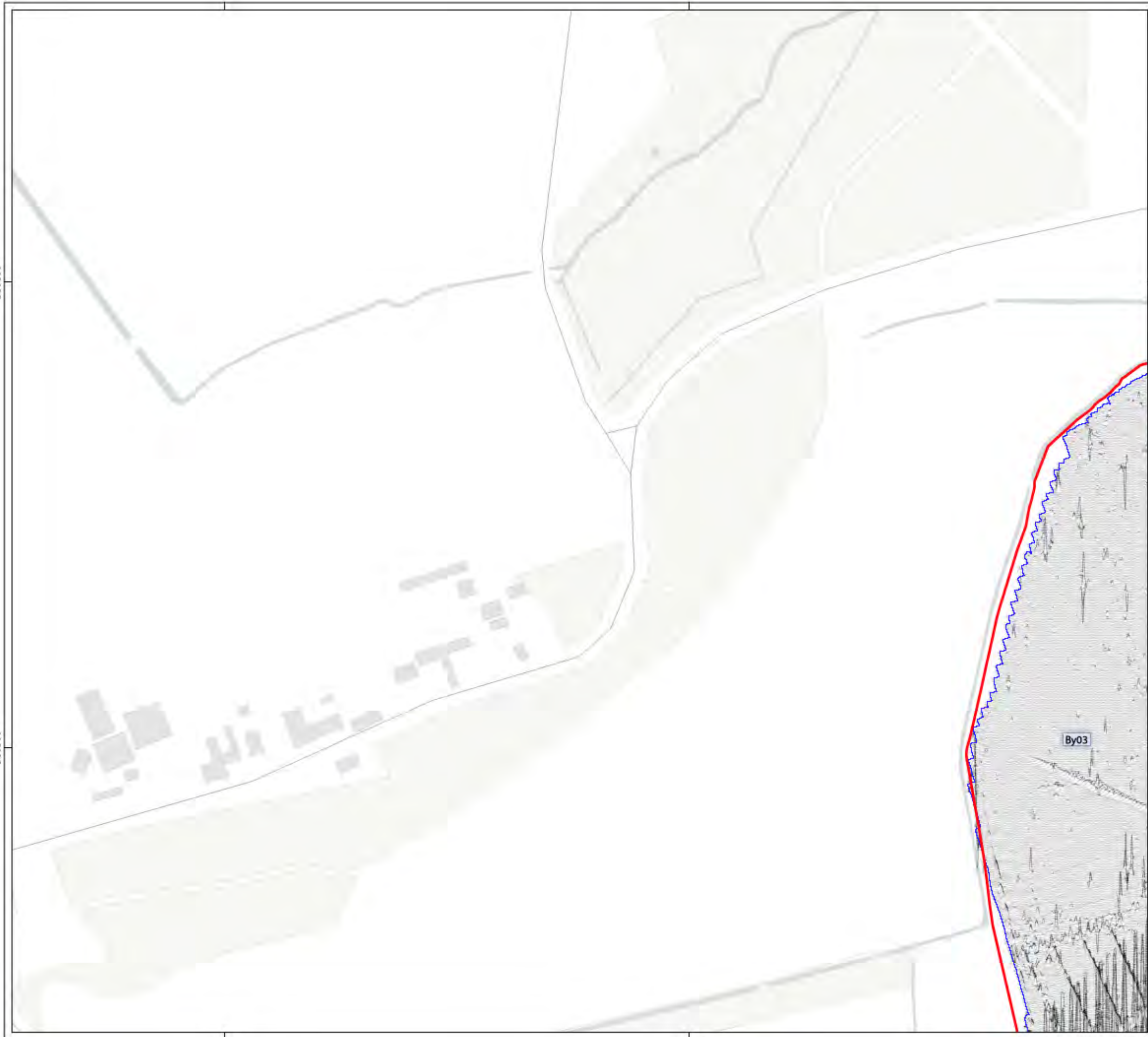




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507000 507300



Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)

0 50 100 m

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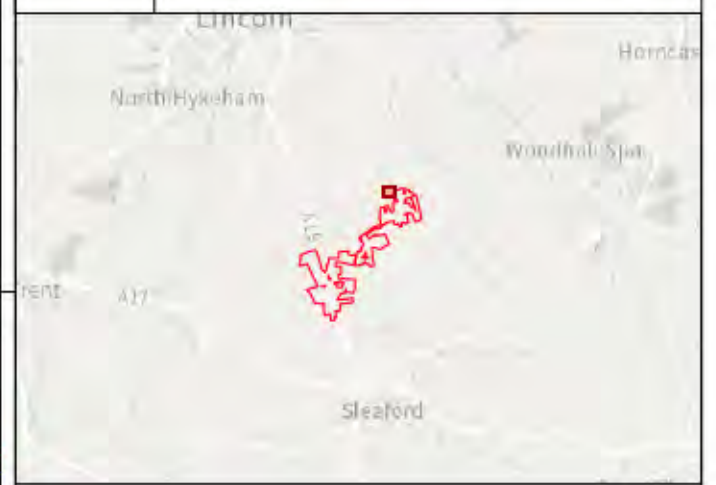
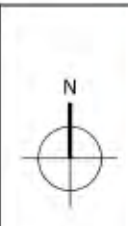


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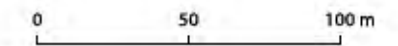
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Key

- Geophysical Survey Area
- Survey Extent
- Interpretation**
- Ferrous Objects
- Agriculture
- Field Boundary
- Field Drain
- Pipe
- Ridge and Furrow
- Magnetic Disturbance
- Possible Archaeology
- Geology



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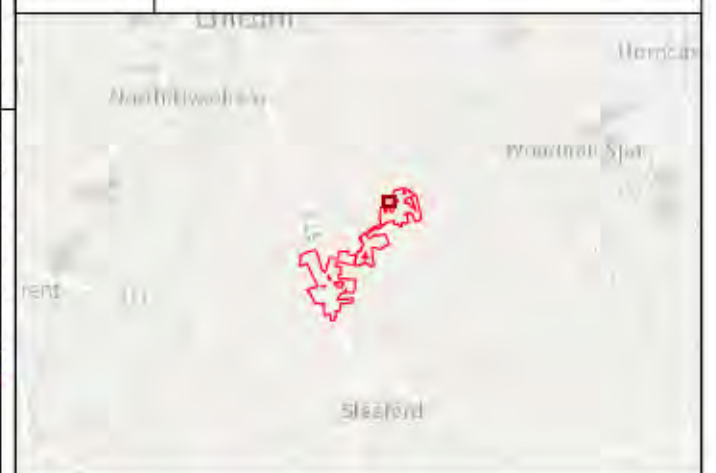
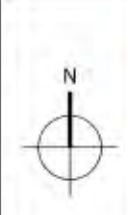


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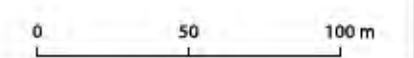
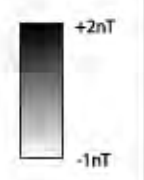
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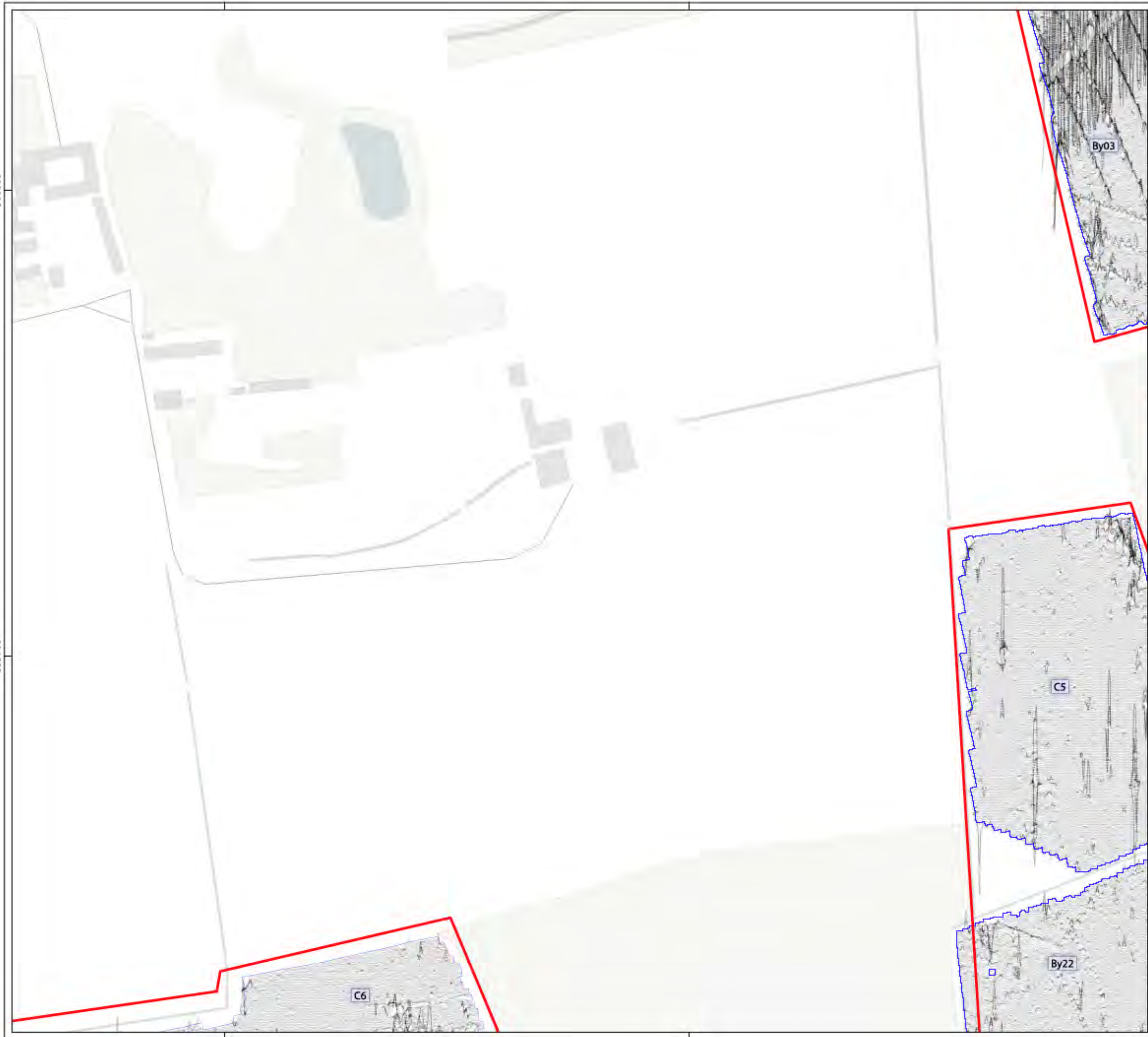
Key

- Geophysical Survey Area
- Survey Extent



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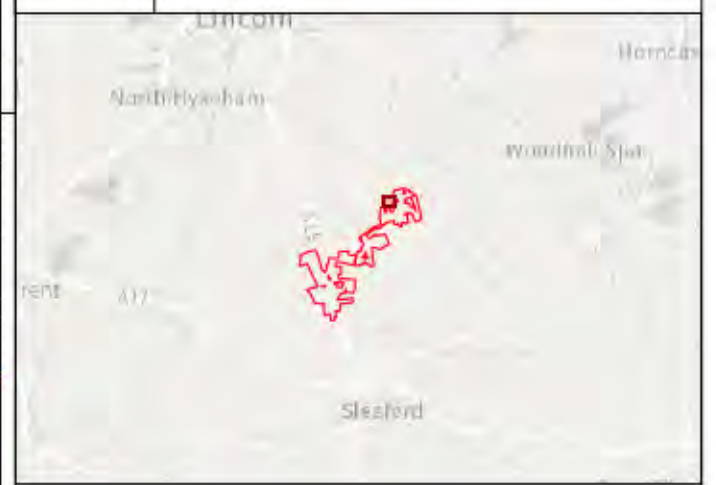
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Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)

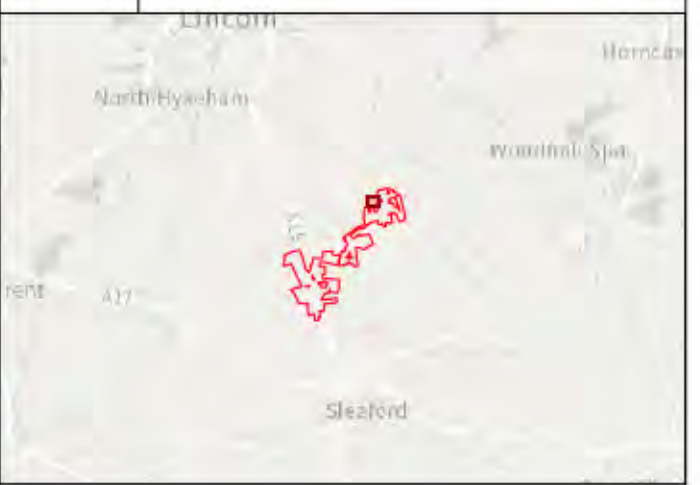
0 50 100 m

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Key

- Geophysical Survey Area
- Survey Extent

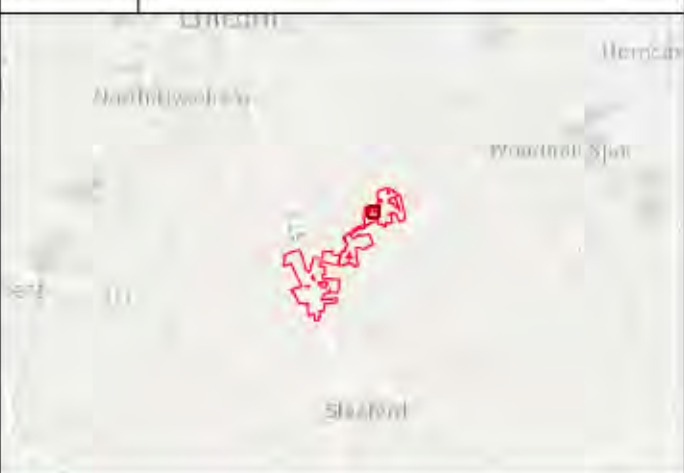
Interpretation

- Ferrous Objects
- Agriculture
- Field Drain
- Natural
- Pipe
- Ridge and Furrow
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Uncertain
- Geology
- Burning

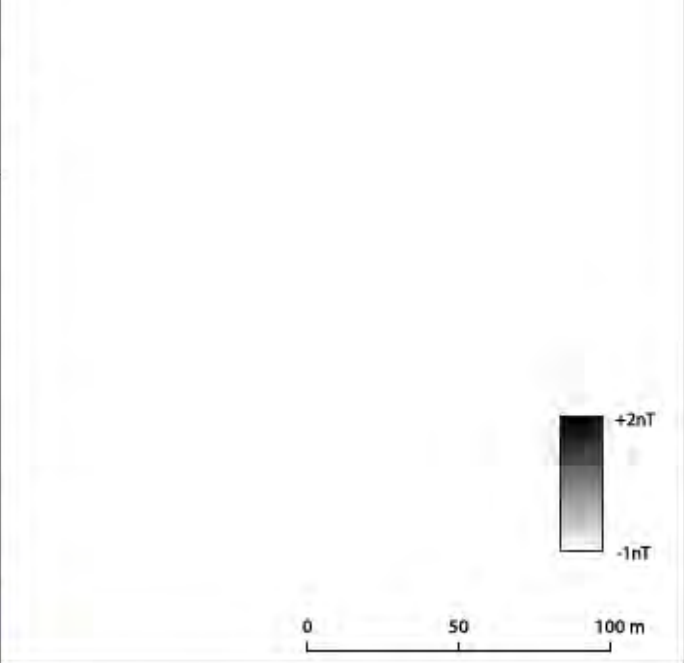
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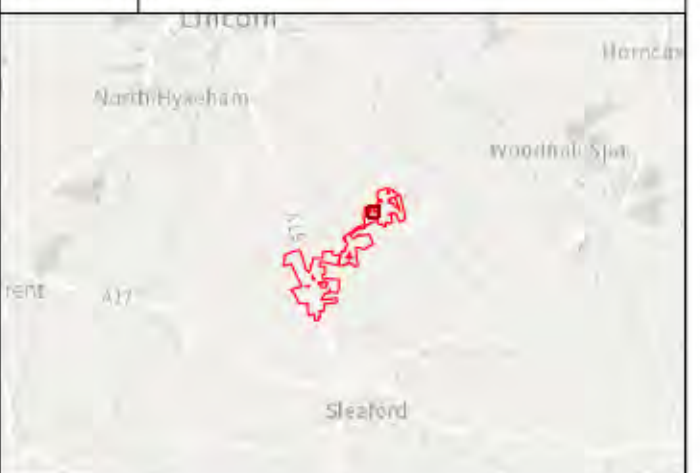
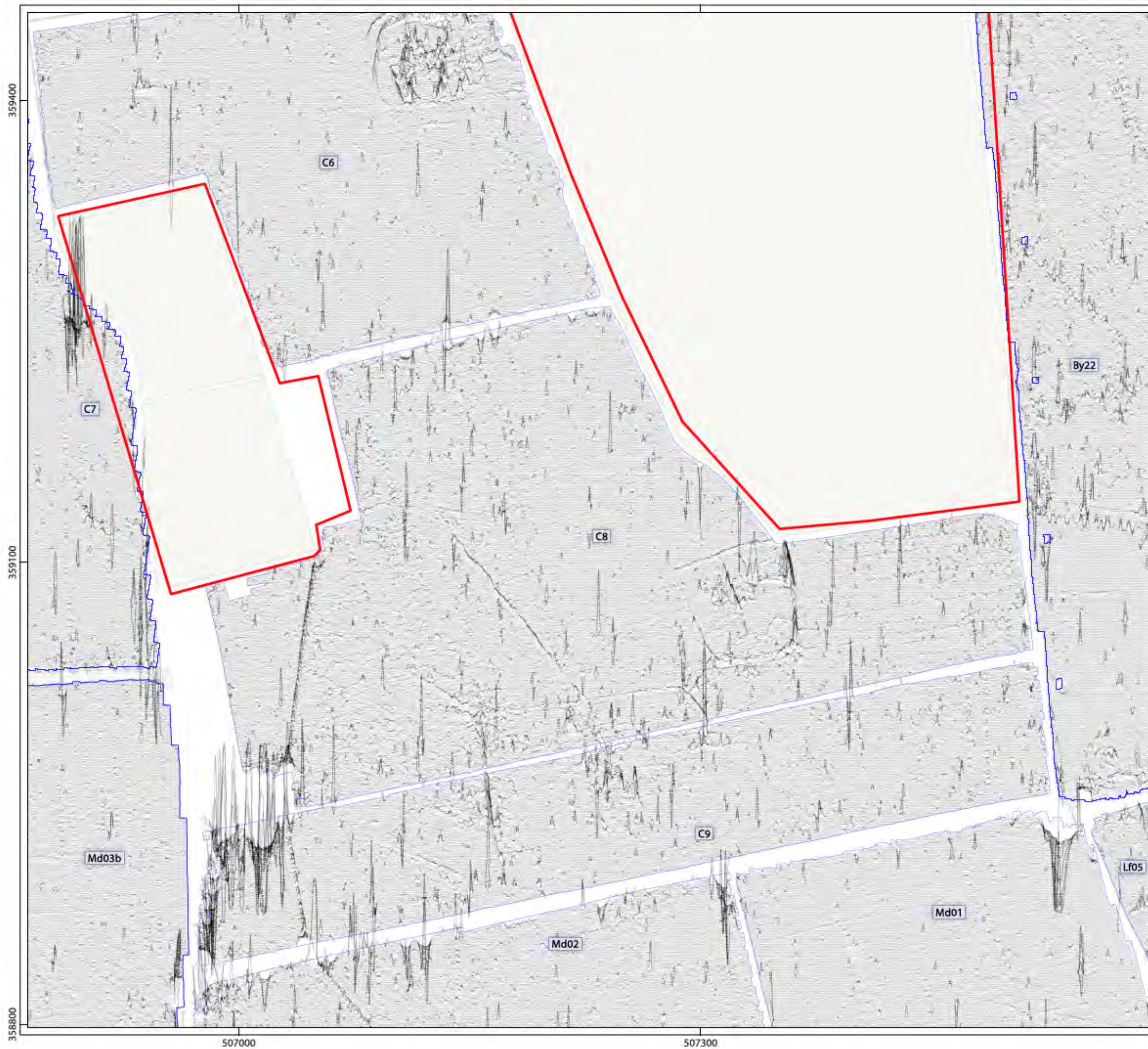


Key
 Geophysical Survey Area
 Survey Extent

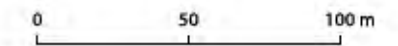


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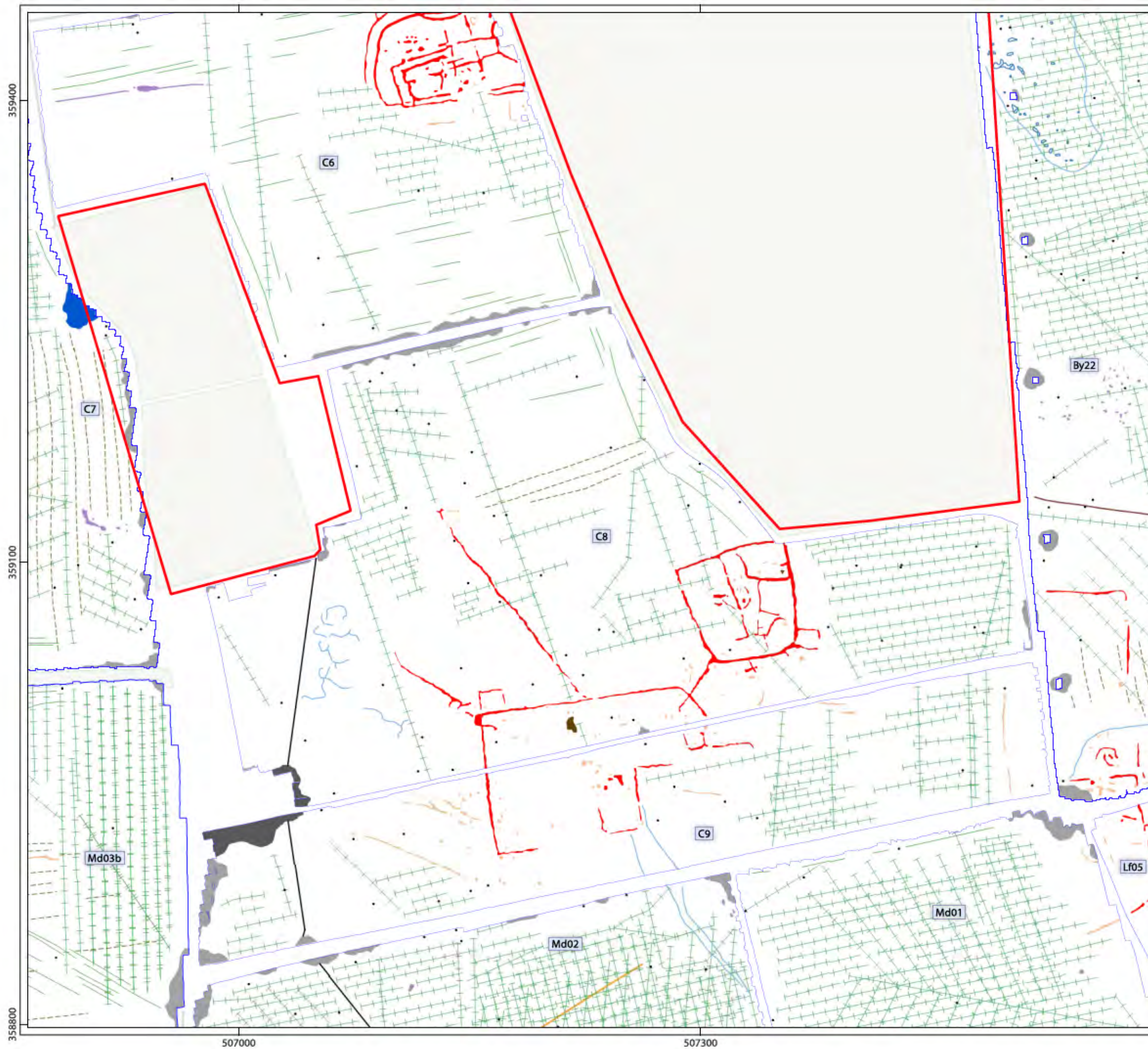


- Key**
- Geophysical Survey Area
 - Survey Extent
 - XY Trace (25nT/cm)



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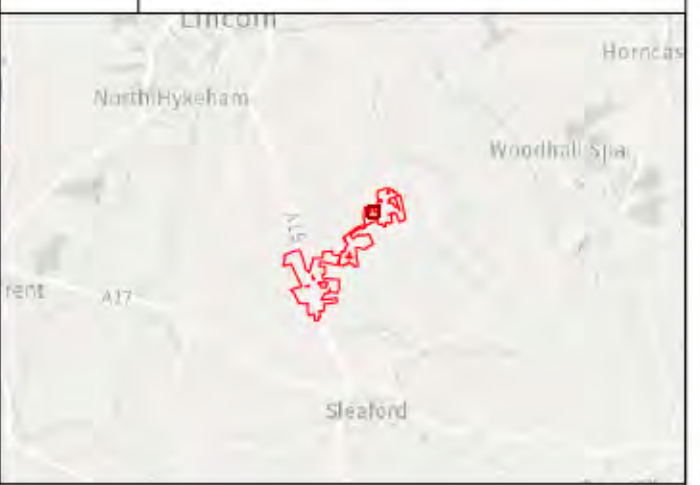
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Key

- Geophysical Survey Area
- Survey Extent

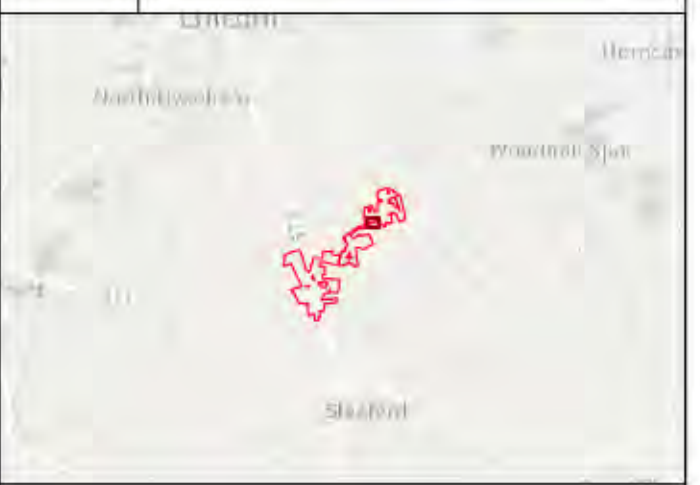
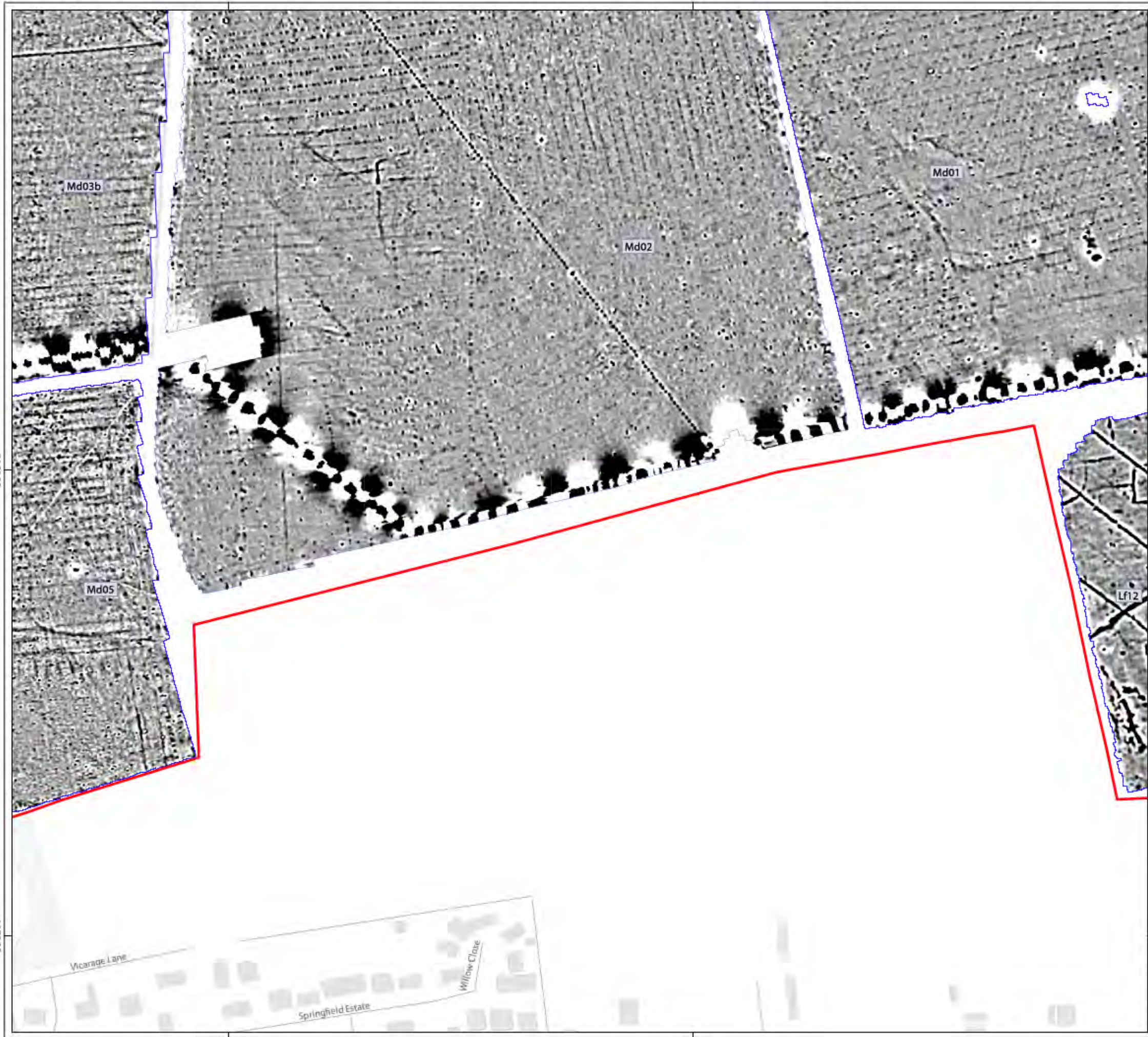
Interpretation

- Ferrous Objects
- Agriculture
- Field Boundary
- Field Drain
- Natural
- Pipe
- Uncertain
- Ridge and Furrow
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Uncertain
- Former Building
- Former Pond
- Geology
- Burning

0 50 100 m


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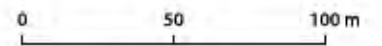
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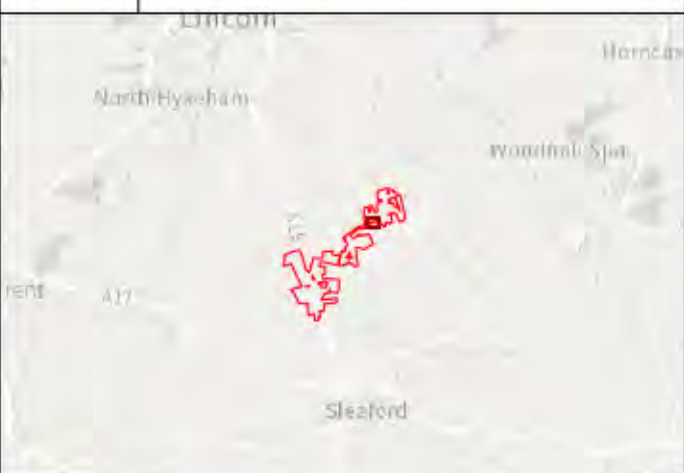
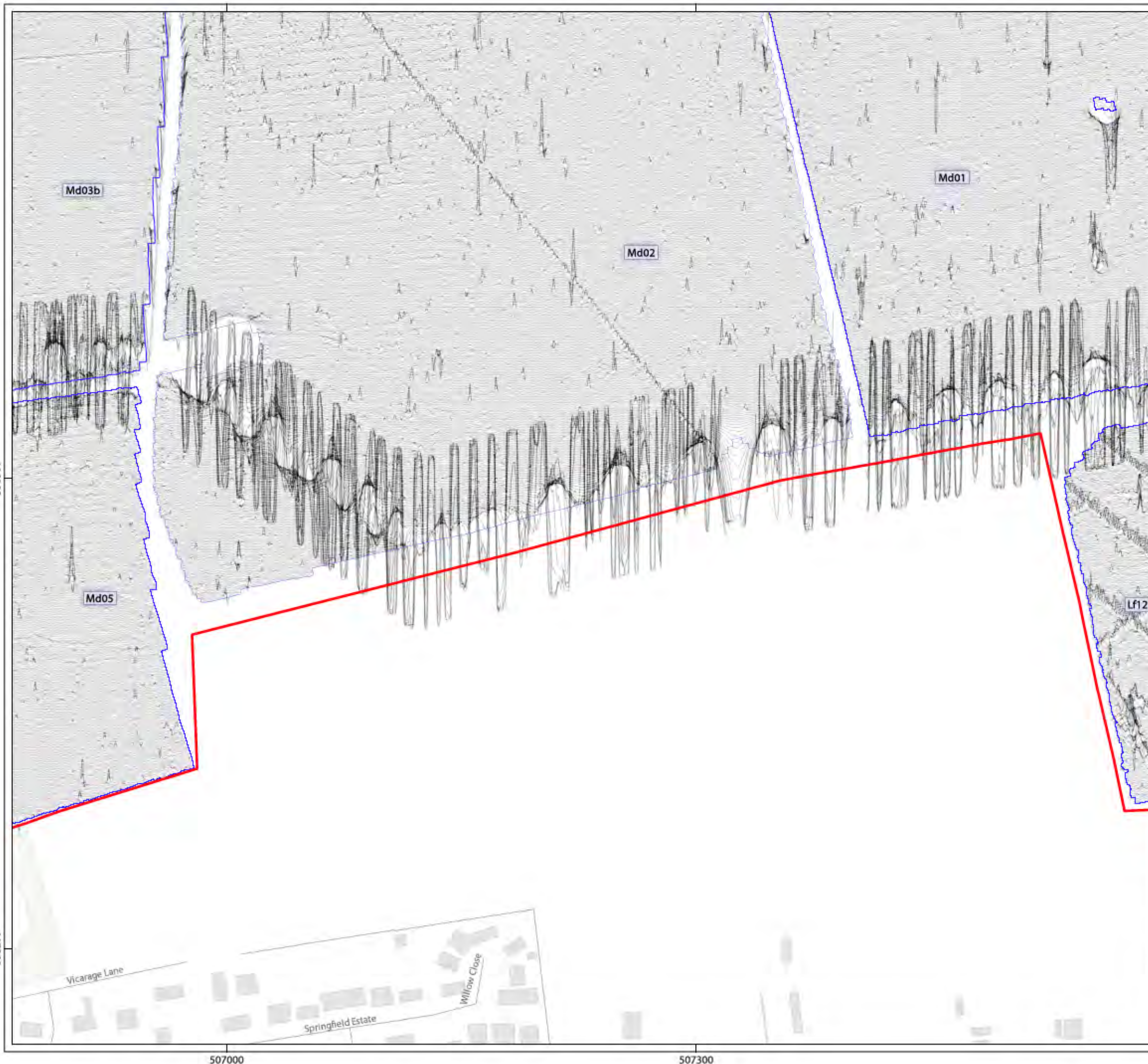
- Geophysical Survey Area
- Survey Extent





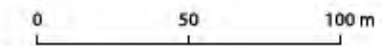
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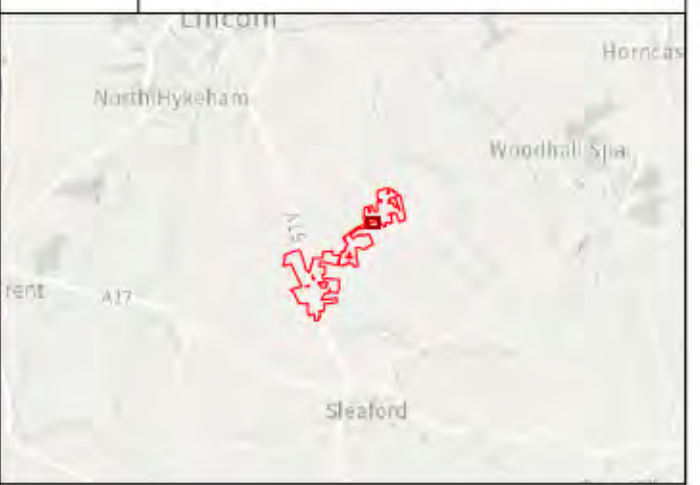
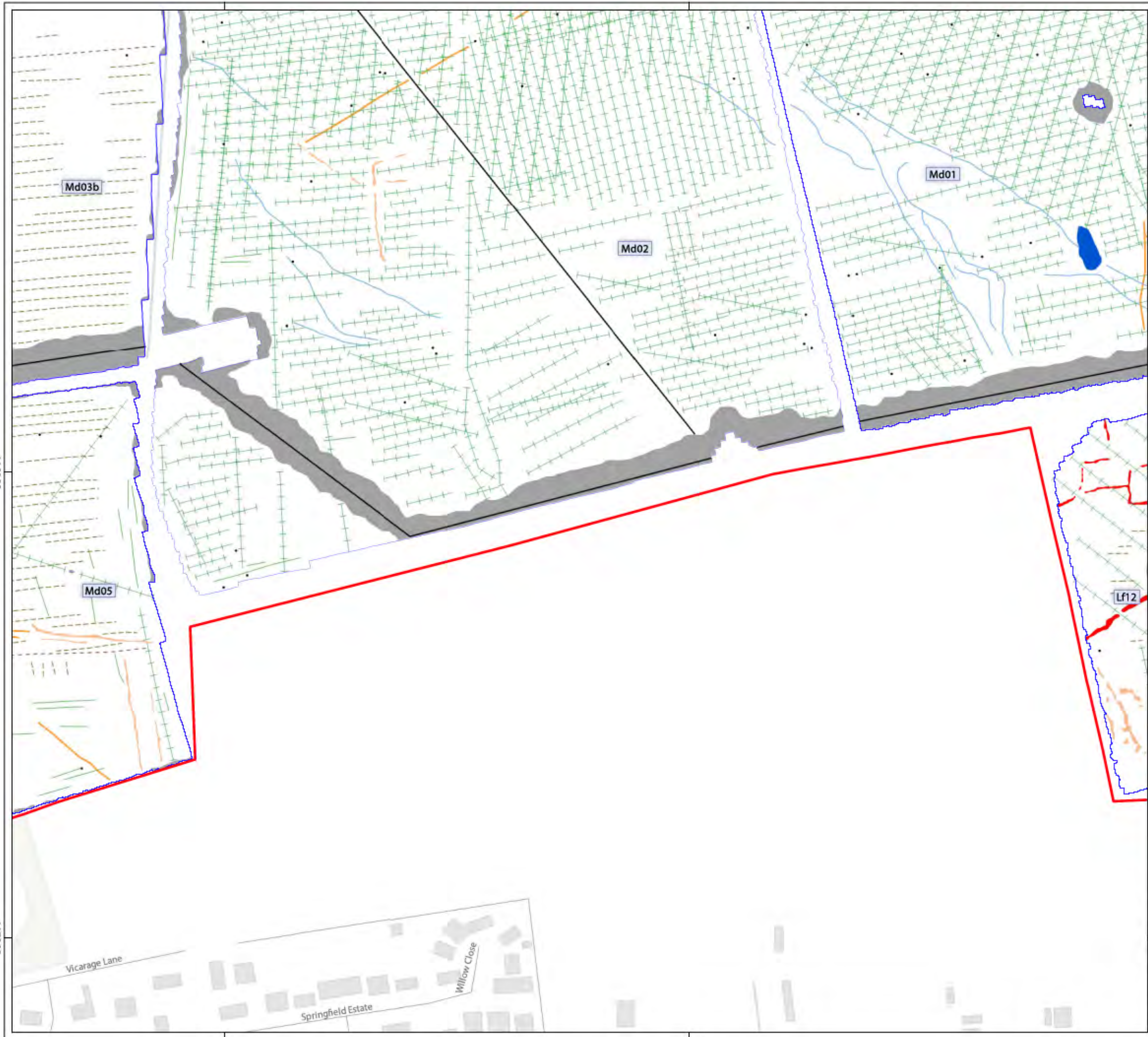
Key

- ▭ Geophysical Survey Area
- ▭ Survey Extent
- XY Trace (25nT/cm)



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Key

- Geophysical Survey Area
- Survey Extent

Interpretation

- Ferrous Objects
- Agriculture
- Possible Field Boundary
- Field Drain
- Natural
- Pipe
- Ridge and Furrow
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Uncertain
- Former Pond

0 50 100 m

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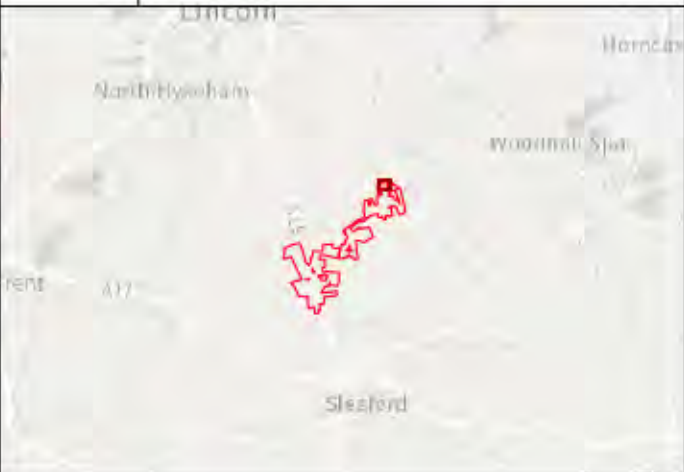
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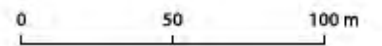
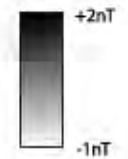
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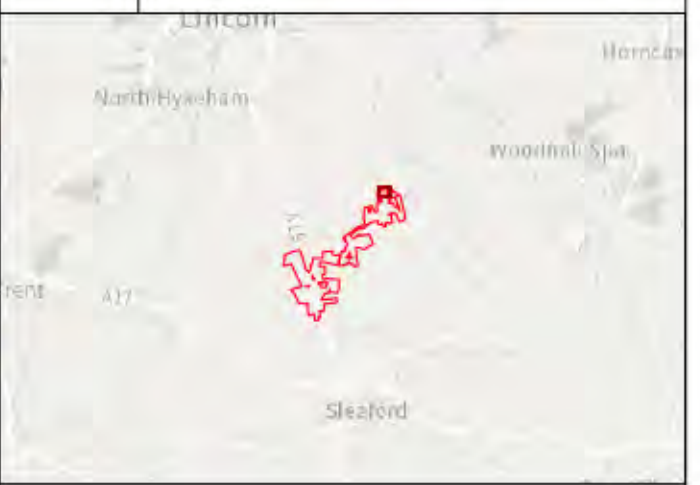
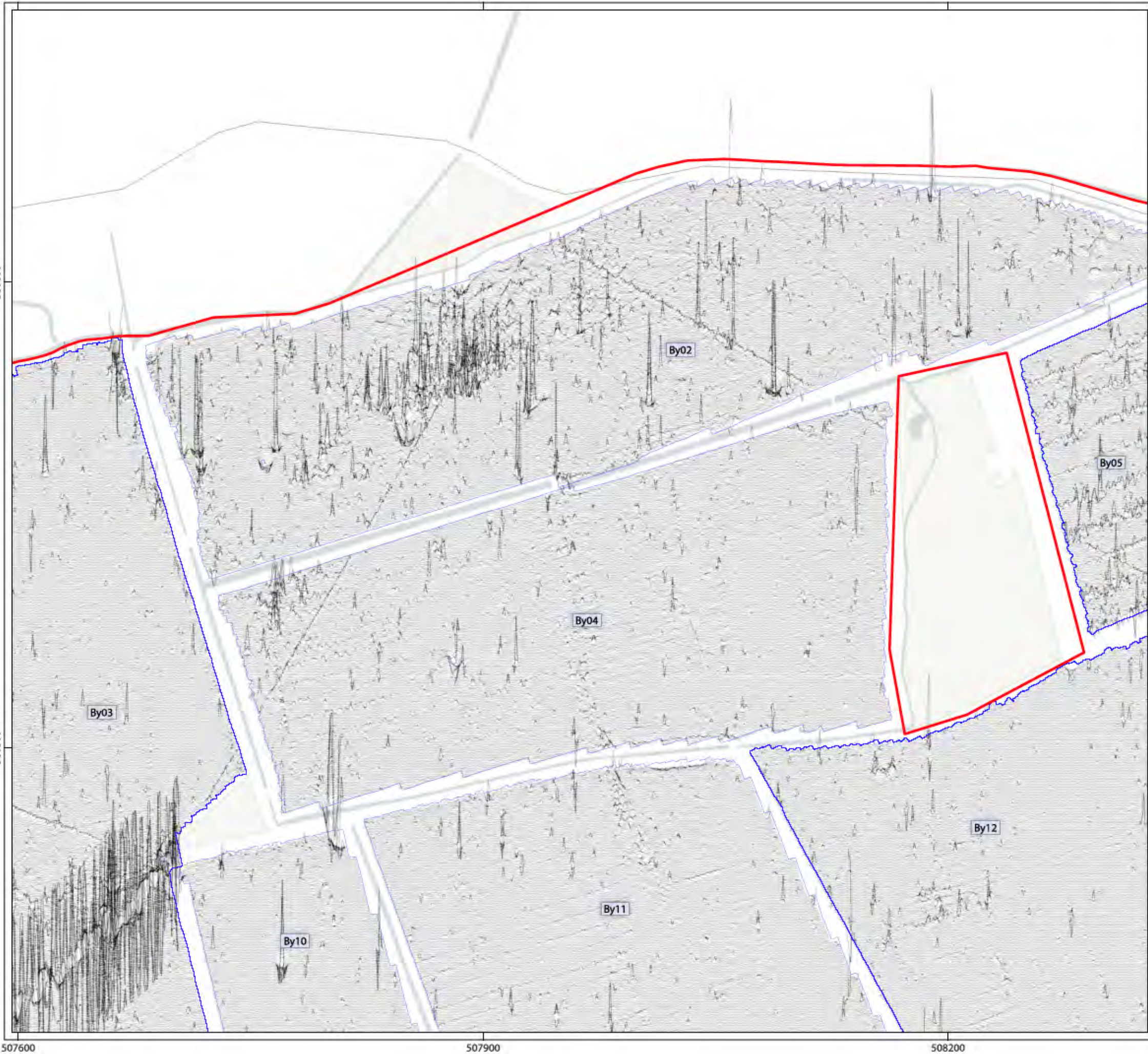
Key
 Geophysical Survey Area
 Survey Extent



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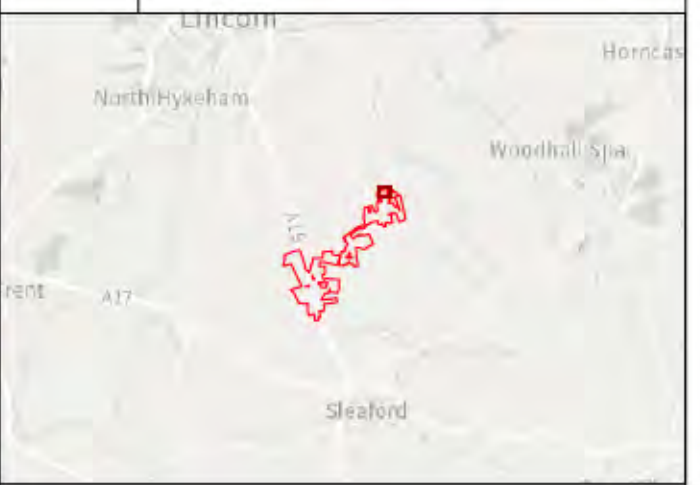
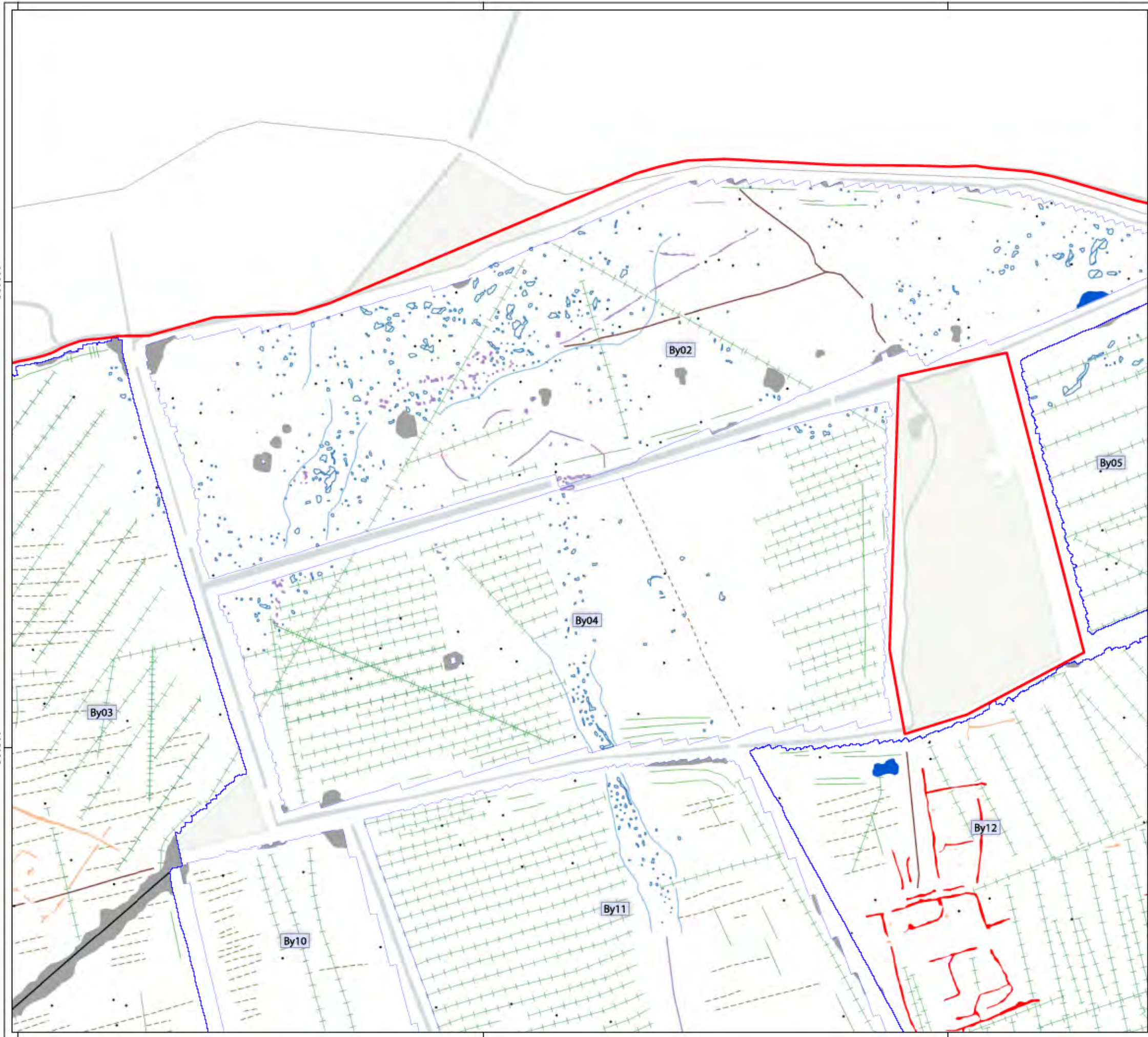
Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)

0 50 100 m

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Key

- Geophysical Survey Area
- Survey Extent

Interpretation

- Ferrous Objects
- Agriculture
- Field Boundary
- Possible Field Boundary
- Field Drain
- Natural
- Pipe
- Uncertain
- Ridge and Furrow
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Uncertain
- Former Pond
- Geology

0 50 100 m

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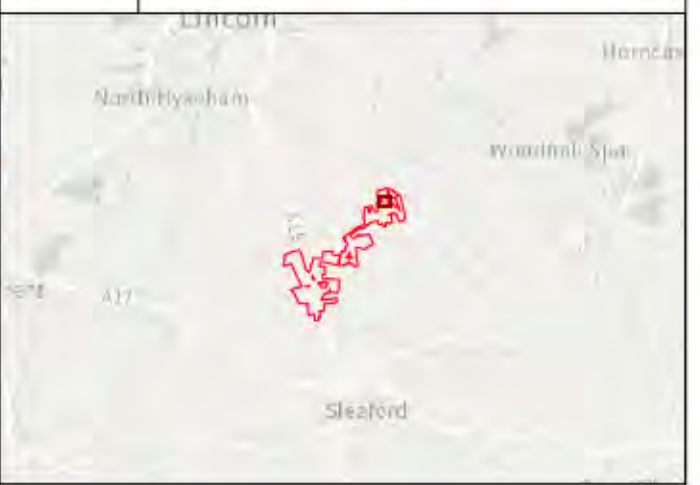
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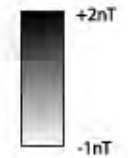


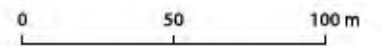
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Key

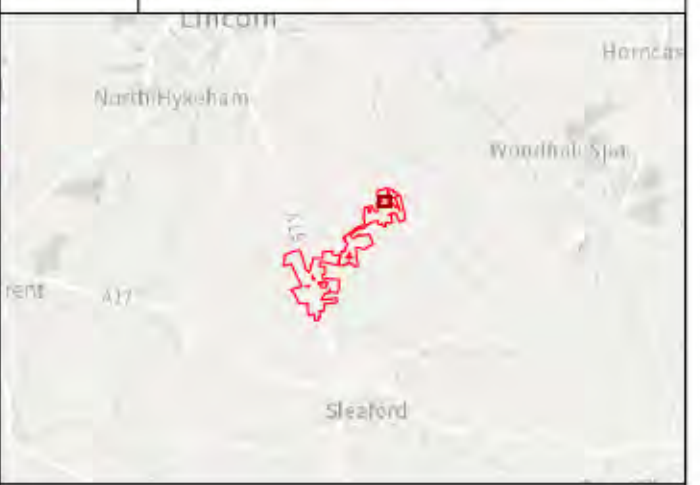
- Geophysical Survey Area
- Survey Extent





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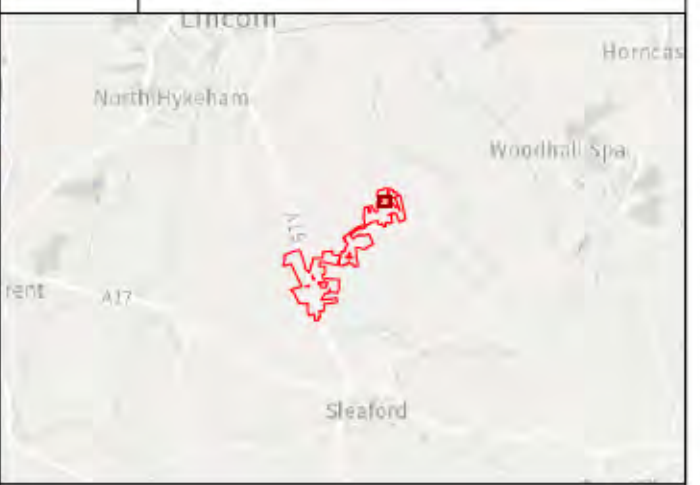
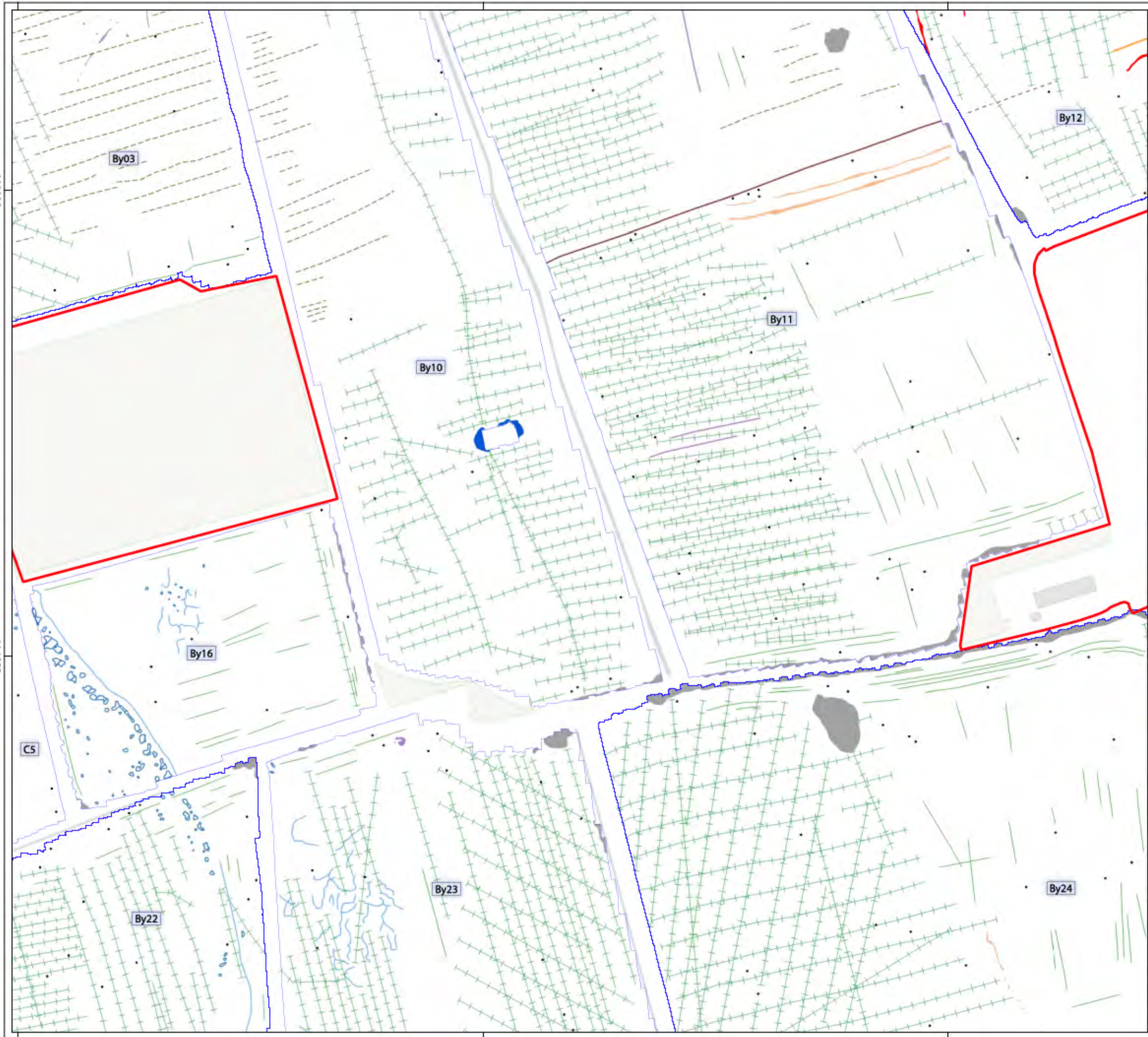
Key

- ▭ Geophysical Survey Area
- ▭ Survey Extent
- XY Trace (25nT/cm)

0 50 100 m

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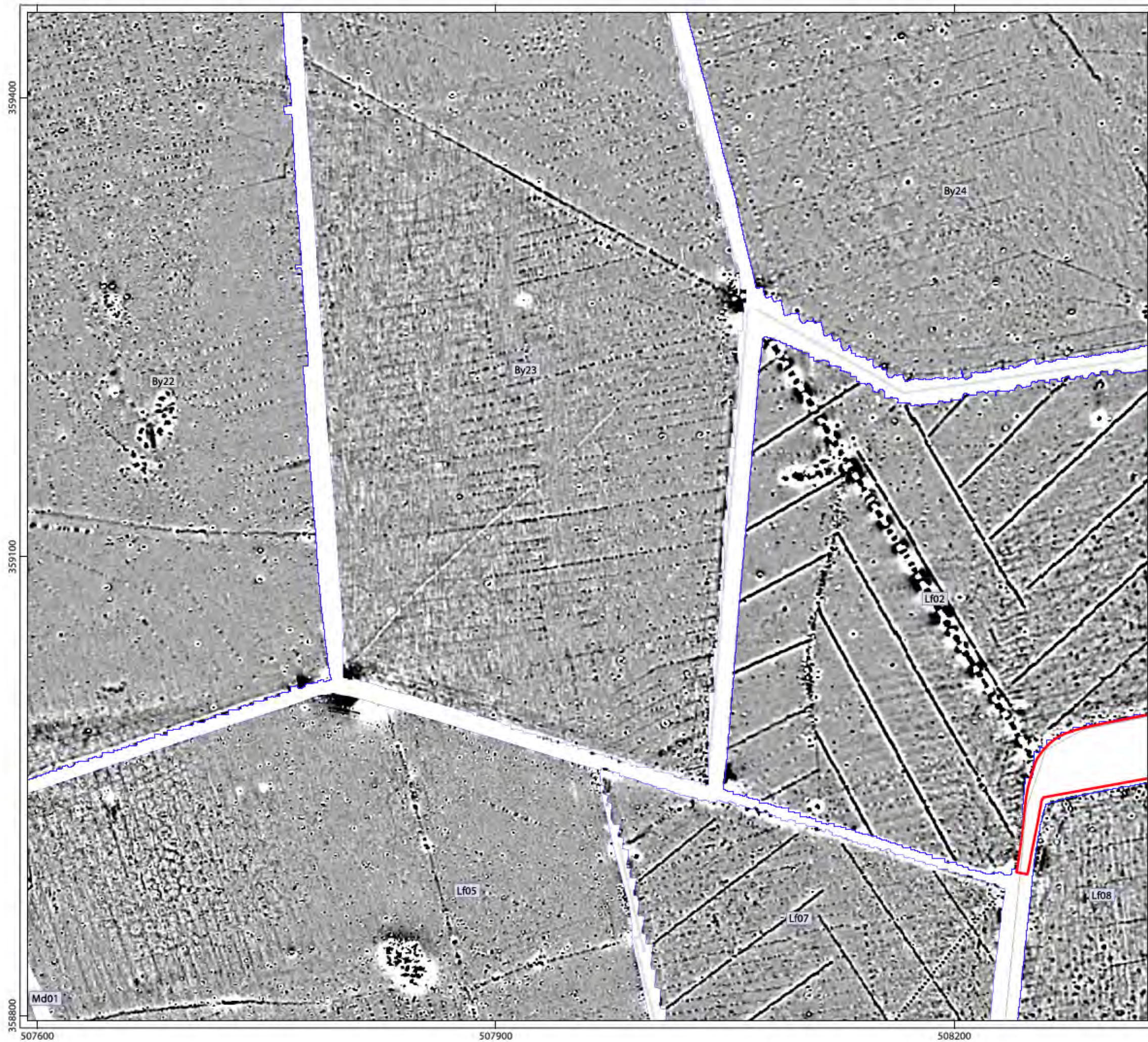
Interpretation

- Ferrous Objects
- Agriculture
- Field Boundary
- Possible Field Boundary
- Field Drain
- Natural
- Uncertain
- Ridge and Furrow
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Uncertain
- Former Pond
- Geology

0 50 100 m

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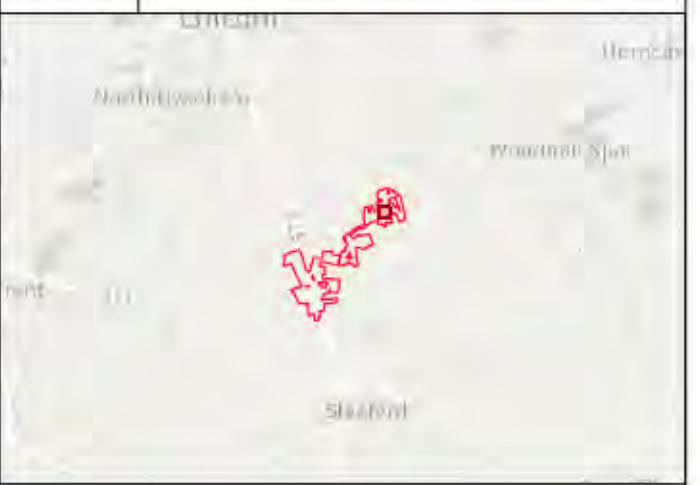
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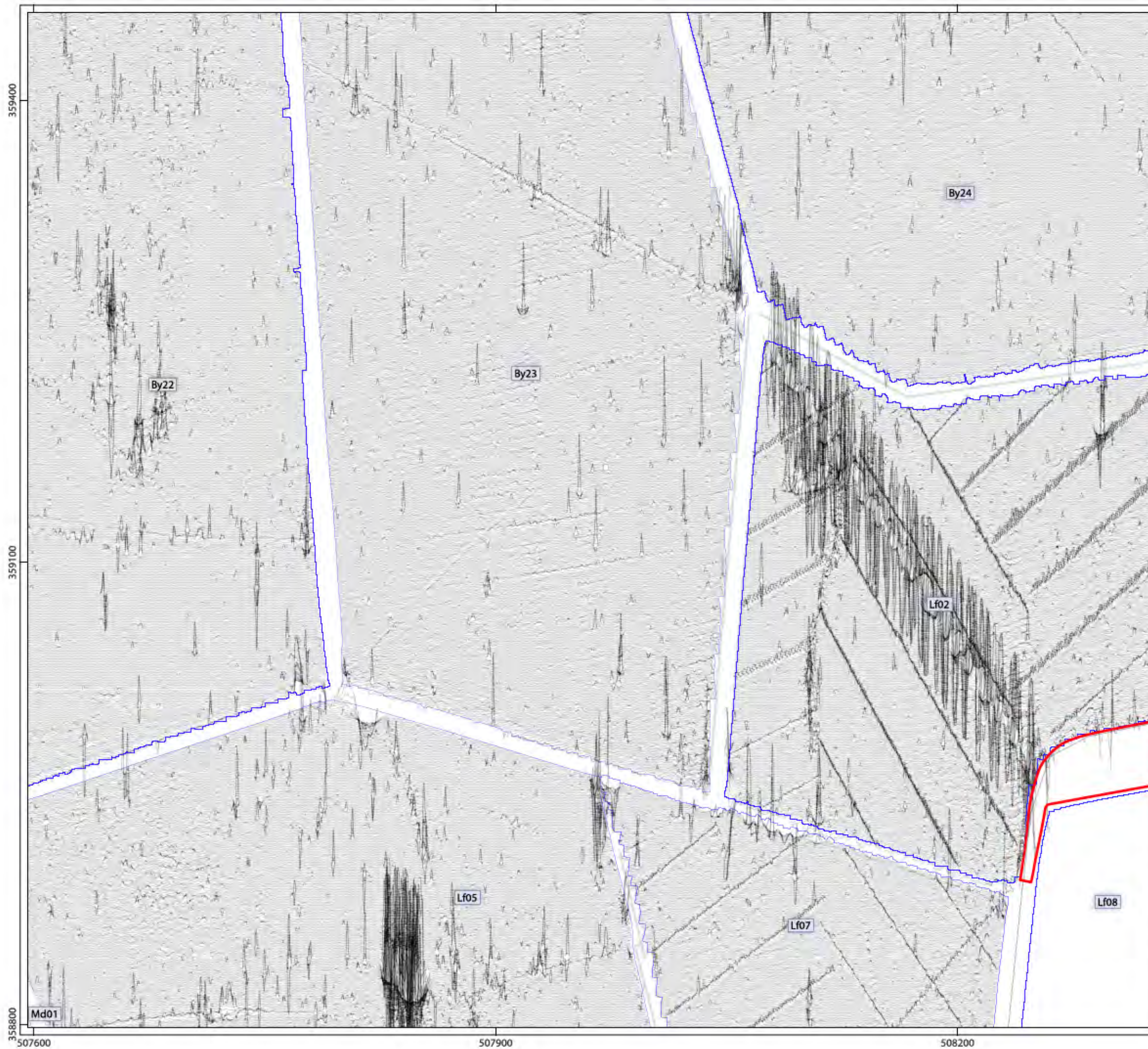


Key

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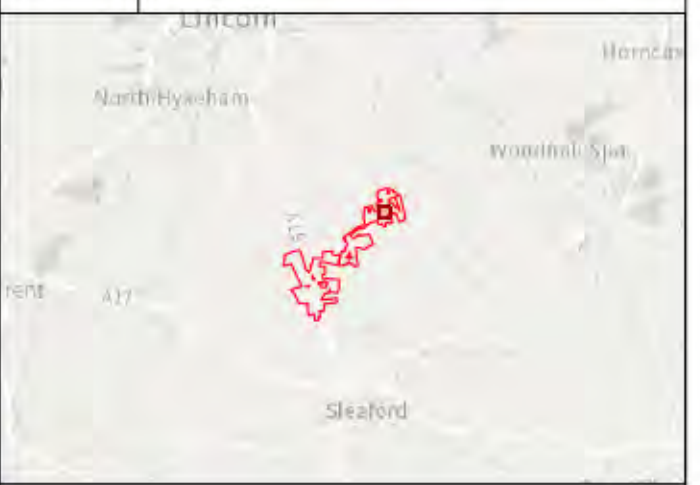
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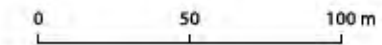
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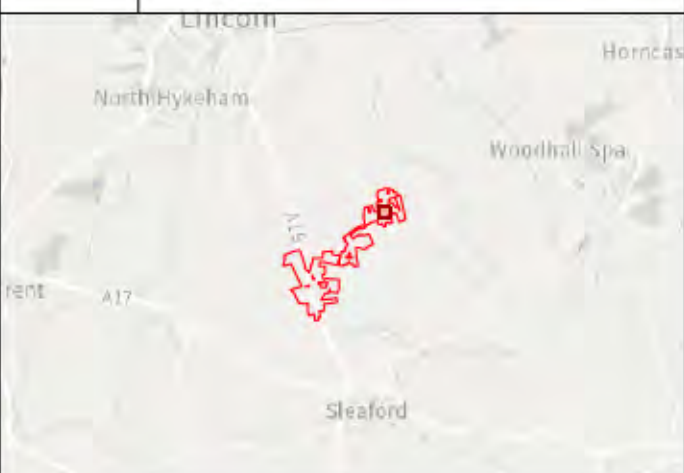
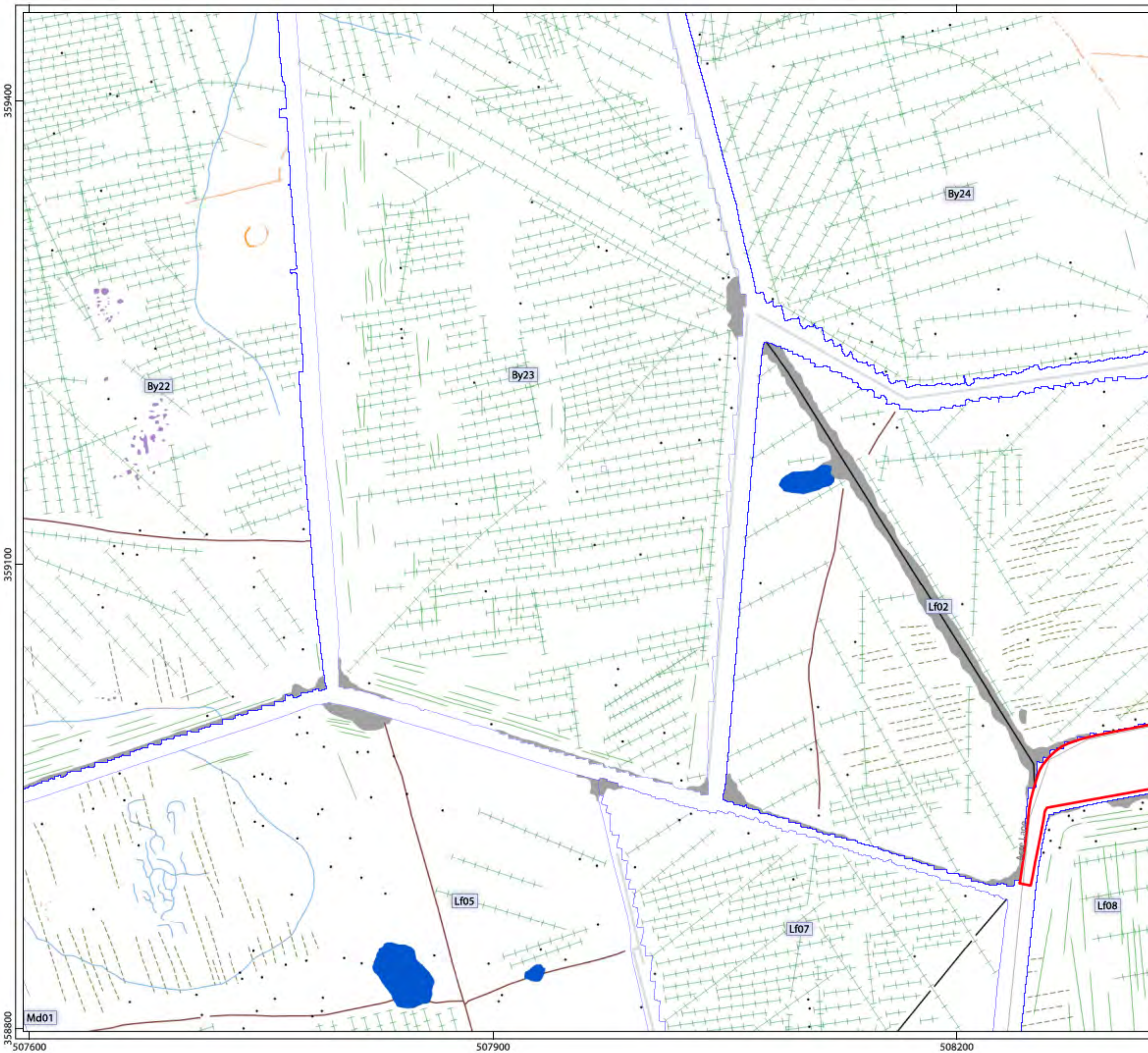
Key

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- Survey Extent
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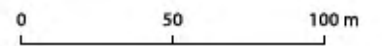


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- Key**
- Geophysical Survey Area
 - Survey Extent
- Interpretation**
- Ferrous Objects
 - Agriculture
 - Field Boundary
 - Field Drain
 - Natural
 - Pipe
 - Ridge and Furrow
 - Possible Archaeology
 - Archaeology
 - Magnetic Disturbance
 - Possible Archaeology
 - Uncertain
 - Former Pond



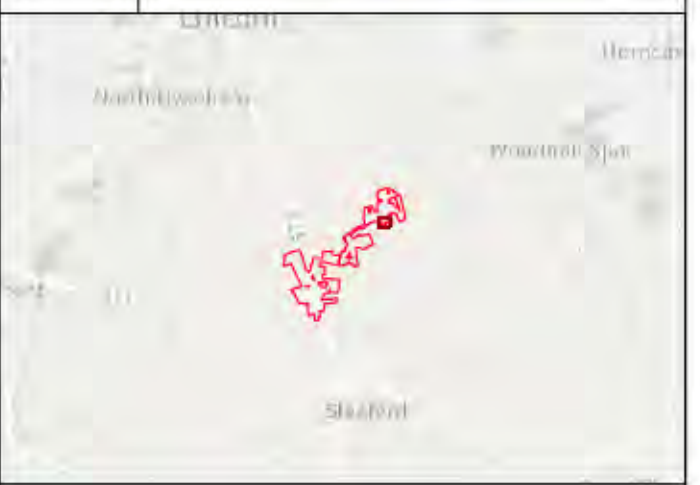
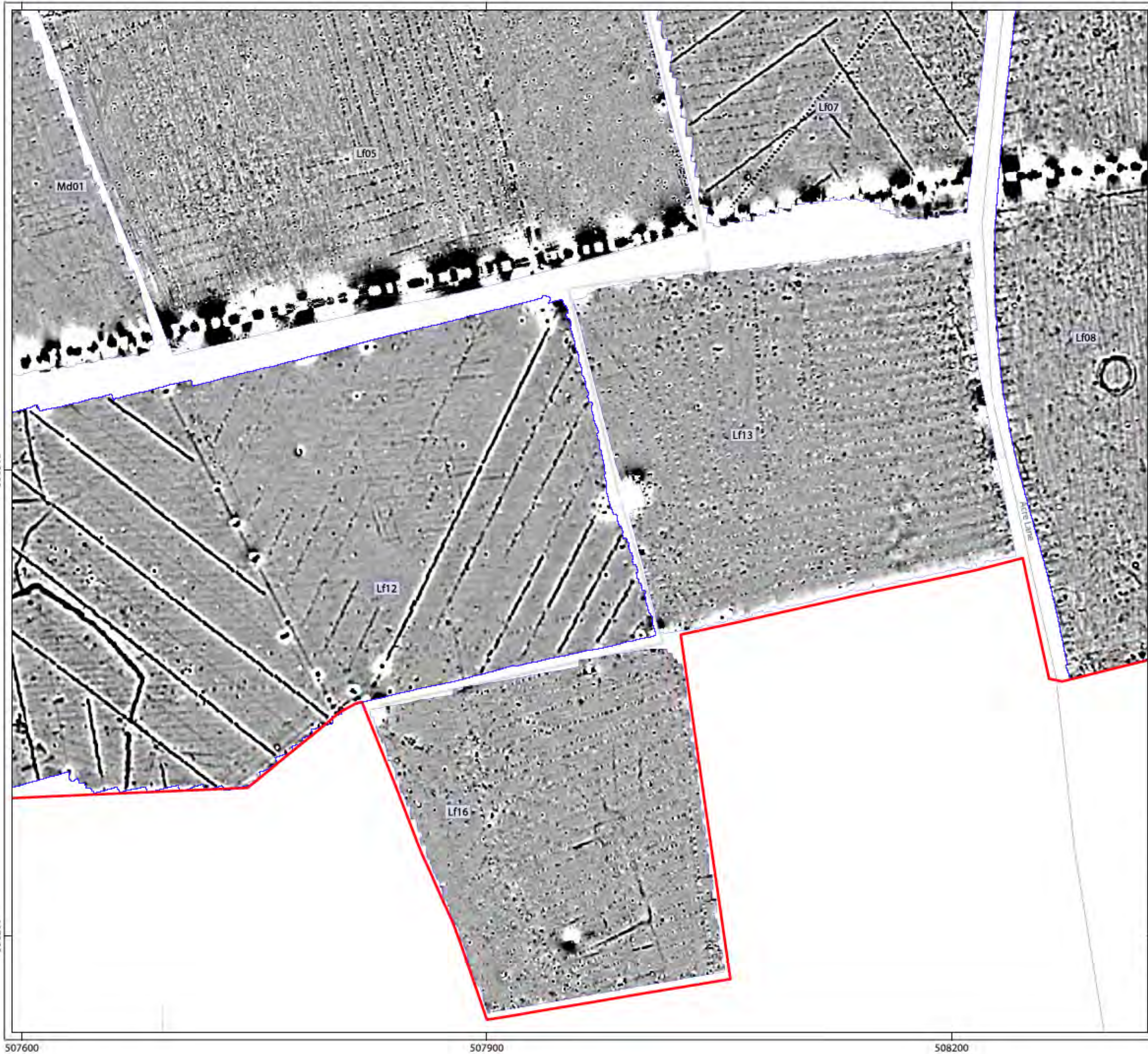
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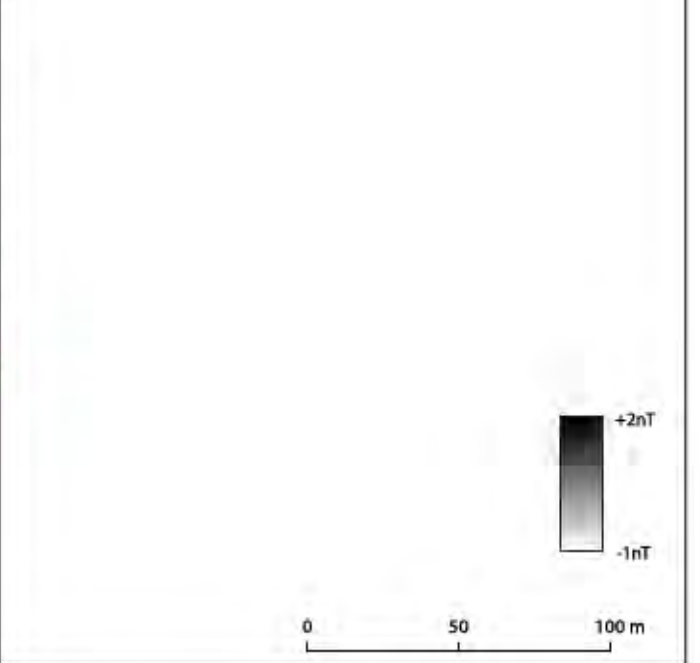
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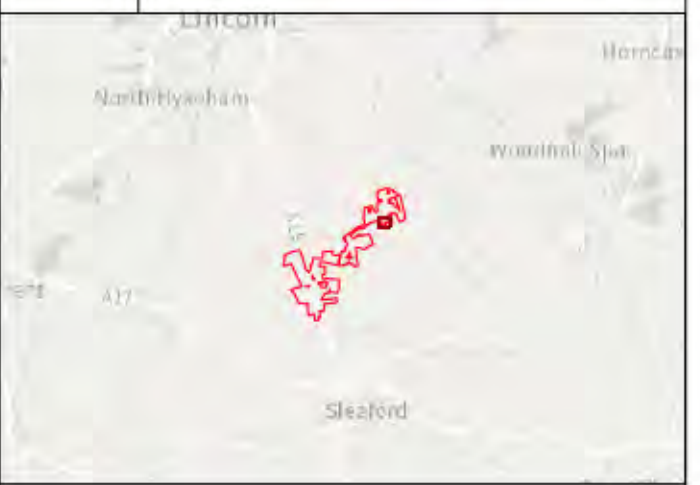
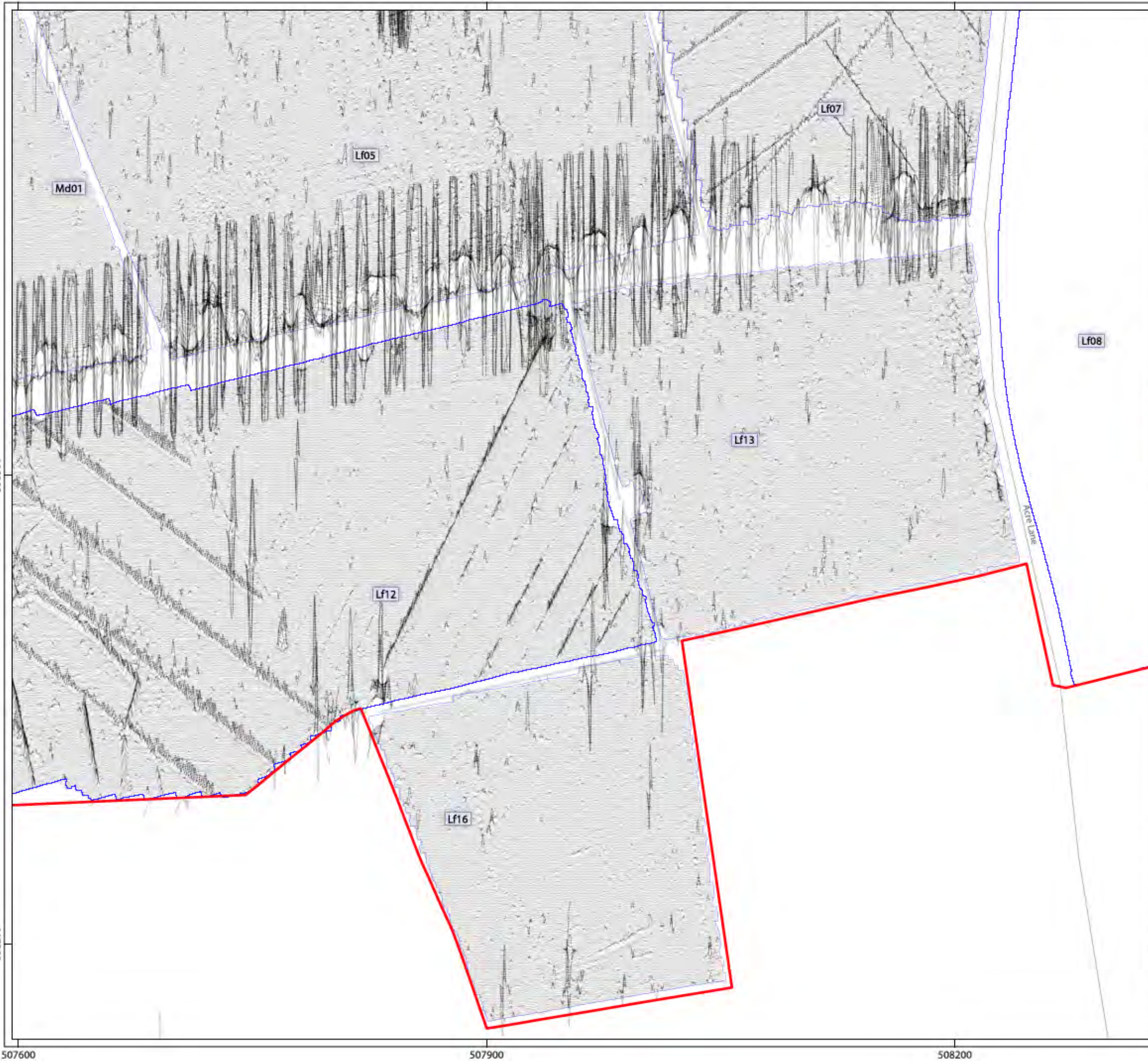
Key
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 Survey Extent



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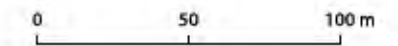
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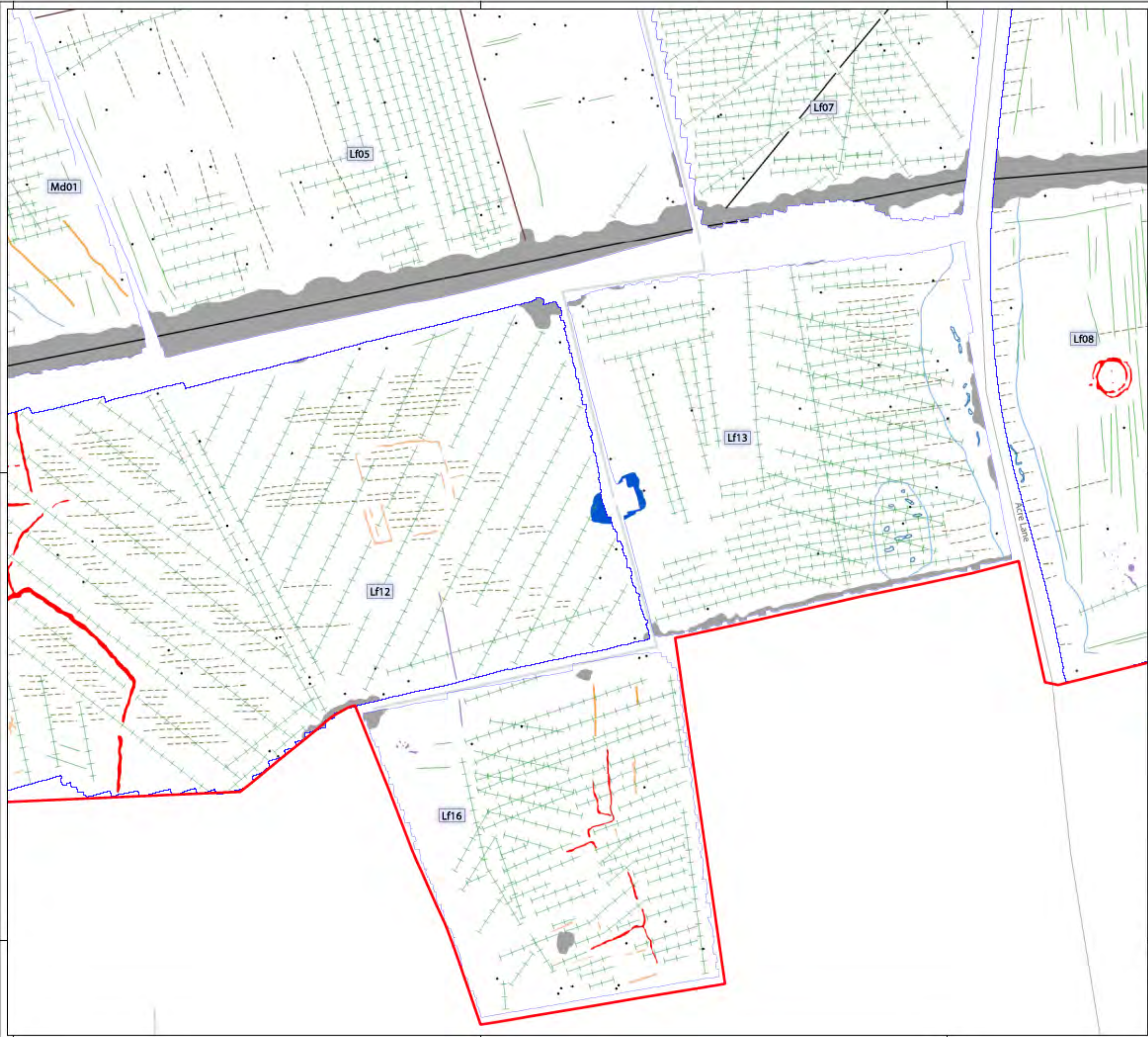
Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)



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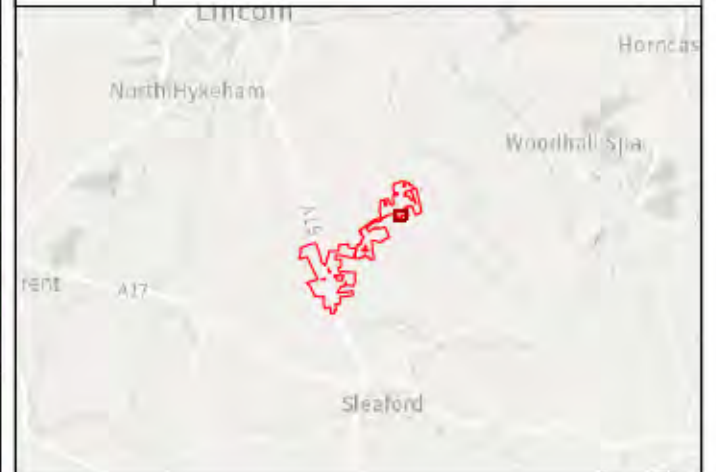
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Key

- Geophysical Survey Area
- Survey Extent
- Interpretation**
- Ferrous Objects
- Agriculture
- Field Boundary
- Field Drain
- Natural
- Pipe
- Uncertain
- Ridge and Furrow
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Uncertain
- Former Pond
- Geology



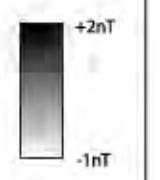
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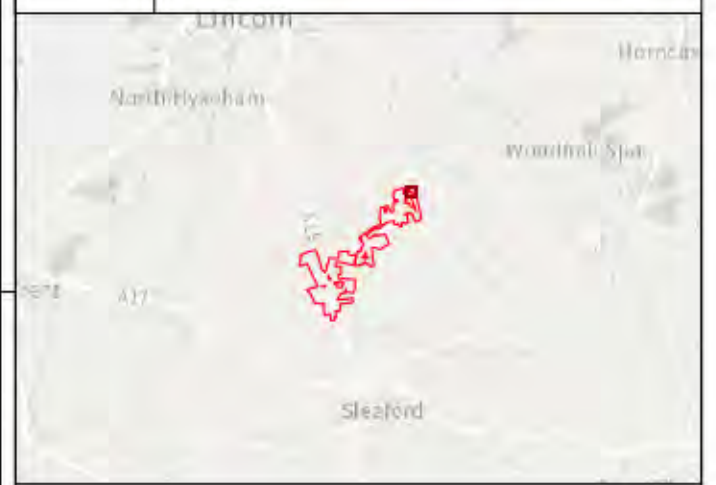
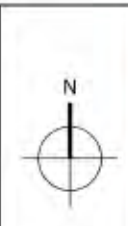


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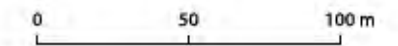
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Key

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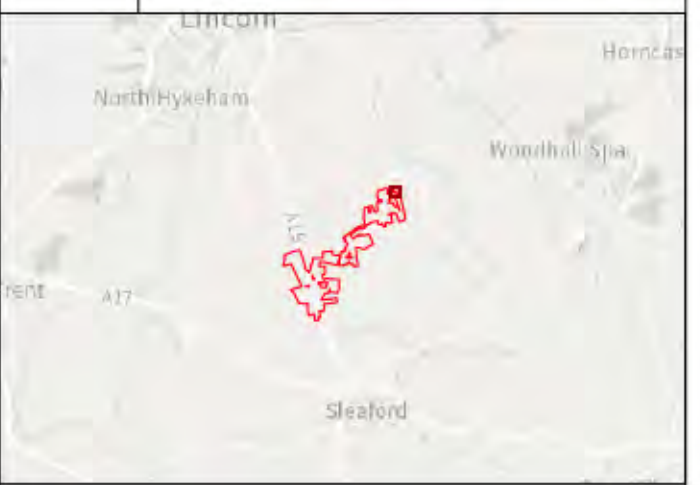
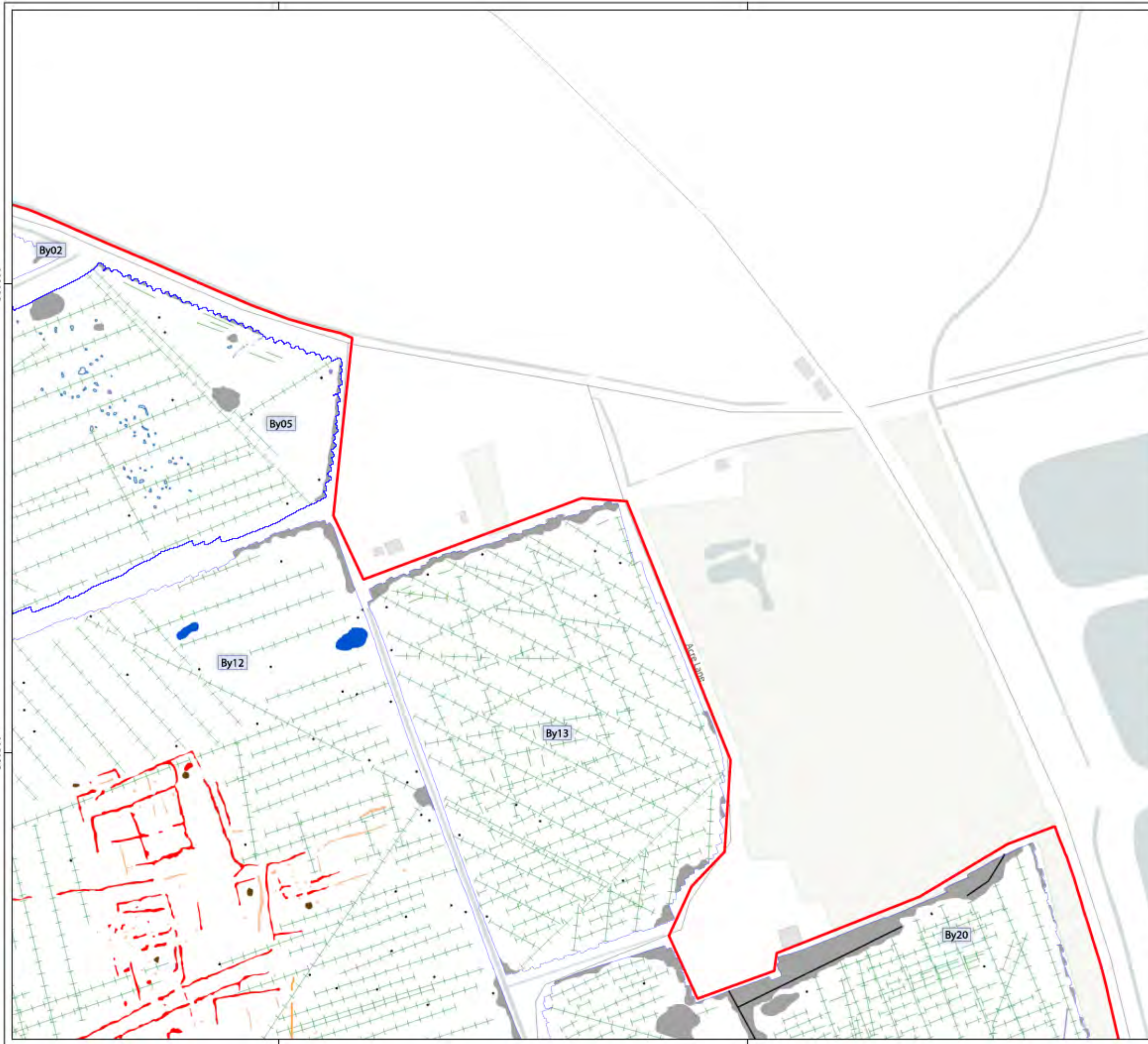


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Key

- Geophysical Survey Area
- Survey Extent

Interpretation

- Ferrous Objects
- Agriculture
- Field Drain
- Pipe
- Uncertain
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Uncertain
- Former Pond
- Geology
- Burning

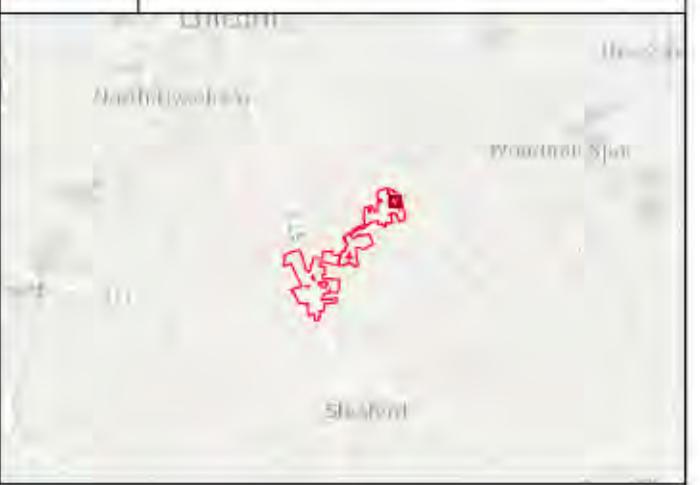
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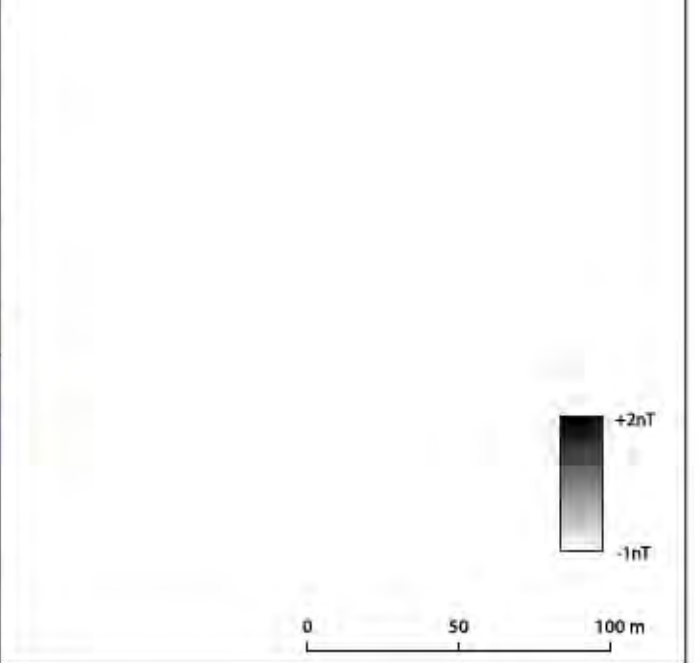
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Key
 Geophysical Survey Area
 Survey Extent

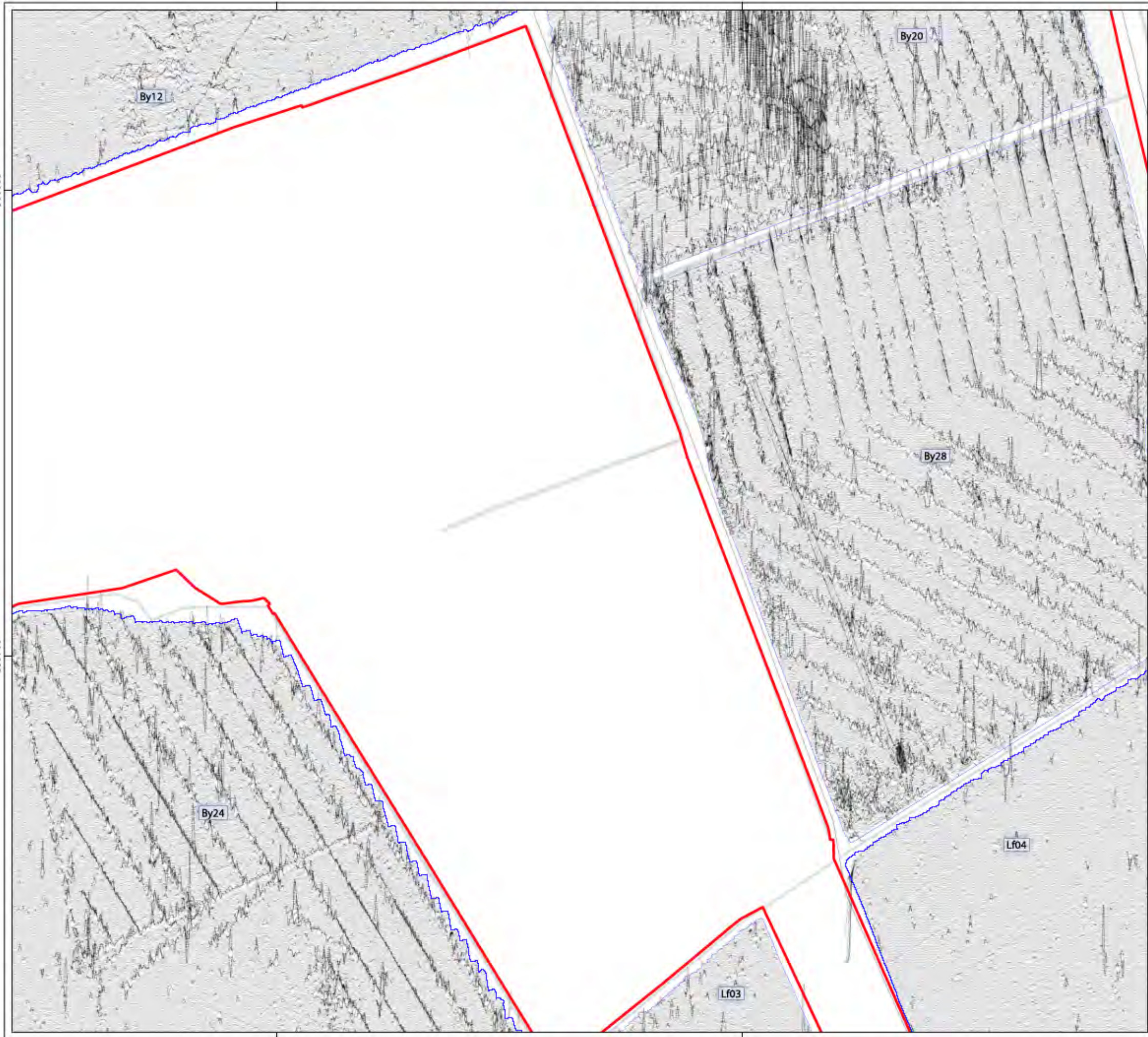


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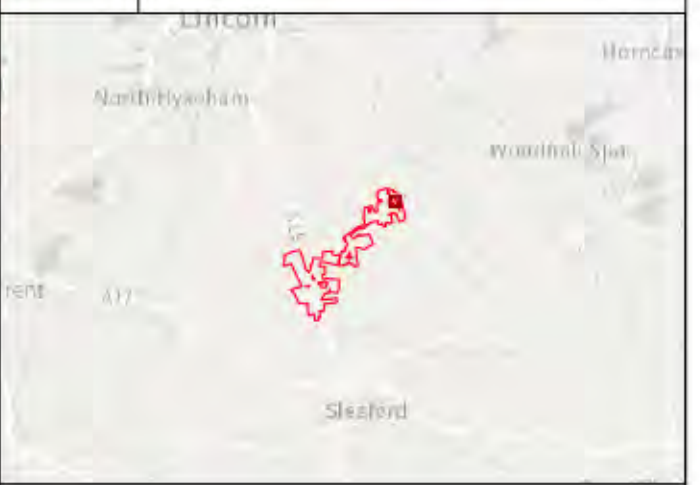
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Key

- Geophysical Survey Area
- Survey Extent
- XY Trace (25nT/cm)

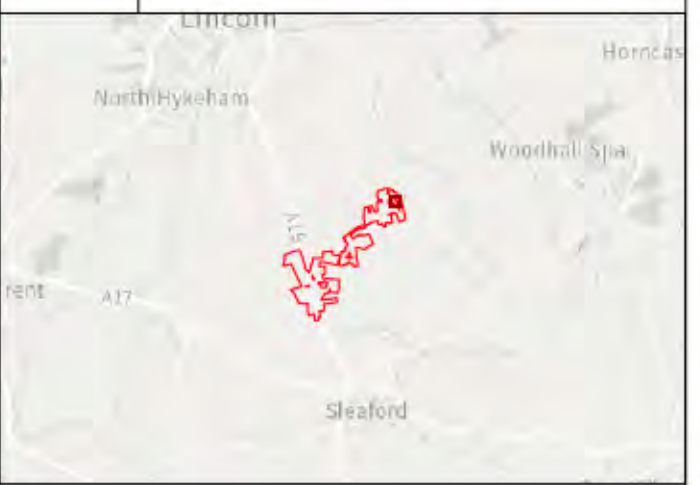
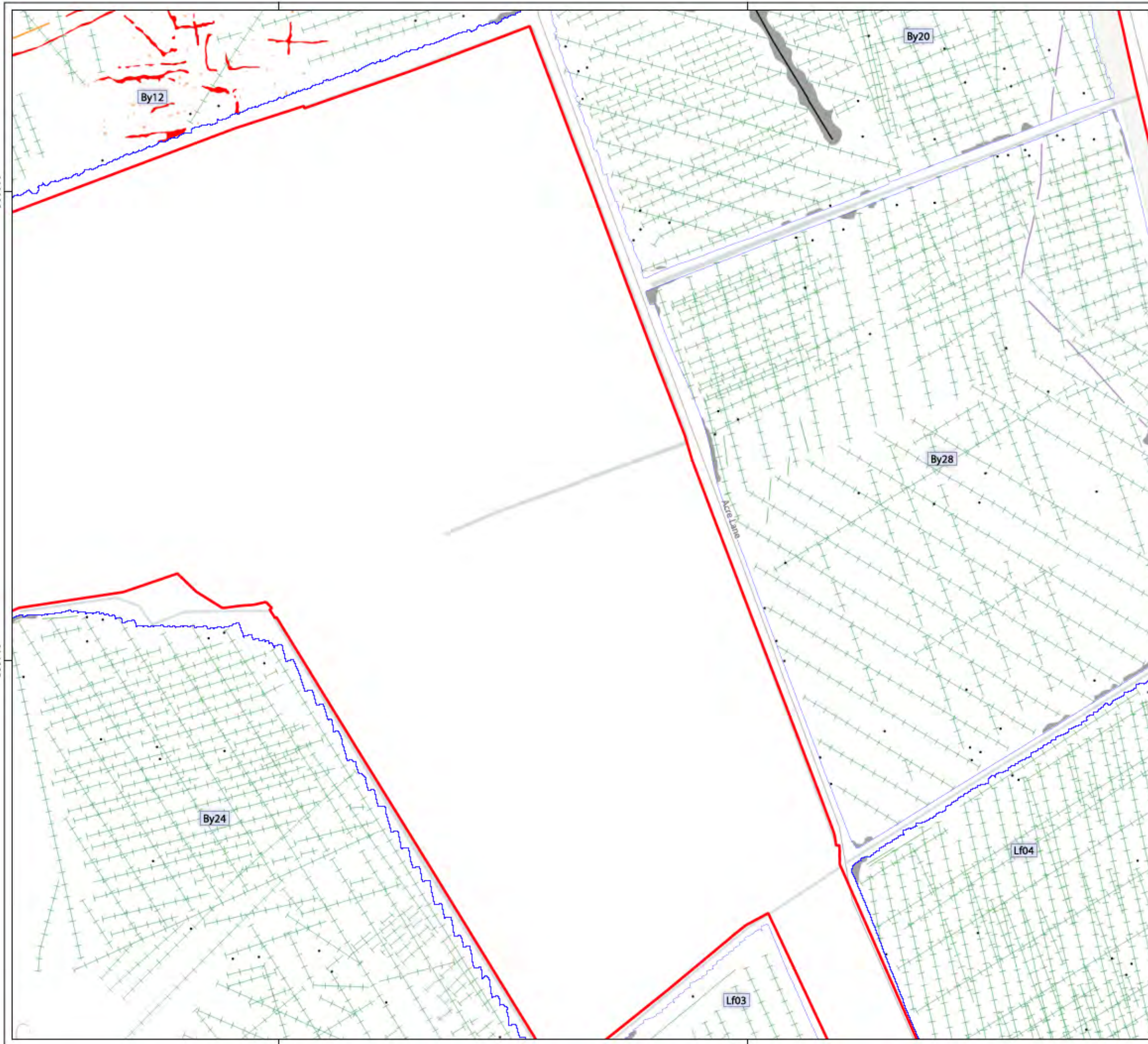
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Key

- Geophysical Survey Area
- Survey Extent

Interpretation

- Ferrous Objects
- Agriculture
- Field Drain
- Pipe
- Uncertain
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology

0 50 100 m

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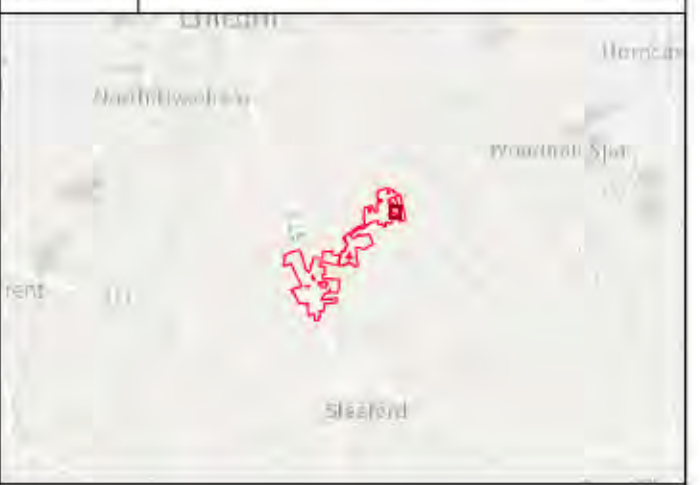
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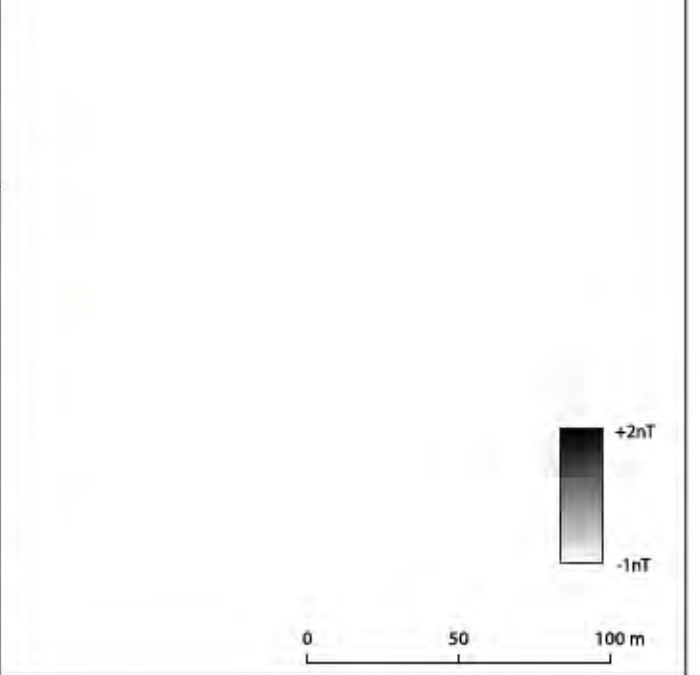



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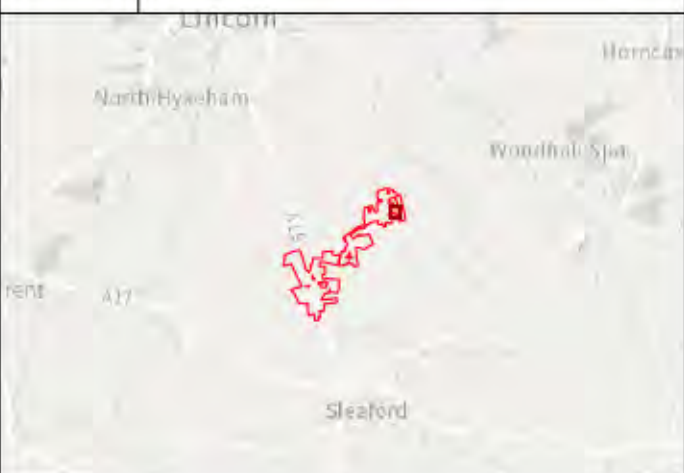
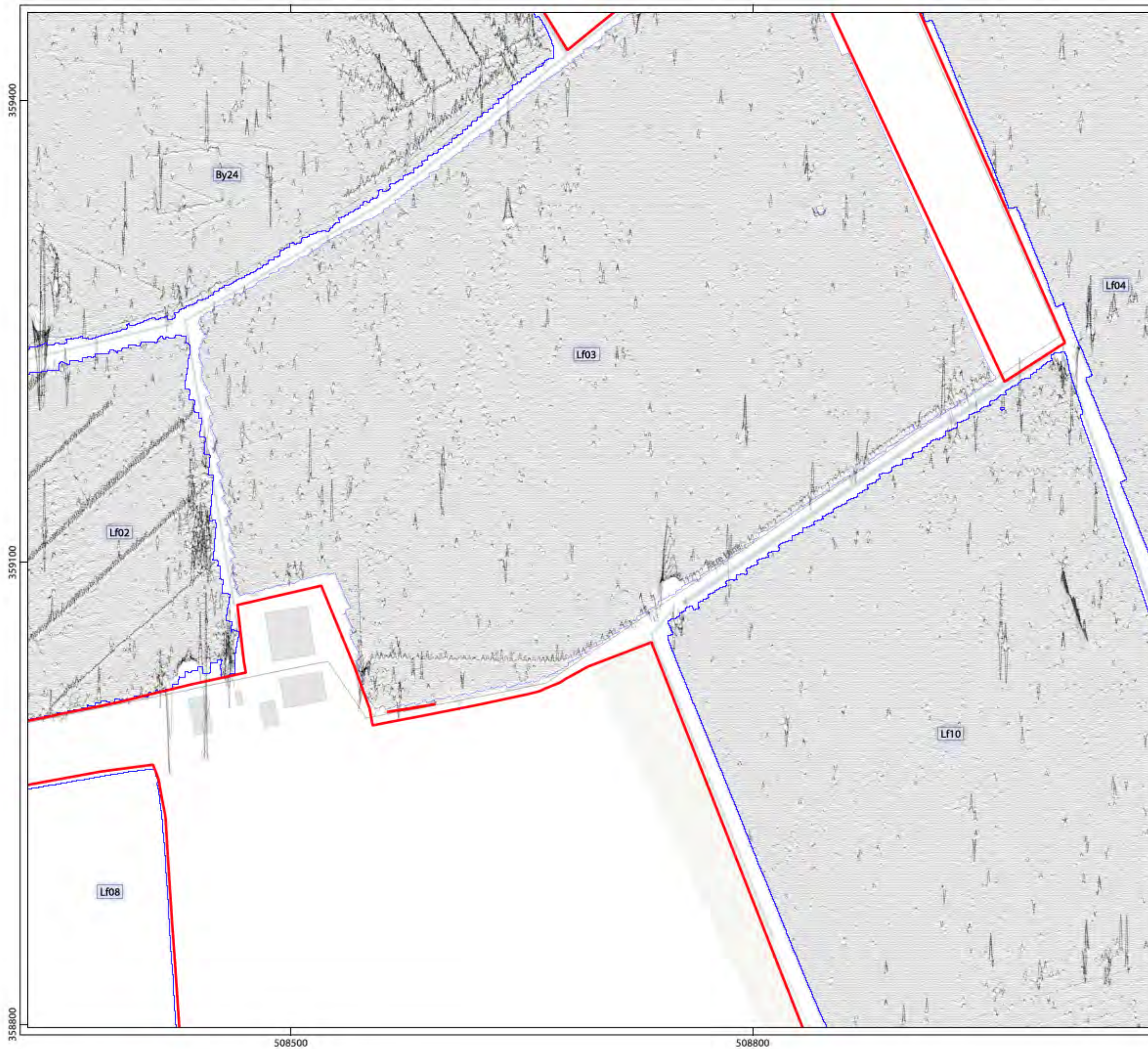
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- Geophysical Survey Area
- Survey Extent



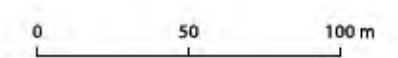
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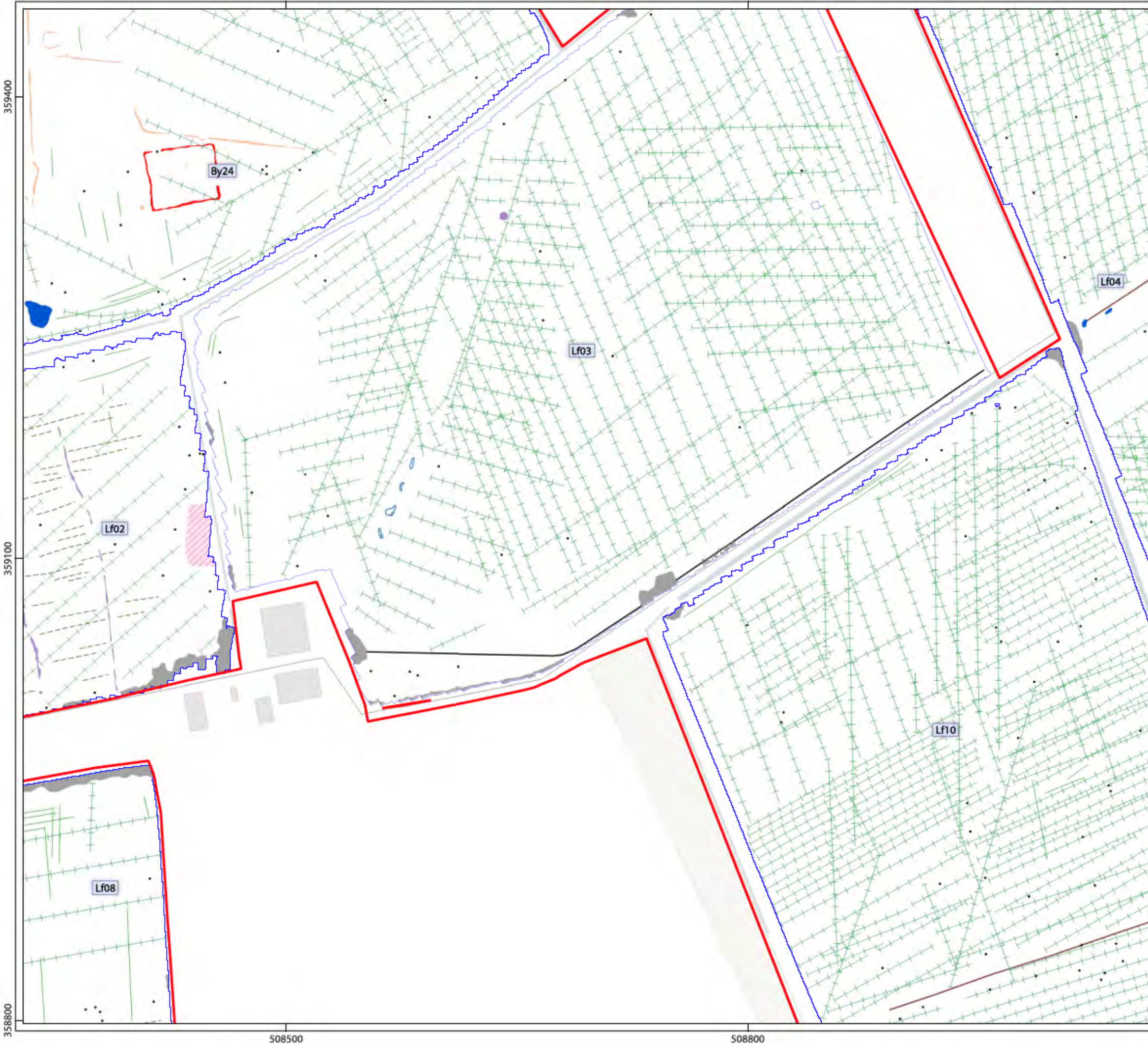
Key

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Key

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- Survey Extent

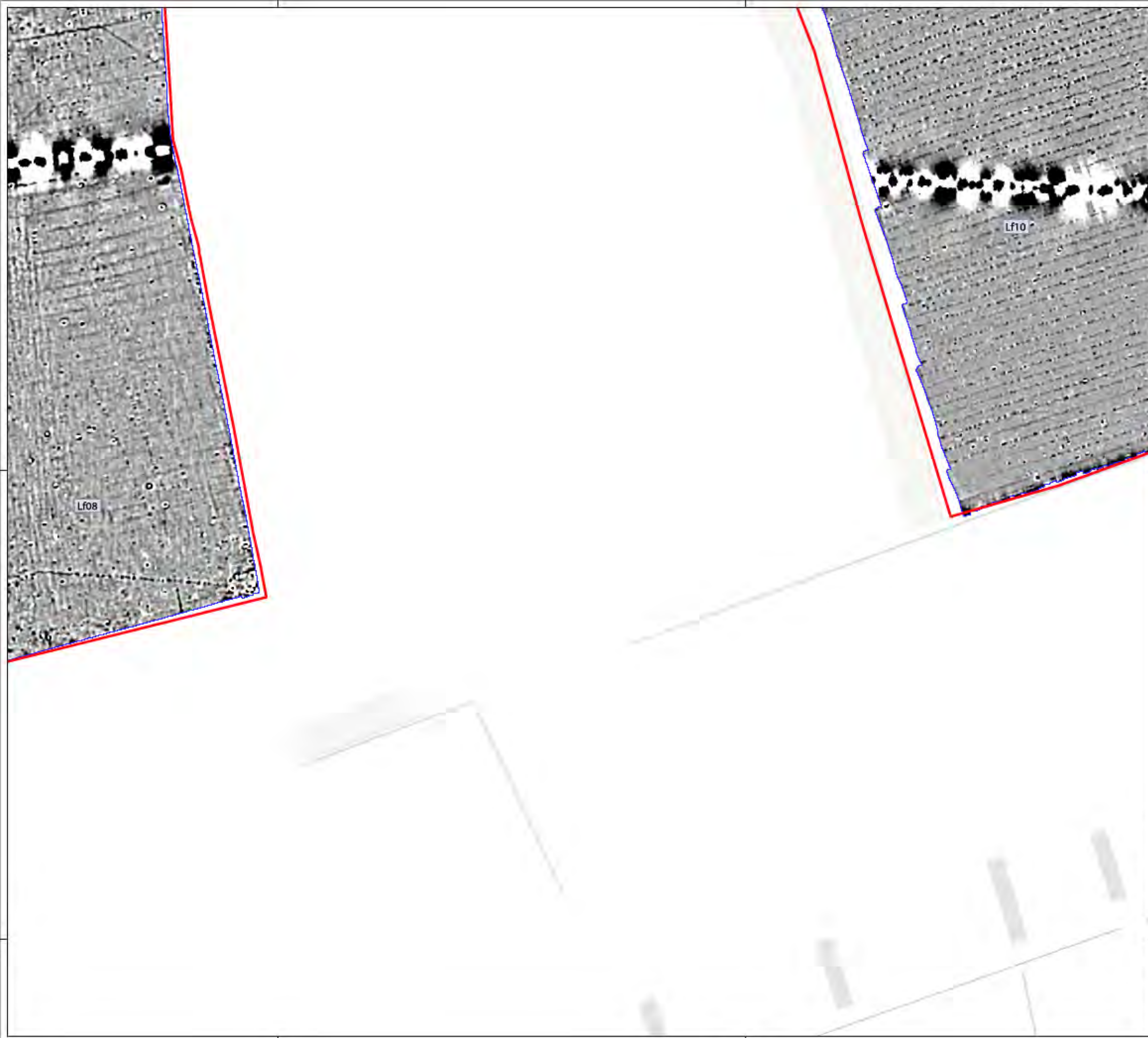
Interpretation

- Ferrous Objects
- Agriculture
- Field Boundary
- Field Drain
- Pipe
- Ridge and Furrow
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Quarry
- Uncertain
- Former Pond
- Geology

0 50 100 m

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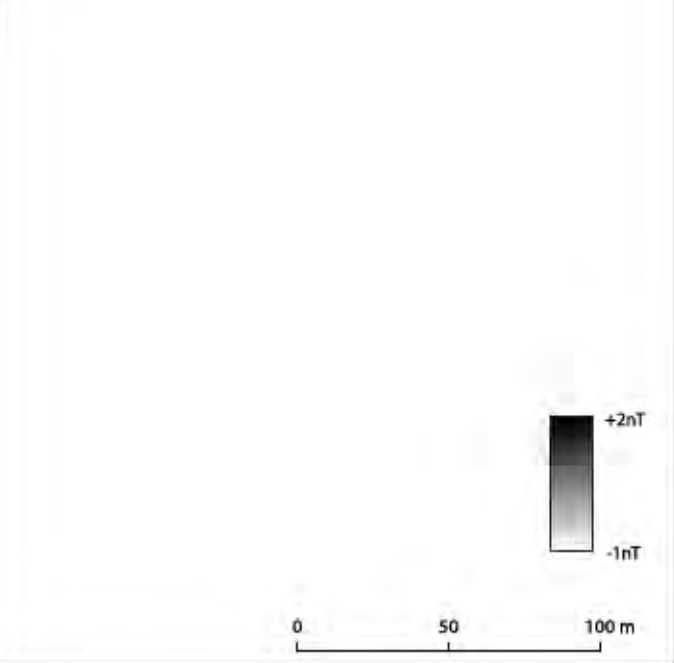



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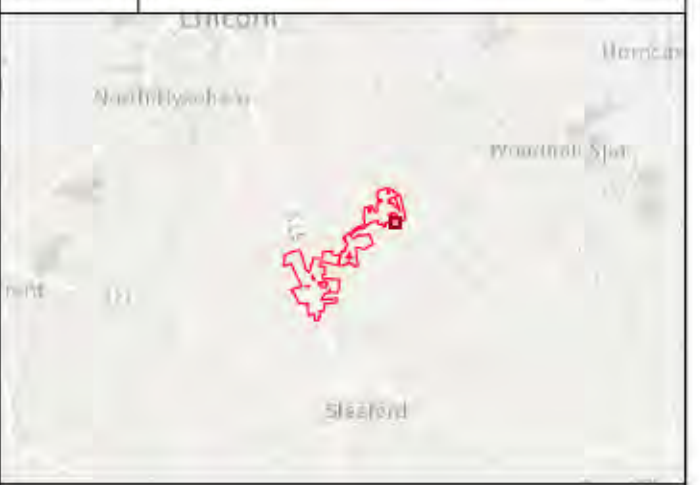
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- Survey Extent



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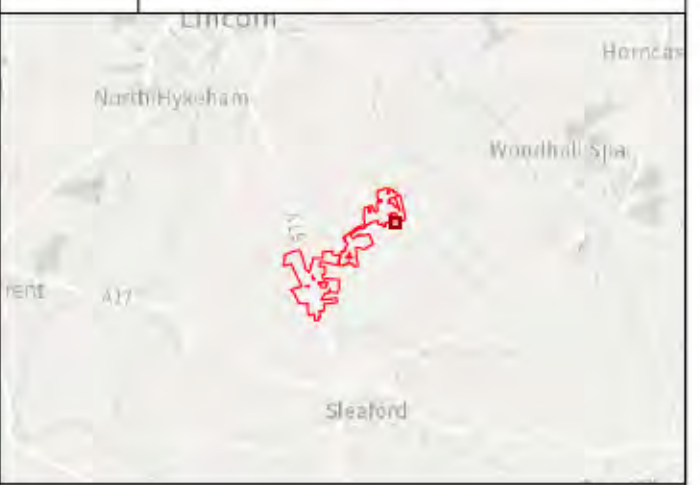
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- XY Trace (25nT/cm)

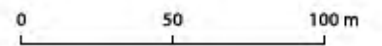
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- Key**
- Geophysical Survey Area
 - Survey Extent
- Interpretation**
- Ferrous Objects
 - Agriculture
 - Field Drain
 - Pipe
 - Ridge and Furrow
 - Magnetic Disturbance
 - Uncertain



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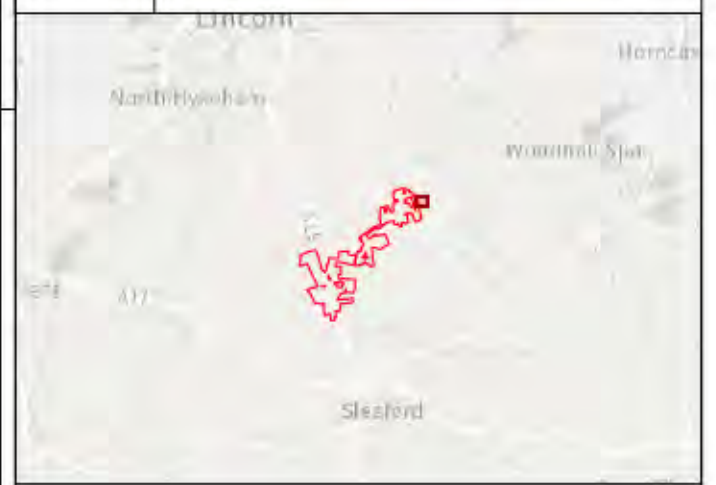
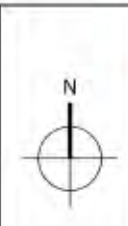
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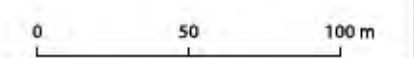
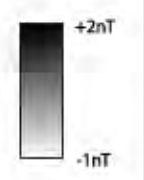
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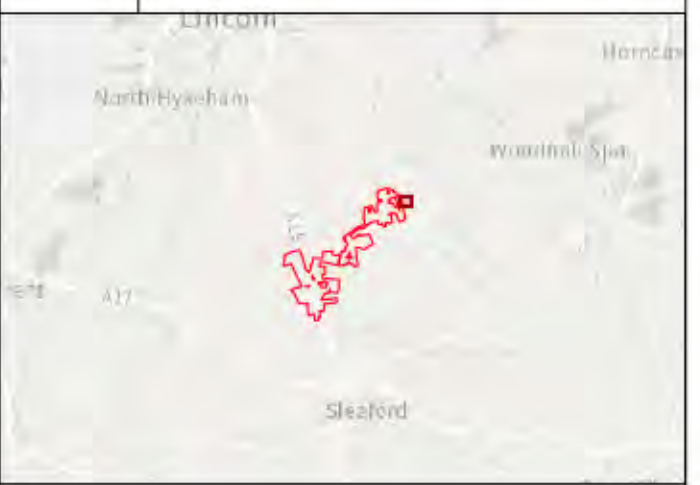
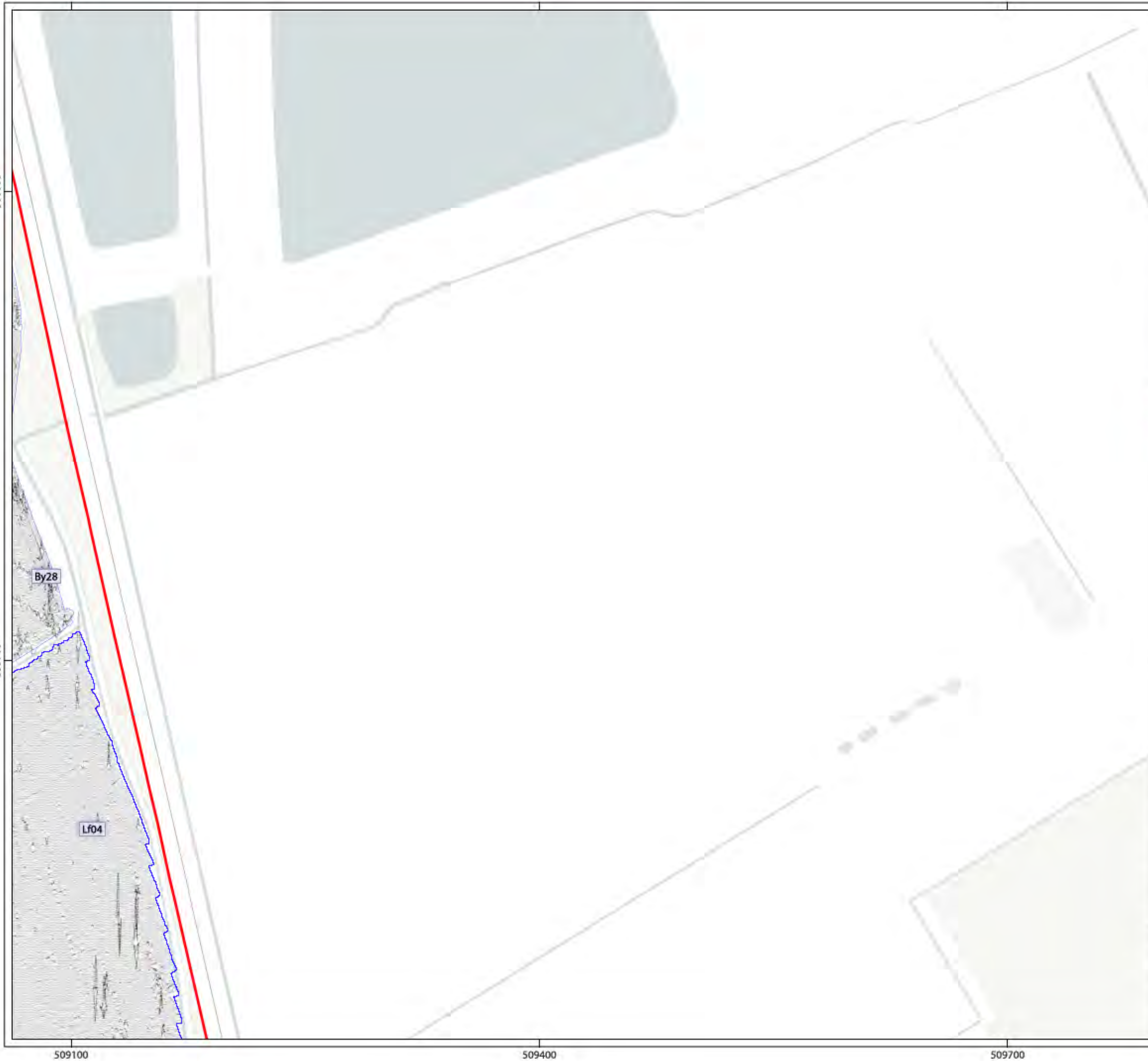
- Geophysical Survey Area
- Survey Extent



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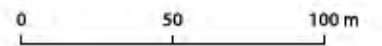
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Key

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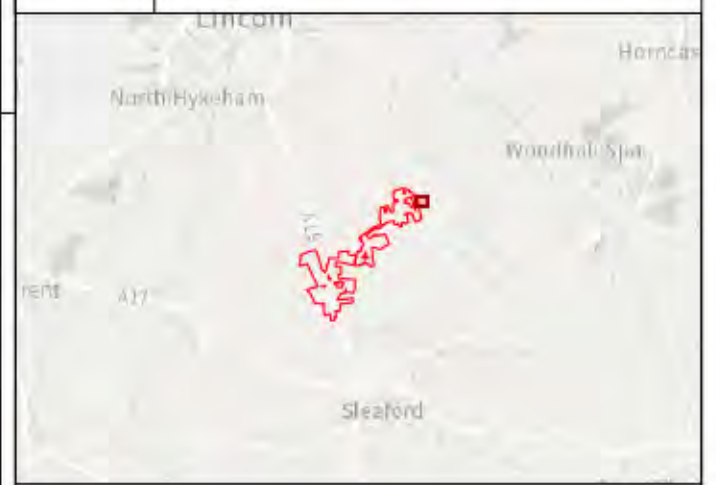
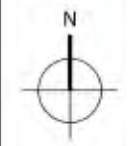
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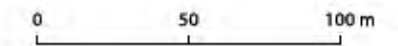
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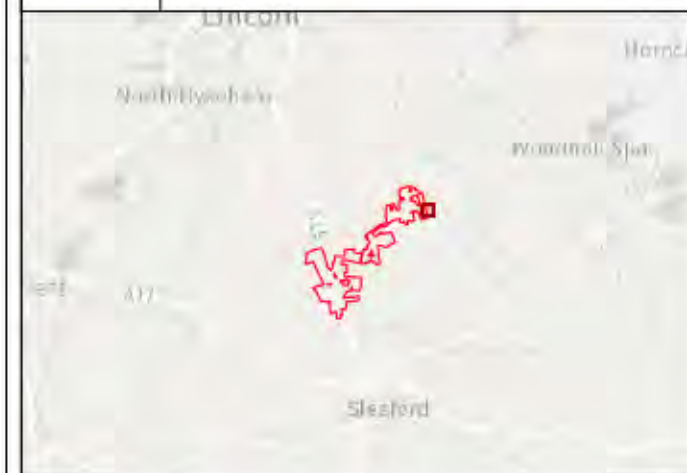
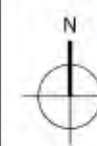
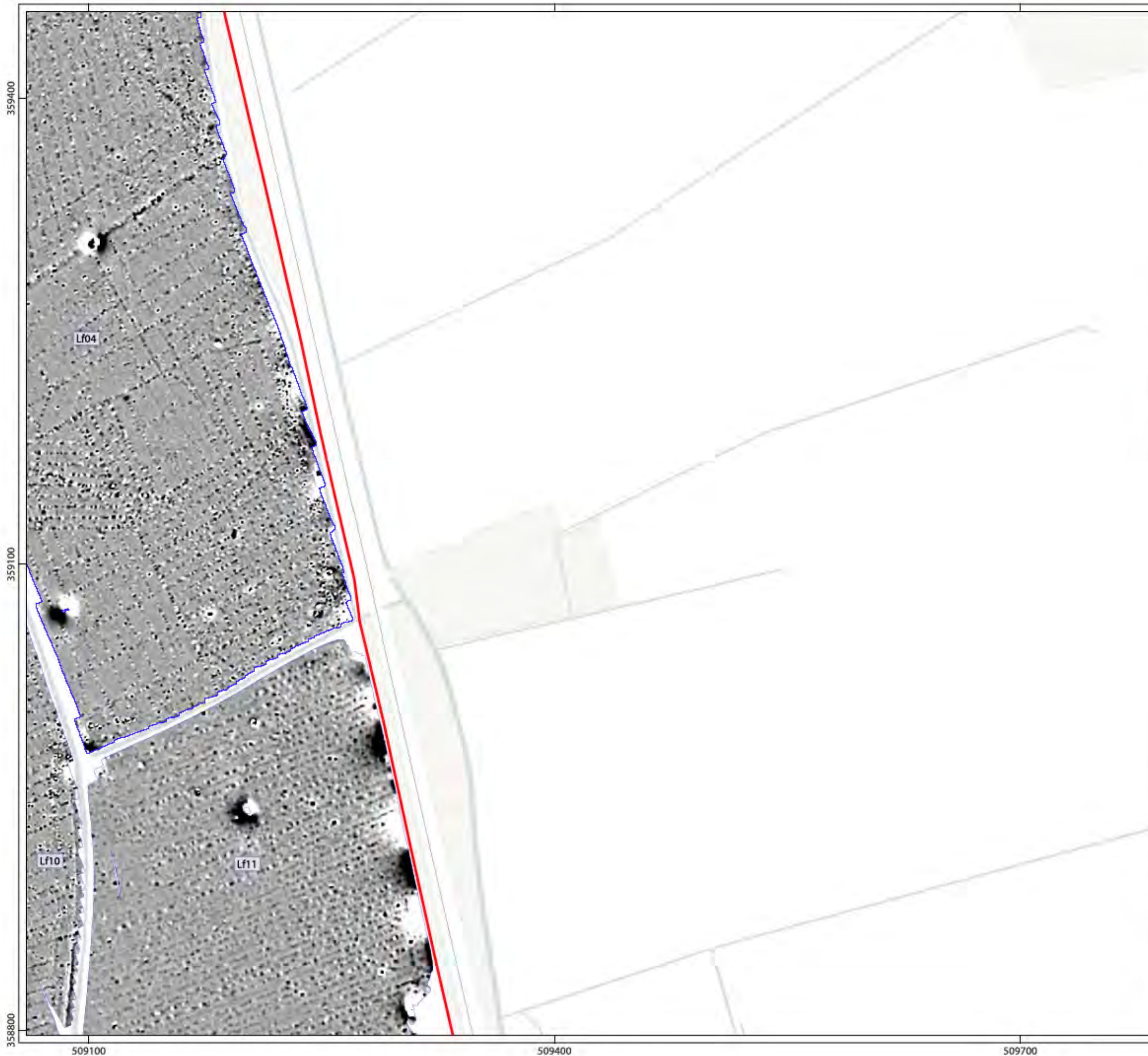
- Geophysical Survey Area
- Survey Extent
- Interpretation**
- Ferrous Objects
- Agriculture
- Field Drain
- Magnetic Disturbance



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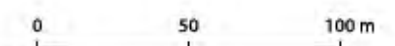
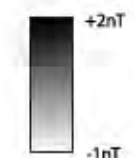
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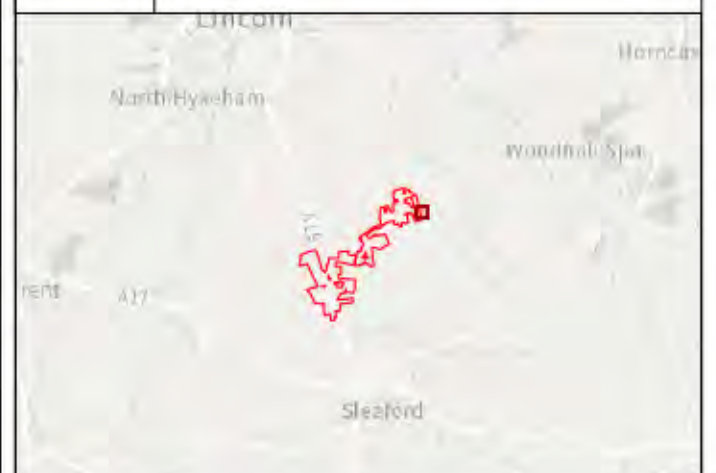
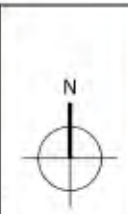
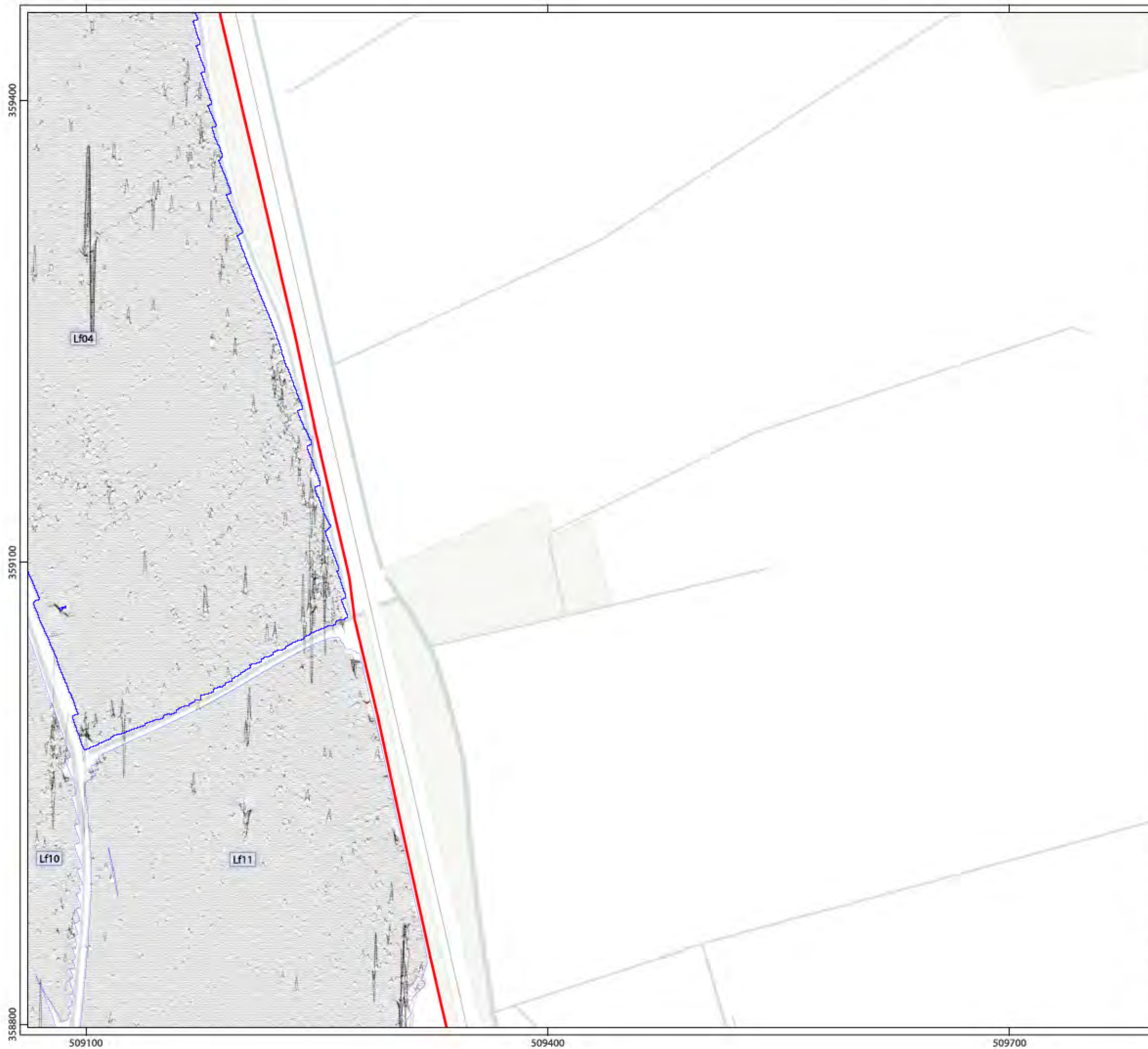
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- Geophysical Survey Area
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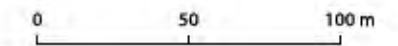
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Key

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- ▭ Survey Extent
- XY Trace (25nT/cm)



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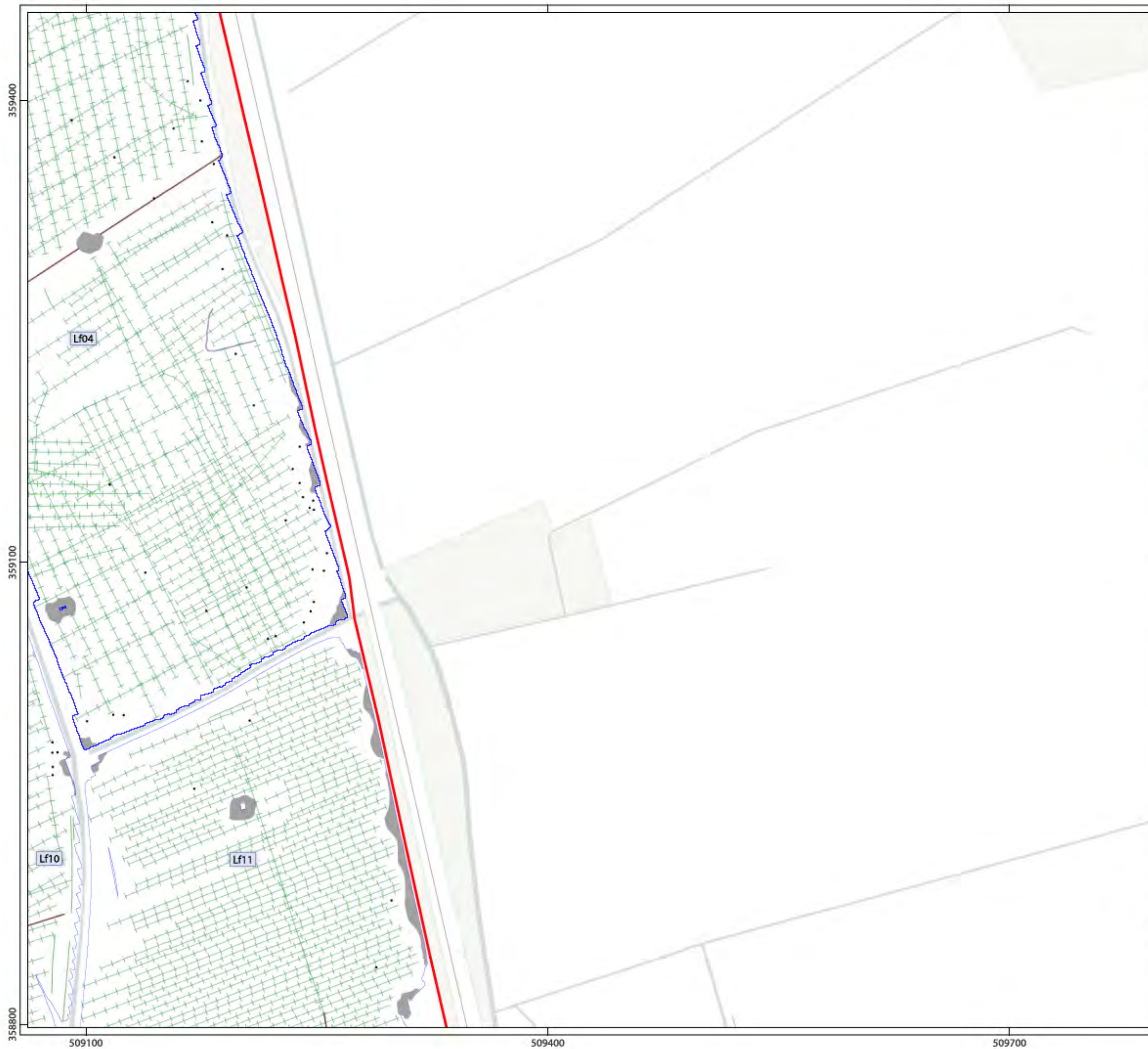
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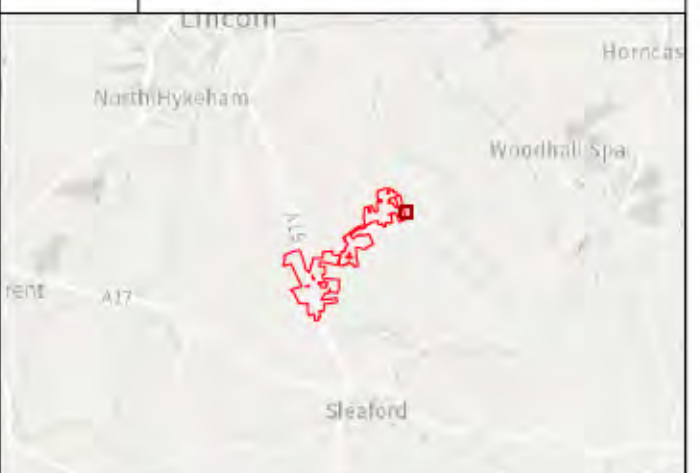
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Key

- Geophysical Survey Area
- Survey Extent

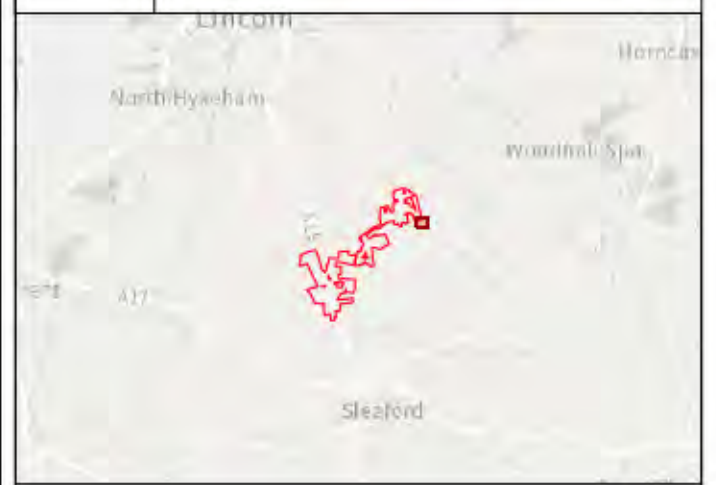
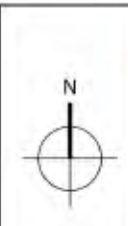
Interpretation

- Ferrous Objects
- Agriculture
- Field Boundary
- Field Drain
- Uncertain
- Magnetic Disturbance

0 50 100 m

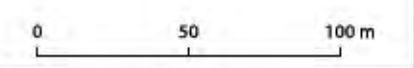
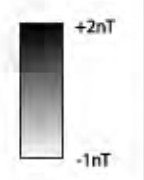
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Key

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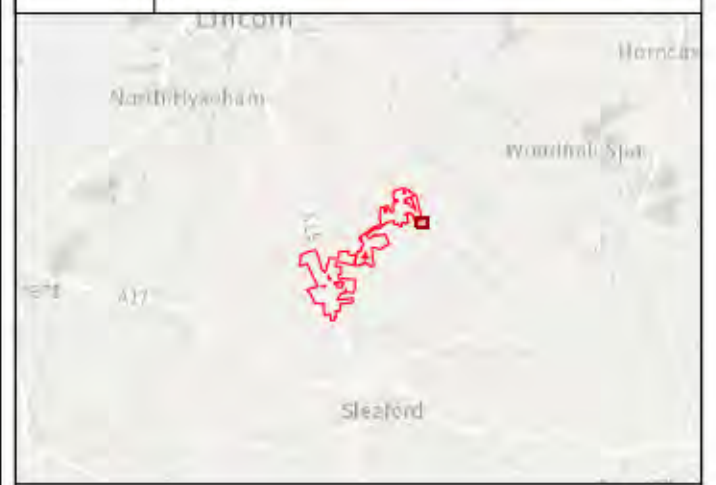
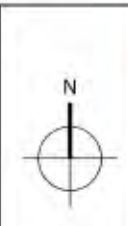
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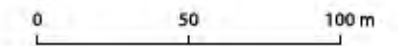
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Key

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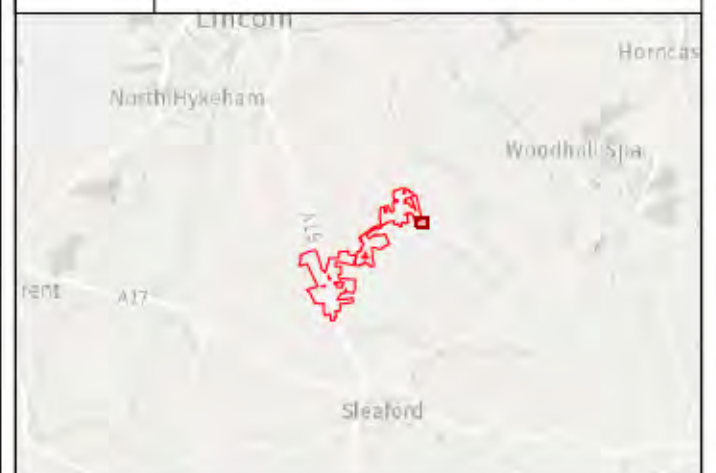
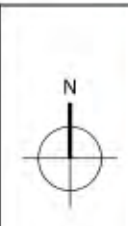
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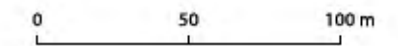
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Key

- Geophysical Survey Area
- Survey Extent
- Interpretation**
- Ferrous Objects
- Agriculture
- Field Boundary
- Field Drain
- Pipe
- Magnetic Disturbance



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7 APPENDICES

APPENDIX 1 SPRINGWELL SOLAR FARM CABLE OPTION ROUTE, LINCOLNSHIRE GEOPHYSICAL SURVEY REPORT

ACRE22



SPRINGWELL SOLAR FARM CABLE OPTION ROUTE, LINCOLNSHIRE

GEOPHYSICAL SURVEY REPORT

commissioned by RSK
on behalf of Springwell Energyfarm Ltd

November 2023

SPRINGWELL SOLAR FARM CABLE OPTION ROUTE, LINCOLNSHIRE

GEOPHYSICAL SURVEY REPORT

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November 2023

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This report adheres to the quality standard of ISO 9001:2015

PROJECT INFO:

HA Project Code **ACRE22** / HA Project No **2023-75** / NGR **TF 502947 356183** / Parish **Ashby de la Launde, Graffoe** / Local Authority **North Kesteven District Council** / Fieldwork Date **05/06/2023 – 07/06/2023 and 29/08/2023 – 31/08/2023** / OASIS Ref. **TBC**

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PROJECT SUMMARY

Headland Archaeology (UK) Ltd was instructed by RSK on behalf of Springwell Energyfarm Ltd (The Client) to undertake a geophysical (magnetometer) survey to assess the archaeological potential of four fields, covering approximately 69ha, being considered for cable route options as part of the proposed 800MW Springwell Solar Farm located 15km south of Lincoln between the villages of Metherringham and Brauncewell, Lincolnshire. A geophysical survey covering the main areas which may form part of the solar farm proposals has been previously reported on (Headland Archaeology 2023a). This report forms an addendum to the earlier report. The geophysical survey report and addendum, together with an archaeological desk-based assessment (DBA, Headland Archaeology 2023b) and Aerial Investigation Report (Headland Archaeology 2023c) will inform the Environmental Impact Assessment (EIA, Headland Archaeology forthcoming) produced in support of a development consent order (DCO) application for the construction of the solar farm. The geophysical survey results will also inform future archaeological strategy.

The original survey evaluated an area of approximately 1390ha and recorded a wide variety of archaeological and non-archaeological anomalies. The results of this survey largely corroborated, but also greatly expanded, the current understanding of the archaeological potential of the proposed site as contained within the Lincolnshire Historic Environment Record (LHER). The main findings included several foci of archaeological activity ranging from ring ditches and likely round barrows, pit alignments and extended series and/or concentrations of ditches, enclosures and pit-like anomalies. The only findings of note in fields adjacent to those in the current geophysical survey area (GSA) were two pit alignments, one located adjacent to the A15 and the other south-west of RAF Digby. The current survey has confirmed that these features extend into the current GSA.

The two pit alignments are the only anomalies of clear archaeological potential identified in this second phase of survey. Four low magnitude, partial circle anomalies possibly recording

the location of ring ditches are all interpreted with moderate to low levels of confidence due primarily to their weak response and/or interference from stronger anomalies and effects of modern cultivation. The survey has also recorded an extension of the gridded pattern of weakly magnetically enhanced, linear trend anomalies aligned north-west/south-east to varying degrees in all four fields, that were identified in almost every field west of the B1191 by the original survey. An anthropogenic cause for these ditch-like anomalies, such as a relict field system, is still considered most likely given the homogeneity and regularity of the responses over such a large area.

Elsewhere several discrete, amorphous low magnitude anomalies of uncertain origin, possibly identify former extraction pits and are comparable to features identified in the previous survey close to the A15. Four service pipes, two former field boundaries and a large number of linear anomalies of agricultural origin identifying field drains and/or modern ploughing trends constitute the remainder of the interpretable anomalies.

Similar to the previous survey the level of detail and range of anomalies recorded across the survey is argued to provide a high level of confidence in the findings and that they accurately reflect the archaeological potential of the GSA, notwithstanding the limitations of magnetometer survey to define particularly small, very weakly enhanced or anomalies masked by areas of disturbance and/or stronger magnetic anomalies. The archaeological potential of the GSA is therefore regraded as generally low except in the location of the two pit alignments.

CONTENTS

1	INTRODUCTION	1
	1.1 LOCATION, TOPOGRAPHY AND LAND-USE	1
	1.2 GEOLOGY AND SOILS	1
2	ARCHAEOLOGICAL BACKGROUND	2
3	AIMS, METHODOLOGY AND PRESENTATION	2
	3.1 MAGNETOMETER SURVEY	2
4	RESULTS	3
5	DISCUSSION AND CONCLUSION	5
6	REFERENCES	5
7	APPENDICES	41
	APPENDIX 1 MAGNETOMETER SURVEY	41
	APPENDIX 2 SURVEY LOCATION INFORMATION	42
	APPENDIX 3 GEOPHYSICAL SURVEY ARCHIVE	42
	APPENDIX 4 MAGNETOMETER DATA PROCESSING	42

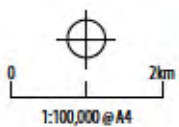
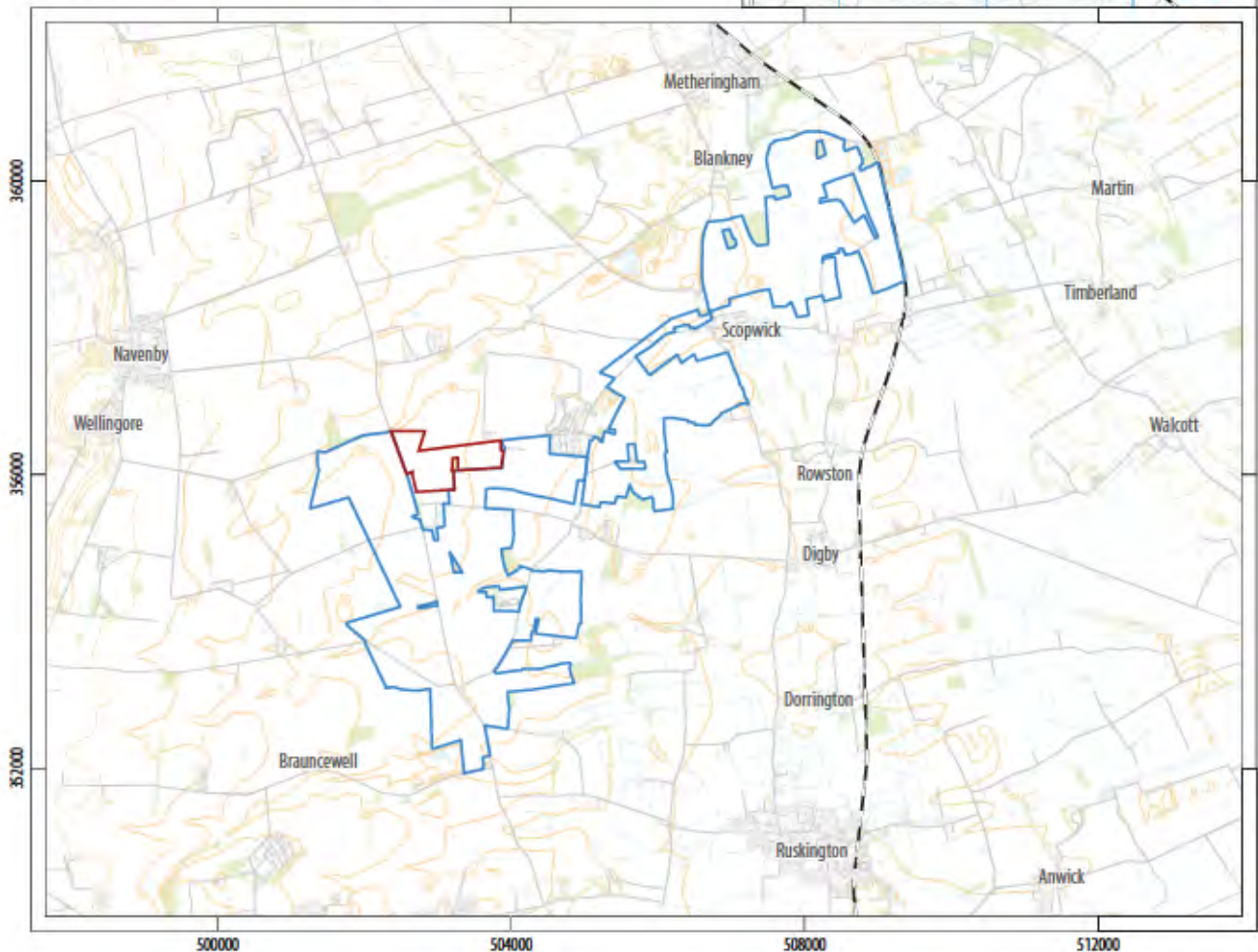
LIST OF ILLUSTRATIONS

ILLUS 1 SITE LOCATION	1
ILLUS 2 SURVEY LOCATION SHOWING GPS SWATHS (1:10,000)	7
ILLUS 3 OVERALL GREYSCALE PLOT OF PROCESSED MAGNETOMETER DATA (1:40,000)	9
ILLUS 4 OVERALL INTERPRETATION OF MAGNETOMETER DATA (1:40,000)	11
ILLUS 5 CABLE OPTION ROUTE GREYSCALE PLOT OF PROCESSED MAGNETOMETER DATA (1:10,000)	13
ILLUS 6 CABLE OPTION ROUTE INTERPRETATION OF MAGNETOMETER DATA (1:10,000)	15
ILLUS 7 PROCESSED GREYSCALE MAGNETOMETER DATA; SECTOR 1 (1:2,500)	17
ILLUS 8 XY TRACE PLOT OF MINIMALLY PROCESSED MAGNETOMETER DATA; SECTOR 1 (1:2,500)	19
ILLUS 9 INTERPRETATION OF MAGNETOMETER DATA; SECTOR 1 (1:2,500)	21
ILLUS 10 PROCESSED GREYSCALE MAGNETOMETER DATA; SECTOR 2 (1:2,500)	23
ILLUS 11 XY TRACE PLOT OF MINIMALLY PROCESSED MAGNETOMETER DATA; SECTOR 2 (1:2,500)	25
ILLUS 12 INTERPRETATION OF MAGNETOMETER DATA; SECTOR 2 (1:2,500)	27
ILLUS 13 PROCESSED GREYSCALE MAGNETOMETER DATA; SECTOR 3 (1:2,500)	29
ILLUS 14 XY TRACE PLOT OF MINIMALLY PROCESSED MAGNETOMETER DATA; SECTOR 3 (1:2,500)	31
ILLUS 15 INTERPRETATION OF MAGNETOMETER DATA; SECTOR 3 (1:2,500)	33
ILLUS 16 PROCESSED GREYSCALE MAGNETOMETER DATA; SECTOR 4 (1:2,500)	35
ILLUS 17 XY TRACE PLOT OF MINIMALLY PROCESSED MAGNETOMETER DATA; SECTOR 4 (1:2,500)	37
ILLUS 18 INTERPRETATION OF MAGNETOMETER DATA; SECTOR 4 (1:2,500)	39

LIST OF TABLES

TABLE 1 DESCRIPTION OF RESULTS	4
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Springwell Solar Farm
Cable Option Route
Lincolnshire



- ▭ Springwell Solar Farm, Cable Option Route - geophysical survey area
- ▭ Springwell Solar Farm - geophysical survey area

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ILLUS 1 Site location

SPRINGWELL SOLAR FARM CABLE OPTION ROUTE, LINCOLNSHIRE

GEOPHYSICAL SURVEY REPORT

1 INTRODUCTION

Headland Archaeology (UK) Ltd was instructed by RSK on behalf of Springwell Energyfarm Ltd (The Client) to undertake a geophysical (magnetometer) survey to assess the archaeological potential of on an additional four fields, amounting to approximately 69ha, being considered for cable route options as part of the proposed 800MW Springwell Solar Farm located 15km south of Lincoln between the villages of Metheringham and Brauncewell, Lincolnshire (Illus 1).

A geophysical survey covering the main areas which may form part of the solar farm proposals has been previously reported on (Headland Archaeology 2023a). This report forms an addendum to the earlier report. The geophysical survey report and addendum, together with an archaeological desk-based assessment (DBA, Headland Archaeology 2023b) and Aerial Investigation Report (Headland Archaeology 2023c) will inform the Environmental Impact Assessment (EIA, Headland Archaeology forthcoming) produced in support of a development consent order (DCO) application for the construction of the solar farm. The geophysical survey results will also inform future archaeological strategy.

The current survey was undertaken in accordance with the original Written Scheme of Investigation for Geophysical Survey (WSI) (Headland Archaeology 2022), following guidance contained in the National Planning Policy Framework (MHCLG 2021) prior to its revision in September 2023, and was carried out in line with current best practice (Chartered Institute for Archaeologists 2014, Europae Archaeologia Consilium 2016).

The survey was undertaken in two phases. An initial survey over pasture fields bcd044 and bcd072 was undertaken between the June 5th and June 7th 2023, with bcd073 and bcd083 surveyed on August 30th and August 31st 2023, post-harvest.

1.1 LOCATION, TOPOGRAPHY AND LAND-USE

The current geophysical survey area (GSA) comprises four adjoining fields, appended to the north of the previous survey area, located between the A15 and RAF Digby and south of Cuckoo Lane, centred at NGR TF 502947 356183. The spatial relationship between the current and earlier survey areas is indicated on Illus 1 to Illus 5 inclusive.

The topography of the GSA gradually slopes down from a height of approximately 47m above Ordnance Datum (AOD) from the western boundary adjacent the A15, down to roughly 36m AOD at the eastern boundary of field bcd073 immediately south of RAF Digby airfield.

1.2 GEOLOGY AND SOILS

The solid bedrock geology comprises sedimentary Jurassic period limestone of the Upper Lincolnshire Limestone Member that belongs to the Southern Lincolnshire Edge, a north/south linear scarp of limestone running the length of Greater Lincolnshire. The bedrock geology changes immediately north of the GSA to another type of Jurassic limestone, that of the Lincolnshire Limestone Formation. No superficial deposits are recorded over a significant majority of the GSA (NERC 2022).

The overlying soils are classified in Soilscape 3 Association as loamy, shallow lime-rich soils over chalk limestone (Cranfield University 2021).

Guidance (English Heritage 2008; Table 4) indicates that magnetometer survey can be recommended over any sedimentary geology and average responses to magnetometer survey over Jurassic limestone are good, although a wide range of magnetic susceptibilities in the parent rock can result in very variable background responses to magnetometer survey. Also, any

Quaternary deposits overlying the solid geology are a primary consideration as they often show a high degree of local variation, and the magnetic response is usually dependent on the magnetic mineralogy of the parent solid geology.

The combination of underlying limestone bedrock and widespread absence of superficial deposits means the prevailing geological and pedological conditions are appropriate for the application of magnetometer survey for the detection of archaeological features. The suitability of magnetometry in these conditions is demonstrated by the results of the previous survey (Headland Archaeology 2023a) in fields adjacent to the GSA.

2 ARCHAEOLOGICAL BACKGROUND

A detailed archaeological background adapted from information compiled within a comprehensive archaeological desk-based assessment (ADBA - Headland Archaeology 2023b) and aerial investigation report (Headland Archaeology 2023c) gathered in support of an Environmental Impact Assessment (EIA) for the wider solar development including the fields covered by this survey, was included in the original geophysical survey report. Only information pertaining to the current survey area is included here.

No designated or non-designated heritage assets are identified within the GSA boundary. Non-designated assets located adjacent or close to the GSA include the former Roman road, now the A15 (MLI86228), World War 2 (WW2) infrastructure such as pillboxes (MLI89150, MLI89151) associated with RAF Digby (MLI69621) to the west or post-medieval quarry sites (MLI86694, MLI86695) and farmsteads (MLI60266) to the west and south respectively.

Analysis of historic maps indicates the presence of former field boundaries in fields bcd072 and bcd083 aligned roughly north/south and splitting the fields in half.

The results of the previous survey largely corroborated but also greatly expanded the current understanding of the archaeological potential of the proposed site as contained within the Lincolnshire Historic Environment Record (LHER). The main findings of the original survey included several foci of archaeological activity ranging from ring ditches and likely round barrows, pit alignments and extended series and/or concentrations of ditches, enclosures, and pit-like anomalies however these are all located at least 850m from the nearest part of the GSA.

The original survey did however, identify two pit alignments adjacent to the A15 in field Tb2 and south-west of RAF Digby in field Bcd084 which, on their current alignment, looked likely to extend into the GSA in fields Bcd044 and Bcd073 respectively.

3 AIMS, METHODOLOGY AND PRESENTATION

The general aim of the geophysical survey was to provide enough information to corroborate, identify and characterise sub-surface anomalies that may have an archaeological origin, including defining the spatial limits of already known or suspected heritage assets, within the defined survey areas. This information will form part of the much larger body of evidence from a variety of sources, including the previous magnetometer survey, that taken as a whole, will enable an assessment to be made of the impact of the proposed development on any sub-surface archaeological remains, where present and therefore help determine an appropriate mitigation strategy.

The specific archaeological objectives of the geophysical survey were:

- › to gather enough information to inform the extent, condition, character and date (as far as circumstances permit) of any archaeological features and deposits within the GSA,
- › to obtain information that will contribute to an evaluation of the significance of the proposed solar development upon cultural heritage assets, and
- › to prepare a fully illustrated report on the results of the survey that is compliant with all relevant standards, guidance and good practice.

3.1 MAGNETOMETER SURVEY

It is acknowledged that magnetometry has limitations and that certain types of sub-surface remains may, under certain circumstances, be more likely to be identified by other survey techniques such as earth resistance, ground penetrating radar (GPR) or electro-magnetic methods which measure different geophysical properties. However, given the success of the preceding survey and other project considerations, magnetometry was selected as the best methodology for assessing the additional survey area.

Magnetic survey methods rely on the ability of a variety of instruments to measure very small magnetic fields associated with buried archaeological remains. A feature such as a ditch, pit or kiln can act like a small magnet, or series of magnets, that produce distortions (anomalies) in the earth's magnetic field. In mapping these slight variations, detailed plans of sites can be obtained as buried features often produce reasonably characteristic anomaly shapes and strengths (Gaffney & Gater 2003). Further information on soil magnetism and the interpretation of magnetic anomalies is provided in Appendix 1.

The surveys were undertaken using four Bartington Grad601 sensors mounted at 1m intervals (1m traverse interval) onto a rigid carrying frame. The system was programmed to take readings at a frequency of 10Hz (allowing for a 10–15cm sample interval) on roaming traverses (swaths) 4m apart. These readings were stored on an external weatherproof laptop and later downloaded for processing and interpretation. The system was linked to a Trimble R12 Real Time Kinetic (RTK) differential Global Positioning System (dGPS) outputting in NMEA mode to ensure a high positional accuracy for each data point.

MLGrad601 and MultiGrad601 (Geomar Software Inc.) software was used to collect and export the data. Anomaly GeoSurvey v1.12.3 (Lichenstone Geoscience) and QGIS v.3.28.5 software was used to process and present the data respectively.

An overall location plan of the GSA shown in relation to the original survey for the solar farm is presented at a scale of 1:100,000 in Illus 1. Overall processed greyscale and interpretation illustrations of all the results from both surveys are shown for reference in Illus 2 and Illus 3 respectively at a scale of 1:40,000.

Overview greyscale and interpretation plans of the cable option route GSA with Sector boundaries indicated are shown in Illus 5 and Illus 6 respectively at a scale of 1:10,000. Fully processed (greyscale) data, minimally processed data (XY trace plot) data and interpretative plans are presented by Sector, at 1:2,500, in Illus 7 to Illus 18 inclusive.

Individual fields are referred to using nomenclature provided to Headland Archaeology at the commencement of the project.

Technical information on the equipment used, data processing and magnetometer survey methodology is given in Appendix 1. Details of the survey location information are in Appendix 2. A note on the format of the geophysical data archive is present in Appendix 3. Data processing details for the magnetometer survey are presented in Appendix 4. The OASIS Archive entry is included as Appendix 5.

The survey methodology, report and any recommendations comply with guidelines outlined by Europae Archaeologia Consilium (EAC 2016) and by the Chartered Institute for Archaeologists (CIFA 2014b). All Illustrations from Ordnance Survey (OS) mapping are reproduced with the permission of the controller of His Majesty's Stationery Office (© Crown Copyright).

The illustrations in this report have been produced following analysis of the data in 'raw' (minimally processed) and processed formats (see above) and over a range of different display levels. All illustrations are presented to display and interpret the data from this site to best effect based on the experience and knowledge of management and reporting staff.

4 RESULTS

As with the previous survey the results are described in tabular format by field (see below). The associated archaeological LHER assets and events included in the results table are not exhaustive and only include those assets relevant to the anomalies identified in the survey lying within or immediately adjacent to those fields forming the current GSA. Any relevant findings from the previous geophysical survey are also discussed herein.

TABLE 1 Description of results

FIELD NO	ARCHAEOLOGICAL ANOMALIES	ASSOCIATED ARCHAEOLOGICAL LHER ASSETS AND EVENTS WITHIN GSA LIMITS	SURVEY INTERPRETATION
Bcd044 (Sectors 1 and 3 Illus 7-9 and 13-15)	Yes	ML186694 ML186228	<p>A roughly linear section of discrete anomalies aligned north-east/south-west identifying a pit alignment (P1; Illus 7-9), is recorded across the north-west corner of the field and marks a continuation of the same feature recorded in the previous survey within field Tb2 on the opposite side of the A15 (former Roman road ML186228). The pit alignment was not previously recorded in the LHER and its western extent within Tb2 remains unclear given the presence of strong geological responses. The feature lies adjacent to a former quarry site (ML186694) also within field Tb2.</p> <p>No other anomalies of clear archaeological potential are recorded within this field. However, there is a clear continuation of the pattern of regular low magnitude parallel and perpendicular linear trend anomalies forming a grid like design, that was recorded adjacent to the A15 in the previous survey (Sectors 1 and 2). As previously identified the pattern of anomalies does not respect the alignment of present or former field boundaries. The interpretation of this landscape scale feature as some form of relict field system remains unchanged.</p> <p>Two parallel, low magnitude, linear ditch-like trend anomalies at the northern boundary of the field (D2?; Illus 7-9) remain of uncertain origin. The anomalies share an alignment with the regular grid like pattern of linear features but not the modern field boundaries or approximate east/west trend of natural/geological trends.</p> <p>As recorded in the previous survey in fields adjacent to the A15, several discrete, widely spaced, magnetically enhanced anomalies of uncertain origin are identified predominantly, but not exclusively, at the periphery of the field adjacent the A15. These anomalies possibly identify former extraction pits. Four lower magnitude but similarly amorphous responses may also indicate some form of localised extraction (and are interpreted separately as such) but with little other context provided by the survey results, could also represent natural variations in the limestone geology.</p> <p>Linear trends identifying modern cultivation patterns parallel to the modern-day field boundaries and irregular patterns of sinuous anomalies resulting from natural periglacial effects and/or surface cracks in the limestone are also identified.</p>

FIELD NO	ARCHAEOLOGICAL ANOMALIES	ASSOCIATED ARCHAEOLOGICAL LHER ASSETS AND EVENTS WITHIN GSA LIMITS	SURVEY INTERPRETATION
Bcd072 (Sectors 1-3 Illus 7-15)	No	None	The only findings from this field include a patchy continuation of the grid like pattern of linear features as seen widely in adjacent fields, a former field boundary aligned north-south across the centre of the field and one discrete low magnitude anomaly at the northern boundary of uncertain origin. This anomaly is again similar to other features seen at the periphery of nearby fields that are interpreted as possible sites of localised extraction.
Bcd083 (Sector 3 Illus 13-15)	No?	ML186228	No anomalies of clear archaeological potential are recorded in this field close to the A15 and north of Navenby Lane. Findings from this field are limited to three very faint, partial circular anomalies of uncertain origin (RD?1-RD?3; Illus 13-15) located towards the centre and in the northern half of the field. All three anomalies are suggestive of possible ring ditches but are interpreted with a low level of confidence, largely because the magnetic response is so weak but also because of the effects of stronger features that lay adjacent such as a former boundary and service pipes (SP1 and SP2; Illus 13-15). A continuation of the grid like pattern of faint linear trend anomalies aligned north-west/south-east seen in adjacent fields is also recorded in parts of this field. Linear trends identifying field drains and/or modern cultivation patterns parallel to the modern-day field boundaries and irregular patterns of sinuous anomalies resulting from natural periglacial effects and/or surface cracks in the limestone are also identified.
Bcd073 (Sectors 2 and 4 Illus 10-12 and 16-18)	Yes	ML188357 ML1125038 ML160621	A pit alignment oriented roughly north-northeast/south-southwest is recorded as a series of low magnitude discrete anomalies extending for approximately 340m across the centre of the field. This pit alignment in the LHER (ML188357) and marks a continuation of the same feature recorded to the south in the previous survey where it was recorded in nine adjoining fields, extending uninterrupted for 2.1km southwards from the previous GSA limits at the northern boundary of Bcd084 at NGR 503463, 356058, towards the centre of field Bcd115 at NGR 503243. In this section the pit alignment was identified as crossing fields Bcd084, Bcd093, Bcd096, Bcd100, Bcd104 and Bcd105 but did not appear to be associated with any other anomalies/features recorded by the previous survey. The survey data showed that the two previously recorded pit alignments identified from cropmarks ML184452 and ML188357 are in fact a single unified feature. An isolated low magnitude partial circular anomaly, approximately 17m in diameter, located towards the south-east corner of the field possibly identifies a ring ditch (RD1; Illus 16-18). The anomaly response remains somewhat unclear however due to the effects of modern cultivation close to the field boundary. No other anomalies of possible or clear archaeological potential are identified in the immediate vicinity which further restricts a more confident interpretation. A continuation of the grid like pattern of faint linear trend anomalies aligned north-west/south-east seen in adjacent fields is also detected in parts of this field. Similar to the results from fields adjacent to the A15 in the previous survey, three discrete, widely spaced, magnetically enhanced anomalies of uncertain origin are recorded close to the field boundary. These anomalies possibly identify former sites of localised extraction. Modern agricultural trends aligned parallel to the modern field boundaries and two service pipes and/or field drains (SP3 and SP4; Illus 10-12) located parallel to the western boundary of the field are the only other anomalies recorded in this field.

5 DISCUSSION AND CONCLUSION

The survey has evaluated all the areas within the additional Geophysical Survey Area (GSA) and has recorded a similar pattern of anomalies and extension of some landscape scale features recorded in the previous survey but has not identified any new foci of archaeological activity.

The current survey has mapped an extension of two separate pit alignments, one adjacent to the A15 in the north-west corner of the GSA that was previously unrecorded in the LHER, as well as a 340m continuation of the pit alignment (MLI88357 and MLI84452) which is now identified as extending uninterrupted for over 2.4km from the northern boundary of Bcd073 southwards towards the centre of field Bcd115.

In addition to the pit alignments the survey has also identified four low magnitude partial circular anomalies all interpreted with moderate to low levels of confidence as identifying possible ring ditches. The very weak nature, presence of stronger anomalies and/or cultivation effects adjacent to them restricts a more confident interpretation of these anomalies.

The survey has also recorded an extension of the gridded pattern of weakly magnetically enhanced linear trend anomalies aligned north-west/south-east to varying degrees in all four fields, previously identified in almost every field west of the B1191 constituting the western third of the previous survey area. An anthropogenic cause for these ditch-like anomalies, such as a relict field system, is still considered most likely given the homogeneity and regularity of the responses over such a large area. If this large feature was to identify some form of systematic, pre-modern land management it would certainly be of archaeological interest but perhaps of low intrinsic value. Their relationship (if any) with the other landscape scale features recorded by both surveys remains uncertain.

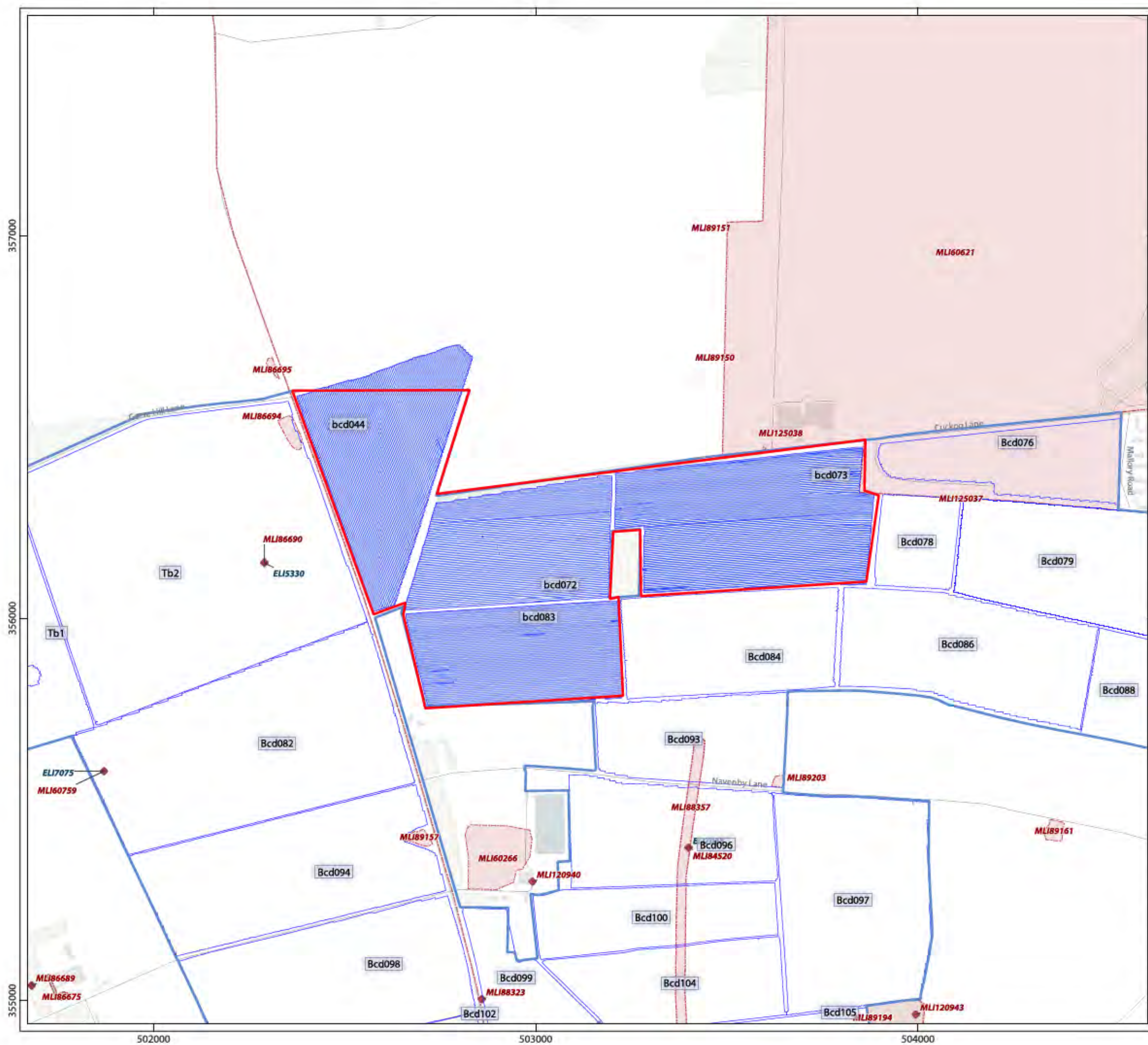
Several discrete, widely spaced, magnetically enhanced amorphous anomalies of uncertain origin recorded predominantly but not exclusively at the periphery of some of the field boundaries possibly identify former extraction pits and are comparable to features identified in the previous survey close to the A15.

Elsewhere the survey has recorded four probable service pipes, two former field boundaries and a large number of linear anomalies of agricultural origin identifying field drains and/or modern ploughing trends.

Similar to the previous survey the level of detail and range of anomalies recorded across the survey is argued to provide a high level of confidence in the findings and that they accurately reflect the archaeological potential of the GSA having likely recorded the extent of any significant archaeological remains, notwithstanding the limitations of magnetometer survey to define particularly small, very weakly enhanced or anomalies masked by areas of disturbance and/or stronger magnetic anomalies. The archaeological potential of the GSA is therefore regraded as generally low except in the location of the two pit alignments present within fields Bcd044 and Bcd073

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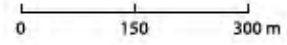


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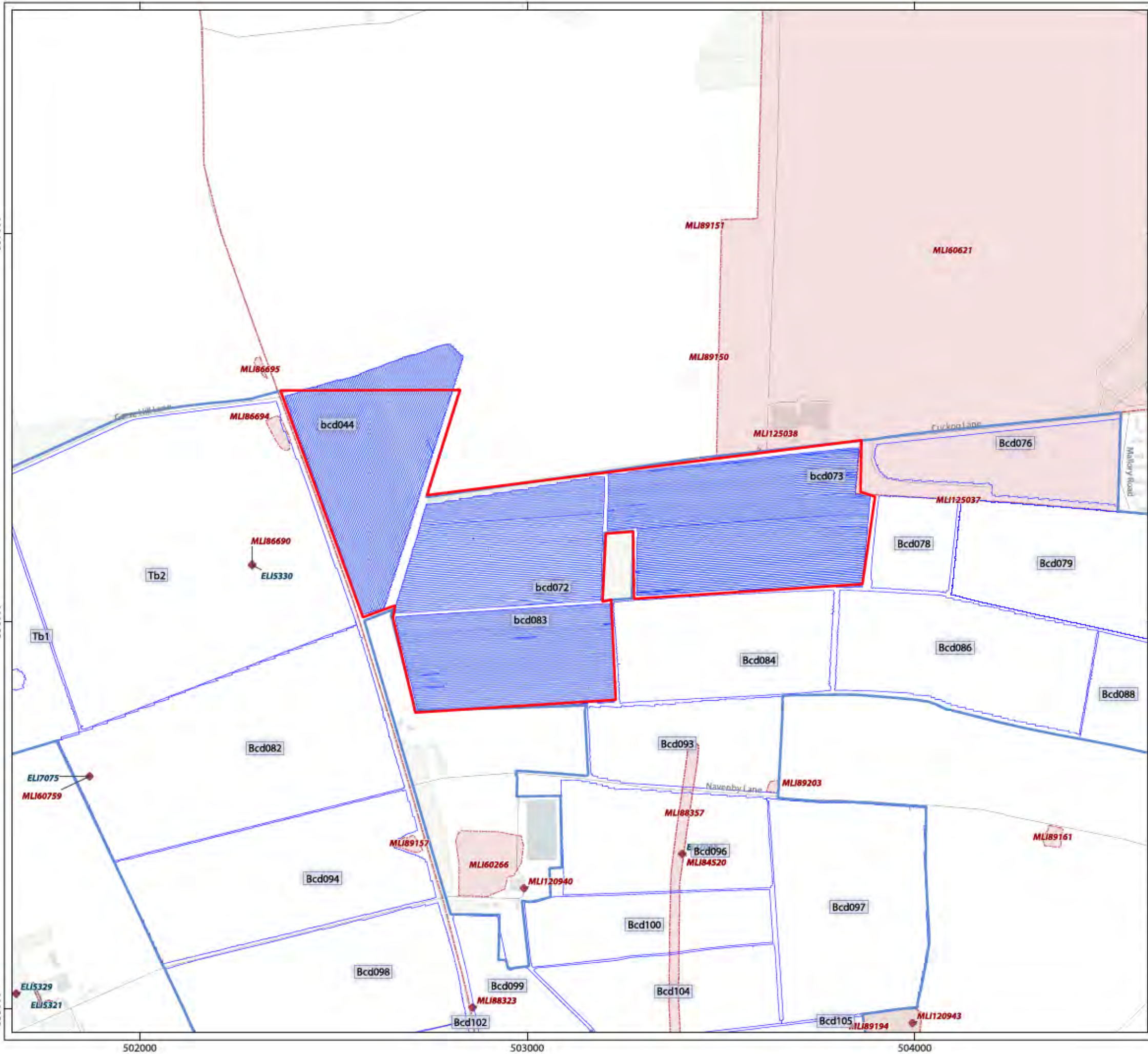
- Cable Option Route - Geophysical Survey Area
- Geophysical Survey Area
- Survey Extent
- GPS Swaths
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- ◆ Acre Lane Monuments Point
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- Acre Lane Events Polygon
- Acre Lane Monuments Polygon



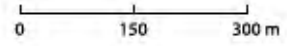
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Scale:	1:10,000 @ A3

Illus 02 - Survey location showing GPS swaths



- Key**
- Cable Option Route - Geophysical Survey Area
 - Geophysical Survey Area
 - Survey Extent
 - GPS Swaths
 - ◆ Acre Lane Events Point
 - ◆ Acre Lane Monuments Point
 - Acre Lane Monuments Line
 - Acre Lane Events Polygon
 - Acre Lane Monuments Polygon



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Illus 02 - Survey location showing GPS swaths



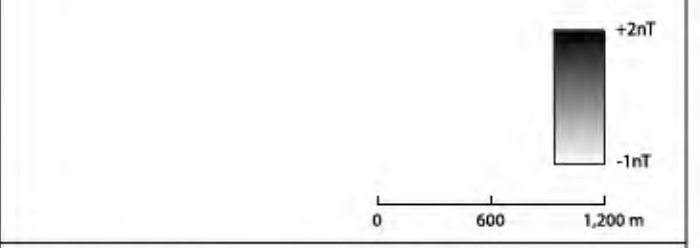


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Key

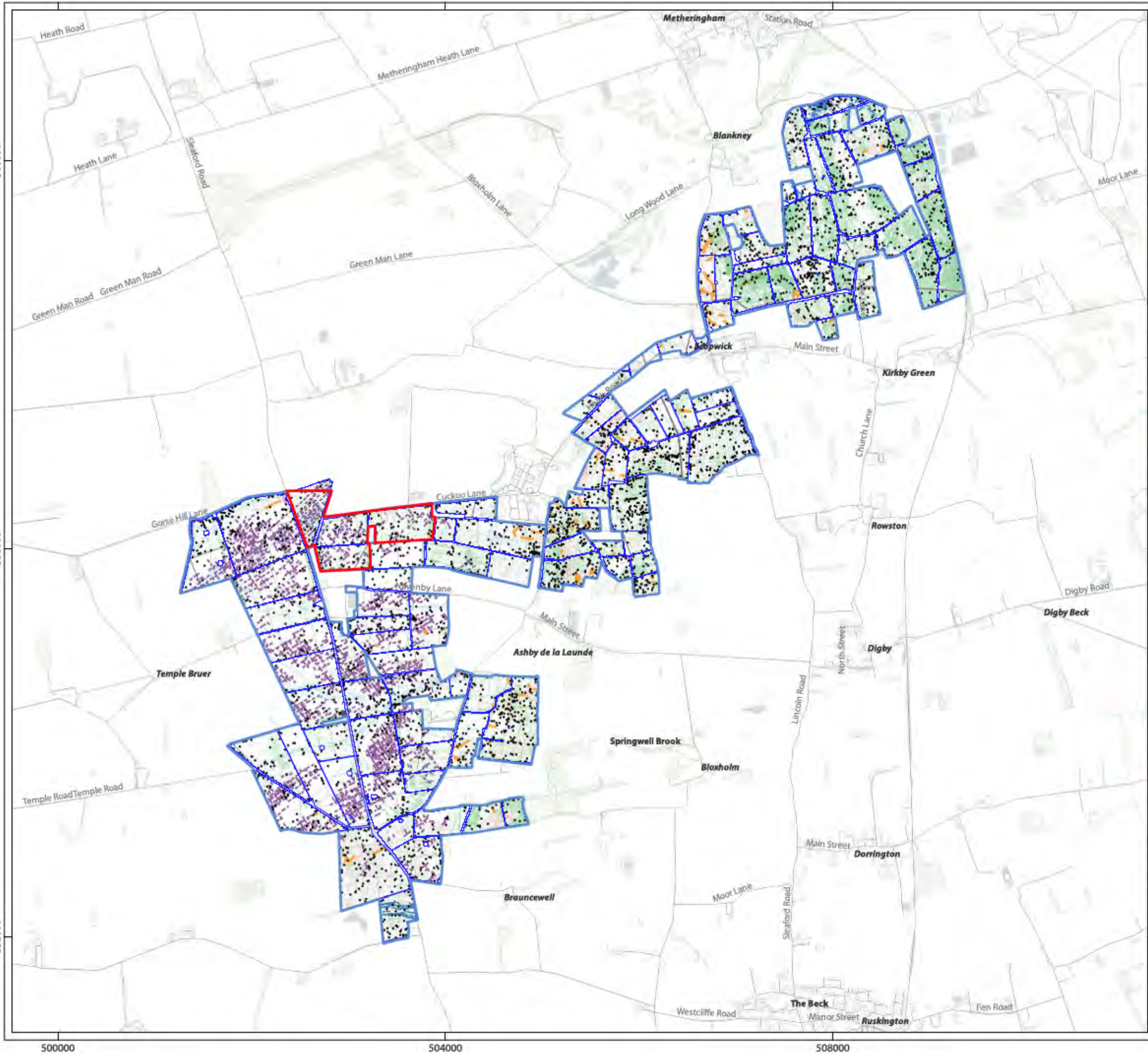
- Cable Option Route - Geophysical Survey Area
- Geophysical Survey Area
- Survey Extent



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Illus 03 - Overall greyscale plot of processed magnetometer data



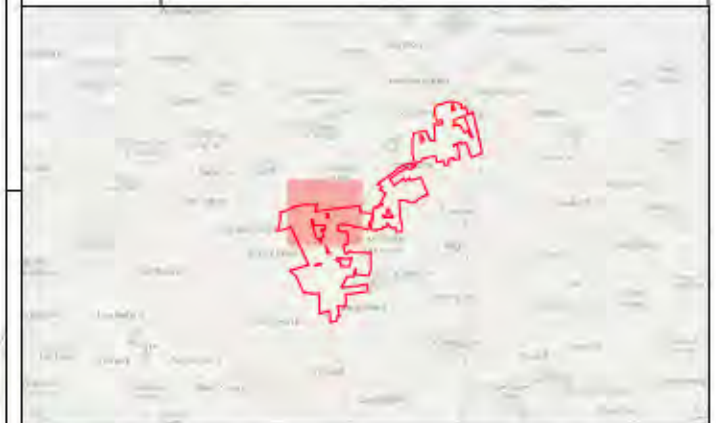
Key

- Cable Option Route - Geophysical Survey Area
- Geophysical Survey Area
- Survey Extent
- Ferrous Objects
- Agriculture
- Field Boundary
- Possible Field Boundary
- Field Drain
- Natural
- Pipe
- Uncertain
- Ridge and Furrow
- LIRM
- Field System
- Possible Archaeology
- Quarry
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Quarry
- Uncertain
- Former Building
- Former Pond
- Geology
- Kiln Burning
- Null Value



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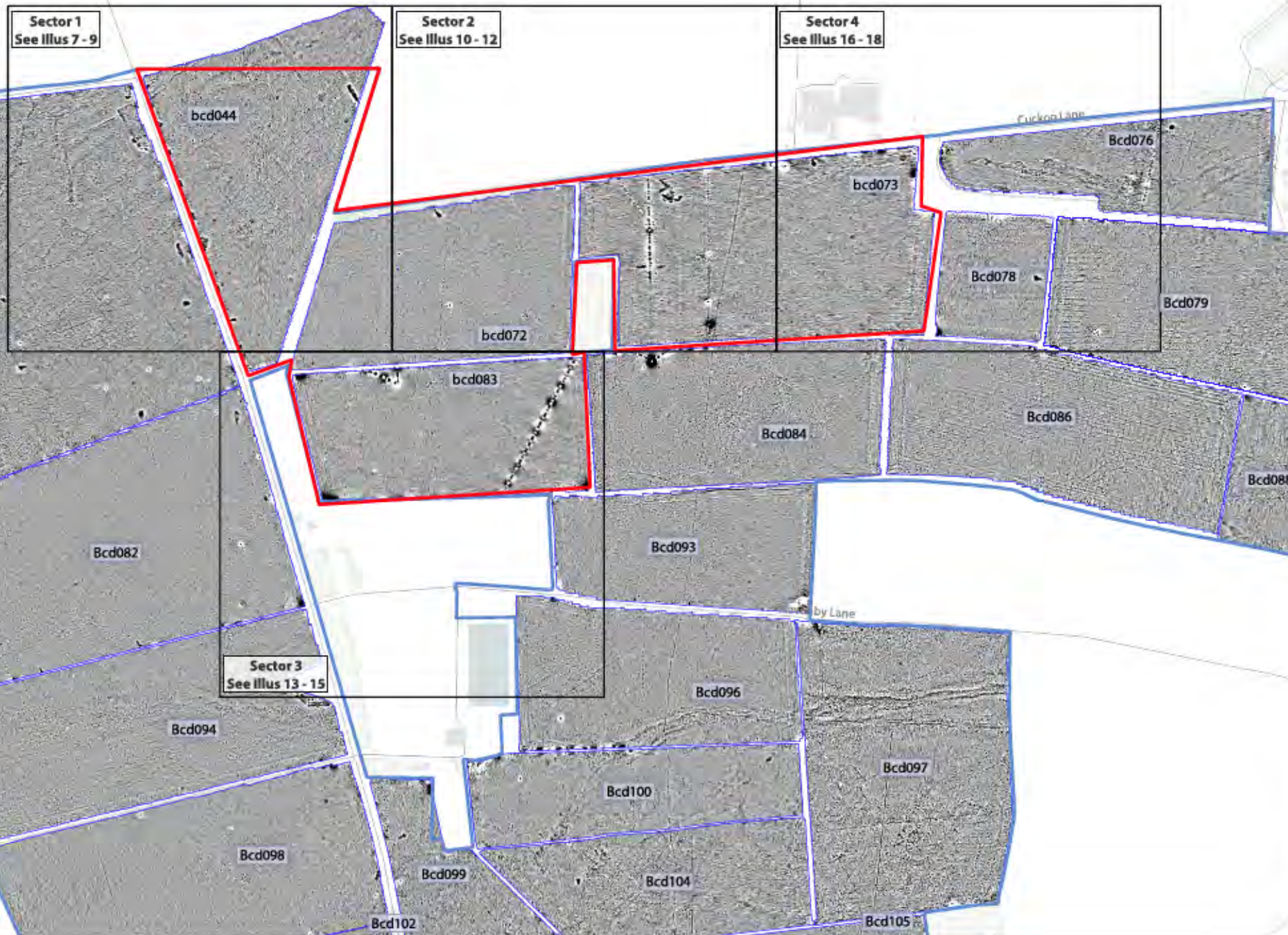
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
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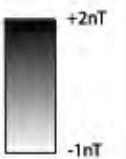
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Key

-  Cable Option Route - Geophysical Survey Area
-  Geophysical Survey Area
-  Survey Extent
-  Areas for Illus 7 - 15



0 150 300 m

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Illus 05 - Cable option route greyscale plot of processed magnetometer data



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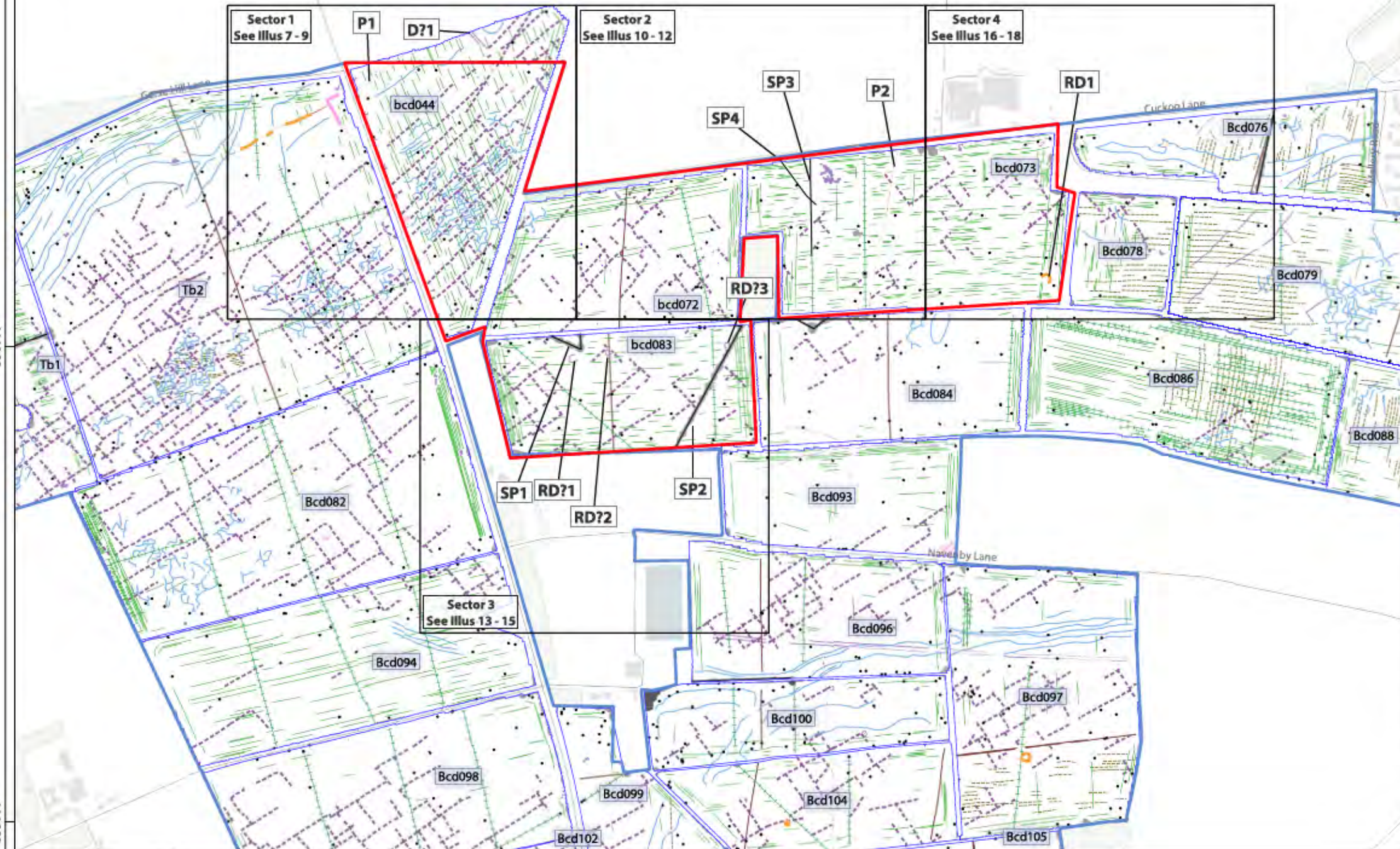
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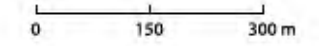


Key

- Cable Option Route - Geophysical Survey Area
- Geophysical Survey Area
- Survey Extent
- Areas for Illus 7 - 15
- Ferrous Objects
- Agriculture
- Field Boundary
- Possible Field Boundary
- Field Drain
- Natural
- Pipe
- Uncertain
- Ridge and Furrow
- Field System
- Possible Archaeology
- Quarry
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Quarry
- Uncertain
- Former Building

Abbreviations

D?	Ditch?
P	Pit Alignment
SP	Service Pipe
RD	Ring Ditch
RD?	Ring Ditch?

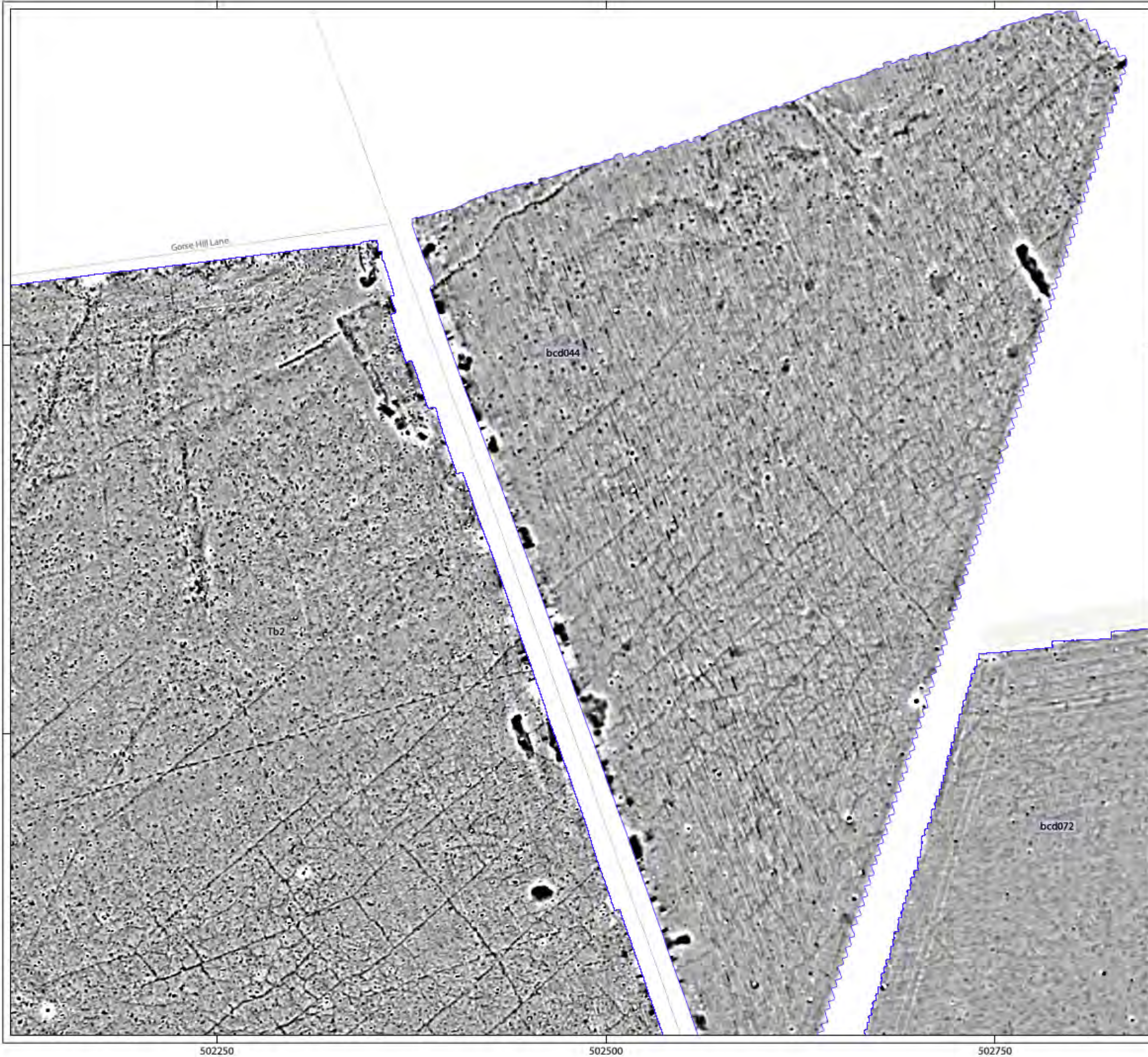


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Illus 06 - Cable option route interpretation of magnetometer data



Gorse Hill Lane

bcd044

Tb2

bcd072

356500

356250

502250

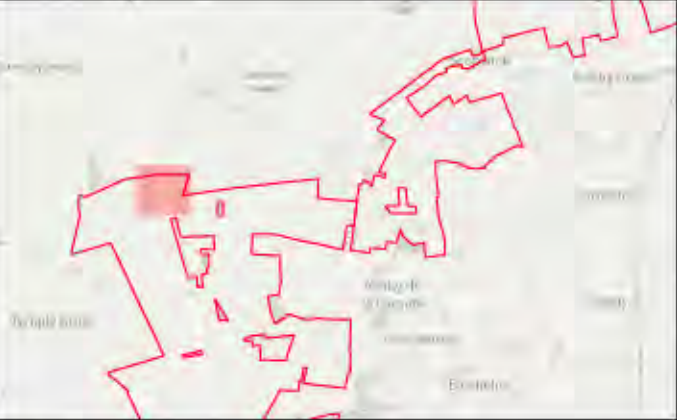
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Key

Survey Extent

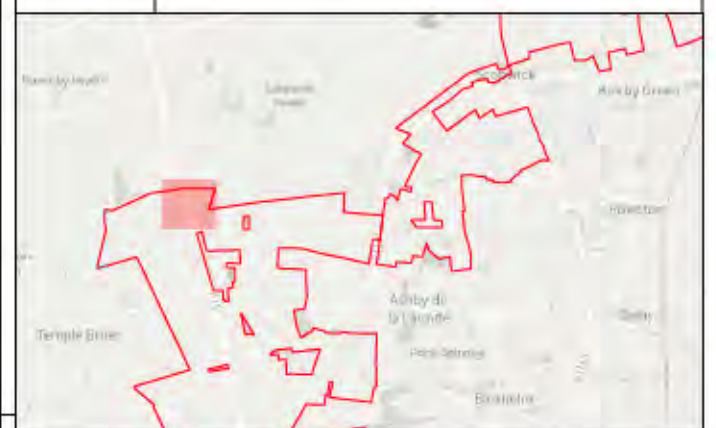
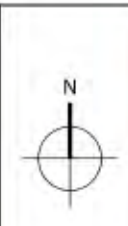
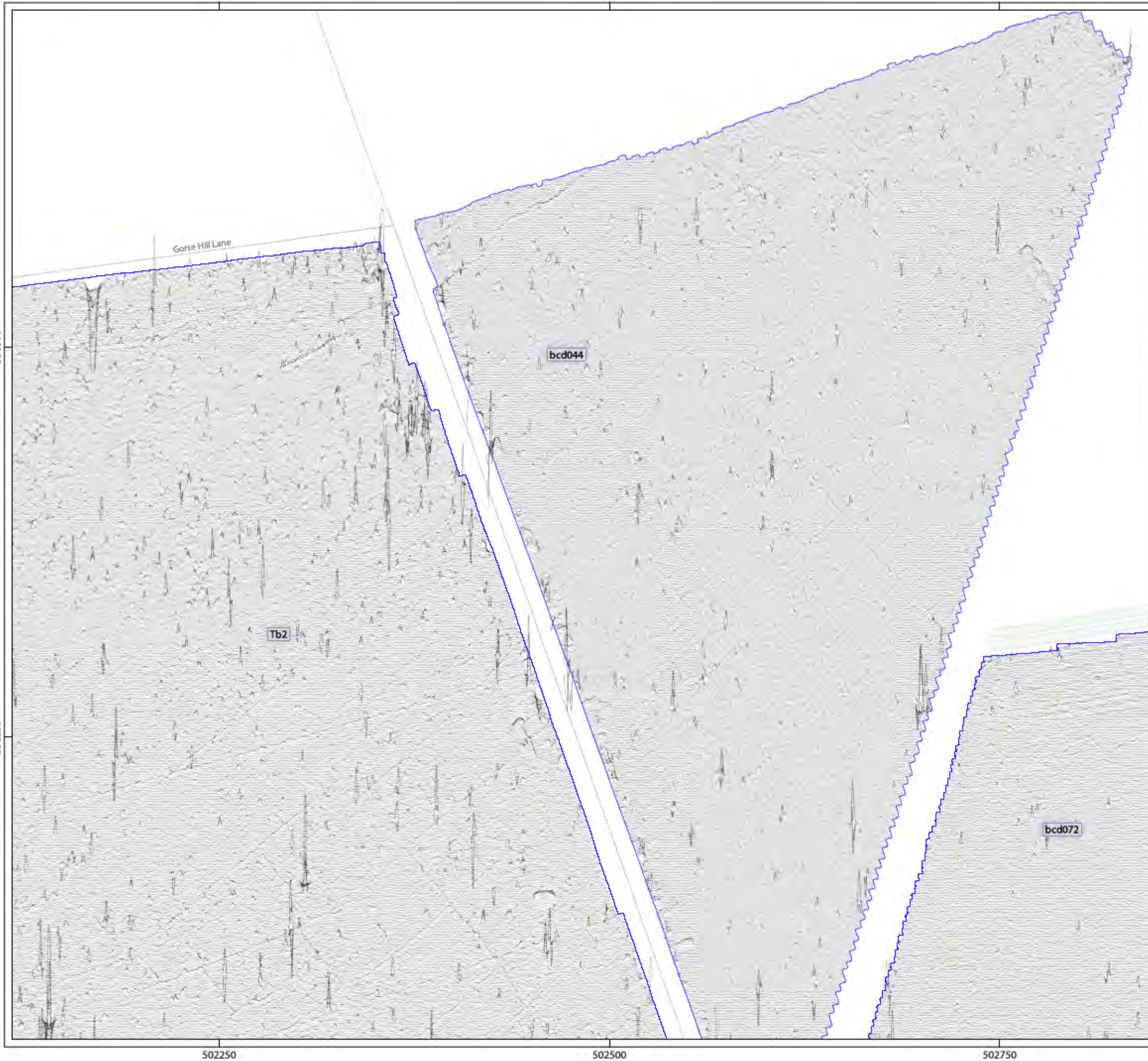


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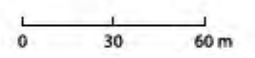
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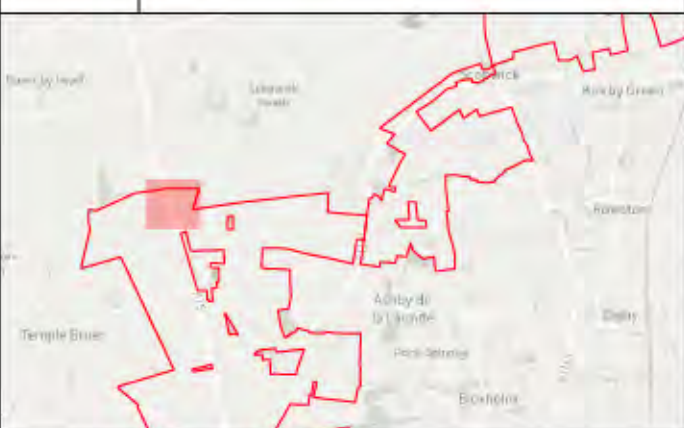
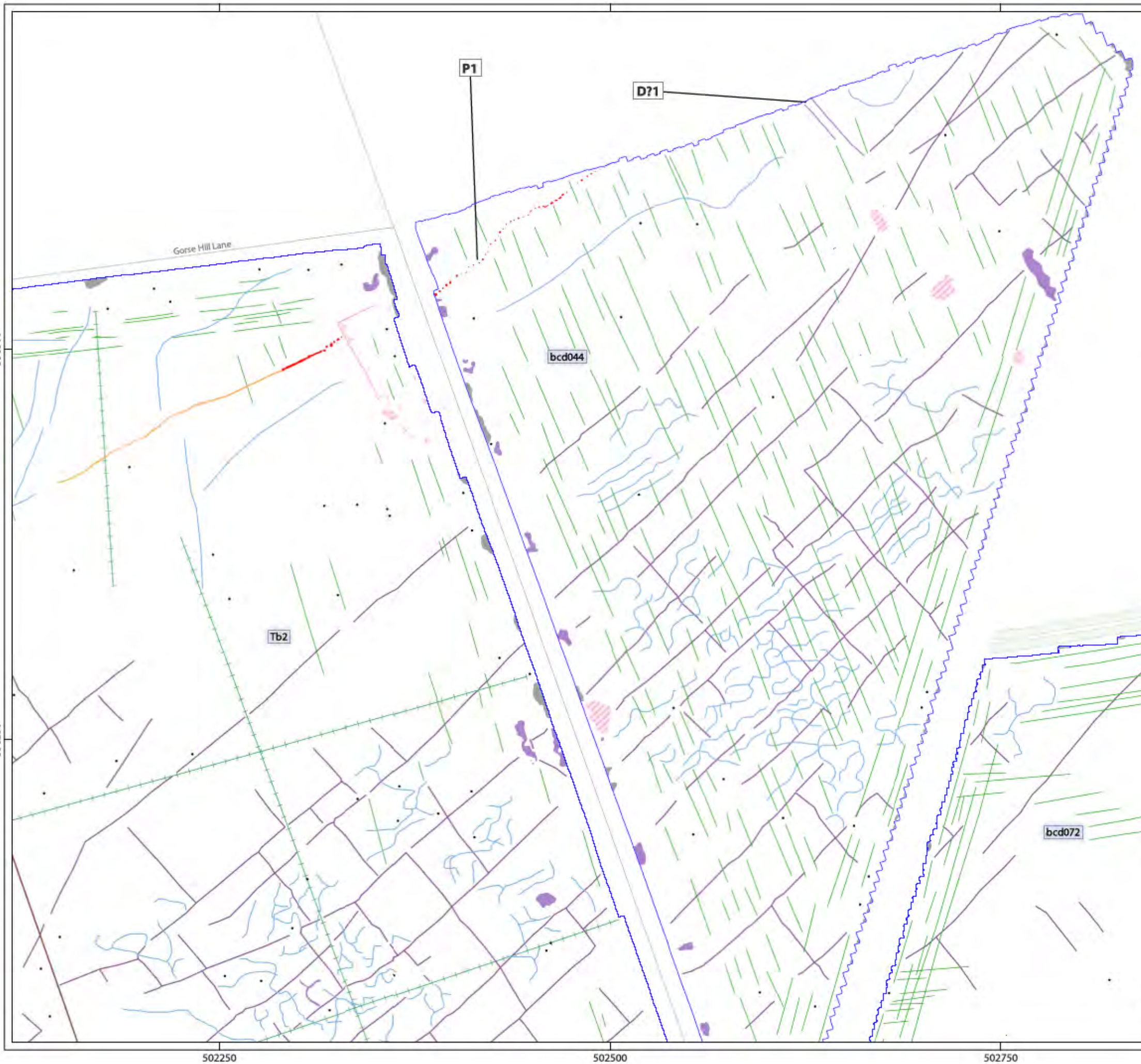


Key
 Survey Extent
 — XY Trace (25nT/cm)



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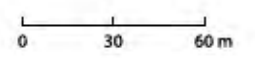


Key

- Survey Extent
- Ferrous Objects
- Agriculture
- Field Boundary
- Field Drain
- Natural
- Uncertain
- Field System
- Possible Archaeology
- Quarry
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Quarry
- Uncertain

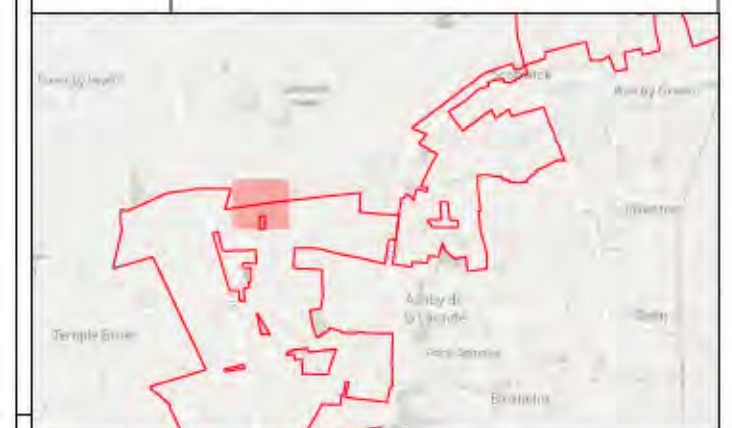
Abbreviations

D?	Ditch?
P	Pit Alignment

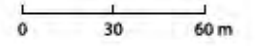
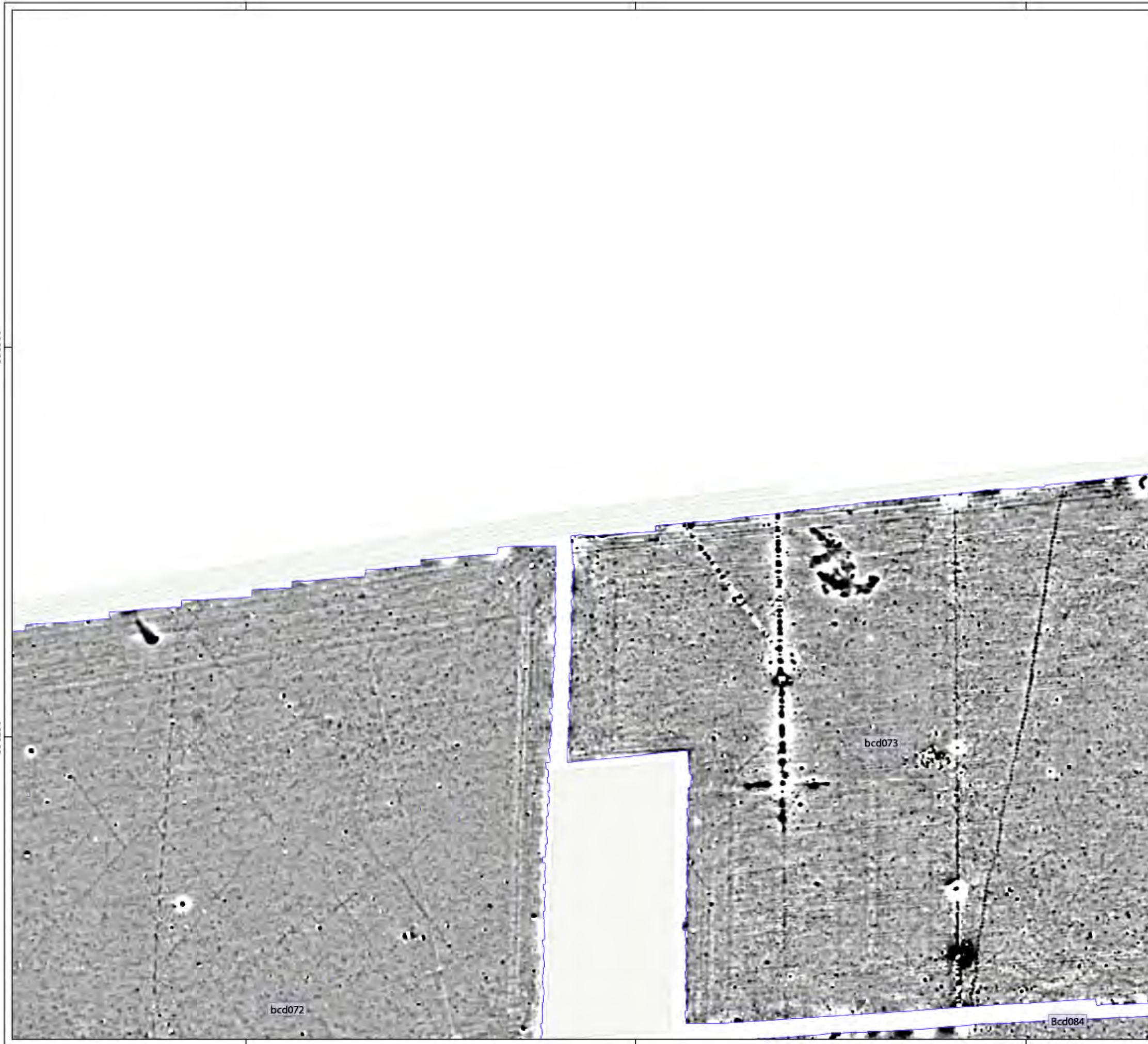


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Key
 Survey Extent



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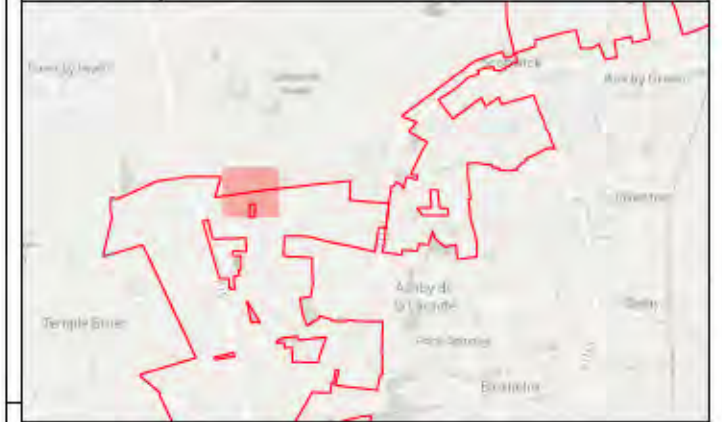
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503000

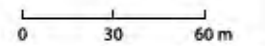
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Key

-  Survey Extent
-  XY Trace (25nT/cm)

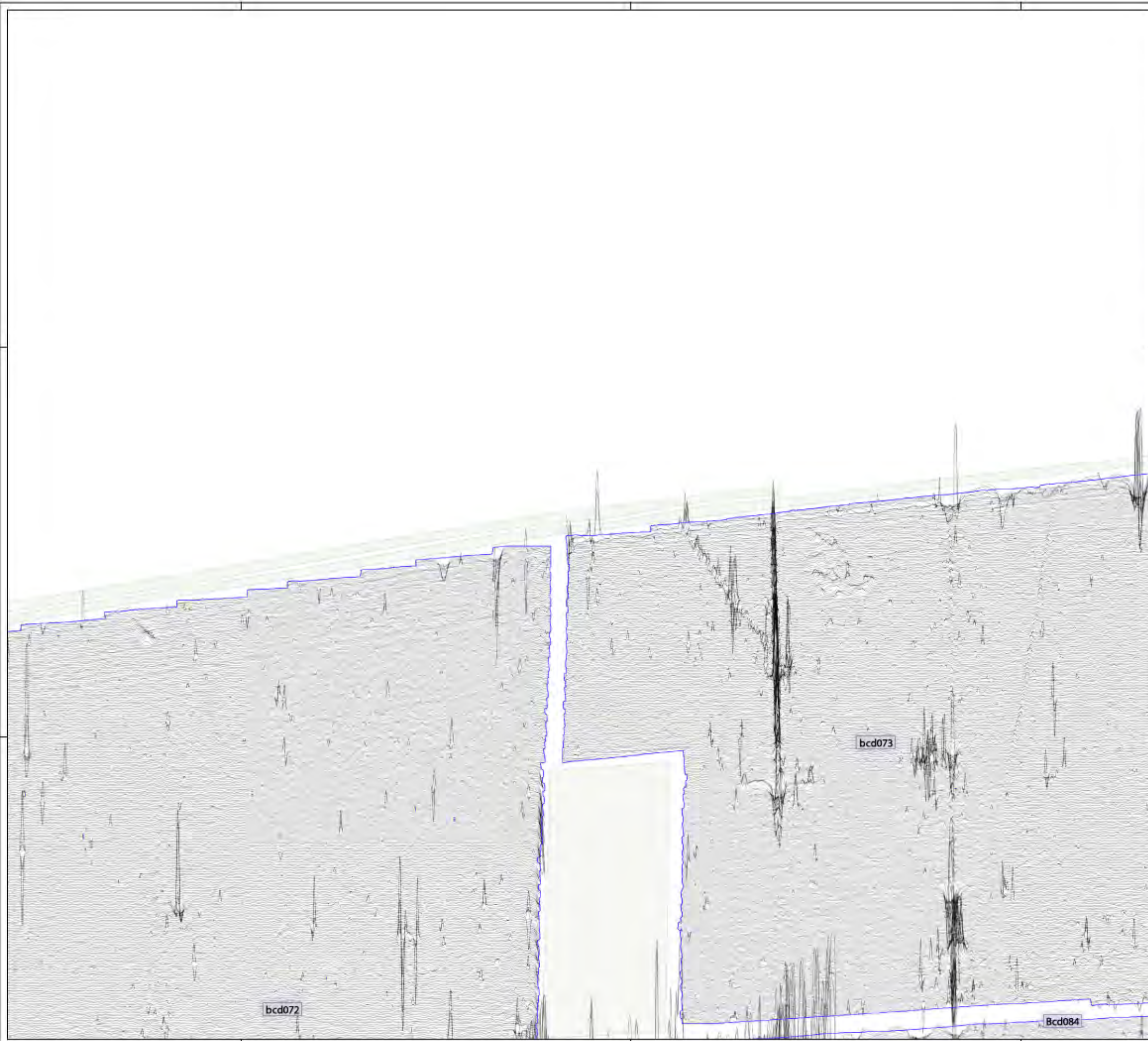


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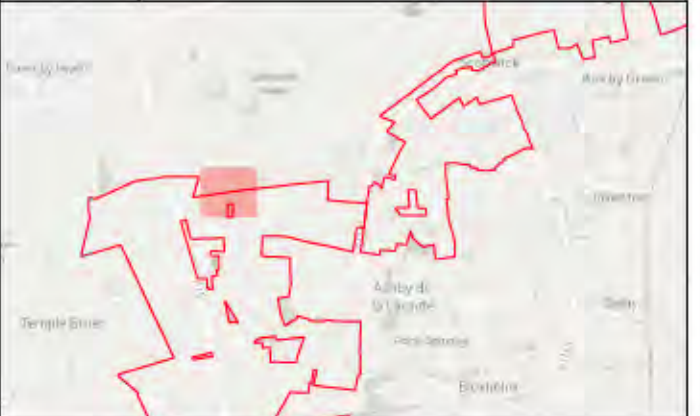
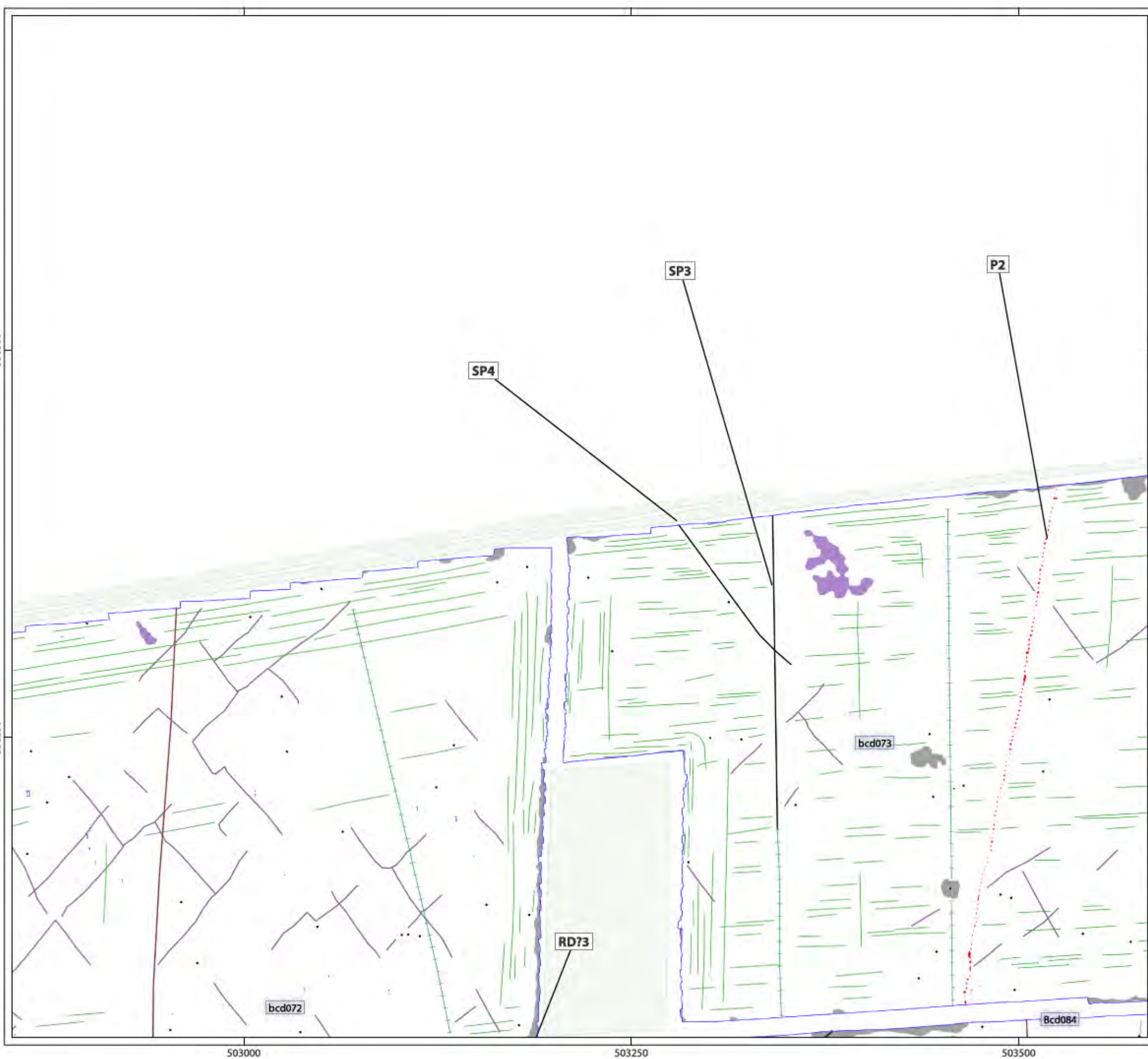
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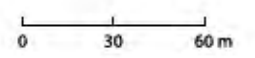


Key

- Survey Extent
- + Ferrous Objects
- Agriculture
- Field Boundary
- Field Drain
- Natural
- Pipe
- Field System
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Uncertain

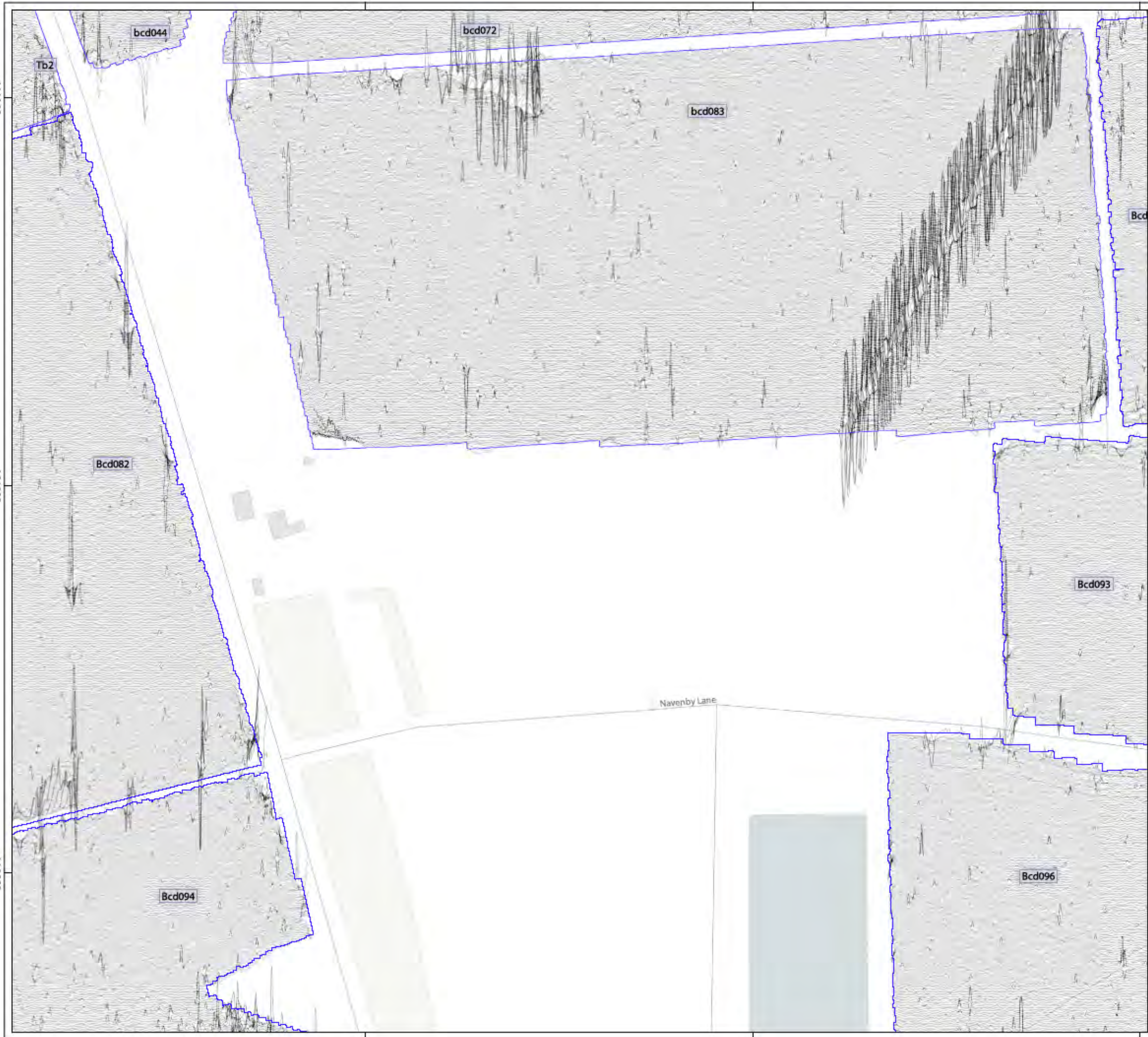
Abbreviations

P	Pit Alignment
SP	Service Pipe
RD?	Ring Ditch?



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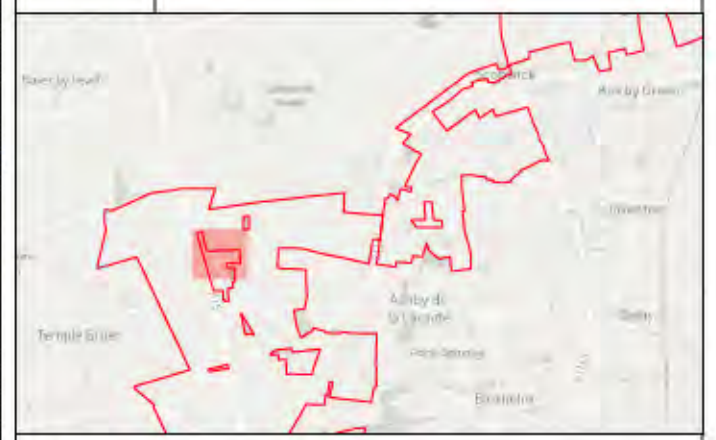
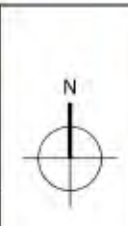
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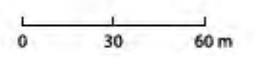
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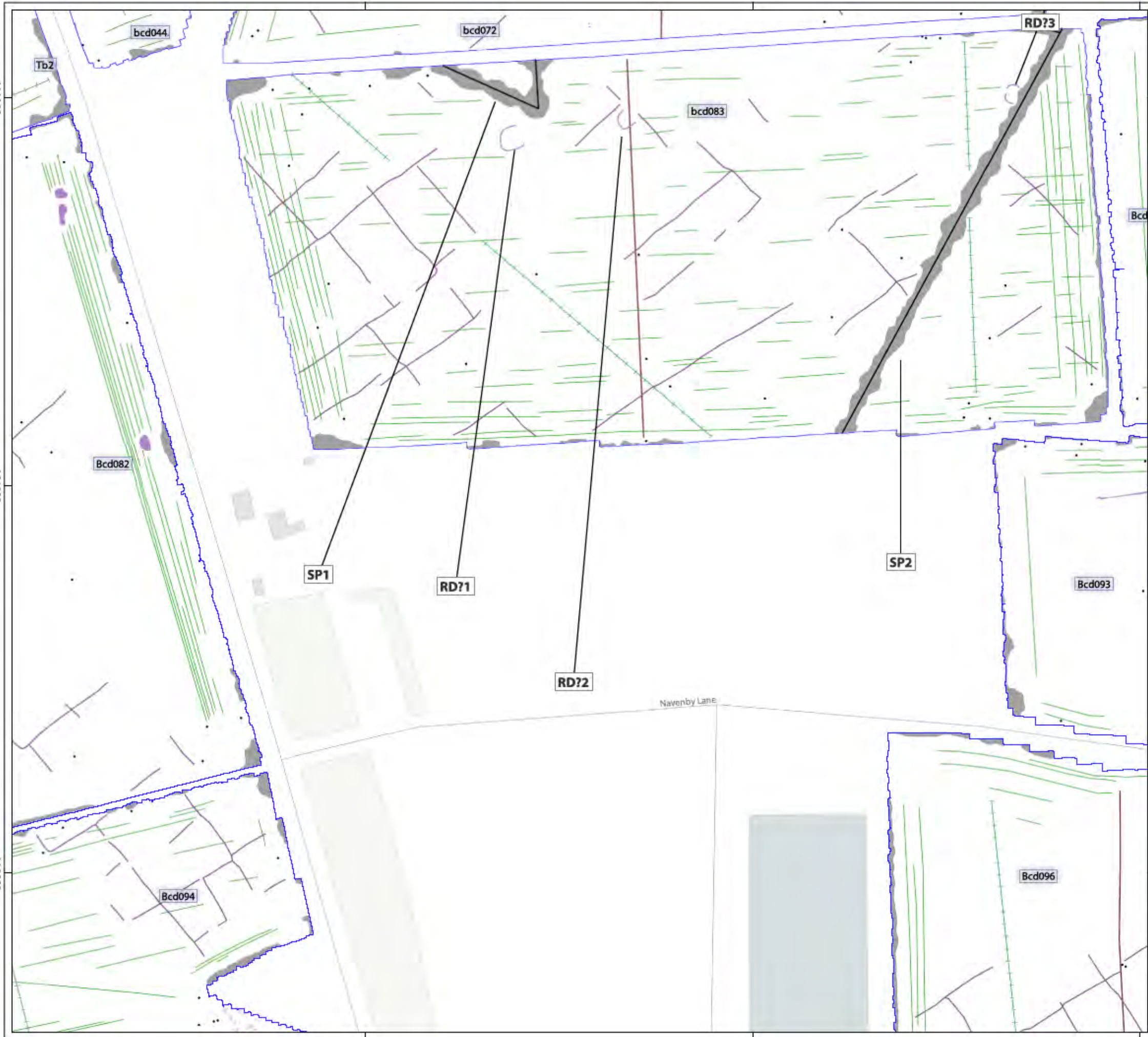
Key
 Survey Extent
 XY Trace (25nT/cm)



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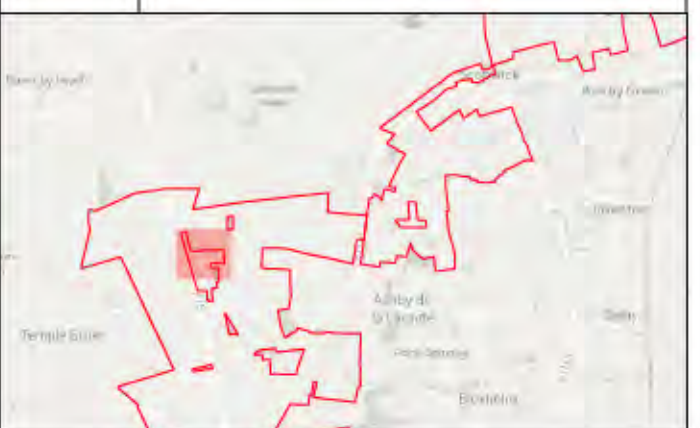
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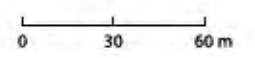


Key

- Survey Extent
- Ferrous Objects
- Agriculture
- Field Boundary
- Field Drain
- Pipe
- Uncertain
- Field System
- Magnetic Disturbance
- Quarry
- Uncertain

Abbreviations

SP	Service Pipe
RD?	Ring Ditch?

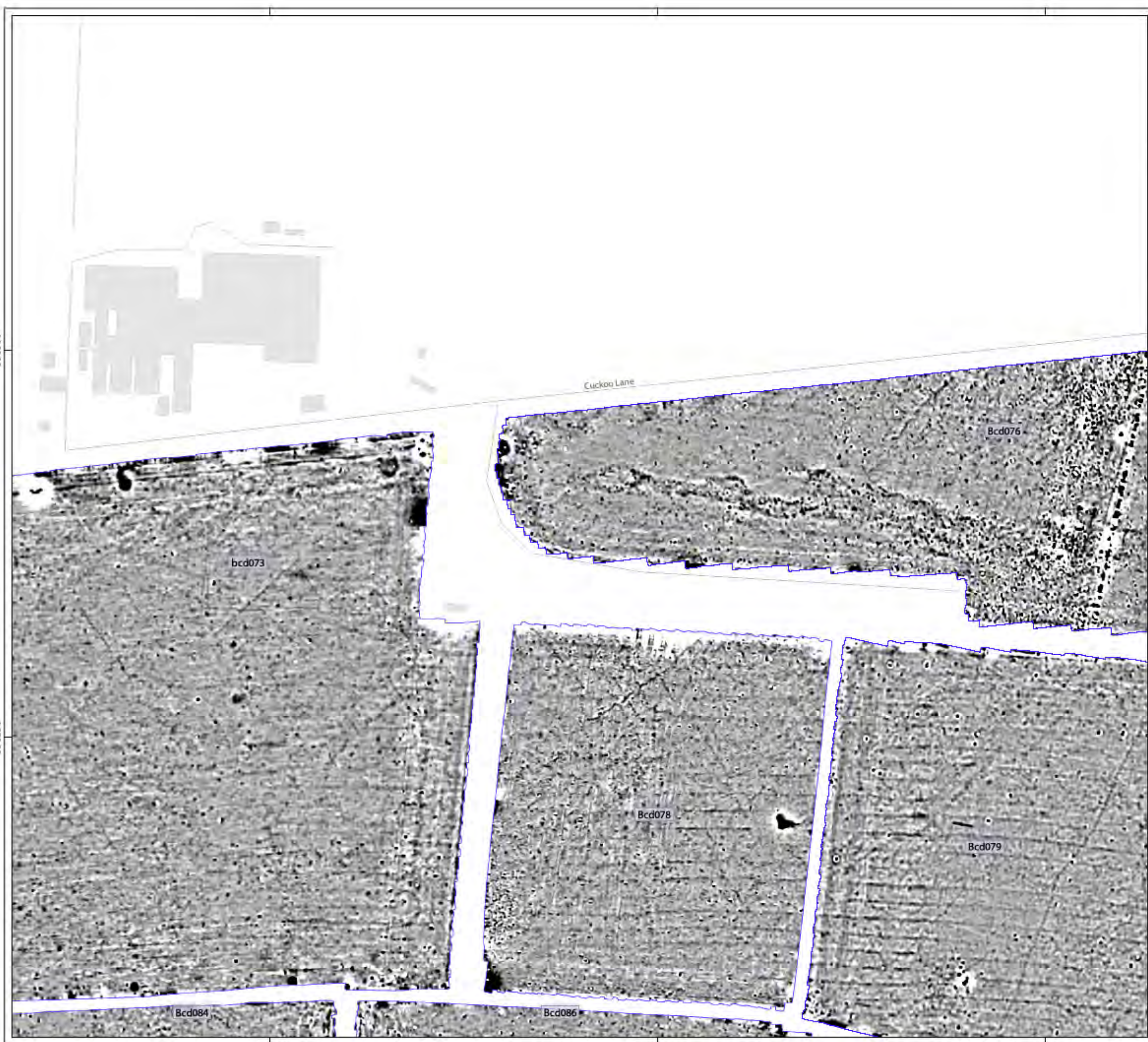


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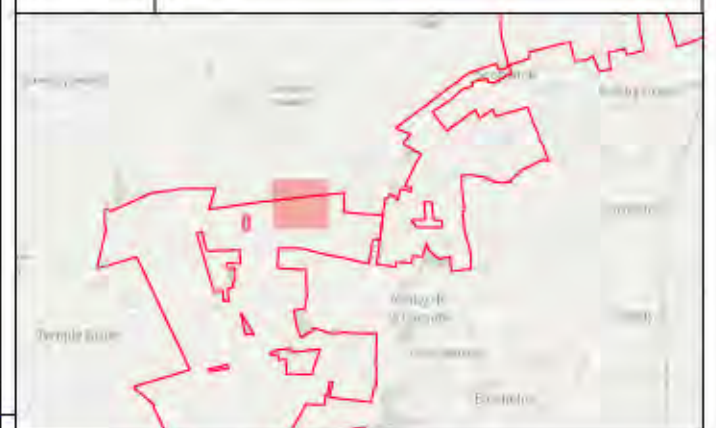
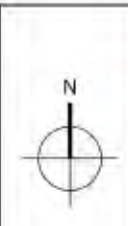
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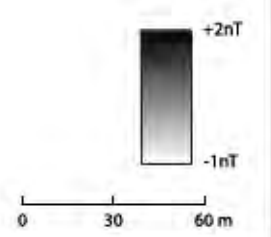
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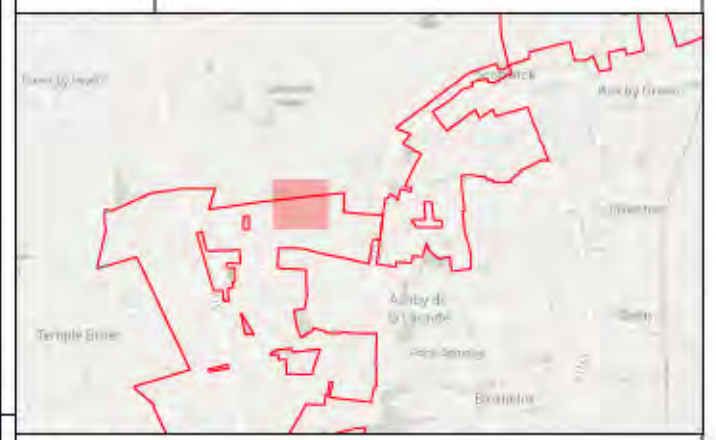
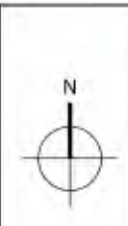
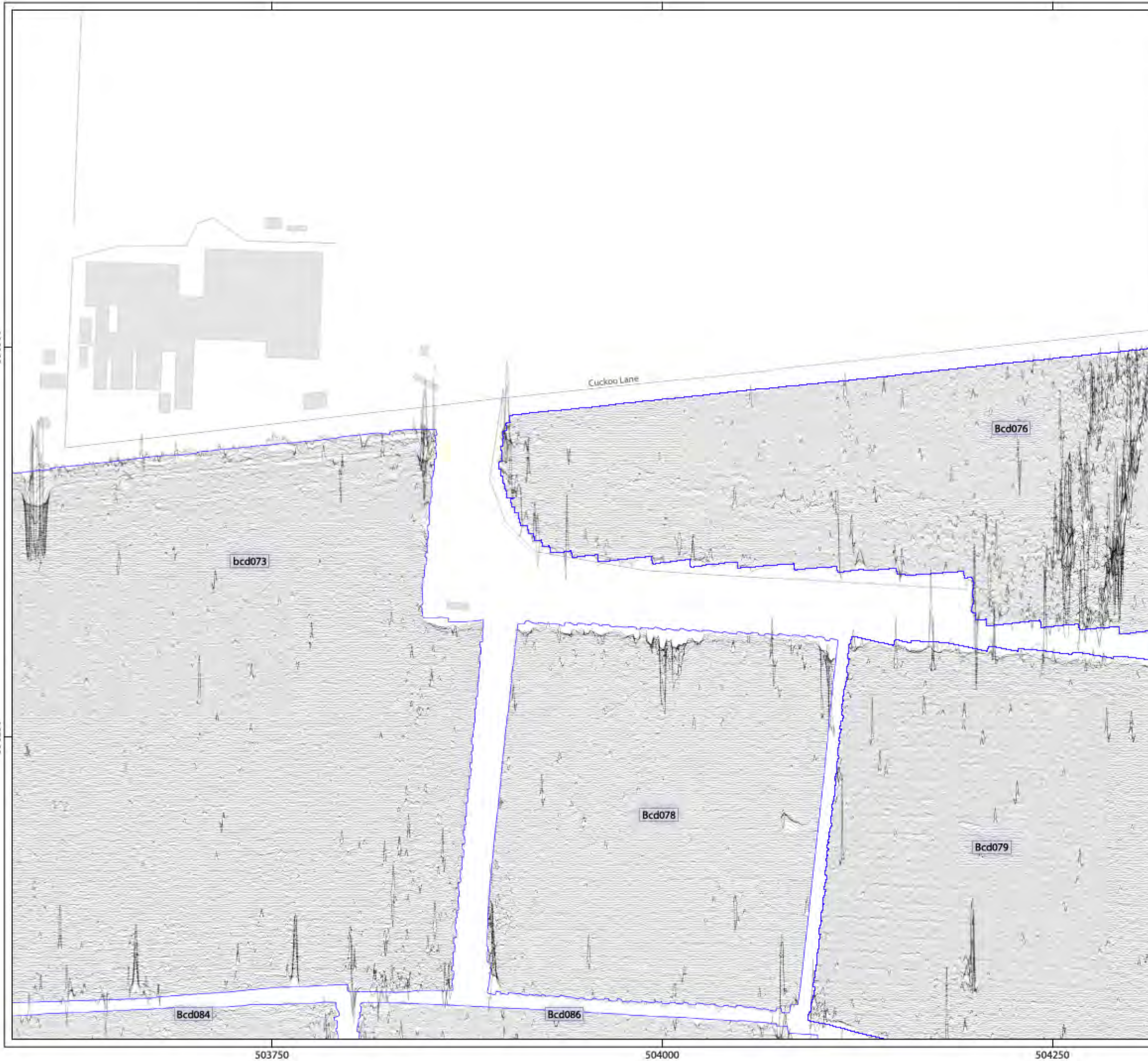


Key
 Survey Extent

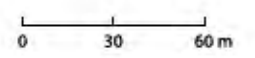


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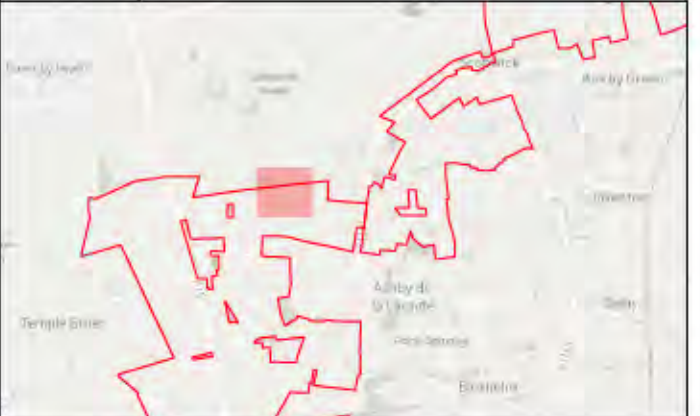


Key
 Survey Extent
 XY Trace (25nT/cm)



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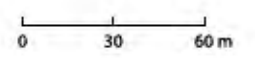


Key

- Survey Extent
- Ferrous Objects
- Agriculture
- Field Boundary
- Field Drain
- Natural
- Pipe
- Uncertain
- Ridge and Furrow
- Field System
- Possible Archaeology
- Archaeology
- Magnetic Disturbance
- Possible Archaeology
- Uncertain

Abbreviations

RD Ring Ditch



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Scale:	1:2,500 @ A3

7 APPENDICES

APPENDIX 1 MAGNETOMETER SURVEY

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 haematite. 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 so that by measuring the magnetic susceptibility of the topsoil, areas where human occupation or settlement has occurred can be identified by virtue 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 the topsoil, subsoil and rock 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 (clay) can also be enhanced by the application of heat. This effect can lead to the detection of heat affected features such as hearths, kilns or areas of burning.

Types of magnetic anomaly

In most cases 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 introduced into the soil during 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.

Lightning-induced remnant magnetisation (LIRM) LIRM anomalies are thought to be caused in the near surface soil horizons by the flow of an electrical current associated with lightning strikes. These observed anomalies have a strong bipolar signal which decreases with distance from the spike point and often appear as linear or radial in shape.

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 (sometimes only visible on an XY trace plot) 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.

APPENDIX 2 SURVEY LOCATION INFORMATION

An initial survey base station was established using a Trimble VRS differential Global Positioning System (dGPS). The magnetometer data was georeferenced using a Trimble RTK differential Global Positioning System (Trimble R8s model).

Temporary sight markers were laid out using a Trimble VRS differential Global Positioning System (Trimble R8s model) to guide the operator and ensure full coverage. The accuracy of this dGPS equipment is better than 0.01m.

The survey data 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 coordinates are measured off hard copies of the mapping rather than using the digital coordinates.

Headland Archaeology cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party.

APPENDIX 3 GEOPHYSICAL SURVEY ARCHIVE

The geophysical archive comprises an archive disk containing the raw data in XYZ format, a raster image of each greyscale plot with associate world file, and a PDF of the report.

The project will be archived in-house in accordance with recent good practice guidelines [REDACTED]. [REDACTED] The data will be stored in an indexed archive and migrated to new formats when necessary.

APPENDIX 4 MAGNETOMETER DATA PROCESSING

The gradiometer data has been presented in this report in processed greyscale and minimally processed XY trace plot format.

Data collected using RTK GPS-based methods cannot be produced without minimal processing of the data. The minimally processed data has been interpolated to project the data onto a regular grid and de-striped to correct for slight variations in instrument calibration drift and any other artificial data.

A high pass filter has been applied to the greyscale plots to remove low frequency anomalies (relating to survey tracks and modern agricultural features) to maximise the clarity and interpretability of the archaeological anomalies.

The data has also been clipped to remove extreme values and to improve data contrast.



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APPENDIX 2 MAGNETOMETER SURVEY

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 haematite. 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 so that by measuring the magnetic susceptibility of the topsoil, areas where human occupation or settlement has occurred can be identified by virtue 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 the topsoil, subsoil and rock 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 (clay) can also be enhanced by the application of heat. This effect can lead to the detection of heat affected features such as hearths, kilns or areas of burning.

Types of magnetic anomaly

In most cases 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 introduced into the soil during 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.

Lightning-induced remnant magnetisation (LIRM) LIRM anomalies are thought to be caused in the near surface soil horizons by the flow of an electrical current associated with lightning strikes. These observed anomalies have a strong bipolar signal which decreases with distance from the spike point and often appear as linear or radial in shape.

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 (sometimes only visible on an XY trace plot) 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.

APPENDIX 3 SURVEY LOCATION INFORMATION

An initial survey base station was established using a Trimble VRS differential Global Positioning System (dGPS). The magnetometer data was georeferenced using a Trimble RTK differential Global Positioning System (Trimble R8s model).

Temporary sight markers were laid out using a Trimble VRS differential Global Positioning System (Trimble R8s model) to guide the operator and ensure full coverage. The accuracy of this dGPS equipment is better than 0.01m.

The survey data 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 coordinates are measured off hard copies of the mapping rather than using the digital coordinates.

Headland Archaeology cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party.

APPENDIX 4 GEOPHYSICAL SURVEY ARCHIVE

The geophysical archive comprises an archive disk containing the raw data in XYZ format, a raster image of each greyscale plot with associate world file, and a PDF of the report.

The project will be archived in-house in accordance with recent good practice guidelines [REDACTED].
[REDACTED] The data will be stored in an indexed archive and migrated to new formats when necessary.

APPENDIX 5 MAGNETOMETER DATA PROCESSING

The gradiometer data has been presented in this report in processed greyscale and minimally processed XY trace plot format.

Data collected using RTK GPS-based methods cannot be produced without minimal processing of the data. The minimally processed data has been interpolated to project the data onto a regular grid and de-striped to correct for slight variations in instrument calibration drift and any other artificial data.

A high pass filter has been applied to the greyscale plots to remove low frequency anomalies (relating to survey tracks and modern agricultural features) to maximise the clarity and interpretability of the archaeological anomalies.

The data has also been clipped to remove extreme values and to improve data contrast.



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Appendix 8.4

Listed Building Visibility



Table A8.1: Listed buildings not predicted to have visibility of the proposed development

List Entry	Name	Grade
1061823	Cottages In Theaker's Yard	II
1061844	Stables To Welbourn Manor	II
1061845	Welland Cottage	II
1061846	The Old House	II
1061847	Burtts Cottage	II
1061848	Myrtle Cottage And Co-Operative Cottages	II
1061849	Blacksmith's Forge	II
1061850	27, High Street	II
1061851	Welbourn House	II
1061852	Church Of St Chad	I
1061853	Hill House	II
1061864	1 And 2, West Street	II
1061880	House At Rear Of No 10 High Street	II
1061881	Stoneacres	II
1061882	Butcher's Arms	II
1061883	25, High Street	II
1061884	The Grange	II
1061885	63, High Street	II
1061908	Orchard House	II
1061909	Star And Garter Public House	II
1061910	Field House And Wall To Nocton Hall	II*
1061911	Church Of All Saints	II*
1061912	Park Farmhouse	II
1061913	The Old Post Office	II
1061914	Lodge To Nocton Hall	II
1061939	Cottage To East Of Brook Cottage	II
1061940	Dunston House	II
1061941	Church Farmhouse	II
1061943	Church Of St Peter	II
1061944	1, Drury Street	II
1061945	Methodist Church And Hall	II
1061946	White Hart Public House	II
1061947	46, High Street	II
1061948	The Grange	II
1061977	Church View And Gates	II
1061978	Manor Farm And Outbuildings	II
1064285	Church Of St Oswald	II*
1064286	The Old School	II
1064287	Village Hall	II

List Entry	Name	Grade
1064288	The Lodge	II
1064289	Stonehaven And Attached Cottage	II
1064290	Kennel House	II
1064305	K6 Telephone Kiosk	II
1147458	Church Of St Peter	I
1147477	Clint House, And Clint Cottage	II
1147517	20, High Street	II
1147527	The Bakery	II
1147533	King's Head	II
1147537	The Lion And Royal Public House	II
1147557	Tana Cottage	II
1147619	Trevella	II
1147625	Barn At Greengates	II
1147631	Welbourn Farmhouse	II
1147800	Rovistan House	II
1147811	Goat Cottage	II
1165640	Church Of St Wilfred	II*
1165689	29, Drury Street	II
1165707	Pair Of Cottages To Rear Of No 8	II
1165828	18-21, Main Road	II
1165852	Lodge In Grounds Of Nocton Hall	II
1205442	Lychgate To St Oswald's Church	II
1205446	Stable Block At Blankney Hall	II
1205456	Post Office And Attached Cottage	II
1205464	Pair Of Cottages To South Of Village Hall	II
1205469	Kingfisher Cottage	II
1205477	Cosi-Cot And Attached Cottage	II
1205493	Holy Trinity Church	II
1205514	Barn To West Of Manor House Farmyard	II
1205554	Village Farmhouse And Number 5	II
1205586	Church Of St Andrew	II*
1205610	Thorpe Tilney Hall	II
1241051	K6 Telephone Kiosk On The Village Green	II
1247059	K6 Opposite The Lion And Royal Public House	II
1254077	Gatepiers 20 Metres West Of Church Of St Mary	II
1254083	Hall Farmhouse	II
1254084	Village Cross	II
1254085	Church Of St James And St John	I
1254155	17-23, North Road	II
1254166	Church Of St Andrew	I
1254173	Beck House	II
1254201	Dorrington House	II

List Entry	Name	Grade
1254203	Gates To Dorrington House	II
1254205	Hall Farmhouse	II
1254206	Milepost 3 Metres South Of Hall Farmhouse	II
1254207	Leasingham Hall	II
1254210	Wellhead 10 Metres North Of Rookery Cottage	II
1254265	Wellhead To Rear Of No 18	II
1254324	Holme Farmhouse	II
1254325	2, Manor Street	II
1261162	K6 Telephone Kiosk To East Of Blankney School	II
1261359	Temple Farmhouse	II
1261371	The Manor	II*
1261375	Church Of All Saints	I
1261412	The Priory	II
1261413	Church Of St Andrew	I
1261414	The Old House	II
1261415	Homeleigh / Llanberis	II
1261470	Icehouse 20 Metres North Of Ashby Hall, Stable Block	II
1280640	25 And 27, Main Street	II
1280648	The Royal Oak	II
1280682	Range Of Farmbuildings To South Of Home Farm House	II
1280685	Village Farmhouse And Attached Railings	II
1307159	Church Of St Hybald	II*
1308462	Stable To Rear Of Greystone Cottage	II
1317180	Market Cross	II
1317189	38, High Street	II
1317194	56, High Street	II
1317224	The Old Vicarage	II
1317250	6,7, Lincoln Road	II
1317253	Blue House	II
1359357	Carr Dyke Farmhouse And Attached Outbuilding	II
1359359	Winfred And Attached Cottage	II
1359360	Blackney Golf Clubhouse And Attached Cottage	II
1359361	Home Farmhouse	II
1359364	The Village Cross	II
1359366	The Manor House	II
1359367	The Old School	II
1359369	2, West Street	II
1360510	Southview	II
1360513	The Pinfold	II
1360534	War Memorial	II
1360535	Nook House And No 36	II
1360536	Pitts Farmhouse	II

List Entry	Name	Grade
1360543	3, East Road	II
1360544	Stonyhurst	II
1360545	51, High Street	II
1360557	Windmill	II
1360558	Manor House	II
1360559	Nocton School And School Masters House	II
1360561	Nocton Hall	II
1360567	Welbourn Manor	II*
1360568	Wheelwright Cottage	II
1360570	Hunt House	II
1360571	Greystone Cottage	II
1360573	The Close	II
1360574	Corner House	II
1360575	The Old Mill House	II
1360576	Greystones	II
1360596	The Lodge	II
1360597	Barn In Theaker's Yard	II
1360600	Stable Block To The North Of Ashby Hall	II
1391598	Building 16 (lot Headquarters)	II
1391599	Building 259 (Station Headquarters)	II
1391601	Building 279 (York House)	II
1391705	War Memorial In The Churchyard Of Holy Cross Church	II
1413991	Blankney Signal Box	II
1439202	Martin War Memorial	II

Table A8.2: Listed dwellings in settlements over 1km from Site

List Entry	Name	Grade
1147759	The Garth	II
1254212	The Close	II
1261333	1, Pinfold Lane	II
1261356	6 And 8 Jubilee Street	II
1261357	14 And 16 Manor Street	II
1261411	Kew Cottage	II
1280624	School House	II
1280659	Rowston Manor	II
1308381	Double Oxer	II
1308383	The Den	II
1308386	Doughty's Cottage	II
1308493	2, High Street	II

List Entry	Name	Grade
1360512	Brankley House	II
1360542	10 Church Lane	II
1360546	Dail House	II
1061854	Laburnum House And Country Set Salon	II
1061857	The Annexe	II
1061858	The Manor House	II
1061859	The Old Bakehouse	II
1061860	The Island And Outbuilding And Garden Wall	II
1061861	The Cottage South-East Of Sunningdale	II
1061862	The Old Sweet Shop	II
1061863	Beehive Cottage	II
1064303	Clifton House	II
1147649	The Cottage	II
1147678	Cottage To North Of The Annexe	II
1147775	Saddlers Cottage	II
1254076	The Round House	II

Table A8.3: Findspots recorded by Lincolnshire HER within the Site

LCC HER reference:	Name
MLI60508	Palaeolithic Hand Axe
MLI60579	Late Neolithic Polished Stone Axehead
MLI84530	Roman Oil Lamp
MLI86164	Romano-British Finds
MLI82650	Brass Jetton Found South Of Blankney Hall
MLI82653	Roman Coin From Near Brickyard Farm
MLI86690	Middle Bronze Age Socketed Spearhead, Near Ermine Street, Temple Bruer With Temple High Grange
MLI87384	A Few Romano-British Pot Sherds, North Of Kirkby Green, Scopwick
MLI86162	Bronze Pendant From West Of Dunsby Pit Plantation, Brauncewell

Table A8.4: Farmhouses and agricultural buildings over 1km from the site

List Entry	Name	Grade
1280733	Green Man Farmhouse	II
1261474	Manor Farmhouse	II
1061855	Home Farmhouse	II
1064291	Wright's Farmhouse	II
1166117	Ryland Grange Farmhouse	II
1254326	Brook Farmhouse	II
1261358	White House Farmhouse	II
1147669	Barn At Home Farm	II
1254211	Dovecote 15 Metres North West Of Roxholm Hall	II
1205500	The Manor House	II
1359362	Coach House And Stable Block To The North Of The Manor House	II
1359368	Evans Farmhouse	II
1254111	Bloxholm Hall Farmhouse	II
1254078	Stable Block At Bloxholm Hall Farmhouse	II

Appendix 8.5

Listed Dwellings in Settlements over
1km from the Site



Listed dwellings in settlements over 1km from Site

List Entry	Name	Grade
1147759	The Garth	II
1254212	The Close	II
1261333	1, Pinfold Lane	II
1261356	6 and 8 Jubilee Street	II
1261357	14 and 16 Manor Street	II
1261411	Kew Cottage	II
1280624	School House	II
1280659	Rowston Manor	II
1308381	Double Oxer	II
1308383	The Den	II
1308386	Doughty's Cottage	II
1308493	2, High Street	II
1360512	Brankley House	II
1360542	10 Church Lane	II
1360546	Dail House	II
1061854	Labumum House And Country Set Salon	II
1061857	The Annexe	II
1061858	The Manor House	II
1061859	The Old Bakehouse	II
1061860	The Island and outbuilding and garden wall	II
1061861	The Cottage south-east of Sunningdale	II
1061862	The Old Sweet Shop	II
1061863	Beehive Cottage	II
1064303	Clifton House	II
1147649	The Cottage	II
1147678	Cottage to north of The Annexe	II
1147775	Saddlers Cottage	II
1254076	The Round House	II

Appendix 9.1

L VIA Methodology and Assessment Criteria



Introduction

The purpose of a Landscape and Visual Impact Assessment (LVIA) when produced in the context of an EIA is to identify and report any likely significant landscape and visual effects.

In the Preliminary Environmental Information Report (PEIR), potential likely significant landscape and visual effects have been identified. Chapter 9 is not, however, intended to constitute a final or complete LVIA.

The following appendix sets out the methodology and criteria against which the preliminary assessment of landscape and visual effects has been undertaken in Chapter 9. It is proposed that the same methodology and assessment criteria will be applied to the LVIA presented in the subsequent Environmental Statement (ES) although a more detailed justification for the judgements given will be set out in the ES.

The Guidelines for Landscape and Visual Impact Assessment (Third Edition) (GLVIA3) are widely recognised as the primary source of guidance for LVIA in the UK but clearly state that:

“The guidance concentrates on principles while also seeking to steer specific approaches where there is a general consensus on methods and techniques. It is not intended to be prescriptive, in that it does not provide a detailed ‘recipe’ that can be followed in every situation. It is always the primary responsibility of any landscape professional carrying out an assessment to ensure that the approach and methodology adopted are appropriate to the particular circumstances.” (paragraph 1.20)

GLVIA 3 also states that: *“professional judgement is a very important part of the LVIA”* (paragraph 2.23) and that *“in all cases there is a need for the judgements that are made to be reasonable and based on clear and transparent methods so that the reasoning applied at different stages can be traced and examined by others.”* (paragraph 2.24).

It goes on to state that *“there are no hard and fast rules about what effects should be deemed significant but LVIA’s should always distinguish clearly between what are considered to be the significant and non-significant effects.”* (paragraph 3.32)

Wherever possible, identified effects are quantified, but as noted above, the nature of landscape and visual assessment requires interpretation using professional judgement. In order to provide a level of consistency to the assessment, the prediction of magnitude and the assessment of significance of the residual landscape and visual effects are based on pre-defined criteria as set out in this appendix.

Landscape and visual assessments are separate, though linked processes which GLVIA3 notes are *“related but very different considerations”*. The assessment of the potential effect on the landscape is carried out as an effect on the environmental resource (i.e. the landscape). Visual effects are assessed as the inter-related effect on people.

- Landscape effects derive from changes in the physical landscape elements which may give rise to changes in its distinctive character and how this is experienced, including consideration of aesthetic and perceptual aspects.
- Visual effects relate to changes that arise in the composition of available views as a result of changes to the landscape, to people’s responses to the changes and to the overall effects with respect to visual amenity.

Establishing the Baseline

The baseline for consideration of landscape and visual effects is evaluated through desk study and site work and is the current situation at the time of the assessment, unless noted otherwise. Other operational developments and those under construction are considered as part of the baseline and included as part of the assessment of landscape and visual effects.

Direct and Indirect Effects

Direct and indirect effects are defined in GLVIA3. Direct effects may be defined as resulting “*directly from the development itself*” (paragraph 3.22). An indirect (or secondary) effect is one that results “*from consequential change resulting from the development*” (paragraph 3.22) and is often produced away from the site of the proposed development or as a result of a complex pathway or secondary association.

Landscape Effects

The starting point for an assessment of landscape effects is a desk-based assessment of published landscape studies, which may include landscape character assessments, sensitivity and capacity studies and/or landscape designation reviews. Relevant documents are listed as appropriate in the LVIA and relevant extracts may be included where this is judged appropriate. Desk based assessment is supplemented by field work to verify the key characteristics of the landscape.

In accordance with GLVIA3, the significance of landscape effects is determined by combining judgements regarding the sensitivity of the receiving landscape and the magnitude of the landscape effects arising from the Proposed Development.

An assessment of the degree to which the proposed development changes the “*distinct and recognisable pattern of elements, or characteristics, in the landscape that make one landscape different from another, rather than better or worse*” (‘An Approach to Landscape Character Assessment’, Natural England, 2014), enables a judgement to be made as to the significance of the effect in landscape character terms.

In order to reach an understanding of the effects of development upon the landscape resource it is necessary to consider different aspects of the landscape baseline including:

- Landscape fabric/elements: The individual features of the landscape, such as hills, valleys, woods, hedges, tree cover, vegetation, buildings and roads for example which can usually be described and quantified.
- Landscape key characteristics: The particularly notable elements or combinations of elements which make a particular contribution to defining or describing the character of an area, which may include experiential characteristics such as wildness and tranquillity.

Landscape Sensitivity

It should be noted, as stated in GLVIA3, “*LVIA sensitivity is similar to the concept of landscape sensitivity used in the wider arena of landscape planning but is not the same as it is specific to the particular project or development that is being proposed and to the location in question*”. (paragraph 5,39)

In LVIA, landscape sensitivity is assessed by combining judgements about the value attached to a landscape and its susceptibility to the type of change and nature of the development proposed. The overall sensitivity of the landscape to a particular development is described in Chapter 9 of the PEIR as **High, Medium** or **Low**.

- Landscape Value:** Landscape value varies in relation to the different stakeholders and different parts of society that use or experience a landscape. It reflects the importance attached to a landscape. Sometimes it is used as a basis for designation or recognition which expresses national or local authority consensus, because of its special qualities/attributes. Although factors such as formal designations are an important component when determining landscape value, other aspects are also considered as part of the judgement process as explained in Landscape Institute Technical Guidance Note 02-21 *Assessing Landscape Value Outside National Designations*. These include issues related to natural and cultural heritage (for example ecological, geological or heritage matters), landscape condition, associations (in terms of connections with people, arts or events), distinctiveness (i.e. a sense of unique identity in the landscape), recreational opportunities, perceptual aspects (including scenic quality, wildness and tranquillity) and landscapes with a clearly identifiable role or function. In Chapter 9 of the PEIR, the value attributed to the landscape is described as: **National, Regional, or Community**.
- Landscape Susceptibility:** Landscape Susceptibility according to GLVIA3 means *“the ability of the landscape receptor to accommodate the proposed Development without undue consequences for maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies”* (paragraph 5.40). The susceptibility of the landscape varies depending on the type of development proposed and the particular site location. Judgements on landscape susceptibility include references to both the physical and aesthetic characteristics and the potential scope for mitigation. In Chapter 9 of the PEIR, the susceptibility of the landscape is described as **High, Medium or Low**.

The criteria and the detailed judgements regarding susceptibility and value of landscape receptors are identified within the sensitivity tables included within **Appendix 9.3** to this assessment.

Sensitivity is judged taking into account the component judgments about the value and susceptibility of the receptor as illustrated by **Table A9.1** below. Where sensitivity is judged to lie between levels, an intermediate assessment will be adopted.

Table A9.1 Landscape Sensitivity Criteria

		Susceptibility		
		High	Medium	Low
Value	National	High	High/medium	Medium
	Regional	High/Medium	Medium	Medium/Low
	Community	Medium	Medium/Low	Low

Magnitude of Landscape Change

The magnitude of landscape change arising from the proposed development at any particular location is assessed in terms of “*size or scale, the geographic extent of the area or receptor that is influenced and its duration and reversibility*” (paragraph 5.48).

Judgements concerning the **Scale** of the change take account of:

- Degree of loss or alteration to key landscape features/elements; characteristics; and for designated areas – special qualities and/or purposes of designation.
- Distance from the Proposed Development.
- Landscape context to the Proposed Development.

The approach to assessing effects on landscape character is to consider the key characteristics for the Landscape Character Area (LCA) within which the proposed development is located (the host LCA) and if relevant the adjacent LCA's (non-host) and identify which of these the proposed development would affect. A large scale change in landscape character is likely to occur where key characteristics would be lost or substantially changed. A small scale change is likely to occur where key characteristics are altered to a lesser degree and this can be influenced by distance and surrounding context.

Where particular views are a key characteristic of a LCA, large or medium scale landscape character effects may occur where the proposed development becomes a key feature of those views. A similar approach applies to designated landscapes, for which the effects on the defined purposes of designation and special qualities are considered.

In Chapter 9 of the PEIR, the scale of landscape change is described as: **Large, Medium or Small**.

Having established the scale of change to the landscape baseline, the **Geographic Extent** of the change can be identified. In Chapter 9 of the PEIR, the geographical extent of landscape change is described as: **Wide, Intermediate, Localised or Limited**.

Duration and Reversibility can be linked depending on the nature of the development. Reversibility is a judgement about the practicality of reversing the landscape effects of the proposed development (for example, solar farms are ultimately largely reversible whilst housing is permanent). Duration reflects how long the change will last. In Chapter 9 of the PEIR, the duration of the change would be considered:

- short term when lasting less than 2 years;
- medium term when lasting between 2 and 10 years;
- long term when lasting between 10 and 40 years, and
- permanent for more than 40 years.

Magnitude is considered taking into account the three contributory factors as illustrated by the diagrams presented in **Figure A9.1** below.

Visual Effects

In accordance with GLVIA3, the significance of visual effects is determined by combining judgements regarding the sensitivity of visual receptors (people who view the landscape) and the magnitude of the change they experience arising from the Proposed Development.

Visual Receptor Sensitivity

In LVIA, visual receptor sensitivity is assessed by combining judgements about the value attached to views and the susceptibility of the viewer to the type of change and nature of the development proposed. The overall sensitivity of the visual receptor to a particular development is described in Chapter 9 of the PEIR as **High, Medium or Low**.

- **Value of Views:** The value of public views, which is the focus of GLVIA3, will vary depending on the nature, location and context of the view and the recognised importance of the view. Considerations include cultural associations; designation or policy protection; views of or from landmarks; and/or the scenic quality of the view. It should be noted that the value attributed relates to the value of the view only (e.g. a National Trail is nationally valued for access, but not always for the available views from every section). In Chapter 9 of the PEIR, the value attributed to visual amenity is described as: **National, Regional, or Community**.
- **Susceptibility of Visual Receptors:** Those living within view of the Proposed Development are usually regarded as the highest susceptibility group as well as those engaged in outdoor pursuits for whom landscape experience is the primary objective. The susceptibility of potential visual receptors will also vary depending on the activity of the receptor. For visual receptors, susceptibility and value are closely linked - the most valued views are also likely to be those where viewer's expectations will be highest. In Chapter 9 of the PEIR, visual receptor susceptibility is defined in accordance with the criteria below.

High - Local residents; users of outdoor recreation focussed on the appreciation of views including footpaths, beauty spots and picnic areas and people experiencing views to or from important features of physical, visual, cultural or historic interest.

Medium - Local road users and travellers on trains. People engaged in outdoor recreation with some appreciation of the landscape e.g. road cycling, nature conservation, golf and water based recreation.

Low - Workers, users of facilities and commercial buildings (indoors) experiencing views from buildings. Road and rail users on fast moving commuting or trunk routes. Visual receptors where views are incidental to the activity and/or location.

Sensitivity is judged taking into account the component judgments about the value and susceptibility of the receptor, as illustrated by **Table A9.2** below. Where sensitivity is judged to lie between levels, an intermediate assessment will be adopted.

Table A9.2 Visual Sensitivity Criteria

		Susceptibility		
		High	Medium	Low
Value	National	High	High/medium	Medium
	Regional	High/Medium	High/Medium	Medium/Low
	Community	High/Medium	Medium	Low

Magnitude of Visual Change

The magnitude of visual change arising from the Proposed Development is assessed in terms of its size or scale, geographic extent of the area or receptor that is influenced and its duration.

Representative viewpoints are used in the LVIA as 'samples' on which to base judgements of the scale of change on visual receptors. The wider extent of the effect and its duration are not captured in the viewpoint analysis (as a viewpoint cannot capture these factors for an entire route or area). As duration and extent are necessary considerations in determining magnitude of change, judgements concerning magnitude and significance are provided for visual receptors and not for representative viewpoints. The only exception to this rule would be a specific viewpoint – where people visiting that location to look at the view are assessed as a visual receptor group in its own right.

With the exception of specific viewpoints (as noted above), each route (e.g. a footpath or road) and receptor group (e.g. a community or village) will encompass a range of possible views, which might vary from no view of the development to very clear, close views. Therefore effects are described in such a way as to identify where views towards the development are likely to arise and what the scale and duration and extent of those views is likely to be. In some cases this will be further informed by a nearby viewpoint and in others it will be informed with reference to ZTV studies, aerial photography and site visits. Each of these individual effects are then considered together in order to reach a judgement of the effects on the visual receptors along that route, or in that place.

The **Scale** of change arising from the proposed development as experienced by a visual receptor group reflects the degree to which the nature of the views from that location would be changed taking into account:

- the distance from the proposed development;
- the degree to which the proposed development is visible or screened;
- the angle of view in relation to main receptor activity or main focus of the view;
- the horizontal and vertical field of view occupied by the proposed development; and
- the extent and nature of other built development visible.

In Chapter 9 of the PEIR, the scale of change in view is described as: **Large, Medium or Small**.

The approach to assessing effects on views is to consider the full 360 degree view from any given receptor – not just those towards the development and/or shown in visualisations. It is assumed that the change would be seen in clear visibility and the assessment is carried out on that basis. Seasonal variations in visibility due to varying vegetation cover is also taken into account in all judgements.

For visual receptors moving through the landscape (e.g. road and rail users), the length of their journey during which they would see the proposed development is reflected in the judgement of the **Geographic Extent** of effects. In Chapter 9 of the PEIR, the geographical extent of visual change is described as: **Wide, Intermediate, Localised or Limited**.

Duration reflects how long the change will last and judgements are framed in the same way as described above for landscape effects. In Chapter 9 of the PEIR, the duration of the change would be considered:

- short term when lasting less than 2 years;
- medium term when lasting between 2 and 10 years;

- long term when lasting between 10 and 40 years, and
- permanent for more than 40 years.

Magnitude is considered taking into account the three contributory factors as illustrated by the diagrams presented in **Figure A9.1** below.

Combining Scale of Change, Extent and Duration to Determine Magnitude of Landscape and Visual Effects

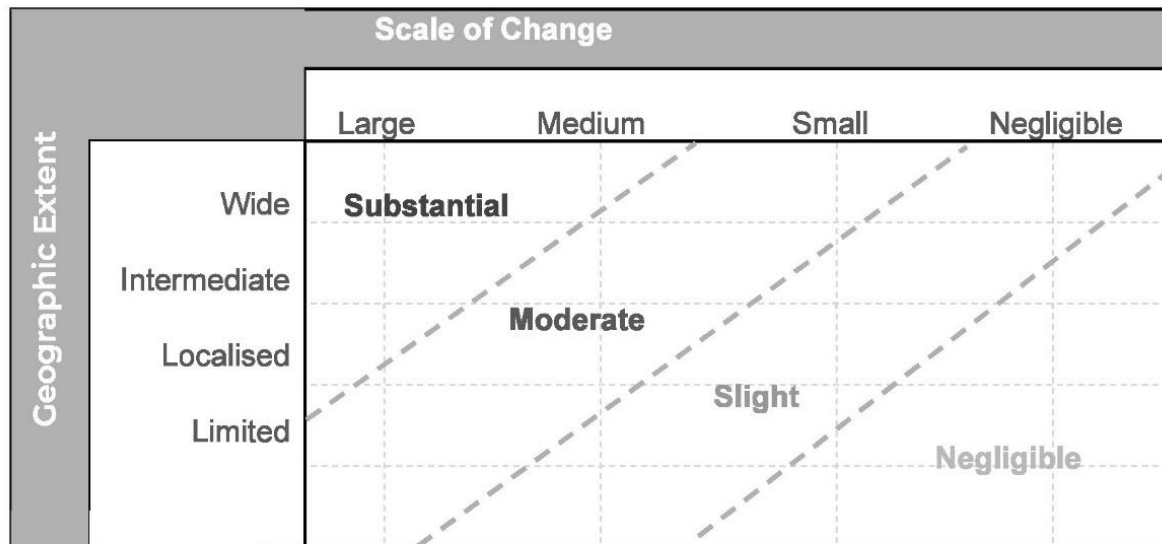
Scale of change is the first and primary factor in determining magnitude. Geographical extent and duration of the effect are modifying factors to the overall magnitude judgement which may be higher if the effect is particularly widespread and/or long lasting, or lower if it is constrained in geographic extent and/or timescale.

The diagrams presented below in **Figure A9.1** illustrate in outline how these two modifying factors are considered in a two-stage process. A judgement is first formed about the scale of the change to the landscape or visual receptor. The geographic extent of the effect is then considered as a modifying influence in the first part of Figure A9.1 (Stage 1). The result or outcome of Stage 1 is then considered again in relation to the duration of the effect as illustrated in the second part of Figure A9.1. The outcome of Stage 2 is the overall magnitude of effect judgement reported in the assessment. Figure A9.1 IS not intended to be interpreted rigidly as a chart to provide definitive answers; professional judgement is employed as appropriate to arrive at an overall magnitude judgement.

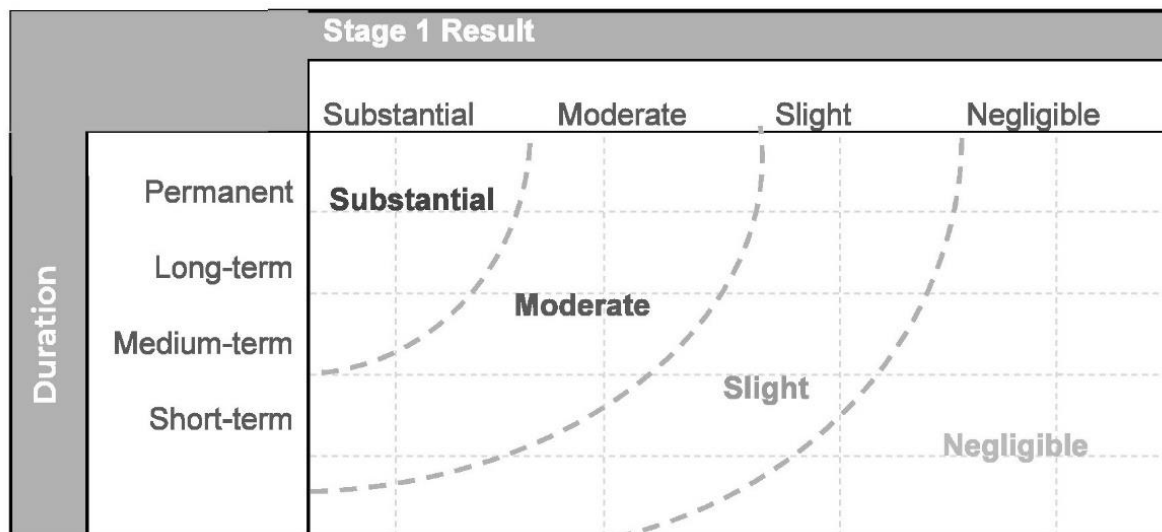
In Chapter 9 of the PEIR, the magnitude of effects is described as **Substantial, Moderate, Slight or Negligible**. Where magnitude is judged to lie between levels, an intermediate assessment will be adopted. In Chapter 9 of the PEIR preliminary judgments are simply stated. Within the LVIA chapter of the ES the judgements will be fully justified as necessary.

Figure A9.1 Scale of Effect Diagrams

Stage 1 - Modifying Influence of Geographic Extent on Magnitude of Effect



Stage 2 - Modifying Influence of Duration on Magnitude of Effect



Significance of Landscape and Visual Effects

The significance of any identified landscape or visual effect is described in Chapter 9 of the PEIR as **Major, Moderate, Minor or Negligible**. These categories are based on the consideration of sensitivity with the predicted magnitude of change. **Table A9.3** below is not used as a prescriptive tool and illustrates the typical outcomes, allowing for the exercise of professional judgement. In some instances, a particular parameter may be considered as having a determining effect on the analysis.

Table A9.3 Significance of effect criteria

		Magnitude of Change			
		Substantial	Moderate	Slight	Negligible
Receptor Sensitivity	High	Major	Major/ Moderate	Moderate	Minor
	Medium	Major/ Moderate	Moderate	Moderate/ Minor	Minor/Negligible
	Low	Moderate	Moderate/ Minor	Minor	Negligible

Where the effect has been classified as Major or Major/Moderate, this is considered to be equivalent to likely significant effects. Where ‘Moderate’ effects are predicted, professional judgement will be applied to determine whether the effect is significant or not ensuring that the potential for significant effects to arise has been thoroughly considered. In Chapter 9 of the PEIR preliminary judgments are simply stated. Within the LVIA chapter of the ES the judgements will be fully justified as necessary.

Beneficial/Adverse

Landscape and visual effects can be beneficial or adverse and in some instances may be considered neutral. Neutral effects are those which overall are neither adverse nor positive but may incorporate a combination of both. Whether an effect is beneficial, neutral or adverse is identified based on professional judgement. GLVIA3 indicates at paragraph 2.15 that this is a “particularly challenging” aspect of assessment, especially in the context of a changing landscape.

However, for the avoidance of doubt, in this LVIA it has been assumed that where new infrastructure is introduced into the landscape or views, this will generally constitute an adverse effect. Any variation from this stance will be clearly justified in the LVIA.

Cumulative Effects

The overarching NPS for Energy (EN-1) paragraph 4.2.5 states that *“When considering cumulative effects, the ES should provide information on how the effects of the applicant’s proposal would combine and interact with the effects of other development (including projects for which consent has been sought or granted, as well as those already in existence)”*.

Planning Inspectorate Advice Note 17: Cumulative Effects Assessment Relevant to Nationally Significant Infrastructure Projects, paragraph 1.4 states that *“For the purposes of this Advice Note, ‘other existing development and/or approved development’ is taken to include existing developments and existing plans and projects that are ‘reasonably foreseeable’.*” It also states at paragraph 3.4.2 that *“The assessment should be undertaken to an appropriate level of detail, commensurate with the information available at the time of assessment.”*

Table 2 of Planning Inspectorate Advice Note 17 sets out three ‘Tiers’ of ‘other existing development and/or approved development’ and at paragraph 3.4.3 it details the level of assessment that should be undertaken for each ‘Tier’. The LVIA presented in the ES will adopt this guidance and assess cumulative landscape and visual effects depending on the status of ‘other existing development and/or approved development’ at the time of submission.

An assessment of cumulative effects should focus on whether there are any potential significant cumulative impacts which are reasonably foreseeable and which are likely to influence the decision making of the proposed development, rather than an assessment of every potential cumulative effect, which in practice means focussing on other nearby development proposals and the effects that might arise from the combined influence of those developments on landscape and visual receptors.

The cumulative assessment is based on the same landscape and visual baseline and receptor groups as the main LVIA, and the methodology is also the same in terms of forming and expressing judgements.

- Cumulative effects on landscape receptors arise from combined direct and/or indirect effects on the same receptor – such as two developments within the same character area; or one development within, and one visible from, a designated area.
- Cumulative effects on visual receptors arise either from two (or more) developments both being visible from the same place; or from sequential views as people travel.

Methodology for Production of ZTV Plans and Visualisations

All Zone of Theoretical Visibility Maps (ZTVs), photography, visualisations (wirelines and photomontages) and their graphical presentation has been undertaken in line with the Landscape Institute's Technical Guidance Note 06/19, Visual Representation of Development Proposals.

Visibility Maps: Zone of Theoretical Visibility (ZTV)

Zone of Theoretical Visibility (ZTV) maps have been generated using GIS to assist in identifying areas where visibility would not occur as well as viewpoint selection, illustrate areas from where part or all of the proposed development may be visible and to indicate its potential influence in the wider landscape.

Specifically, the ZTVs have been generated using the Viewshed routine in the Visibility Analysis plugin for QGIS software.

Two types of ZTV have been presented in the LVIA:

- **Standard Screening ZTVs** – which take account of buildings and significant blocks of woodland in the landscape; and
- **Detailed Screening ZTVs** which also take account of hedgerows and other vegetation over 2.5m in height.

In both cases the viewer's eye height has been set at 2m above ground level and in both cases the ZTVs include an adjustment that allows for the Earth's curvature and light refraction.

The Standard Screening ZTVs show the maximum theoretical extent of visibility for the structures modelled (as indicated on the individual ZTVs) taking into account the screening effect of topography, principal woodlands and buildings. In order to generate the Standard Screening ZTVs a digital surface model (DSM) has been derived from the DEFRA LIDAR 2020 2m digital terrain model (DTM) with the locations of woodland and buildings taken from the OS Open Map Local dataset. Heights of buildings and woodland are taken from the DEFRA LIDAR 2020 2m DSM height data. Visibility on these ZTV outputs is illustrated using a 5m x 5m grid size. These ZTVs do not take into account some localised features such as hedgerows or individual trees and therefore tend to give an exaggerated impression of the extent of visibility. This is particularly the case in relatively flat landscapes which contain hedgerows and other vegetation not captured in the OS Open Map Local dataset. The actual extent of visibility on the ground will be less than suggested on the plan.

The Detailed Screening ZTVs provide an extra layer of detail as they take account of additional vegetation in the landscape (over 2.5m in height) not captured in the Standard Screening ZTVs. This typically includes hedgerows, tree belts, small clusters of trees and also individual trees. In order to generate the Detailed Screening ZTVs a detailed digital surface model (DSM) has been derived from the DEFRA LIDAR 2020 2m digital terrain model (DTM). The locations of buildings are again taken from the OS Open Map Local dataset but woodland and other vegetation (over 2.5m in height) is taken from the Environment Agency's Vegetation Object Model (VOM) dataset. Heights of buildings and woodland are taken from the DEFRA LIDAR 2020 2m DSM height data. Visibility on these ZTV outputs is illustrated using a 2m x 2m grid size. Whilst these ZTVs still do not take into account some localised features such as vegetation below 2.5m in height, ground truthing in low lying landscapes has consistently found these ZTVs to be considerably more accurate than the Standard Screening ZTVs. Nevertheless, it is important to understand their limitations. Firstly, it should be noted that hedgerows in the UK are typically deciduous and in winter months may not act as an absolute visual barrier – filtered views through hedgerows are sometime possible. Secondly, it should also be noted that hedgerows are often cut lower (below 2.5m) in winter months and depending on when the LIDAR data was captured visibility may extend further in winter months.

The actual extent of visibility on the ground will still typically be less than suggested on the plan. However, at Springwell, the Detailed Screening ZTVs have been extensively tested/ground truthed in the field in winter and it is the professional opinion of the assessors that they provide a reasonable and accurate reflection of potential visibility of the Proposed Development.

Viewpoint Photography

All photography presented in the LVIA has been taken in accordance with guidance outlined in Landscape Institute Technical Guidance Note 06/19.

All photography has been taken using a Canon EOS 5D MK IV digital SLR camera with a high quality fixed 50mm focal length lens. This camera has a Full Frame Sensor (FFS).

For all viewpoints, the camera has been mounted on a panoramic head equipped tripod, levelled and set up with the camera at 1.5m height Above Ground Level (AGL).

At each viewpoint, a series of photographs (landscape orientation) have been taken to capture a 360 degree panorama. The panoramic head has been set to 20 degrees between shots giving a 50% overlap between adjacent shots.

At each viewpoint the OS grid coordinates have been captured using a hand held GPS system.

Stitching of Photographic Panoramas

For each of the viewpoints in the PEIR, photographs have been stitched and presented as panoramas. Photographs have been stitched using PTGui software.

Visualisations: Annotated Photographs (LI Type 1)

Most of the viewpoints in the PEIR are illustrated as Type 1 Visualisations as outlined in Landscape Institute Technical Guidance Note 06/19. Many of the viewpoints in the final ES will also be presented as Type 1 Visualisations. The purpose of Type 1 visualisations is to represent context to the viewpoint, communicate the extent of the development and highlight any notable features in the view.

In each case the viewpoints are presented to illustrate, as a minimum, a 90 degree horizontal field of view and are presented in cylindrical projection. Where the horizontal extent of the Proposed Development extends beyond 90 degrees, a series of 90 degree annotated

visualisations may be presented to illustrate the panoramic views obtained at the viewpoint. The photographs are annotated to indicate the extent of the proposed development and highlight any important features within the view.

Visualisations: Annotated Photomontages and Photowires (LI Type 3)

It is anticipated that LI TGN 06/19 Type 2, 3 and possibly Type 4 visualisations will be included in the ES. A methodology for production of these illustrations will be provided in the ES.

Glossary of Terms Used in the LVIA

Term	Definition
CLVIA	Cumulative Landscape and Visual Impact Assessment
Direct Effect	A direct (or primary) effect may be defined as an effect that is directly attributable to the development
GLVIA3	'Guidelines for Landscape and Visual Impact Assessment, Third Edition', published jointly by the Landscape Institute and Institute of Environmental Management and Assessment 2013.
Indirect Effect	An indirect (or secondary) effect is an effect that results indirectly from the proposed project as a consequence of the direct effect, often occurring away from the site, or as a result of a sequence of interrelationships or a complex pathway. They may be separated by distance or in time from the source of the effects.
Key Characteristics	Those combinations of elements which are particularly important to the current character of the landscape and help to give an area its particularly distinctive sense of place.
LVIA	Landscape and Visual Impact Assessment.
Landscape Capacity	The amount of change which a particular landscape character type or area is able to accommodate without significant detrimental effects on its character. Capacity is likely to vary according to the type and nature of change proposed.
Landscape Character	The distinct and recognisable pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.
Landscape Character Areas	These are single unique areas which are the discrete geographical areas of a particular landscape type
Landscape Character Types	These are distinct types of landscape that are relatively homogeneous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but wherever they occur, they share broadly similar combinations of geology, topography, drainage patterns, vegetation and historical land use and settlement pattern, and perceptual and aesthetic attributes.
Landscape Effects	Effects on the landscape as a resource in its own right

Term	Definition
Landscape Elements	Individual components which make up the landscape such as trees and hedges.
Landscape Features	Particularly prominent or eye-catching elements, like tree clumps, church towers or wooded skylines.
Landscape Quality or Condition	This is a measure of the physical state of the landscape. It may include the extent to which a typical character is represented in individual areas, the intactness of the landscape and the condition of individual elements
Landscape Receptor	Defined aspects of the landscape resource that have the potential to be affected by a proposal.
Landscape Resource	The combination of elements that contribute to landscape context, character and value.
Landscape Value	The relative value or importance attached to different landscapes by society on account of their landscape qualities
Level of Effect	Determined through the combination of sensitivity of the receptor and the proposed magnitude of change brought about by the development.
Magnitude (of effect)	A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short or long term in duration.
Mitigation	Measures including any process, activity or design to avoid, reduce, remedy or compensate for adverse environmental impact or effects of a development.
Photomontage	A visualisation which superimposes an image of a proposed development upon a photograph or series of photographs.
Residential Visual Amenity	A collective term describing the views and visual amenity from a residential property, relating to the type, nature, extent and quality of views that may be experienced from the property and its 'domestic curtilage' including gardens and access driveway. Residential Visual Amenity is only one component of the overall Residential Amenity, others being for example noise, shadow flicker and access amongst others.
Residual Effects	Potential environmental effects remaining after mitigation.
Sense of Place	The essential character and spirit of an area: genius loci literally means 'spirit of the place'.
Sensitivity	A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor.
Significant Effects	It is a requirement of the EIA Regulations to determine the likely significant effects of development on the environment which should relate to the level of an effect and the type of effect. Where possible significant effects should be mitigated. The significance of an effect gives an indication as to the degree of importance (based on the magnitude of the effect and sensitivity of the receptor) that should be attached to the impact described. Whether an effect

Term	Definition
	should be considered significant is not absolute and requires the application of professional judgement.
Type or Nature of Effect	Whether an effect is direct, indirect, temporary or permanent, positive (beneficial), neutral or negative (adverse) or cumulative.
Visual amenity	Value of a particular place in terms of what is seen by visual receptors taking account of all available views and the total visual experience.
Visual Effect	Effects on specific views and on the general visual amenity experienced by people.
Visual Receptors	Individuals and/or defined groups of people who have the potential to be affected by a proposal
Visualisation	Computer simulation, photomontage or other technique to illustrate the appearance of a development.
Zone of Theoretical Visibility (ZTV)	Area within which a proposed development may have an influence or an effect on visual amenity.

Appendix 9.2

Extracts from Published Landscape
Character Assessments



Introduction

This appendix collates and where necessary provides commentary on relevant extracts from the following published landscape character assessments which cover the study area:

- *National Character Area Profile 47 – Southern Lincolnshire Edge*, 2014, Natural England
- *North Kesteven Landscape Character Assessment*, 2007, David Tyldesley and Associates

National Character Area 47 (NCA 47) – Southern Lincolnshire Edge

At a national level the site falls within National Character Area (NCA 47) – Southern Lincolnshire Edge and the majority of the study area also falls within this NCA. There would be a negligible effect on the character of the landscape beyond this NCA.

NCA 47 is located between the limestone cliff to the west and the dip slope that drops gently away to the edge of the fens in the east. The summary description of the NCA states:

“An open landscape with far-reaching views over the Trent and Belvoir Vales and up to Lincoln Cathedral. On the free draining higher ground, landcover is primarily arable, in large geometric fields divided by limestone walls, with few trees or woodland. On the wetter, heavier clay soils to the east and south-west, pasture is more prevalent; hedgerows are the predominant boundary and the landscape has a more intimate, enclosed feel, with more trees, woodland and parkland.”

In relation to the above statement, it is noted that there are no far reaching views over the Trent and Belvoir Vales or towards Lincoln Cathedral within the LVIA study area. Views of the vales are found further to the west in the NCA and views towards the cathedral are found further north in the NCA.

The summary description goes on to state that:

“The underlying Jurassic Limestone geology has a defining impact on the landscape, not just through the distinctive topography, but also through its widespread use for construction of walls and buildings and numerous limestone quarries, both active and disused. Semi-natural habitats – including calcareous and neutral grassland and broadleaved woodland – are fragmented and sparsely scattered. Wide verges along roads and tracks provide important refuges for unimproved flower-rich grassland. There are many visible reminders of early human activity in the form of Roman roads and canals, such as Ermine Street and Car Dyke, medieval ridge and furrow, deserted medieval villages and moated sites. The 20th-century heritage includes a number of airfields created during the World Wars.”

Finally, the summary description notes that:

“The primary ecosystem services provided by this area include food provision, biomass provision, water availability, sense of place and sense of history. Enhancements in management of soil, water, habitats and landscape features on agricultural land could help to strengthen the provision of many of these services.” and

“The protection of archaeology, historic buildings and traditional villages is key to preserving sense of place and sense of history.”

The key characteristics of NCA 47 are recorded as follows:

- *“Elevated arable escarpment with a distinct cliff running north–south along the western boundary, providing far-reaching views over the Trent and Belvoir Vales NCA.*
- *Productive loamy soils on the limestone plateau, giving rise to a large-scale open landscape of arable cultivation with large, regular fields and few boundaries of tightly cut hedgerows or rubble limestone walls.*
- *Heavy clay soils in the east and south-west of the area, which support more grazing land in smaller, less regular fields, along with small areas of woodland and parkland.*
- *Semi-natural habitats in small, isolated fragments, with pockets of woodland on clay soils, fen at the foot of the dip slope and flower rich limestone grassland, particularly along road verges.*
- *Sparse settlement on higher land, with spring line villages along the foot of the cliff, parklands and country estates such as Rauceby and Belton on lower ground, and larger settlements – including Sleaford, Ruskington and Metheringham – to the east of the dip slope.*
- *Active and re-used airfields prominent on the ridgetop.*
- *Long, straight roads and tracks, often with wide verges, including Ermine Street, which follows the route of a key Roman north–south route.*
- *Vernacular architecture and walling, especially in villages, of local warm-coloured limestone with dark brown pantiles.”*

Under the heading of ‘Physical and functional links to other National Character Areas’, the NCA profile notes that:

“Major road routes include the A15 linking Sleaford to Lincoln. Railways run north–south linking Sleaford to Lincoln and Spalding.”

Under the heading of ‘The Southern Lincolnshire Edge Today’, the NCA describes the landform and drainage of the NCA as an:

- *“elevated, gently sloping plateau with a sharply defined western boundary.” And*
- *“On lower land to the eastern edge, where the dip slope falls to meet the fens, deposits of glacial till result in heavier land that is slower draining and prone to waterlogging in winter. This landscape has a more enclosed, wooded feel, with smaller, less regular fields and more hedgerows, hedgerow trees, parkland and woodland.” And*
- *“Dry valleys indicate the free-draining nature of the underlying geology. The agricultural land has a dense network of ditches, particularly on the heavier land, and many have farm reservoirs.”*

The NCA notes that:

- *“Settlement is concentrated around the perimeter of the NCA, along the cliff foot, where villages have been founded on springlines, and at the foot of the dip slope.” And*
- *“Industry in the area, both historically and today, focuses on limestone and aggregate quarrying and agriculture. Major transport links include busy A roads, such as the A15 between Lincoln and Sleaford, and railway lines.” And*
- *“Publicly accessible routes and areas are less prolific than in some NCAs; there are only 0.9 km per km² of public rights of way and no country parks or National Nature Reserves.” and*

- *“The area is moderately tranquil; less-disturbed areas include the more remote parts of the sparsely settled areas, the open landscape of the dip slope and the more sheltered, enclosed, traditional landscapes of the claylands.”*

Under the heading of ‘The Landscape through Time’ the NCA provides commentary on the evolution of the landscape over time. The following extracts are relevant in the context of the study area:

- *“Roman activity is visible in structures such as..... Ermine Street”.*
- *“Saxon and medieval settlement developed in a series of small villages along the springlines on the western scarp, and on the lower claylands of the dip slope to the east.”*
- *“Archaeological and placename evidence suggests that the area was substantially cleared of woodland by the 11th century and, on higher land, largely unsettled heath was used as common grazing until it was enclosed for farmland from the late 18th century.”*
- *“Enclosure of fields from the common land under the Parliamentary Enclosures Acts of the 18th and 19th centuries resulted in a large-scale regular field boundary network away from the villages.”*
- *“The latter half of the 20th century saw widespread agricultural intensification, involving comprehensive drainage schemes, removal of drystone walls and hedgerows to create bigger fields, and an increase in arable production. It also saw an increase in the size of the major settlements and the upgrading of major transport routes. All of these served to reduce and fragment seminatural habitats.”*

North Kesteven Landscape Character Assessment

At a district level, the North Kesteven Landscape Character Assessment identifies four regional Landscape Character Types (LCTs). The Proposed Development site and the entire study area falls within the Central Plateau LCT.

The LCTs are further subdivided into Landscape Character Sub-Areas (LCAs). The western and central parcels of the site fall within LCA 7 - The Limestone Heath LCA whilst the eastern parcel of land falls within LCA 11 - The Central Clays and Gravels LCA.

LCA 7 - The Limestone Heath

Relevant key characteristics of LCA 7 – Limestone Heath include:

- *“This is a large landscape character sub-area situated in the centre of the District between the ridge of the Lincoln Cliff and the Central Clays and Gravels to the east.*
- *Its position on the upper reaches of the cliff’s dip slope gives it a feeling of relative elevation and exposure.*
- *It is predominantly an empty, open landscape with wide views to the skyline in all directions.*
- *The landform is a gently undulating plateau which dips gently towards the east.*
- *Generally the whole area is dry, with no obvious surface drainage as a consequence of the underlying limestone geology.*
- *Scattered woodland copses pepper the whole of the sub-area, which although relatively small are prominent features because of the openness of the landscape.*

- *Roadside hedgerows are often found with mature trees within.*
- *Limestone dry stone walls are apparent along roadside and some field boundaries, but are generally in poor condition.*
- *Fields are very large and rectilinear. Field boundaries are often absent, broken or delineated by a strip of rough grass or remnant hedgerow or wall.*
- *The soil colour is a striking reddish brown colour with visually prominent stone content giving it a rough texture.*
- *Intensive arable agriculture dominates land use with wheat and root crop common.*
- *The central plateau area is generally unsettled except for isolated farmsteads and occasional ribbon development along the A15. Larger settlements are situated on the edge of the sub-area characterised by having historic cores with limestone buildings but often surrounded by significant levels of 20th Century development.*
- *Utility Infrastructure, which although sparse, makes an impact on the landscape including prominent pylons and the main A15 running north to south.*
- *RAF installations have made a significant impact on the landscape sub-area with several large bases and training centres.*
- *Mineral working is a feature of the sub-area with several large limestone quarries.*
- *Pressures for change on the Plateau predominately relate to minerals operations, decline of field boundaries, particularly walls, and intensive agricultural practices.*
- *Opportunities for landscape strengthening and enhancement mainly lie in field boundary reinstatement, particularly of dry stone walls and for more appropriately designed development on the outskirts of settlements.”*

Other relevant extracts relating to LCA 7 include the following:

“The landform consists of an open, gently undulating plateau with the gradient sloping down from west to east (approx 80m down to 25m). The ridges and dips run in an east-west direction following shallow ‘dry’ valleys, and this is particularly apparent when travelling along the A15 which falls and rises with the topography.” And

“There are extensive 360 degree views throughout the sub-area afforded by the generally low relief, large field size and absence of field boundaries. The sense of relative elevation is obvious and the general lack of tree cover or other features accentuates the feeling of exposure and emptiness.”

“There are a number of small copses, mostly broadleaved, throughout the sub-area which because of the general openness of the landscape are prominent and make important features. The copses often abut the many scattered farmsteads and agricultural buildings.”

“There are several active stone quarries at a number of sites including Scopwick, Dunston and Harmston Heath, which is operated as a waste disposal site. These are generally well screened by earth bund walls and landscaping and therefore not immediately obvious in the landscape. There is also evidence of a number of small scale abandoned quarries and minerals workings which have become naturalised and overgrown.”

“Obtrusive infrastructure elements are present in the two lines of large pylons and high voltage electricity cables running across the landscape to the eastern fringe of the area and also across its south-west quadrant..... The flat and open landscape does not afford any softening landscape backdrop and so their prominence is emphasised and visually significant from relatively long distances.”

“RAF establishments are a current and important historic feature of the area within the open, exposed and largely flat landscape.”

“There are very few settlements in the central parts of this landscape character subarea and the lasting impression is of an empty landscape. There are a few isolated farmsteads and agricultural buildings and occasional sporadic ribbon development along the A15.”

“The road pattern is distinctive with the straight main road (A15) running from north to south (Lincoln to Sleaford) dividing the character sub-area in two and acting as a central communications spine, with straight and parallel minor roads dissecting the area into a grid pattern, running generally north-east to south-west.”

“The only other settlements of any size in the sub-area are Ashby de Launde and Bloxham which are attractive estate villages with old manor houses and distinctive cottages. Both are framed by attractive treescapes to give an enclosed, intimate setting in contrast to surrounding open landscape. Ashby de Launde has a prominent church steeple and water tower.”

It should be noted that the character assessment makes reference to radio masts at RAF Digby. These are no longer present in the landscape and have been removed.

The following ‘Opportunities for Enhancement’ are identified in the character assessment and are relevant in the context of the Proposed Development:

- Replacement hedgerow planting where these have been lost or degraded.
- Reinstatement and repair of the dry stone walls.
- There are steps that could be taken to improve the dominant appearance of the RAF establishments, such as additional tree and hedge planting around some buildings and around and away from the perimeter fences.
- Habitat friendly limestone grass management regimes should be investigated.

LCA 11 - The Central Clays and Gravels

Relevant key characteristics of LCA 11 – Central Clays and Gravels include:

- *“Landscape sub-area runs the entire length of the District.*
- *The western edge is defined by the Limestone Heath, whilst the Fens lie to the east along its full extent.*
- *A gently undulating lowland, edged by areas of woodland in the north.*
- *Fields are generally smaller and more varied in shape than on the adjacent limestone plateau with some grazing land as well as arable.*
- *Surface water drains into small streams running from west to east and drainage ditches run by the sides of the fields.*
- *Well kept hedgerows along roadsides and sometimes between fields.*
- *Dark brown coloured soil.*
- *Small copses of broadleaved woodland throughout the sub-area and larger areas of woodland on the eastern edge.*
- *Three distinctive lines of settlements – the limestone villages following the spring lines coming off the limestone plateau; the line of villages on the clay strip; and the villages edging the fens to the south.*
- *Road network orientated with the main roads running from north to south (Lincoln to Sleaford) with smaller roads running west to east.*

- *Pressures for change in the sub-area relate to inappropriate development on the edge of villages and the loss of hedgerows and tree cover.*
- *Opportunities for landscape enhancement mainly rest with increased hedgerow and tree planting and maintaining the character of the villages”*

Other relevant extracts relating to LCA 11 include the following:

“The landform consists of a gently undulating lowland clay vale, underlain with boulder clay and gravel deposits. The gradient slopes gently down from west to east (approx. 20m down to 5m).”

“Surface water emerging from springs at the limestone plateau edge drains into small streams which run from west to east. Often these streams run through villages as a central feature. Drainage ditches by the side of the fields are indicative of the change in porosity from the dry landscapes of the plateau.”

“This is generally a mid-scaled landscape. There are some very large fields but also fields of mixed shape and size. Although generally flat and of low relief, this sub-area differs from its immediate neighbours, it does not have the same emptiness and exposure of the limestone heath nor the uniform flatness of the Fens. The general impression of this sub-area is of a gentle, agricultural landscape which is well managed and settled.”

“There are a few scattered agricultural buildings mostly associated with farmsteads and occasional poultry units. The only industrial and commercial uses are located on the edges of the larger settlements such as Metheringham and Ruskington, which has a large food processing factory on its southern edge and is conspicuous in the landscape.”

“The main infrastructure feature in the sub-area is the main line Lincoln-Sleaford railway line.”

“High voltage power lines and pylons cross the area but whilst massive, are generally less prominent in the landscape than in the more open landscapes of the Fens or the Limestone Heath.”

“A line of villages comprising Potterhanworth, Nocton, Dunston, Digby and Scopwick, follow the spring lines rising from the limestone heath plateau and, as a result, present a linear distribution of settlement. Metheringham and Ruskington are the largest villages in the sub-area, which both have a significant level of modern development around their historic cores.”

“There are other scattered villages which do not fit into an obvious pattern, particularly the estate village of Blankney.”

“The road network is orientated with the main roads running from north to south (Lincoln to Sleaford) with minor connector routes roads running west to east. The B1188 north of Sleaford was once a major trading route known as the ‘Low Road’.”

“The spring-line settlements all have similar characteristics, with the original buildings constructed of honey coloured limestone walls with pantiled roofs. The streams often running beside the central village streets with adjacent greenspaces are an attractive feature of these villages.”

“Blankney has a distinctly different and strong identity as an estate village with dwellings built in dressed and coursed limestone in a pseudo-Elizabethan or Tudor style with mullioned windows and elaborate chimneys.”

The following ‘Opportunities for Enhancement’ are identified in the character assessment and are relevant in the context of the Proposed Development:

- Replacement hedgerow planting where these have been lost or degraded.

- An increase in grassland and pasture would help to restore a more mixed pattern of land use, returning to a more visually varied and traditional landscape.
- Maintaining the distinctive character of the villages in this unit is very important.

Appendix 9.3

Landscape Sensitivity Appraisal



Introduction

This appendix considers the sensitivity of landscape character within the study area of the Proposed Development. The concluding judgements regarding landscape sensitivity are carried through into the preliminary assessment of effects presented in the Chapter 9 of the PEIR.

In the context of LVIA, landscape sensitivity as described in paragraph 5.39 of GLVIA3 is not absolute and is specific to each development and its location. To assess the sensitivity of a particular landscape it is good practice to consider the value attached to the landscape and its susceptibility to the particular type of change likely to result from the Proposed Development.

The appraisal of sensitivity in this appendix draws upon observations contained within National Character Area Profile 47 (NCA 47) and the North Kesteven Landscape Character Assessment (NKLCA) as summarised in Appendix 9.2; as well as observations made in the field during the baseline assessment of landscape character. Where relevant, extracts from the two documents above are reproduced in the appraisal below (in italics).

The landscape value criteria below are based on guidance contained within LI TGN 02/21; specifically Table 1 within that document.

The Proposed Development site falls across two Landscape Character Areas (LCAs), namely LCA 7 - Limestone Heath and LCA 11 - Central Clays and Gravels. These two LCAs are considered to be 'host landscape character areas'. It has been determined that there would be no greater than a negligible effect on any other LCAs and therefore the appraisal of sensitivity in this appendix focuses solely on the two LCAs identified above.

It should be noted that both LCAs extend considerably beyond the study area. Some of the descriptive text relating to these two LCAs in the North Kesteven Landscape Character Assessment is therefore not relevant and the discussion of landscape sensitivity below specifically focuses on the tract of the LCAs within the study area.

As noted above, part of the process of determining landscape sensitivity requires a judgement regarding the susceptibility of the LCAs to the specific type of change likely to result from the Proposed Development. It should be noted that whilst solar PV development is proposed across both LCAs, the project substation and BESS would all be located within LCA 7 - Limestone Heath approximately 5km away from LCA 11 - Central Clays and Gravels. At this distance, these taller structures would have a negligible effect on LCA 11.

The judgements below relating to LCA 7 therefore assume that the type of development is commercial scale ground mounted solar PV development only whilst the judgements relating to LCA 11 assume that the type of development also includes ancillary energy infrastructure typical of a project substation and BESS.

Host Landscape: LCA 7 – Limestone Heath				
Factors affecting sensitivity	Indicators of Lower Sensitivity to Solar development	Indicators of Higher Sensitivity to Solar development	Explanation	Judgement
Value attached to Landscape				
Designated scenic quality	No specific designation	National or regional designation	There are no national or local landscape designations covering any part of the LCA within the study area.	Community
Natural Heritage	Landscape with little evidence of ecological, geological, geomorphological or physiographic interest which contributes positively to the landscape	Landscape with strong evidence of ecological, geological, geomorphological or physiographic interest which contributes positively to the landscape	<p>Ecological interest is relatively limited and the landscape is primarily occupied by intensive arable farmland. Bloxham Woods (a local nature reserve) is a small pocket of ecological interest and other copses/plantations provide the main focus of attention locally.</p> <p><i>“Semi-natural habitats – including calcareous and neutral grassland and broadleaved woodland – are fragmented and sparsely scattered. (NCA 47)”</i></p> <p><i>“Field boundaries are often absent, broken or delineated by a strip of rough grass” and a “lack of tree cover” (NKLCA).</i></p> <p>Underlying geology results in a gentle landform and there is no discernible evidence of geomorphological change. Dry valleys provide local interest but result in relatively modest variation in topography. The distinct cliff on the Lincoln Edge has no influence on the character of the LCA within the study area.</p> <p><i>“gently undulating plateau with the gradient sloping down from west to east” (NKLCA).</i></p>	Community

Host Landscape: LCA 7 – Limestone Heath				
Factors affecting sensitivity	Indicators of Lower Sensitivity to Solar development	Indicators of Higher Sensitivity to Solar development	Explanation	Judgement
Cultural Heritage	Landscape with little evidence of archaeological, historical or cultural interest which contributes positively to the landscape	Landscape with strong evidence of archaeological, historical or cultural interest which contributes positively to the landscape	<p>Primary evidence of Roman activity is Ermine Street. There is some buried archaeological interest and there is a scattering of listed buildings throughout the landscape but the <i>“latter half of the 20th century saw widespread agricultural intensification, involvingremoval of drystone walls”</i> (NCA 47).</p> <p>Settlements with historic cores with limestone buildings are typically <i>“surrounded by significant levels of 20th Century development”</i> (NKLCA) and have little influence on the character of the wider landscape within the study area.</p> <p>RAF infrastructure is of local heritage interest but does not contribute positively to landscape character.</p> <p>Heritage assets within Ashby de la Launde, Bloxham, Brauncewell and Temple Bruer provide localised heritage interest but are not widely visible across the landscape as a whole.</p>	Community

Host Landscape: LCA 7 – Limestone Heath				
Factors affecting sensitivity	Indicators of Lower Sensitivity to Solar development	Indicators of Higher Sensitivity to Solar development	Explanation	Judgement
Landscape Condition	Landscape which is in a poor physical state both with regard to individual elements and overall landscape structure	Landscape which is in a good physical state both with regard to individual elements and overall landscape structure	<p>Whilst managed effectively as a productive landscape, in terms of its landscape fabric and structure, this is a landscape generally in poor condition.</p> <p><i>“Limestone dry stone walls are apparent along roadside and some field boundaries, but are generally in poor condition” (NKLCA)</i></p> <p><i>“Field boundaries are often absent, broken or delineated by a strip of rough grass or remnant hedgerow or wall” (NKLCA)</i></p> <p><i>Individually, clusters of properties, farmsteads, farm tracks and tree belts are typically well maintained by estates.</i></p>	Community
Associations	Landscape which has few recognised connections with notable people, events and the arts	Landscape which has well recognised connections with notable people, events and the arts	No known associations with notable people, events and the arts.	Community
Distinctiveness	Landscape that has a weak sense of identity or a sense of identity that is appreciated principally by local communities.	Landscape that has a strong sense of identity and is valued more widely by society.	The landscape has a strong sense of identity as an intensively farmed landscape but is not specifically valued as such beyond the local community.	Community

Host Landscape: LCA 7 – Limestone Heath				
Factors affecting sensitivity	Indicators of Lower Sensitivity to Solar development	Indicators of Higher Sensitivity to Solar development	Explanation	Judgement
Recreational	Landscape offering few recreational opportunities where experience of landscape is important	Landscape offering many recreational opportunities where experience of landscape is important	<p>Landscape provides limited recreational offering except by informal consent of the estates. PROWs are sparse and not well connected, thus informally local residents frequently use field margins for walking.</p> <p><i>“Publicly accessible routes and areas are less prolific than in some NCAs; there are only 0.9 km per km² of public rights of way and no country parks or National Nature Reserves.”</i> (NCA 47)</p>	Community
Perceptual (Scenic)	Landscape that has little that appeals to the senses, primarily the visual sense	Landscape that appeals strongly to the senses, primarily the visual sense	A pleasantly rural, open landscape with long distance views and ‘big skies’, understandably valued locally by residents and appreciated by travellers passing through the landscape but no characteristics which elevate the scenic qualities of the landscape above other similar landscapes.	Community

Host Landscape: LCA 7 – Limestone Heath				
Factors affecting sensitivity	Indicators of Lower Sensitivity to Solar development	Indicators of Higher Sensitivity to Solar development	Explanation	Judgement
Perceptual (Wildness and Tranquillity)	Landscape with a weak perceptual value notably wildness, tranquillity and/or dark skies	Landscape with a strong perceptual value notably wildness, tranquillity and/or dark skies	<p>A working arable landscape; sparsely settled and remote with a sense of detachedness in places but not wild.</p> <p><i>“The area is moderately tranquil; less-disturbed areas include the more remote parts of the sparsely settled areas and the open landscape of the dip slope” (NCA 47) but the A15 is a “major transport link” and a “busy A road” (NCA 47). Views of and the audible sound of moving vehicles diminishes any sense of tranquillity locally.</i></p>	Community

Host Landscape: LCA 7 – Limestone Heath				
Factors affecting sensitivity	Indicators of Lower Sensitivity to Solar development	Indicators of Higher Sensitivity to Solar development	Explanation	Judgement
Functional	Landscape which does not perform a clearly identifiable and valuable function, particularly in the healthy functioning of the landscape	Landscape which performs a clearly identifiable and valuable function, particularly in the healthy functioning of the landscape	<p>The overriding function of this landscape is farming and food production, but it contributes little else beyond the local community in terms of other ecosystem services.</p> <p><i>“The primary ecosystem services provided by this area include food provision, biomass provision, water availability, sense of place and sense of history.” (NCA 47)</i></p>	Community
Overall Judgement of Value				Community
Susceptibility				

Host Landscape: LCA 7 – Limestone Heath				
Factors affecting sensitivity	Indicators of Lower Sensitivity to Solar development	Indicators of Higher Sensitivity to Solar development	Explanation	Judgement
Scale	Landscapes where scale of development is similar to or smaller than scale of receiving landscape	Landscapes where scale of development is larger than scale of receiving landscape	<p>The landscape is large scale and predominantly open.</p> <p><i>“the limestone plateau, giving rise to a large-scale open landscape of arable cultivation with large, regular fields” (NCA 47)</i></p> <p><i>“It is predominantly an empty, open landscape with wide views to the skyline in all directions.” (NKLCA)</i></p> <p>Large scale solar PV could reflect the scale of the landscape. Associated grid infrastructure and BESS of the scale proposed could be out of scale with other structures in the landscape depending on design.</p>	Medium
Landform	Smooth regular flowing, or uniform landscapes	Dramatic and rugged landscapes	<p>A gentle landscape with some undulations across dry valleys but no prominent landform, irregular topography or notables hill sides.</p> <p><i>“The landform consists of an open, gently undulating plateau with the gradient sloping down from west to east” (NKLCA)</i></p>	Low

Host Landscape: LCA 7 – Limestone Heath				
Factors affecting sensitivity	Indicators of Lower Sensitivity to Solar development	Indicators of Higher Sensitivity to Solar development	Explanation	Judgement
Openness/enclosure	Enclosed and sheltered landscapes	Open and exposed landscapes	<p>An open and exposed landscape.</p> <p><i>“A large-scale open landscape of arable cultivation with large, regular fields and few boundaries” (NCA 47)</i></p> <p><i>“Its position on the upper reaches of the cliff’s dip slope gives it a feeling of relative elevation and exposure” and “It is predominantly an empty, open landscape with wide views to the skyline in all directions.” (NKLCA)</i></p>	High
Land cover, complexity and patterns	Areas of simple or regular landcover, linear features and patterns or with a mosaic of vegetation cover	Complex, intimate or irregular patterns or with limited vegetation cover	<p>Simple patterns in the landscape with notable linear features (eg the A15) and some woodland blocks/plantations which provide backdrop to development but overall limited vegetation cover.</p> <p><i>“regular fields and few boundaries” (NCA 47)</i></p>	Medium

Host Landscape: LCA 7 – Limestone Heath				
Factors affecting sensitivity	Indicators of Lower Sensitivity to Solar development	Indicators of Higher Sensitivity to Solar development	Explanation	Judgement
Built Environment	Contemporary masts, pylons, industrial elements, buildings infrastructure, settlements	Established, traditional or historic built character	<p>A generally sparsely settled landscape but utilitarian farm buildings are frequent. The A15 is a prominent linear feature through the landscape and overhead pylons.</p> <p><i>“Utility Infrastructure, which although sparse, makes an impact on the landscape including prominent pylons and the main A15 running north to south” and “RAF installations have made a significant impact on the landscape sub-area with several large bases and training centres” and “Mineral working is a feature of the sub-area with several large limestone quarries.” (NKLCA)</i></p>	Medium
Views and intervisibility	Visually contained and have limited inward or outward views	Extensive views within or of the area with distant horizons.	<p>An open landscape enabling long distance views across exposed arable farmland but no clear vistas or focal points and no prominent horizon which is the focus of these long distance views.</p> <p><i>“Its position on the upper reaches of the cliff’s dip slope gives it a feeling of relative elevation and exposure” and</i></p> <p><i>“It is predominantly an empty, open landscape with wide views to the skyline in all directions.” (NKLCA)</i></p>	Medium

Host Landscape: LCA 7 – Limestone Heath				
Factors affecting sensitivity	Indicators of Lower Sensitivity to Solar development	Indicators of Higher Sensitivity to Solar development	Explanation	Judgement
Landscapes that form settings, skylines, backdrops, focal points	Generally low lying landscapes without distinctive landform or horizon	Areas with strong features, focal points that define the setting or skyline	A low lying landscape with no distinctive horizon. Skylines are typically defined by distant woodland blocks. Energy infrastructure would generally sit below the tree lines formed by blocks of woodland and not define the skyline.	Low
Overall Judgement of Susceptibility				Medium
Overall Judgement of Sensitivity				Medium/Low

Host Landscape: LCA 11 – Central Clays and Gravels				
Factors affecting sensitivity	Indicators of Lower Sensitivity to Solar development	Indicators of Higher Sensitivity to Solar development	Explanation	Judgement
Value attached to Landscape				
Designated scenic quality	No specific designation	National or regional designation	There are no national or local landscape designations covering any part of the LCA within the study area.	Community
Natural Heritage	Landscape with little evidence of ecological, geological, geomorphological or physiographic interest which contributes positively to the landscape	Landscape with strong evidence of ecological, geological, geomorphological or physiographic interest which contributes positively to the landscape	<p>Ecological interest is primarily focussed on blocks of woodland and hedgerows; otherwise habitats are largely limited to arable farmland and small areas of improved pasture.</p> <p><i>“hedgerows are the predominant boundary and the landscape with more trees, woodland and parkland.” (NCA 47)</i></p> <p><i>“Small copses of broadleaved woodland throughout the sub-area” (NKLCA).</i></p> <p>Underlying geology results in a gentle landform and there is no discernible evidence of geomorphological change or physiographic interest.</p> <p><i>“A gently undulating lowland” (NKLCA).</i></p>	Community

Host Landscape: LCA 11 – Central Clays and Gravels				
Factors affecting sensitivity	Indicators of Lower Sensitivity to Solar development	Indicators of Higher Sensitivity to Solar development	Explanation	Judgement
Cultural Heritage	Landscape with little evidence of archaeological, historical or cultural interest which contributes positively to the landscape	Landscape with strong evidence of archaeological, historical or cultural interest which contributes positively to the landscape	<p>Several villages designated in the local plan as Conservation Areas and several listed buildings scattered throughout the landscape. The settlements are typically enclosed by woodland and do not influence the wider landscape although some church towers and spires are visible in the wider landscape. In localised areas, farmland exhibits the characteristics of historic estate management.</p> <p><i>“The spring-line settlements all have similar characteristics, with the original buildings constructed of honey coloured limestone walls with pantiled roofs. The streams often running beside the central village streets with adjacent greenspaces are an attractive feature of these villages.”</i> and</p> <p><i>“Blankney has a distinctly different and strong identity as an estate village with dwellings built in dressed and coursed limestone in a pseudo-Elizabethan or Tudor style with mullioned windows and elaborate chimneys.”</i> (NKLCA)</p>	Regional

Host Landscape: LCA 11 – Central Clays and Gravels				
Factors affecting sensitivity	Indicators of Lower Sensitivity to Solar development	Indicators of Higher Sensitivity to Solar development	Explanation	Judgement
Landscape Condition	Landscape which is in a poor physical state both with regard to individual elements and overall landscape structure	Landscape which is in a good physical state both with regard to individual elements and overall landscape structure	Farmland management throughout the LCA varies. Locally, the farmland is well maintained and much of the landscape fabric is in good condition but elsewhere the hedgerows have been removed and agriculture intensified. <i>“Well kept hedgerows along roadsides and sometimes between fields” and “The general impression of this sub-area is of a gentle, agricultural landscape which is well managed and settled.” (NKLCA)</i>	Regional
Associations	Landscape which has few recognised connections with notable people, events and the arts	Landscape which has well recognised connections with notable people, events and the arts	No specific associations have been identified although there are local associations with the RAF throughout the 20 th century.	Community
Distinctiveness	Landscape that has a weak sense of identity or a sense of identity that is appreciated principally by local communities.	Landscape that has a strong sense of identity and is valued more widely by society.	The landscape has a strong sense of identity as agricultural farmland and locally there are associations with the Blankney estate but identity is valued primarily at a local to regional scale.	Regional/Community

Host Landscape: LCA 11 – Central Clays and Gravels				
Factors affecting sensitivity	Indicators of Lower Sensitivity to Solar development	Indicators of Higher Sensitivity to Solar development	Explanation	Judgement
Recreational	Landscape offering few recreational opportunities where experience of landscape is important	Landscape offering many recreational opportunities where experience of landscape is important	Landscape is relatively well served by PROWs and the Spires and Steeples Trail passes through the landscape from north to south. Whilst these are well used by residents/ communities in Lincolnshire there are no recreational opportunities which attract wider interest.	Regional
Perceptual (Scenic)	Landscape that has little that appeals to the senses, primarily the visual sense	Landscape that appeals strongly to the senses, primarily the visual sense	A pleasantly rural, landscape with a pleasing combination of farmland and woodland; understandably valued locally by residents but no characteristics which elevate the scenic qualities of the landscape above other similar landscapes.	Community
Perceptual (Wildness and Tranquility)	Landscape with a weak perceptual value notably wildness, tranquillity and/or dark skies	Landscape with a strong perceptual value notably wildness, tranquillity and/or dark skies	A working, predominantly arable landscape; sparsely settled and remote with a sense of detachedness in places but not wild. <i>“The area is moderately tranquil; less-disturbed areas include the more remote parts of the sparsely settled areas.... and the more sheltered, enclosed, traditional landscapes of the claylands” (NCA 47) but “The main infrastructure feature in the sub-area is the main line Lincoln-Sleaford railway line.” (NKLCA)</i>	Community

Host Landscape: LCA 11 – Central Clays and Gravels				
Factors affecting sensitivity	Indicators of Lower Sensitivity to Solar development	Indicators of Higher Sensitivity to Solar development	Explanation	Judgement
Functional	Landscape which does not perform a clearly identifiable and valuable function, particularly in the healthy functioning of the landscape	Landscape which performs a clearly identifiable and valuable function, particularly in the healthy functioning of the landscape	<p>The overriding function of this landscape is farming and food production, but it also provides local recreational opportunities.</p> <p><i>“The primary ecosystem services provided by this area include food provision, biomass provision, water availability, sense of place and sense of history.” (NCA 47)</i></p>	Community
Overall Judgement of Value				Regional/Community
Susceptibility				
Scale	Landscapes where scale of development is similar to or smaller than scale of receiving landscape	Landscapes where scale of development is larger than scale of receiving landscape	<p><i>“This is generally a mid-scaled landscape. There are some very large fields but also fields of mixed shape and size.” (NKLCA)</i></p> <p>Large scale solar PV could reflect the scale of the landscape. Blocks of mature planting provide vertical scale comparison but solar panels have the potential to impose on the existing scale of PROWs and lanes.</p>	Medium
Landform	Smooth regular flowing, or uniform landscapes	Dramatic and rugged landscapes	<p>A gentle landscape with some undulations but no prominent landform, irregular topography or notable hill sides.</p> <p><i>“A gently undulating lowland” (NKLCA)</i></p>	Low

Host Landscape: LCA 11 – Central Clays and Gravels				
Factors affecting sensitivity	Indicators of Lower Sensitivity to Solar development	Indicators of Higher Sensitivity to Solar development	Explanation	Judgement
Openness/enclosure	Enclosed and sheltered landscapes	Open and exposed landscapes	<p>Openness varies across the landscape but locally is relatively well enclosed due to woodland blocks and mature hedgerows.</p> <p><i>“Small copses of broadleaved woodland throughout the sub-area and larger areas of woodland on the eastern edge.” and “Although generally flat and of low relief, this sub-area differs from its immediate neighbours, it does not have the same emptiness and exposure of the limestone heath nor the uniform flatness of the Fens.” (NKLCA)</i></p>	Low
Land cover, complexity and patterns	Areas of simple or regular landcover, linear features and patterns or with a mosaic of vegetation cover	Complex, intimate or irregular patterns or with limited vegetation cover	A mosaic of farmland and woodland copses which provides opportunities for existing natural screening. Solar development likely to fit within the existing pattern of the landscape.	Low

Host Landscape: LCA 11 – Central Clays and Gravels				
Factors affecting sensitivity	Indicators of Lower Sensitivity to Solar development	Indicators of Higher Sensitivity to Solar development	Explanation	Judgement
Built Environment	Contemporary masts, pylons, industrial elements, buildings infrastructure, settlements	Established, traditional or historic built character	<p>Locally and away from the roads, a relatively sparse landscape.</p> <p><i>“the limestone villages following the spring lines coming off the limestone plateau” (NKLCA)</i></p> <p><i>“There are a few scattered agricultural buildings mostly associated with farmsteads and occasional poultry units. The only industrial and commercial uses are located on the edges of the larger settlements such as Metheringham and Ruskington.”</i></p> <p><i>“The main infrastructure feature is the main line Lincoln-Sleaford railway line.” And “High voltage power lines and pylons cross the area but ...are generally less prominent.” (NKLCA)</i></p>	Medium
Views and intervisibility	Visually contained and have limited inward or outward views	Extensive views within or of the area with distant horizons.	<p>A variable landscape; open in places enabling long distance views across arable farmland but there are no recognised vistas or focal points and no prominent horizon which is the focus of any long distance views. Locally views are foreshortened by woodland blocks.</p> <p>The claylands are <i>“more sheltered, enclosed, traditional landscapes.” (NCA 47)</i></p>	Medium
Landscapes that form settings, skylines, backdrops, focal points	Generally low lying landscapes without distinctive landform or horizon	Areas with strong features, focal points that define the setting or skyline	<p>A low lying landscape with no distinctive horizon. Skylines are typically defined by woodland blocks. Energy infrastructure would generally sit below the tree lines formed by blocks of woodland and not define the skyline.</p>	Low

Host Landscape: LCA 11 – Central Clays and Gravels				
Factors affecting sensitivity	Indicators of Lower Sensitivity to Solar development	Indicators of Higher Sensitivity to Solar development	Explanation	Judgement
Overall Judgement of Susceptibility				Medium/Low
Overall Judgement of Sensitivity				Medium/Low

Appendix 9.4

Preliminary Viewpoint Analysis



Introduction

The LVIA presented in the ES will include a detailed viewpoint assessment carried out from a selection of representative viewpoint locations to inform the assessment of landscape and visual effects arising as a result of the Proposed Development.

Thirty eight (38) viewpoints have been identified, in consultation with North Kesteven District Council and Lincolnshire County Council, as part of the scoping process to represent the main landscape and visual receptors found in the study area. Details for each viewpoint are provided in the table below.

The location of the viewpoints is shown on **Figure 9.4** (Viewpoint Location Plan) and also on the ZTVs presented in **Figures 9.5 to 9.8**.

Annotated panoramic photographs are provided to illustrate the potential extent of development visible at each viewpoint location in **Volume 4** of the PEIR (Viewpoints 1-38).

The viewpoint analysis presented in this appendix of the PEIR presents a preliminary assessment of the likely scale of change in landscape character and the view at each viewpoint based on a 'worst case' interpretation of the parameters plans in the PEIR.

Commentary is provided in the table below to indicate what measures may be proposed to mitigate the scale of the change. The likely scale of change identified in the final two columns of the following table makes an assumption that the proposed mitigation identified is adopted.

VP	Location	Springwell parcels visible	Substation/ BESS visible?	Potential mitigation	Comments	Preliminary assessment of likely scale of change in landscape character	Preliminary assessment of likely scale of change in view
1	B1189/Moor Lane, Blankney TF 10040 60859	Eastern parcel only	No	None required	Potential glimpses of solar PV development through vegetation on the eastern boundary in winter only.	Yr 1 – Negligible Yr 10 - Negligible	Yr 1 – Negligible Yr 10 - Negligible
2	Junction of Footpaths BLN/4/3, BLN/4/2 and BLN/738/1 TF 08662 60144	Eastern parcel only	No	Offsets from footpaths and potential new/enhanced hedgerow planting alongside new fence lines.	Open views of solar PV development at close proximity in multiple directions. Potential new hedgerows and management of existing hedgerows could soften and largely screen the development in the long term but views would be more enclosed than at present.	Yr 1 – Large Yr 10 - Small	Yr 1 – Large Yr 10 - Medium
3	Junction of Footpaths Scop/738/1 and Scop/8/1 TF 09001 59249	Eastern parcel only	No	Offsets from footpaths and potential new/enhanced hedgerow planting alongside new fence lines.	Open views of solar PV development at close proximity in to one side of footpath Scop/738/1 and distant glimpses of solar PV development in the winter in the opposite direction. Potential new hedgerows and management of existing hedgerows could soften and largely screen the development in the long term but views would be more restricted than at present.	Yr 1 – Large Yr 10 - Small	Yr 1 – Large Yr 10 - Medium

VP	Location	Springwell parcels visible	Substation/ BESS visible?	Potential mitigation	Comments	Preliminary assessment of likely scale of change in landscape character	Preliminary assessment of likely scale of change in view
4	Footpath Scop 7/2 at Junction with Footpath Scop 7/1 TF 08583 58371	Eastern parcel only	No	Potential infill planting to close gaps in hedgerow and management of hedges to 3m.	Filtered views of solar PV development through field boundary hedgerows – more prominent in winter than in summer. New hedgerows and management of existing hedgerows could soften and largely screen the development in the long term.	Yr 1 – Small Yr 10 - Negligible	Yr 1 – Small Yr 10 - Negligible
5	Footpath Scop 7/1 at Junction with B1191 in Kirkby Green TF 08651 57963	Eastern parcel only	No	None required	Potential glimpses of solar PV development through vegetation on the southern boundary in winter only but development would be barely discernible.	Yr 1 – Negligible Yr 10 - Negligible	Yr 1 – Negligible Yr 10 - Negligible
6	Junction of Bridleway Scop/1135/4 and Acre Lane TF 08239 58901	Eastern parcel only	No	Offsets from footpaths and potential new/enhanced hedgerow planting alongside new fence lines.	Open views of solar PV development at close proximity in multiple directions. Potential new hedgerows and management of existing hedgerows would soften and largely screen the development in the long term but views would be more enclosed than at present.	Yr 1 – Large Yr 10 - Medium	Yr 1 – Large Yr 10 - Medium

VP	Location	Springwell parcels visible	Substation/ BESS visible?	Potential mitigation	Comments	Preliminary assessment of likely scale of change in landscape character	Preliminary assessment of likely scale of change in view
7	Permissive Path Between Footpaths Scop /1134/1 and BLN/4/2 TF 08016 59686	Eastern parcel only	No	Offsets from footpaths and potential new/enhanced hedgerow planting alongside new fence lines.	Open views of solar PV development at close proximity in multiple directions. Potential new hedgerows and management of existing hedgerows would soften and largely screen the development in the long term but views would be more enclosed than at present.	Yr 1 – Large Yr 10 - Medium	Yr 1 – Large Yr 10 - Medium
8	Footpath BLAN/4/2 TF 07771 60245	Eastern parcel only	No	Offsets from footpaths and potential new/enhanced hedgerow planting alongside new fence lines.	Open views of solar PV development at close proximity in multiple directions. Potential new hedgerows and management of existing hedgerows would soften and largely screen the development in the long term but views would be more enclosed than at present.	Yr 1 – Large Yr 10 - Medium	Yr 1 – Large Yr 10 - Medium
9	Footpath Scop/3/1 at Junction with Main Street, Scopwick TF 07616 58049	None visible	No	None required	No view of any development. Included to demonstrate that there would be no impact on views from Scopwick village.	Yr 1 – Negligible Yr 10 - Negligible	Yr 1 – Negligible Yr 10 - Negligible

VP	Location	Springwell parcels visible	Substation/ BESS visible?	Potential mitigation	Comments	Preliminary assessment of likely scale of change in landscape character	Preliminary assessment of likely scale of change in view
10	Spires and Steeples Trail Junction with Trundle Lane – North of Scopwick TF 06972 58430	Eastern parcel only	No	A generous offset from the Spires and Steeples Trail and potential new planting between the trail and the site boundary fence line.	Open views of solar PV development at close proximity in to one side of the Spires and Steeples Trail. Potential new planting could soften and largely screen the development in the long term but views would be more restricted than at present.	Yr 1 – Large Yr 10 - Small	Yr 1 – Large Yr 10 - Medium
11	B1188 Junction with Bloxholm Lane - East Side of Junction TF 06649 58523	Eastern parcel only	No	Enhanced planting along the route of the Spires and Steeples Trail (western boundary of eastern parcel) and management of intervening hedgerows to 3m.	A view of the access gates at the end of an existing wide farm track. Mid distance filtered views of the solar PV development beyond intervening hedgerows. Potential new hedgerows and management of existing hedgerows could soften and largely screen the development in the long term.	Yr 1 – Small Yr 10 - Small	Yr 1 – Medium Yr 10 - Small
12	Spires and Steeples Trail – South of Blankney TF 06855 59445	Eastern parcel only	No	A generous offset from the Spires and Steeples Trail and potential new planting between the trail and the site boundary fence line.	Open views of solar PV development at close proximity to one side of the Spires and Steeples Trail. Potential new planting could soften and largely screen the development in the long term but views would be more restricted than at present.	Yr 1 – Medium Yr 10 - Small	Yr 1 – Large Yr 10 - Small

VP	Location	Springwell parcels visible	Substation/ BESS visible?	Potential mitigation	Comments	Preliminary assessment of likely scale of change in landscape character	Preliminary assessment of likely scale of change in view
13	Blankney Stepping Out Car Park Picnic Area TF 07418 60577	Eastern parcel only	No	Enhanced planting along the northern boundary of eastern parcel.	Filtered mid distance views of solar PV development beyond a tree lined ditch – more obvious in winter months than in summer. Potential new planting could soften and largely screen the development in the long term.	Yr 1 – Small Yr 10 - Negligible	Yr 1 – Small Yr 10 - Negligible
14	Blankney Walks Lane near Brickyard Cottage TF 08370 60628	Eastern parcel only	No	Offsets from Blankney Walks Lane and potential new planting between the road and the site boundary fence line. New/enhanced hedgerows along northern boundary of site.	Open views of solar PV development at close proximity to one side of Blankney Walks Lane. Potential new planting could soften and largely screen the development in the long term but views would be more restricted than at present.	Yr 1 – Medium Yr 10 - Small	Yr 1 – Large Yr 10 - Small

VP	Location	Springwell parcels visible	Substation/ BESS visible?	Potential mitigation	Comments	Preliminary assessment of likely scale of change in landscape character	Preliminary assessment of likely scale of change in view
15	B1191 - Western Edge of Scopwick TF 06358 57964	Central parcel only	No	Potential new hedgerow along northern edge of solar PV development in central parcel. Potential to manage the hedgerows south of Heath Road at a taller height.	Solar PV development likely to be largely screened by rising landform in the foreground and hedgerows in the intervening fields. Potential mid distance glimpses of the tops of the solar PV panels beyond the crest of the rising landform. Potential new planting could soften and largely screen the development in the long term.	Yr 1 – Medium Yr 10 - Negligible	Yr 1 – Medium Yr 10 - Negligible
16	Footpath Rows/5/1 - West of Sheffield House TF 06401 56655	Central parcel only	No	Infilling any gaps in hedgerows and management of intervening hedgerows to 3m.	Glimpses of solar PV development above intervening hedgerows. Enhanced hedgerows could potentially screen the development in the long term.	Yr 1 – Small Yr 10 - Negligible	Yr 1 – Small Yr 10 - Negligible
17	Footpath Rows/5/1 - North of The Maltings at Rowston Top TF 05581 56426	Central parcel only	No	A generous offset from the PROW and potential new planting between the footpath and the site boundary fence line.	Open views of solar PV development at close proximity to one side of footpath Rows/5/1 and potentially views of collector compound behind solar panels. Potential new planting could soften and largely screen the development in the long term but views would be more restricted than at present.	Yr 1 – Large Yr 10 - Small	Yr 1 – Large Yr 10 - Medium

VP	Location	Springwell parcels visible	Substation/ BESS visible?	Potential mitigation	Comments	Preliminary assessment of likely scale of change in landscape character	Preliminary assessment of likely scale of change in view
18	Heath Road (B1191) near Digby Quarry TF 05316 57209	Central parcel only	No	Potential new hedgerow along northern edge of solar PV development in central parcel. Potential new woodland planting belt on the rising landform immediately north of the development. Potential to manage the hedgerows south of Heath Road at a taller height.	Solar PV development likely to be largely screened by rising landform in the foreground and hedgerows in the intervening fields. Potential mid distance glimpses of the tops of the solar PV panels beyond the crest of the rising landform in one field. Potential new planting could soften and largely screen the development in the long term.	Yr 1 – Medium Yr 10 - Negligible	Yr 1 – Medium Yr 10 - Negligible

VP	Location	Springwell parcels visible	Substation/ BESS visible?	Potential mitigation	Comments	Preliminary assessment of likely scale of change in landscape character	Preliminary assessment of likely scale of change in view
19	Scopwick Heath Restricted Byway SCOP/12/2 TF 05372 57874	Central parcel only	No	Potential new hedgerow along northern edge of solar PV development in central parcel. Potential new woodland planting belt on the rising landform immediately north of the development.	Solar PV development likely to be partially screened by rising landform in the foreground and hedgerows in the intervening fields. However some distant views of the solar PV panels on the crest of the rising landform to the south. Potential new planting could soften and largely screen the development in the long term.	Yr 1 – Small Yr 10 - Negligible	Yr 1 – Medium Yr 10 - Small
20	Main Street, West of Junction with B1188, Lincoln Road in Digby TF 07720 54830	Central parcel only	No	None required	No view of any development. Included to demonstrate that there would be no impact on views from Digby village.	Yr 1 – Negligible Yr 10 - Negligible	Yr 1 – Negligible Yr 10 - Negligible
21	Main Street, Ashby de la Launde TF 05269 55085	Western parcel only	No	None required	Distant glimpses of solar PV development west of Heath Road (B1191) and alongside the A15. A minor feature in the distance in the context of the A15 and overhead pylons.	Yr 1 – Negligible Yr 10 - Negligible	Yr 1 – Small Yr 10 - Small

VP	Location	Springwell parcels visible	Substation/ BESS visible?	Potential mitigation	Comments	Preliminary assessment of likely scale of change in landscape character	Preliminary assessment of likely scale of change in view
22	Junction of Heath Road (B1191) and Navenby Lane TF 04815 55349	Western parcel only	Potentially depending on final location and design	Potential new/enhanced hedgerow planting along field boundaries to the north of Navenby Lane approaching RAF Digby.	Mid distance views of solar PV development set back from Navenby Lane, partially filtered by hedgerows. Potentially distant glimpses of the top of the substation in the context of existing overhead electricity pylons. Potential new hedgerow planting could soften the development in the long term.	Yr 1 – Medium Yr 10 - Small	Yr 1 – Medium Yr 10 - Small
23	Heath Road (B1191) at Slate House Farm TF 04123 54238	Western parcel only	No	Potential enhanced hedgerow planting along field boundaries to the south of Slate House Cottages. Potential to manage the hedgerows west of Heath Road at a taller height.	Views of the solar PV development west of Heath Road and south of Slate House Cottages over existing low cut hedgerows – more obvious in winter months. Potential new hedgerow planting and management of existing hedgerows to a higher height could soften and largely screen the development in the long term.	Yr 1 – Medium Yr 10 - Small	Yr 1 – Medium Yr 10 - Small

VP	Location	Springwell parcels visible	Substation/ BESS visible?	Potential mitigation	Comments	Preliminary assessment of likely scale of change in landscape character	Preliminary assessment of likely scale of change in view
24	Bloxham Wood Nature Reserve Layby TF 03758 53324	Western parcel only	No	A generous offset from the Nature Reserve and potential new planting between the car park/layby and the site boundary fence line. Management of hedgerows on the western side of Heath Road to a taller height.	Open views of solar PV development (and potentially a collector compound and BESS) at close proximity to one side of the Heath Road but solar PV largely screened by existing hedgerow on the western side. Potential new planting could soften the development in the long term but views would be more restricted than at present.	Yr 1 – Large Yr 10 - Medium	Yr 1 – Large Yr 10 - Medium
25	Footpath AshL/11/1 in Long Plantation (Bloxham Woods) TF 04464 53376	Western parcel only	No	A generous offset from the Nature Reserve and potential new planting between the Bloxham Woods and the site boundary fence line.	Filtered views of solar PV development (and potentially a collector compound and BESS) at close proximity to one side of the Footpath AshL/11/1 – more prominent in winter than summer months. Potential new planting could soften and largely screen the development in the long term but views would be more enclosed than at present.	Yr 1 – Large Yr 10 - Small	Yr 1 – Large Yr 10 - Small

VP	Location	Springwell parcels visible	Substation/ BESS visible?	Potential mitigation	Comments	Preliminary assessment of likely scale of change in landscape character	Preliminary assessment of likely scale of change in view
26	Church Lane, north of All Saints' Church, Brauncewell TF 04546 52463	Western parcel only	No	Potential hedgerow planting south of Warren Pit Plantation	Views of solar PV development largely screened by intervening landform and vegetation but potentially filtered glimpses south west of Warren Pit Plantation. Potential new planting could soften and largely screen the development in the long term.	Yr 1 – Small Yr 10 - Negligible	Yr 1 – Small Yr 10 - Negligible
27	A15 at Junction with Minor Road to Ruskington TF 03835 51616	Western parcel only	Potentially depending on final location and design	Some ancillary planting may be visible in the distance but design intent is not to provide mass planting along the A15.	Distant views of solar PV development in the open landscape alongside the A15. Potentially long distance glimpses of the project substation/BESS at the far end of the solar development. The views are likely to remain post mitigation due to the inherent openness of the landscape and the slightly elevated nature of the viewpoint.	Yr 1 – Small Yr 10 – Small	Yr 1 – Medium Yr 10 - Medium

VP	Location	Springwell parcels visible	Substation/ BESS visible?	Potential mitigation	Comments	Preliminary assessment of likely scale of change in landscape character	Preliminary assessment of likely scale of change in view
28	A15 at Junction with Church Lane TF 03638 52581	Western parcel only	No	Some infill planting of roadside hedgerows and maintenance of hedges to a taller height	Open views of solar PV development at close proximity in multiple directions. Potential new hedgerows and management of existing hedgerows would soften and partially screen the development in the long term but winter views would remain through hedgerows.	Yr 1 – Medium Yr 10 - Negligible	Yr 1 – Large Yr 10 - Medium
29	A15 at Junction with Warren Lane TF 02772 55279	Western parcel only	Yes	Some ancillary planting within the development. Likely to be more substantial planting around the substation/BESS.	Open views of solar PV development at close proximity in multiple directions. Views of the project substation/BESS at the northern end of the development beyond the solar array. Views would remain similar in the long term.	Yr 1 – Large Yr 10 - Large	Yr 1 – Large Yr 10 - Large

VP	Location	Springwell parcels visible	Substation/ BESS visible?	Potential mitigation	Comments	Preliminary assessment of likely scale of change in landscape character	Preliminary assessment of likely scale of change in view
30	A15 at Junction with Restricted Byway Temp/1/1 TF 02168 57495	Western parcel only	Yes	Potential for substantial planting around the substation/BESS.	The solar PV development would be largely indiscernible due to distance and intervening vegetation. Views of the project substation/BESS at the northern end of the development would be visible but partially screened by Gorse Hill Plantation. Views would remain similar in the long term although potential new planting may soften approach from the north.	Yr 1 – Medium Yr 10 - Medium	Yr 1 – Large Yr 10 - Medium
31	Junction of Footpath Brau/10/1 and Long Lane TF 01514 51973	Western parcel only	No	Some ancillary planting may be visible in the distance.	Distant views of solar PV development in the open landscape alongside the A15. Much of the site is screened by intervening vegetation. The views are likely to remain post mitigation due to the inherent openness of the landscape and the slightly elevated nature of the viewpoint.	Yr 1 – Small Yr 10 - Small	Yr 1 – Small Yr 10 - Small

VP	Location	Springwell parcels visible	Substation/ BESS visible?	Potential mitigation	Comments	Preliminary assessment of likely scale of change in landscape character	Preliminary assessment of likely scale of change in view
32	Temple Road - East of Temple Bruer TF 01437 53626	Western parcel only	No	Some ancillary planting may be visible in the distance. Management of roadside hedgerow on the western boundary to a taller height.	A narrow glimpse of solar PV development at the end of Temple Road beyond hedgerow. Most of the site is screened by intervening landform and vegetation. When roadside hedgerow is managed taller there would be barely any view of the development.	Yr 1 – Negligible Yr 10 - Negligible	Yr 1 – Small Yr 10 - Negligible
33	The Viking Way / High Dike south of Temple Road SK 99250 52993	Western parcel only	No	None required	Development would be indiscernible due to distance and intervening vegetation.	Yr 1 – Negligible Yr 10 - Negligible	Yr 1 – Negligible Yr 10 - Negligible
34	Junction of New England Lane and Warren Lane TF 01021 54671	Western parcel only	Potentially depending on final location and design	Not appropriate	Solar PV development would not be visible due to intervening landform and vegetation. The top of the project substation may just be visible in the distance in the vicinity of existing pylons. Views would remain similar in the long term.	Yr 1 – Small Yr 10 - Small	Yr 1 – Small Yr 10 - Small

VP	Location	Springwell parcels visible	Substation/ BESS visible?	Potential mitigation	Comments	Preliminary assessment of likely scale of change in landscape character	Preliminary assessment of likely scale of change in view
35	Warren Lane near Thompson's Bottom TF 02066 55112	Western parcel only	Yes	Some ancillary planting within the development. Likely to be more substantial planting around the substation/BESS.	Open views of solar PV development at close proximity to the east. Views of the project substation/BESS at the northern end of the development beyond the solar array. Views would remain similar in the long term.	Yr 1 – Large Yr 10 - Large	Yr 1 – Large Yr 10 - Large
36	New England Lane TF 01271 55547	Western parcel only	Yes	Likely to be substantial planting around the substation/BESS.	Open views of project substation/BESS at close proximity. Potential substantial mitigation planting around the project substation/BESS would soften the development in the long terms but it would remain highly prominent due to proximity.	Yr 1 – Large Yr 10 - Large	Yr 1 – Large Yr 10 - Large
37	Heath Lane at Navenby Heath TF 00424 57511	Western parcel only	Potentially depending on final location and design	Not appropriate	Solar PV development would not be visible due to intervening landform and vegetation. The top of the project substation may just be visible in the distance in the vicinity of existing pylons. Views would remain similar in the long term.	Yr 1 – Small Yr 10 - Small	Yr 1 – Small Yr 10 - Small

VP	Location	Springwell parcels visible	Substation/ BESS visible?	Potential mitigation	Comments	Preliminary assessment of likely scale of change in landscape character	Preliminary assessment of likely scale of change in view
38	Wellingore Playing Fields SK 98807 57209	Western parcel only	No	None required	No view of any development. Included to demonstrate that there would be no impact on views from Navenby/Wellingore.	Yr 1 – Negligible Yr 10 - Negligible	Yr 1 – Negligible Yr 10 - Negligible

Appendix 9.5

Preliminary Residential Visual Amenity Assessment



Introduction

This appendix presents a summary of the Residential Visual Amenity Assessment (RVAA) work undertaken to date. A detailed RVAA will be provided in the ES once final details of the Proposed Development have been established and mitigation measures developed as appropriate.

The RVAA in the ES will be prepared in accordance with:

- *Landscape Institute Technical Guidance Note 2/19: Residential Visual Amenity Assessment* (15 March 2019).

As defined in the guidance above 'Residential Visual Amenity' is taken to mean:

"the overall quality, experience and nature of views and outlook available to occupants of residential properties, including views from gardens and domestic curtilage"

Background

With respect to visual impact the focus of LVIA is on public views and public visual amenity. RVAA is a stage beyond LVIA and focusses exclusively on private views and private visual amenity and may be used by the decision maker when weighing potential effects on Residential Amenity in the planning balance.

Technical Guidance Note 2/19 (TGN 2/19) identifies that:

"The purpose of carrying out a Residential Visual Amenity Assessment (RVAA) is to form a judgement, to assist decision makers, on whether a proposed development is likely to change the visual amenity of a residential property to such an extent that it becomes a matter of 'Residential Amenity'."

It further notes that:

"Changes in views and visual amenity are considered in the planning process. In respect of private views and visual amenity, it is widely known that, no one has 'a right to a view.'"

...

It is not uncommon for significant adverse effects on views and visual amenity to be experienced by people at their place of residence as a result of introducing a new development into the landscape. In itself this does not necessarily cause particular planning concern. However, there are situations where the effect on the outlook / visual amenity of a residential property is so great that it is not generally considered to be in the public interest to permit such conditions to occur where they did not exist before."

RVAA considers only what the resident may see from their property. Views or 'visual amenity' are just one component of the wider consideration of residential amenity and the two should not be confused. The latter is a planning matter and may also include aspects such as noise, air quality, traffic, etc., in addition to visual amenity. The RVAA presented in the ES will consider the visual amenity aspects of residential amenity. Where necessary, other aspects of residential amenity will be considered in the relevant chapters of the ES and it is for decision makers to weigh all these aspects, and documents/assessments relating to them, in determining the acceptability the Proposed Development as submitted and assessed in the ES.

Overall residential amenity will be discussed within the planning statement accompanying the DCO application for the Proposed Development.

The process of RVAA, seeks to identify where effects on residential visual amenity are of such a nature or magnitude that they may need

to be considered in the overall balance of ‘Residential Amenity’ or ‘Living Conditions’. The point at which this happens is referred to as the Residential Visual Amenity Threshold.

Approach

TGN 2/19 advocates a four-step process to RVAA with the first three falling broadly within the scope of LVIA where the magnitude and significance of visual effects is assessed.

The fourth step involves a further assessment of the change to visual amenity of individual properties identified as “having the greatest magnitude of change” and identifying whether the Residential Visual Amenity threshold is reached.

The preliminary assessment presented in this PEIR identifies the potential visual effects at each property and the likely requirement for detailed consideration but does not provide that detailed assessment. This will be presented in the ES once final details of the Proposed Development have been established; including any mitigation measures as appropriate.

Methodology

Preliminary Residential Property Visits

Residential amenity has been considered from the outset of the Proposed Development and throughout the design process to date. In order to refine the layout resulting in the current parameters plans presented in the PEIR, numerous residential properties have been visited in the LVIA study area (including most of the properties discussed in this appendix).

At an early stage in the design development, all residents of properties within 500m of the then site boundary were contacted by letter offering a visit by the Applicant’s Landscape Architect to understand the outlook from their dwellings. The only exception was residents of military properties at RAF Digby. The outlook from these properties is easily established from the roads/fields immediately adjoining them.

Table A9.5-1 below sets out the properties contacted and whether property visits were undertaken.

Table A9.5-1 Preliminary Residential Property Visits

Property Contacted	Visited by Landscape Architect?	Comment
Scopwick Low Field Farm, Blankney	Yes	Viewed internally and externally
Brickyard Farm, Blankney	Yes	Viewed internally and externally
Scopwick House East Wing, Scopwick	Yes	Viewed internally and externally
Scopwick House West Wing, Scopwick	Yes	Viewed from the exterior only
Gardeners Cottage (Scopwick House), Scopwick	No	No response received but outlook established during visit to adjoining properties
The Cottage (Scopwick House), Scopwick	No	No response received but outlook established during visit to adjoining properties

Property Contacted	Visited by Landscape Architect?	Comment
The Threshing Barn (Scopwick House), Scopwick	Yes	Viewed from the exterior only
Scopwick House Farm, Scopwick	No	Property/properties under construction – viewed from adjacent properties
The Paddock (Scopwick House), Scopwick	No	No response received but outlook established during visit to adjoining properties
Sheffield House, Rowston	Yes	Viewed from the exterior only
Eastfield Cottage, Rowston	Yes	Viewed from the exterior only
Westfield Cottage, Rowston	Yes	Viewed from the exterior only
Scopwick Mill, B1191, Scopwick	Yes	Viewed internally and externally
The Windmill, B1191, Scopwick	Yes	Viewed internally and externally
1 Mill Cottages, B1191, Scopwick	No	No response received but outlook established during visit to adjoining property
2 Mill Cottages, B1191, Scopwick	Yes	Viewed internally and externally
Hill Top Farm, Rowston Top	Yes	Viewed internally and externally
The Maltings, Rowston Top	Yes	Viewed internally and externally
The Granary, Rowston Top	Yes	Viewed internally and externally
The Hayloft, Rowston Top	Yes	Viewed internally and externally
1-2 Rowston Hill Top Cottages (nr RAF Digby)	No	No response received but outlook established from public footpath to rear of property
Fieldview (nr RAF Digby)	No	No response received but outlook established from public footpath to rear of property
Fleur de lys (nr RAF Digby)	No	No response received but outlook established from public footpath to rear of property
Fieldview (nr RAF Digby)	No	No response received but outlook established from public footpath to rear of property
Woodview (nr RAF Digby)	No	No response received but outlook established from public footpath to rear of property
Glebe Farm, B1191, Ashby de la Launde	Yes	Viewed internally and externally
Ashby Walled Garden, Ashby de la Launde	Yes	Viewed internally and externally

Property Contacted	Visited by Landscape Architect?	Comment
The Garden House, Ashby de la Launde	Yes	Viewed internally and externally
Slate House Barn, B1191, Ashby de la Launde	Yes	Viewed internally and externally
Slate House, B1191, Ashby de la Launde	Yes	Viewed internally and externally
1-2 Slate House Cottage, B1191, Ashby de la Launde	Yes	Viewed internally and externally
3 Slate House Cottage, B1191, Ashby de la Launde	Yes	Viewed internally and externally
4 Slate House Cottage, B1191, Ashby de la Launde	No	Unable to arrange mutually convenient time but outlook established during visit to adjoining property
Mount Farm, Ashby de la Launde	Yes	Viewed internally and externally
The Stone Barn, Ashby de la Launde	Yes	Viewed internally and externally
The Coach House, Ashby de la Launde	Yes	Viewed internally and externally
1 Peacock Lodge Cottage, Ashby de la Launde	No	No response received but outlook established during visit to adjoining property
2 Peacock Lodge Cottage, Ashby de la Launde	Yes	Viewed internally and externally
Gorse Hill Farm, Wellingore	Yes	Viewed internally and externally
Gorse Hill Bungalow, Wellingore	No	Residents not present but outlook established during visit from adjoining footpath
Toll Bar Cottage, A15, Ashby de la Launde	Yes	Viewed internally and externally
Lupus Lair, A15, Ashby de la Launde	Yes	Viewed internally and externally
1-2 Ashby Lodge Cottages, A15, Ashby de la Launde	Yes	Viewed internally and externally
3 Ashby Lodge Cottage, A15, Ashby de la Launde	No	No response received but outlook established during visit to adjoining property
4 Ashby Lodge Cottage, A15, Ashby de la Launde	No	No response received but outlook established during visit to adjoining property

Property Contacted	Visited by Landscape Architect?	Comment
The Old Blacksmiths Cottage (Ashby Lodge) , A15, Ashby de la Launde	Yes	Viewed internally and externally
Thompson's Bottom Farm, Temple Bruer	No	No response received but outlook established from adjacent road
1 Thompson's Bottom, Temple Bruer	No	No response received but outlook established from adjacent road
2 Thompson's Bottom, Temple Bruer	No	No response received but outlook established from adjacent road
3 Thompson's Bottom, Temple Bruer	No	No response received but outlook established from adjacent road
4 Thompson's Bottom, Temple Bruer	No	No response received but outlook established from adjacent road
5 Thompson's Bottom, Temple Bruer	No	No response received but outlook established from visit to adjoining property
6-7 Thompson's Bottom, Temple Bruer	Yes	Viewed internally and externally
Church View, Brauncewell	No	No response received but outlook established from adjacent road
Old School Cottage, A15, Brauncewell	Yes	Viewed internally and externally

Refinement of Study Area

The residential property visits outlined in Table **A9.5-1** above influenced the layout of the current plans presented in this PEIR. As a consequence, many of the properties listed above are now substantially further away from any potential development and it is not necessary to consider all of the above properties within the RVAA presented in the ES.

There is no standard criteria for defining a RVAA study area and this is determined on a case by case basis. TGN 02/19 suggests that for large structures, such as wind turbines, a preliminary study area of 1.5-2km radius may be appropriate to begin identifying properties for inclusion within RVAA. However, it goes on to state that:

“other development types including potentially very large but lower profile structures and developments such as road schemes and housing are unlikely to require RVAA, except potentially of properties in very close proximity (50-250m) to the development.”

The following study area has been used for the purposes of identifying properties for inclusion in the RVAA; an offset buffer is shown on Figure 9.11 to illustrate this study area:

- 200m of any Solar PV development;
- 400m of any siting zones for structures up to 6m; and

- 800m from any siting zones for structures up to 12m (i.e. including the siting zones for the project substation).

Initial Analysis of Properties within the Refined Study Area

Within the refined RVAA study area, as defined above, all residential properties have been identified. Preliminary analysis has been undertaken and is presented below in Table **A9.5-2** to identify those properties which are likely to experience the greatest effects, and which therefore require further detailed assessment within the RVAA presented in the ES, as well as those where effects would be less and are unlikely to approach the RVA threshold.

Further Detailed Assessment in the ES

For those properties that have been identified at the PEIR stage as requiring further detailed assessment at ES stage, the process will be as follows:

- Evaluation of baseline visual amenity;
- Assessment of likely change to the visual amenity of properties; and
- Forming the RVAA judgement.

Properties are usually assessed individually but may be considered in groups where their outlook or views are essentially the same; for example a row of houses that all share an open outlook towards the Proposed Development. Where properties are grouped for assessment this will be clearly identified and reasons for grouping described.

The existing baseline visual amenity will be described for each property and informed by desk study and field work (including property visits already undertaken). Visual amenity will be described 'in the round' and consider both views from the dwelling itself, the domestic curtilage and views experienced when arriving or leaving the property.

The change to baseline views and visual amenity as a result of the Proposed Development will be described for each property and a judgement on the magnitude of effects likely to be experienced will be provided. This may involve consideration of the following factors:

- Distance between the property and proposed development and their relative locations (e.g. up/down hill);
- Nature of available views (e.g. panoramic, enclosed) and the effect of daily or seasonal variations;
- Direction of view or aspect of property affected;
- Extent to which the proposed development may be visible from various parts of the property (e.g. dwelling, rooms, access, garden);
- Scale of change to views, including the proportion of view occupied by the Proposed Development;
- Compositional changes (e.g. loss/addition of landscape features such as woodland);
- Contrast or integration of new features with the existing views;
- Duration and nature of changes (e.g. temporary/permanent, intermittent/continuous); and

Visualisation and understanding localised mitigating factors.

Within the ES, the RVAA will be supported by a range of visual aids as required including maps, ZTV studies, photography and visualisations. The choice of visual aids is determined on a case by case basis and may be informed by consultation. In line with best practice guidance, the type of visualisation should be proportionate to the nature of the Proposed Development and assessment stage.

In the ES, following assessment, an RVAA judgement will be made for each property or group of properties assessed. This final stage is concerned with identifying “*whether the predicted effects on visual amenity and views at the property are such that it has reached the Residential Visual Amenity Threshold, therefore potentially becoming a matter of Residential Amenity*”. All judgements regarding the RVA threshold will be set out clearly and unambiguously.

Preliminary Analysis

The preliminary analysis presented in **Table A9.5-2** below has been undertaken assuming a worst case scenario of no mitigation in order to identify those residential properties where a large scale of change in the view may occur (depending on the final layout and mitigation adopted) and where there is the theoretical potential for the RVA threshold to be reached.

Where the potential for significant effects on views to arise has been identified, further detailed assessment will be provided in the ES.

Residential properties referred to in **Table A9.5-2** are illustrated on Figure 9.11.

Table A9.5-2 Preliminary Analysis of Residential Properties within RVVA Study Area

N.B. Measurements taken from the nearest elevation of the property or the nearest part of the primary outdoor garden space (excluding paddocks or fields) to the new infrastructure as indicated on the parameters plan.

Property/group of properties	<200m from solar array?	<400m from Siting Zone for Structures up to 6m?	<800m from Siting Zone for Structures up to 12m?	Initial observations	Potential for a large scale of change in views?	Proposed Inclusion in the RVVA at ES Stage?
Springwell East						
Scopwick Low Field Farm	Yes	No	No	This property (including all of its primary windows and principal garden space) is orientated due south across a field in which no development is proposed. Large agricultural sheds dominate views to the rear and to the west. Views of solar PV development will potentially be prominent at the main entrance into the property and on the drive along Acre Lane to the property.	Yes	Yes
Brickyard Farm	Yes	No	No	The front elevation, driveway and gardens of this property face northwards away from the Proposed Development whilst the rear elevation and rear garden faces south over a field in which no development is proposed. A tall hedgerow marks the southern boundary of the rear garden and heavily filters views southwards. Oblique views will potentially be possible from first floor windows of solar PV development to the south west but there would be an offset in the field to the south west	Yes	Yes

Property/group of properties	<200m from solar array?	<400m from Siting Zone for Structures up to 6m?	<800m from Siting Zone for Structures up to 12m?	Initial observations	Potential for a large scale of change in views?	Proposed Inclusion in the RVVA at ES Stage?
				and any additional screen planting would potentially soften any effects. Likely views from the driveway and on the approach to the property along Blankney Walks Lane.		
Springwell Central						
Sheffield House	Yes	No	No	This property's main elevations and primary garden space are orientated south and east away from the Proposed Development. A belt of mature trees to the north east of the property provides a robust buffer to any development in this direction. Any glimpses of Solar PV development through this vegetation in winter months would be heavily filtered. Likely to be some glimpses of Solar PV development along the driveway approaching the property from the B1188.	No	No - despite its relative proximity, any visual effects experienced at this property are unlikely to be significant and therefore will not approach the Residential Visual Amenity Threshold.
Eastfield and Westfield Cottages (2 properties)	Yes (borderline)	No	No	The front elevation of these two properties is oriented southwards away from the Proposed Development. There may be oblique views from the rear elevations of the Solar PV development in the field to the north but any views would be at least partially filtered by the boundary hedgerow. Likely to be some glimpses of Solar PV development along the	Yes	Yes

Property/group of properties	<200m from solar array?	<400m from Siting Zone for Structures up to 6m?	<800m from Siting Zone for Structures up to 12m?	Initial observations	Potential for a large scale of change in views?	Proposed Inclusion in the RVVA at ES Stage?
The Oval (RAF Digby) (multiple properties)	Yes (borderline)	Yes	No	<p>driveway approaching the property from the B1188.</p> <p>Most of the properties within The Oval are orientated inwards towards a central 'green' and back onto woodland of the playing fields. A single property is accessed off the eastern end of The Oval and has some view eastwards towards the Solar PV development and siting zone for structures up to 6m. Mature trees surround the property and rising land to the east topped by a well maintained hedgerow would largely screen views of any development. Glimpses may be possible from first floor windows.</p>	No	No - despite its relative proximity, any visual effects experienced at this property are unlikely to be significant and therefore will not approach the Residential Visual Amenity Threshold.
The Maltings, The Hayloft and The Granary (Rowston Top) (3 properties)	Yes (borderline)	Yes (borderline)	No	<p>These three properties have rear elevations which are orientated to the north towards the proposed Solar PV development. Development would be set back some distance beyond paddocks and a hedgerow to the north. There would be some views of the development especially from first floor windows. Mitigation proposals may soften any effects.</p>	Yes	Yes
1 and 2 Rowston Hill Top Cottages, Fleur-	Yes	Yes	No	<p>These 5 properties are tucked in behind a dense block of woodland known as Rowston</p>	No	No – there would be no view of the

Property/group of properties	<200m from solar array?	<400m from Siting Zone for Structures up to 6m?	<800m from Siting Zone for Structures up to 12m?	Initial observations	Potential for a large scale of change in views?	Proposed Inclusion in the RVVA at ES Stage?
de-lys, Woodview and Fieldview (5 properties)				Plantation and would therefore have no view of the development.		development from these properties.
Springwell West						
Mallory Road (within RAF Digby) (multiple properties)	Yes	No	No	These properties and the drive leading to them have views westwards towards the Proposed Development. The boundary around RAF Digby is delineated by a tall security fence and, together with tree cover along the boundary, this would filter views towards the development. Whilst solar PV development would most likely be visible from these properties, views would be through the boundary security fence moderating the scale of change. An offset has been proposed around these properties and there is scope for mitigation planting within this area.	No	No – whilst there would be views of the Proposed Development from these properties, views would be interrupted by tall security fencing in the foreground and therefore even if visible the effects are unlikely to be significant
Slate Barn	Yes (borderline)	No	No	This property is surrounded by mature woodland on the western and northern side and by Slate House to the south. There would be no view of the Proposed Development from the property itself although there may be views of the Solar PV development along the driveway to the property and the front garden.	No	No - despite its relative proximity, any visual effects experienced at this property are unlikely to be significant and therefore will not approach the

Property/group of properties	<200m from solar array?	<400m from Siting Zone for Structures up to 6m?	<800m from Siting Zone for Structures up to 12m?	Initial observations	Potential for a large scale of change in views?	Proposed Inclusion in the RVVA at ES Stage?
1-2 Slate House Cottage	Yes (borderline)	No	No	This property (including its annex) have views primarily orientated to the south and west and would have views of Solar PV development set back beyond a field from the property. Potential mitigation along hedgerow boundaries may reduce the scale of the change but development would potentially be prominent initially.	Yes	Residential Visual Amenity Threshold. Yes
3 and 4 Slate House Cottages (2 properties)	Yes (borderline)	No	No	These two properties have front elevations views focussed to the east away from the development. Rear elevations and gardens are orientated to the west from which residents would have views of Solar PV development set back by a field from the property. Potential mitigation along hedgerow boundaries may reduce the scale of the effect but development would potentially be prominent initially.	Yes	Yes
1 and 2 Peacock Lodge Cottages (2 properties)	Yes	Yes	No	These two properties are orientated principally to the south with mature trees to the north. Directly due south, in winter months only, there may be glimpses of Solar PV development or structures of up to 6m beyond	Yes	Yes

Property/group of properties	<200m from solar array?	<400m from Siting Zone for Structures up to 6m?	<800m from Siting Zone for Structures up to 12m?	Initial observations	Potential for a large scale of change in views?	Proposed Inclusion in the RVVA at ES Stage?
				<p>a belt of woodland at Bloxholm Woods but in summer months there would be no view through this vegetation.</p> <p>At an oblique angle from the front elevation and also outside the properties at the front, there would potentially be filtered views of Solar PV development through roadside hedgerows on the B1191 (more so in winter months).</p>		
The Old Blacksmiths Lodge (Ashby Lodge)	Yes (borderline)	Yes	Yes	<p>This property's main elevation faces east whilst there are also views southwards and from the garden. Solar PV development would most likely be visible (set back from the property) in several directions. Potential mitigation along hedgerow boundaries may potentially reduce the scale of the change but development would potentially be prominent initially. Property would also be approached along the A15 though Solar development.</p>	Yes	Yes
3 and 4 Ashby Lodge Cottages (*involved properties) (2 properties)	Yes	Yes	Yes	<p>The main elevations from these two properties face north and south and there are also views southwards from the garden. Solar PV development would most likely be visible (set back from the property) in several directions (primarily from first floor windows). Potential</p>	Yes	Yes

Property/group of properties	<200m from solar array?	<400m from Siting Zone for Structures up to 6m?	<800m from Siting Zone for Structures up to 12m?	Initial observations	Potential for a large scale of change in views?	Proposed Inclusion in the RVVA at ES Stage?
1-2 Ashby Lodge Cottage	Yes	Yes	Yes	<p>mitigation along hedgerow boundaries may reduce the scale of the change but development would be prominent initially. Property would also be approached along the A15 though solar development.</p> <p>The main elevations from this property face north and south and there are also views southwards from the garden. Solar PV development would most likely be visible (set back from the property) in several directions. Potential mitigation along hedgerow boundaries may reduce the scale of the change but development would be prominent initially. Property would also be approached along the A15 though solar development.</p>	Yes	Yes
Thompson's Bottom Farm	No	Yes	Yes	<p>This property is entirely surrounded by woodland and other agricultural outbuildings. Whilst there would be views of the Proposed Development from the road along which the property is accessed, there would be no view of the development from the property itself.</p>	No	No – there would be no view of the development from this property.
1, 2, 3 and 4 Thompsons Bottom Cottages (4 properties)	No	Yes	Yes	<p>These four properties are orientated south east and north west and would have oblique views in both directions across adjoining farmland and past existing overhead</p>	Yes	Yes

Property/group of properties	<200m from solar array?	<400m from Siting Zone for Structures up to 6m?	<800m from Siting Zone for Structures up to 12m?	Initial observations	Potential for a large scale of change in views?	Proposed Inclusion in the RVVA at ES Stage?
				electricity lines towards solar PV development. Depending on final location, layout and mitigation, the project substation and BESS may also be visible to the north east. Mitigation measures will be developed but it is likely that there will be a large scale of change in view.		
5 Thompsons Bottom Cottage	No	Yes	Yes	This property is surrounded on the eastern garden boundary by a tall mature hedgerow and trees which greatly restricts views in the direction of the site but the Proposed Development would potentially be visible from first floor windows and access to the property would pass through the development.	Yes	Yes
6-7 Thompsons Bottom Cottage	No	Yes	Yes	This property is orientated eastwards towards the Proposed Development and although it is set back beyond garden vegetation and there is an intervening field, the Solar PV development would potentially be prominent initially. Access to the property would pass through the development.	Yes	Yes
Toll Bar Cottage	Yes	No	Yes	This property is relatively screened by a mature hedgerow and trees adjacent to the A15 but the property access/egress opens out onto the A15 opposite the proposed location	Yes	Yes

Property/group of properties	<200m from solar array?	<400m from Siting Zone for Structures up to 6m?	<800m from Siting Zone for Structures up to 12m?	Initial observations	Potential for a large scale of change in views?	Proposed Inclusion in the RVVA at ES Stage?
Lupus Lair	Yes	No	Yes	<p>of the siting zone for structures up to 12m. Whilst views from ground floor windows would largely remain the same, the development would potentially be prominent from first floor windows and adjoining menage. Mitigation will be developed to reduce any effects on this property, but it is likely that there will be a large scale of change in view.</p> <p>This property is relatively screened by a mature hedgerow and trees adjacent to the A15 but the property access/egress opens out onto the A15 opposite the proposed location of the siting zone for structures up to 12m. Whilst views from ground floor windows would largely remain the same, the development would potentially be prominent from first floor windows. Mitigation will be developed to reduce any effects on this property, but it is likely that there will be a large scale of change in view.</p>	Yes	Yes
Gorse Hill Farm	No	No	Yes	<p>This property has a rear elevation and gardens orientated to the east from where there would be views across rising land towards the siting zone for structures up to 12m. Intervening hedgerows would partially filter the view and existing pylons are visible in</p>	Yes	Yes

Property/group of properties	<200m from solar array?	<400m from Siting Zone for Structures up to 6m?	<800m from Siting Zone for Structures up to 12m?	Initial observations	Potential for a large scale of change in views?	Proposed Inclusion in the RVVA at ES Stage?
Gorse Hill Bungalow	Yes (borderline)	No	Yes	<p>this direction. Mitigation will be developed to reduce any effects on this property, but it is likely that there will be a large scale of change in view.</p> <p>This property is located in a slight depression and has limited views of the site due to dense vegetation on the opposite side of the lane. However, it is possible that structures up to 12m would be visible from this property.</p>	Yes	Yes

Appendix 10.1

Preliminary Risk Appraisal - Part 1





Springwell Energyfarm Ltd

Springwell Solar Farm

Preliminary Risk Assessment

1922604 R01 (01)

RSK GENERAL NOTES

Project No.: 1922604 R01 (01)

Title: Preliminary Risk Assessment : Springwell Solar Farm

Client: Springwell Energyfarm Ltd

Date: 23rd November 2023

Office: RSK Environment Limited, 18 Frogmore Road, Hemel Hempstead, Herts, HP3 9RT. Tel 01442 437500

Status: R01 (01)

Revision control sheet				
Revision ref.	Date	Reason for revision	Amended by:	Approved by:
Rev 00	25.11.22	First issue	n/a	see above
Rev 01	23.11.23	NG substation move	F Clayton	n/a

RSK Environment Limited (RSK) has prepared this report for the sole use of the client, showing reasonable skill and care, for the intended purposes as stated in the agreement under which this work was completed. The report may not be relied upon by any other party without the express agreement of the client and RSK. No other warranty, expressed or implied, is made as to the professional advice included in this report.

Where any data supplied by the client or from other sources have been used, it has been assumed that the information is correct. No responsibility can be accepted by RSK for inaccuracies in the data supplied by any other party. The conclusions and recommendations in this report are based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.

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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

CONTENTS

EXECUTIVE SUMMARY	1
1 INTRODUCTION	1
1.1 Commissioning	1
1.2 Objectives	1
1.3 Scope of works	1
1.4 Existing reports	2
1.5 Limitations	2
2 SITE DETAILS	3
2.1 Site location.....	3
2.2 Site description	4
2.3 Surrounding land uses	4
2.4 Proposed development.....	5
3 DESK-BASED ASSESSMENT	6
4 DESK-BASED ASSESSMENT - ZONE A	8
4.1 Site history	8
4.2 Information from environmental database report.....	9
4.3 Site geology	13
4.4 Mining and quarrying	15
4.5 Hydrogeology.....	15
4.6 Hydrology.....	15
4.7 Sensitive land uses	16
5 DESK-BASED ASSESSMENT – ZONE B	17
5.1 Site history	17
5.2 Information from environmental database report.....	20
5.3 Site geology	22
5.4 Mining and quarrying	26
5.5 Hydrogeology.....	26
5.6 Hydrology.....	27
5.7 Sensitive land uses	27
6 DESK-BASED ASSESSMENT – ZONE C	29
6.1 Site history	29
6.2 Information from environmental database report.....	30
7 DESK-BASED ASSESSMENT – ZONE D	32
7.1 Site history	32
7.2 Information from environmental database report.....	36
7.3 Information from regulatory authorities	38
7.4 Site geology	38
7.5 Mining and quarrying	41
7.6 Hydrogeology.....	41
7.7 Hydrology.....	41
7.8 Sensitive land uses	42
8 DESK-BASED ASSESSMENT – ZONE E	44

8.1	Site history	44
8.2	Information from environmental database report.....	49
8.3	Site geology	52
8.4	Mining and quarrying	54
8.5	Hydrogeology.....	54
8.6	Hydrology.....	55
8.7	Sensitive land uses	55
9	DESK-BASED ASSESSMENT – ZONE F	57
9.1	Site history	57
9.2	Information from environmental database report.....	61
9.3	Information from regulatory authorities	63
9.4	Site geology	63
9.5	Mining and quarrying	66
9.6	Hydrogeology.....	66
9.7	Hydrology.....	67
9.8	Sensitive land uses	67
10	DESK-BASED ASSESSMENT – ZONE G.....	69
10.1	Site history	69
10.2	Information from environmental database report.....	73
10.3	Information from regulatory authorities	75
10.4	Site geology	75
10.5	Mining and quarrying	77
10.6	Hydrogeology.....	77
10.7	Hydrology.....	78
10.8	Sensitive land uses	78
11	DESK-BASED ASSESSMENT – ZONE H.....	79
11.1	Site history	79
11.2	Information from environmental database report.....	83
11.3	Information from regulatory authorities	85
11.4	Site geology	85
11.5	Mining and quarrying	88
11.6	Hydrogeology.....	88
11.7	Hydrology.....	89
11.8	Sensitive land uses	89
12	DESK-BASED ASSESSMENT – ZONE I	91
12.1	Site history	91
12.2	Information from environmental database report.....	95
12.3	Information from regulatory authorities	99
12.4	Site geology	99
12.5	Mining and quarrying	102
12.6	Hydrogeology.....	102
12.7	Hydrology.....	103
12.8	Sensitive land uses	103
13	DESK-BASED ASSESSMENT – ZONE J	105
13.1	Site history	105
13.2	Information from environmental database report.....	109

13.3 Site geology	113
13.4 Mining and quarrying	115
13.5 Hydrogeology	115
13.6 Hydrology	115
13.7 Sensitive land uses	116
14 DESK-BASED ASSESSMENT – ZONE K.....	117
14.1 Site history	117
14.2 Information from environmental database report.....	118
15 DESK-BASED ASSESSMENT – ZONE L	120
15.1 Site history	120
15.2 Information from environmental database report.....	124
15.3 Site geology	126
15.4 Mining and quarrying	129
15.5 Hydrogeology	129
15.6 Hydrology	130
15.7 Sensitive land uses	130
16 DESK-BASED ASSESSMENT – ZONE M	132
16.1 Site history	132
16.2 Information from environmental database report.....	136
16.3 Information from regulatory authorities	138
16.4 Site geology	139
16.5 Mining and quarrying	141
16.6 Hydrogeology	141
16.7 Hydrology	142
16.8 Sensitive land uses	142
17 SITE RECONNAISSANCE FINDINGS.....	143
18 PRELIMINARY GEOTECHNICAL CONSTRAINTS	146
18.1 Design class.....	146
18.2 Preliminary geotechnical hazards assessment.....	146
19 UNEXPLODED ORDNANCE	149
20 INITIAL CONCEPTUAL SITE MODEL	150
20.1 Potential soil, soil vapour and groundwater linkages.....	150
20.2 Potential ground gas linkages.....	151
20.3 Preliminary risk assessment	154
20.4 Data gaps and uncertainties	159
21 CONCLUSIONS AND RECOMMENDATIONS	160
21.1 Site History.....	160
21.2 Likely ground and groundwater conditions	160
21.3 Geo-environmental assessment.....	160
21.4 Geotechnical assessment.....	161
21.5 Recommendations	161
REFERENCES	163

FIGURES

Figure 1	Site location plan
Figure 2	Site parcel plan
Figure 3	Site zoning plan (environmental assessment)
Figure 4	Site additional zoning plan
Figure 5	Site-wide geology plans
Figure 6	Site reconnaissance photograph plan

APPENDICES

Appendix A	Service constraints
Appendix B	Summary of legislation and policy relating to land contamination
Appendix C	Site-wide historical maps and plans
Appendix D1	Environmental database report – Zone A
Appendix D2	Environmental database report – Zone B
Appendix D3	Environmental database report – Zone C
Appendix D4	Environmental database report – Zone D
Appendix D5	Environmental database report – Zone E
Appendix D6	Environmental database report – Zone F
Appendix D7	Environmental database report – Zone G
Appendix D8	Environmental database report – Zone H
Appendix D9	Environmental database report – Zone I
Appendix D10	Environmental database report – Zone J
Appendix D11	Environmental database report – Zone K
Appendix D12	Environmental database report – Zone L
Appendix D13	Environmental database report – Zone M
Appendix E1	BGS borehole logs – Zone B
Appendix E2	BGS borehole logs – Zone D
Appendix E3	BGS borehole logs – Zone E
Appendix E4	BGS borehole logs – Zone F
Appendix E5	BGS borehole logs – Zone G
Appendix E6	BGS borehole logs – Zone H
Appendix E7	BGS borehole logs – Zone I
Appendix E8	BGS borehole logs – Zone J
Appendix E9	BGS borehole logs – Zone L
Appendix E10	BGS borehole logs – Zone M
Appendix F	Site reconnaissance photographs
Appendix G	Technical background
Appendix H	Preliminary UXO assessment

EXECUTIVE SUMMARY

Commissioning and purpose of assessment	<p>RSK Environment Limited (RSK) was commissioned by Springwell Solar Farm Limited to carry out a Preliminary Risk Assessment on numerous parcels of agricultural land located around the villages of Brauncewell, Kirkby Green, Ashby de la Launde, Scopwick and Blankney in Lincolnshire. The overall aim of the project was to assess potential land contamination sources and geotechnical constraints to the proposed development.</p>
DESK-BASED ASSESSMENT	
Site description and proposed development	<p>The site currently comprises a large number of agricultural fields, interspersed with hedgerows, small woodland blocks and farm access tracks. It occupies an area of approximately 1,775 hectares and is being considered for development with a new solar energy farm, comprising ground mounted photovoltaic panels, a battery energy storage system, and infrastructure to connect the solar energy farm to the national grid.</p> <p>The site is split into four development parcels denoted A1, A2, B and C (Figure 2). To support this assessment, the site has been subdivided further into 13No zones (A to M), with each zone split even further into a maximum of sixteen subzones (as shown on Figures 3 and 4).</p>
History of site and surrounding area	<p>The site has largely remained undeveloped throughout its entire history, except for localised construction of minor structures, tracks, paths and access roads. Numerous stone pits, gravel pits and small quarries are shown to be distributed across the site area (notably RSK subzones B10, B14, D4, D12, E7, E10, F13, G4, I10).</p> <p>The surrounding area is equally agricultural, although residential expansion occurred in surrounding villages. A sewage works was constructed within zone H4 (outside the redline site boundary) and a large RAF Base (RAF Digby) was constructed adjacent to the central part of the site to the west.</p> <p>Two adjacent quarries (Brauncewell and Longwood) have been historically used as landfill sites and waste treatment facilities.</p>
Previous site investigation reports	<p>There are no previous site investigation (SI) reports available.</p>
Geology	<p>Given its agricultural setting, the site is likely to be primarily covered by a nominal to limited thickness of topsoil, with any made ground anticipated to be localised to distinct previously developed areas, such as former small structures, roads and paths. There may also be made ground 'overspill' from directly adjacent features such as the RAF airfield and sewage works.</p> <p>As the site is so large, the geological sequence is highly varied. Superficial deposits are localised in the north of the site where a covering of Tidal Flat deposits encroaches upon the northern part of zones L and M. In the central (RSK zone E) and southwestern (RSK zones A, B and D) parts of the site, thin bands of Head Deposits and Sleaford Sand and Gravel are present directly over the bedrock.</p> <p>The bedrock outcrops in a sequence presenting itself from east (youngest) to west (oldest) and comprises Oxford Clay, Kellaways Formation (clays and mudstones), Cornbrash Formation (limestone), Blisworth Clay (clays and mudstones), Blisworth Limestone, Rutland Formation (mudstone with limestone beds) and the Lincolnshire Limestone Formation. An overall figure showing site-wide geology is presented as Figure 5.</p>

Hydrogeology and Hydrology	<p>Through reference to historical BGS borehole records, depths to groundwater appear to vary across the site dependent upon the strata. Groundwater in some cases was recorded at shallow depths (2-3 mbgl) within weathered limestones and locally within superficial deposits. Groundwater was generally recorded within limestone units at depths between 12 and 30 mbgl.</p> <p>The Lincolnshire Limestone and Blisworth Limestone are classed as a Principal aquifer, with other limestone units (Kellaways Formation, Cornbrash Formation, Rutland Formation) classed as Secondary aquifers. The Oxford Clay and Blisworth Clay are classed an Unproductive stratum.</p> <p>The site is low lying and crossed by a number of drainage ditches and smaller un-named streams, which generally flow towards the east. Some discharge into lesser watercourses such as Springwell Brook and Scopwick Beck, ultimately discharging into the River Witham several kilometres to the east of the site.</p> <p>The site largely falls outside of any Source Protection Zone, except for the very south of the site, which falls within a Zone 3 SPZ for a public water supply borehole located over 1km to the south. A localised SPZ1 (inner zone) is located within RSK Zone H and I of the site, associated with a private supply borehole. There are no outer catchment zones associated with this SPZ1, which is why it appears very localised.</p>
Site reconnaissance findings	<p>No obvious signs or sources of on-site contamination were identified during the site walkover. Considering the agricultural nature of the site and the sheer size of the site area, there may be small volumes of chemicals and other materials stored on site which were not directly observed during the reconnaissance survey.</p>
Geotechnical constraints assessment	<p>The following potential geotechnical constraints were identified:</p> <ul style="list-style-type: none"> • Silt rich and shrinkable clay soils associated with all strata except granular superficial soils and unweathered limestone; • Potential compressible and low bearing capacity soils associated with superficial Head Deposits and Tidal Flat Deposits; • Potential running sand associated with saturated granular deposits; • Karstic dissolution features within limestone strata; • Potentially waterlogged ground and/or localised high groundwater table ; • Potential for geological faults within underlying bedrock geology; • Infilled ponds, quarries and gravel pits as well as potential for unrecorded extraction pits, shafts and adits; • Adverse ground chemistry associated with Oxford Clay, Blisworth Clay and Kellaway Formation; and • Lateral variation in ground conditions.
Unexploded Ordnance (UXO)	<p>The site was considered to be at a potential risk of UXO due to the proximity of RAF Digby, which may have been targeted by enemy aircraft during World War II. In addition, the undeveloped and unoccupied nature of the solar site may have resulted in potential strikes going unrecorded.</p>
Contamination assessment	<p>The PRA has identified no obvious potential sources of on-site contamination, except for perhaps the use of pesticides and herbicides as a result of the site's agricultural history. The presence of made ground in some areas is likely although considered to be limited to minor previously developed areas such as small structures (i.e. wind pumps) and tracks, paths and access roads. There are a number of former stone/gravel pits as well as</p>

	<p>ponds that have the potential to be infilled with onerous material, although it is likely that any infill comprised natural and/or inert soils.</p> <p>Two off-site landfills at Brauncewell and Longwood Quarry were licensed to accept inert and non-biodegradable waste, though their proximity and currently active status means that risks may exist for affected zones, but only if the proposed development in these areas comprises manned structures or un-manned enclosed structures where gases could accumulate.</p> <p>Identified potential pollutant linkages were identified, associated with:</p> <ul style="list-style-type: none"> • Potential impactation of shallow groundwater within SPZ1 via leaching of contaminated soils through the infiltration of rainwater – Zones H and I only; and • Migration of ground gases from adjacent landfill sites and accumulation in enclosed spaces resulting in asphyxiation and/or explosion – Zones A, B, I, L only and only if proposed development comprises manned and/or enclosed structures.
<p>Recommendations including issues for further assessment</p>	<p>It is recommended that intrusive investigation be carried out across the site to confirm both geology and groundwater conditions and assess for the presence of any localised made ground. Historical quarries, pits and ponds that have been infilled should also be targeted to ascertain the composition of the backfill.</p> <p>Installation of ground gas monitoring standpipes along boundaries adjacent to off-site landfills (and subsequent monitoring) may be required to assess potential ground gas risks.</p> <p>Intrusive investigation is also likely to be required to facilitate design of the proposed development and further investigate the identified potential geotechnical constraints.</p> <p>It is understood that a ground investigation specification is currently being drafted.</p> <p>The findings of the Unexploded Ordnance (UXO) Preliminary Risk Assessment were that a Detailed UXO Risk Assessment be carried out to assess the risks to the proposed development works.</p>
<p><i>The information given in this summary is necessarily incomplete and is provided for initial briefing purposes only. The summary must not be used as a substitute for the full text of the report.</i></p>	

1 INTRODUCTION

1.1 Commissioning

RSK Environment Limited (RSK) was commissioned by Springwell Solar Farm Limited ('the client') to carry out a Preliminary Risk Assessment (PRA) on numerous parcels of agricultural land located around the villages of Brauncewell, Kirkby Green, Ashby de la Launde, Scopwick and Blankney in Lincolnshire (hereafter referred to as 'the site'). The project was carried out to an agreed brief as set out in RSK's proposal (Ref. 1922604 T01 (00), dated 5th October 2022).

RSK's service constraints are shown in [Appendix A](#).

The Site in question is being considered for development as a solar energy farm.

1.2 Objectives

The objective of the work is:

- to identify any land contamination and/or geotechnical constraints to the proposed development and to support discharge of relevant planning conditions and relevant building control requirements; and
- to identify the need for any additional investigation or remediation works to demonstrate that the site is suitable for its proposed use.

1.3 Scope of works

The scope of this assessment has been developed in accordance with relevant British Standards and authoritative technical guidance as referenced through the report. The assessment of the contamination status of the site is in line with the technical approach presented in Land Contamination Risk Management (LCRM) (Environment Agency, 2021) – which supersedes CLR11 Model Procedures for Land Contamination – and in general accordance with BS 10175: 2011 + A2 2017 (BSI, 2017). It is also compliant with relevant planning policy and guidance.

A brief summary of relevant legislation and policy relating to land contamination is given in [Appendix B](#).

The scope of works for the desk-based assessment has included the following:

- review of the history of development on the site and surroundings;
- assessment of local geology, hydrogeology and hydrology;
- review of relevant information held by appropriate statutory authorities;
- review of any previous site investigation reports made available;
- completion of a site reconnaissance survey to assess the visual condition of the site;
- development of an initial conceptual site model (CSM);

- preliminary consideration of geotechnical constraints and hazards; and
- identification of the need for further action, e.g. intrusive investigations, if any.

1.4 Existing reports

No existing reports relevant to the site assessment have been provided to RSK.

1.5 Limitations

This report is subject to the RSK service constraints given in [Appendix A](#) and limitations that may be described through this document.

2 SITE DETAILS

2.1 Site location

Site location details are presented in **Table 1** and a site location plan is provided on [Figure 1](#).

Table 1 Site location details

Site name	Springwell Solar Farm
Full site address and postcode	Proposed Springwell Solar Farm, Lincoln, LN5 0AX
National Grid reference (centre of site)	506300, 357338



Image 1: Site Location Plan (© Ordnance Survey) – approximate site area shown

2.2 Site description

The site forms an irregular shape and covers an area of c. 1,775 hectares and extends across four distinct parcels (referred to as Parcels A1, A2, B and C). A site parcel plan is included as [Figure 2](#).

The land within the site boundary predominantly consists of agricultural fields, interspersed with hedgerows, small woodland blocks and farm access tracks. The hedgerows within the site range between lengths of dense tall vegetation (shrub and tree species) and thin lines of vegetation with sporadic shrubs and trees present

Any buildings located within the outer site boundary are either residential and or storage facilities associated with the agricultural land use, however the majority of these are not actually included within the site redline boundary and subsequently are not considered as on-site features within this PRA.

The site area is variable in shape, and stretches from Blankney in the north, Ashby de la Launde in the centre and Braucewell towards to south of the site. The site is accessible via many field entrances around the perimeter, with many of the fields possessing either public footpaths or vehicular tracks between them.

There is variation in the features immediately surrounding each of the distinct land parcels within the Site, as presented below:

- **Parcel A1 / A2:** Parcel A forms the southernmost part of the site and is intersected by the A15. Parcel A is characterised by relatively open agricultural landscape and lies adjacent to the Bloxham Wood Nature Reserve in the south-east corner of the Site;
- **Parcel B:** Parcel B is located in the centre of the site, providing connectivity between Parcel A and B. The parcel lies adjacent to RAF Digby and B1191 to the west, Ashby de la Launde to the south and relatively open agricultural fields to the east; and
- **Parcel C:** Parcel C is bounded by the settlements of Scopwick to the south, Kirkby Green to the southeast, Blankney in the north and the B1188 and a railway line to the west. The parcel is interspersed with small woodland plantations and hedgerows.

2.3 Surrounding land uses

The site is located between Blankney and Braucewell, within a predominantly agricultural setting, with some surrounding residential homes and an RAF base in close proximity. Immediate surrounding land uses are described in **Table 2**.

Table 2 Surrounding land uses

North	The site is located in a very rural area and therefore the surrounding land use is primarily agricultural. North of the site there is the village of Metheringham and moving further north there are more villages and numerous agricultural fields.
East	East of the site there are some reservoirs which are used for irrigation purposes, more small villages and primarily agricultural fields.
South	South of the site there is a slightly larger village named Ruskington, but the area is primarily agricultural fields.

West

West of the site runs the A15, and there is Longwood Quarry, RAF Digby and Brauncewell Quarry. Beyond these features there are more small villages and agricultural fields.

2.4 Proposed development

It is understood that the site is intended for redevelopment as a solar energy farm, and this will comprise ground mounted photovoltaic panels, a battery energy storage system, and infrastructure to connect the solar energy farm to the national grid.

Further details are outlined below:

- Ground mounted solar PV generating station with a gross electrical output capacity to the National Grid network in the region of 800 MW. The generating station will include solar PV modules and mounting structures;
- Balance of Solar System (BoSS) which comprises; inverters, transformers, switchgear, and the use of Collector Compounds;
- An onsite Project Substation compound, which will include; substation, switching and control equipment, office / control / welfare buildings, storage areas, and provisions for vehicular parking and material laydown;
- Battery Energy Storage System (BESS) compound(s) and associated inverters, transformers, switchgear and ancillary equipment and their containers, enclosures, monitoring systems, air conditioning, electrical cables and fire safety infrastructure;
- Works to facilitate vehicular access to the Site;
- Ancillary infrastructure works including; underground cables, boundary treatments, security equipment, lighting, landscaping, access tracks, earthworks, surface water management, and any other works identified as necessary to enable the development;
- Equipment facilitating electrical connection to the proposed National Grid Substation (to be located off-site);
- New public footpaths and amenity improvements; and
- Areas for habitat management and biodiversity enhancement.

No details of the proposed ground levels have been provided therefore for the purposes of this report it has been assumed that the current levels will remain unchanged.

3 DESK-BASED ASSESSMENT

The overall site covers an area of approximately 1,775 hectares and therefore is too large to carry out a single site-wide assessment of historical use, geology, hydrogeology, hydrology and other environmental aspects. For ease of understanding, RSK has subdivided the site into thirteen (13No) smaller areas, consistent with the way in which the historical maps and environmental database reports have been provided from the supplier.

The zones have been categorised as zones A to M as shown below and on [Figures 3](#) and [4](#).



The desktop study was designed generally to meet the objectives of a preliminary (phase 1) investigation, as defined by BS 10175:2011 + A2 2017 (BSI, 2017) and this assessment relates to LCRM Stage 1, Tier 1 preliminary risk assessment. The "vicinity" of the site for the purposes of this report is defined as locations situated within an approximate 250 m radius of the site, although certain sources and/ or sensitive targets further than 250 m may also have been considered.

The study aims principally to identify and assess the potential risks and liabilities associated with contamination of the ground, on and in the vicinity of the site. While this

includes consideration of current operations and housekeeping on the site, the report does not constitute a comprehensive environmental audit of the site, as covered under ISO 14001.

The 1:2,500 historical OS maps each cover an even smaller area and are individually referenced within the historical summary and site reconnaissance chapter to aid locating features within the larger zones. A plan showing the further subdivision of each of the 13No zones is shown below and on [Figure 4](#).



Image 3: Additional Site Zoning Plan (1:2,500 historical maps)

Minor changes to the overall site redline boundary occurred after commissioning of the project and therefore the site boundaries shown on the individual historical maps may differ slightly from those boundaries at the time of reading. These discrepancies have been highlighted in the relevant section where they occur.

To aid digestion of information, site plans and historical maps for the entire site area have been constructed and these are presented in [Appendix C](#).

Geological plans covering the entire site are presented in [Figure 5](#).

4 DESK-BASED ASSESSMENT - ZONE A




4.1 Site history

4.1.1 Historical development record

The development history of Zone A and the surrounding area based upon assessment of historical plans and records is detailed in **Table 3**. The historical maps reviewed are shown within the environmental database report in [Appendix D1](#).



Table 3 Summary of historical development – Zone A

Dates	Historical Land Use (on-site)	Area of site
1887	The majority of Zone A is occupied by fields, which are presumably used as farmland. There is a track/road running south-east to north-west across the zone (A16) which is lined with trees, and there is a plantation located at the southern boundary of the zone (A8).	
1906	There are no longer any trees running alongside the track, according to the historic map. No other significant changes.	
1907 to Present Day	No significant change	

Date from	Date to	Historical Land Use (off-site)
1887	1988	Zone A is primarily surrounded by fields. Approximately 800 m west and 400 m south (A8) of the zone there are some Stone Pits. There is a wooded area named Moor Wood 550 m west of the zone, and some more stone, gravel and clay pits >1 km west. Some structures associated with the village of Brauncewell are located approximately 1.2 km south west of the zone.
1989	1904	Data Gap
1905	1906	No significant change
1907	1946	Data Gap
1947	1950	There is now a built structure located approximately 900 m south of the zone. No other significant change.
1951	1955	Data Gap
	1956	No significant change
1957	1978	Data Gap
1979	2000	The stone pit located approximately 400 m south of the zone (A8) is now labelled as a stone quarry and has increased in size.
	1985	No significant change
1986	1993	Data Gap
1994	2000	No significant change
2001	2021	Data Gap
	2022	The stone quarry is no longer labelled on the map. No other significant change.
Relevant information sources: Historical OS maps <input checked="" type="checkbox"/> Town plans <input type="checkbox"/> Information from the Local Planning Authority <input type="checkbox"/> Aerial photography <input type="checkbox"/> Previous reports <input type="checkbox"/>		
<i>Note: Reference to published historical maps provides invaluable information regarding the land use history of the site, but historical evidence may be incomplete for the period pre-dating the first edition and between successive maps.</i>		

There has been a minimal level of development on and around Zone A, and therefore it has not been subject to significant contaminative land use in this respect.

It is not clear whether the land functioned as arable farmland, however if this is the case then there may be some level of contamination associated with agricultural industry and the use of pesticides, herbicides and fertilisers.

4.2 Information from environmental database report

Relevant environmental permits and incidents detailed within the environmental database report (see [Appendix D1](#)) are summarised below in **Table 4**.

Table 4 Summary of environmental permits, landfills and incidents – Zone A

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Agency and hydrological				
Environmental permits – incorporating Integrated Pollution Prevention and Control, Integrated Pollution Controls, Local Authority Integrated Pollution Prevention and Control	0	0	3	555 m SE: Braucewell Quarries, Ref YP3238LE, waste landfilling ; any other landfill to which the 2002 landfill regulations apply. 555 m SE: Braucewell Quarries Ltd, Ref PPC/2004/7, 01/01/2005, PG3/8 Quarry processes including roadstone plants and the size reduction of bricks tiles and concrete. 581 m SE: Braucewell Quarries Ltd, Ref IPPC/2004/7, Quarry processes including roadstone plants and the size reduction of bricks tiles and concrete.
Enforcement and prohibition notices	0	0	0	N/A
Pollution incidents to controlled waters, Prosecutions relating to controlled waters, Substantiated pollution incident register, Water Industry Act referrals	0	0	0	N/A

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Discharge consents	0	0	0	<p>648 m NW: R T Mountain Farms, Arable Farming, Temple Farm, Ref. Gwnlf40489, effective 1st April 1999, trade discharge onto land, receiving water - groundwater.</p> <p>763 m S: AG Reserves Ltd, Arable Farming, Manor Farm, Ref Gwnlf40713, 01/04/1999, trade discharge (agricultural and surface), onto land, receiving water – groundwater.</p> <p>815 m S: Hallsworth (Farmland Trust) Ltd, domestic property, Ref Pr3lfu5511, 14/12/2011, sewage discharges (final/treated effluent), land/soakaway.</p>
Registered radioactive substances	0	0	0	N/A
Landfill and waste				
Active landfills	0	0	0	N/A
Historic / closed landfills	0	0	0	N/A

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Other waste management licences	0	1	1	8 m SE: Brauncewell Quarry, license no. 73008, landfills taking non-biodegradable waste (not construction), issued 12 th April 2001. 468 m SE: Brauncewell Quarries Ltd, Ref 101884, inert and excavation waste TS and treatment, 30/01/2012.
Potentially in-filled land (pit, quarry, pond, marsh, river, stream, dock etc)	0	0	0	N/A
Hazardous substances/ industrial land uses				
Control of Major Accident Hazards (COMAH) sites	0	0	0	N/A
Explosives sites, Notification of Installations Handling Hazardous Substances (NIHHS), Planning hazardous substance consents/ enforcements	0	0	0	N/A
Contaminated land Part 2A register entries and notices	0	0	0	N/A
Contemporary trade directory entries	0	0	1	555 m SE: Brauncewell Quarries Ltd, Active.
Fuel station entries	0	0	0	N/A
<i>Note: Entries have only been included within the table where they are located within a 250 m radius of the site or, where they fall outside of this radius but are considered to comprise a significant entry.</i>				

The environmental database report has identified a licensed waste management facility directly adjacent to the southern boundary and southwestern corner of Zone A (Brauncewell Quarry). The report lists a number of different licenses, presumably


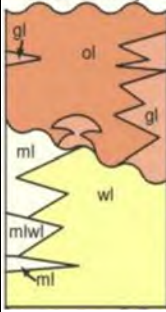
associated with different parts or cells of the landfill. The landfill appears to have been licensed to accept non-biodegradable wastes, with these licenses having expired by 2007. Part of the landfill appears to currently be active and licensed to accept “inert and excavation waste TS + treatment”.

4.3 Site geology

4.3.1 Anticipated geological sequence

Published records (British Geological Survey, 2022) for the area and available historical borehole logs indicate the geology of Zone A to be characterised by the succession recorded in **Table 5**. There are no publicly available BGS historical boreholes located within the zone.

Table 5 Site geology – Zone A

Strata	Description	Estimated thickness	Permeability	Map Legend
Head (only in the north of the zone)	Poorly sorted and poorly stratified, angular rock debris and/or clayey hillwash and soil creep.	Variable	Variable	
Upper Lincolnshire Limestone (widespread across the whole site)	Limestone, mainly coarse grained ooidal grainstones (ol), with subsidiary limestones of other types (gl) including fine to medium grained grainstone, recrystallized limestone and possible reef knolls	Up to 15 m	Permeable	
Lower Lincolnshire Limestone (only potentially intruding in the north-east of the site)	Limestones, dominated by low-energy calcilutite and peloidal wackestone (wl) and packstone. With subsidiary carbonate mudstone (ml).	Up to 20 m	Permeable	
Relevant information sources: BGS Geoindex <input checked="" type="checkbox"/> BGS borehole logs <input type="checkbox"/> Previous SI reports <input type="checkbox"/>				

With reference to the historical data the majority of Zone A has never been developed, and therefore Made Ground would not be anticipated.

The zone would be expected to be directly underlain by a limited thickness of topsoil.

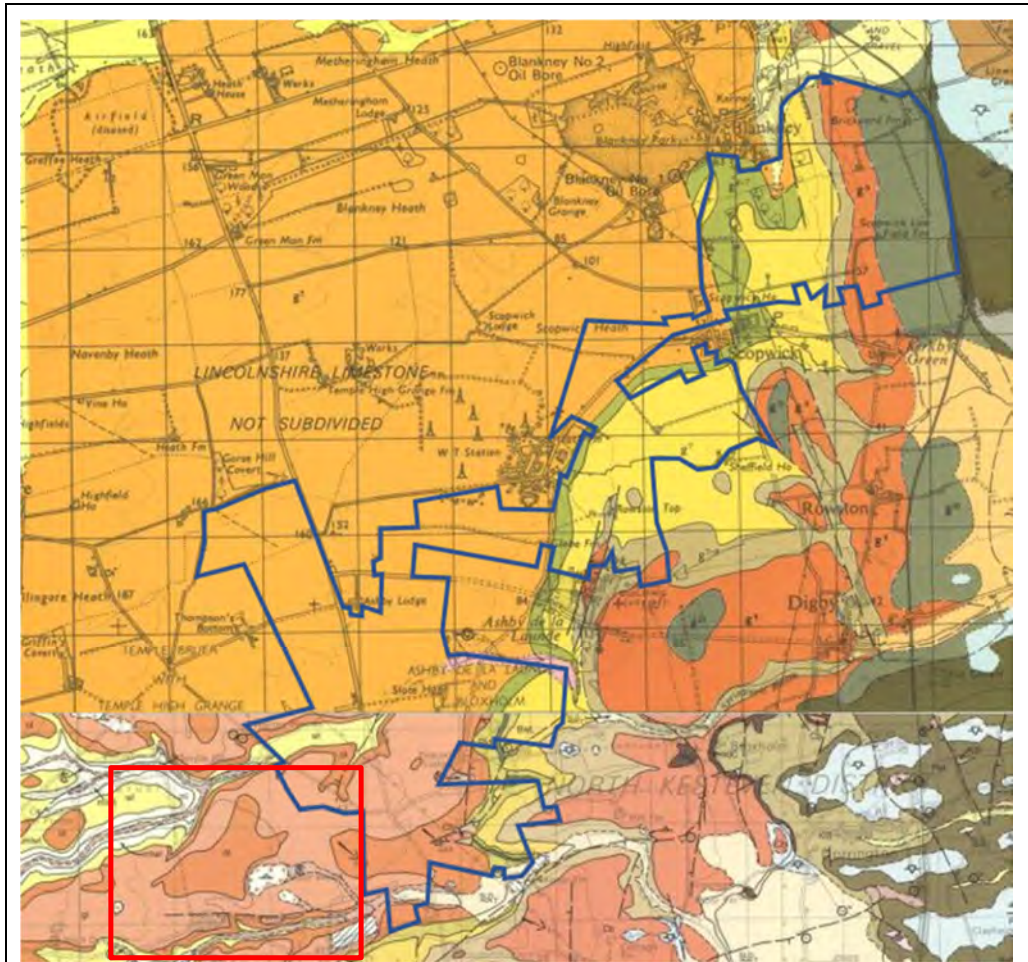


Image 4: Anticipated Geology – Zone A

4.3.2 Radon

The environmental database report indicates that Zone A is located within an area where more than 1% of homes are above the Action Level (termed an 'Affected Area') and indicates that radon protection measures are required. The report indicates that 5-10% of homes are at or above the Action Level of 200 Bq m⁻³. Although the radon data used in production of the ukradon.org indicative atlas comes from measurements in homes, the maps indicate the likely extent of the local radon hazard in all buildings.

In Affected Areas radon concentrations are generally low in well-ventilated workplaces such as workshops, but problems have been found in some more confined workplaces, such as offices, where rates of ventilation are relatively slow. HSE guidance suggests that where a premise is in an Affected Area, the employer should take a precautionary approach and undertake measurements in all premises located within an Affected Area. Based on the information in the database report, it would be prudent to arrange monitoring of any poorly ventilated areas to determine if there is a current risk to site staff. If the zone is considered for future residential development, further assessment will be required, in

line with the guidance provided in BRE publication 211 “Radon: Guidance on Protective Measures for New Dwellings (2015)”.

4.4 Mining and quarrying

Evidence has been sought to identify any mining, quarrying, landfilling and land reclamation operations, past and present, which have taken place within 500 m of the zone.

4.4.1 Areas of other (rock or mineral) mining

Zone A lies in an area with a known history of quarrying of limestone from the Lincolnshire Limestone Member. While there has been no quarrying within the zone itself, there are stone pits 800 m west and 400 m south of the zone, with more pits being located >1 km away. The quarrying site approximately 400 m south is now the Brauncewell Quarry and appears to currently still be operating.

4.5 Hydrogeology

A summary of the hydrogeological setting of Zone A, with respect to the anticipated geological sequence, is presented below in **Table 6**.

Table 6 Summary of hydrogeological setting – Zone A

Condition	Description
Aquifer characteristics	Zone A is underlain by a principal aquifer relating to the Upper Lincolnshire Limestone Member, and a secondary undifferentiated aquifer relating to the Head Deposits (only in the north of the zone).
Depth to groundwater and flow	The anticipated depth to the groundwater table is in the order of 20 m below ground level estimated from BGS logs advanced through the limestone up to 1 km from the zone. Shallow groundwater in the zone area is anticipated to flow in a south easterly direction, in line with local topography.
Groundwater recharge/attenuation	Most of the zone is currently unsurfaced and will therefore drain to ground.
Licensed groundwater abstractions	The environmental database report indicates that there are no current licensed groundwater abstractions located within 1 km of the zone.
Source protection zones	Information available in the Envirocheck report and MAGIC website indicates that the south of the zone lies within Zone 3 of the groundwater Source Protection Zone (SPZ). The public supply borehole to which this SPZ relates is not within the boundary of the maps.

4.6 Hydrology

A summary of the hydrology within the zone area is summarised in **Table 7**.

Table 7 Summary of hydrology in site area – Zone A

Condition	Description
Surface watercourses/features	There are no ponds, streams or drainage ditches on or directly adjacent to the zone. The nearest identified surface watercourses to the zone are a number of unnamed streams and drains located approximately 2 km to the east.
Surface water abstractions	There are no surface water abstractions identified by the environmental database, within a 1 km radius of the zone.
Site drainage	Surface drainage from the zone appears to be discharged directly to the ground.
Preliminary flood risk assessment	The indicative floodplain map for the area, shows that the zone does not lie within any designated floodplain.

4.7 Sensitive land uses

Table 8 provides a summary of any environmentally sensitive areas identified within 250 m of the zone based on the environmental database report.

Table 8 Environmentally sensitive areas – Zone A

Feature	Present within 250 m of site?	Details	Likely pathways from site?
International designations – Ramsar wetland, Special Area of Conservation (SAC), Special Protection Area (SPA)	No	N/A	N/A
National designations – Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), ancient woodland	No	N/A	N/A
Local designations – Local Nature Reserve, Site of Importance for Nature Conservation (SINC)	No	N/A	N/A
Nearest high sensitivity development, e.g. residential	No	N/A	N/A

5 DESK-BASED ASSESSMENT – ZONE B

5.1 Site history

5.1.1 Historical development record

The development history of Zone B and the surrounding area based upon assessment of historical plans and records is detailed in **Table 9**. The historical maps reviewed are shown within the environmental database report in [Appendix D2](#).

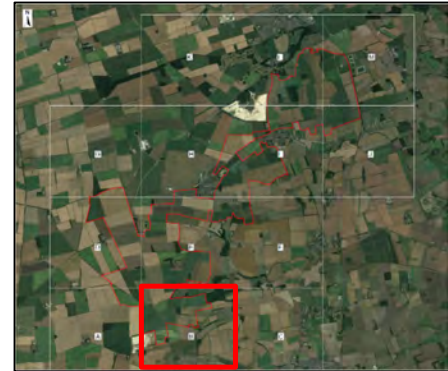


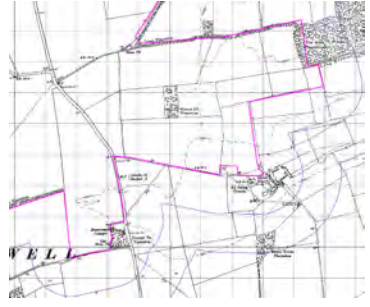

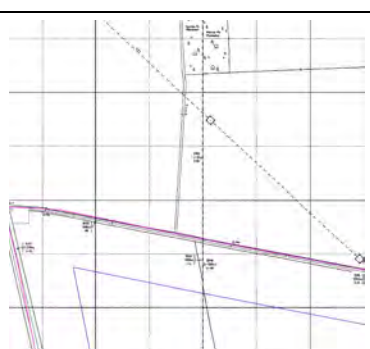
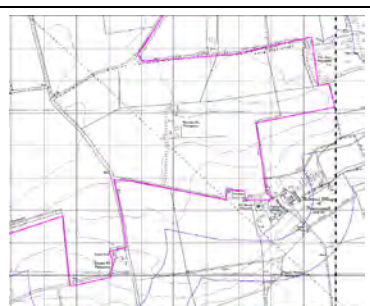


Table 9 Summary of historical development – Zone B

Date from	Date to	Historical Land Use (on-site)	Area of site
1887	1888	Zone B is primarily fields, which are presumably used as agricultural land, as they are in the present day. There is Long Plantation in the north (B14, B15) and Warren Pit Plantation in the centre of the site (B10), which is also labelled as an Old Stone Pit. There is a Stone Pit on the eastern boundary of the zone (B14). The site encroaches onto Ten Acre Plantation on the north-eastern boundary. There are guideposts located in the west of the zone (B13) and there is one road/track running east to west across the centre of the zone and another road located in the west of the zone running north to south, both of which can be seen in zone B13.	
1889	1904	Data Gap	
1905	1906	No significant change	
1907	1949	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
1950		Warren Pit Plantation (B10) has increased in size, and the road running east to west is now labelled as the B1191. No other significant changes.	
1951	1955	Data Gap	
1956		No significant change	
1957	1978	Data Gap	
1979		Pylons have been erected across the western portion of the zone (B10, B13). The stone pit adjacent to Long Plantation in zone B14 is no longer present.	
1980	1984	Data Gap	
1985		No significant change	
1986	1993	Data Gap	
1994		No significant change	

Date from	Date to	Historical Land Use (on-site)	Area of site
1995	1999	Data Gap	
2000		No significant change	
2001	2021	Data Gap	
2022		The road located in the west of the zone, running north to south, is now labelled as the A15.	

Date from	Date to	Historical Land Use (off-site)	
1887	1888	There is an Old Stone Pit located immediately adjacent to the northern boundary of the zone (B14). There is an estate called Manor House (part of the village of Brauncewell) approximately 100 m south of the south-western boundary of the zone (B11), and this includes a rectory called All Saints Church and a small pond. Brauncewell Cottages are located immediately south of the southern boundary of the zone split between B5 and B6, and there is also a school and a stone pit here. There are multiple plantations around the zone, most notably Ten Acre Plantation (B15 and B16), Nine Acre Plantation (B16) and Spruce Covert immediately north-east of the zone (B16). The village of Dunsby is located 750 m south of the zone, Dale Farm is located 1 km south-east of the zone, Hill Farm is located 500 m east with some associated cottages and West Pastures is located 800 m southwest of the zone with an associated Old Stone Pit.	
1889	1904	Data Gap	
1905	1906	There is a well located at the Manor House estate (B11). No other significant change.	
1907	1949	Data Gap	
1950		A small structure has been built north of All Saints Church and just south of the zone boundary (B11). No other significant change.	
1951	1955	Data Gap	
1956		A windpump has been erected at the Manor House estate (B11). No other significant change.	
1957	1978	Data Gap	
1979		Pylons have been constructed running south-east to north-west across the centre of the zone.	
1980	1984	Data Gap	
1985		Brauncewell cottages no longer appear to be present in zones B5 and B6. The area around Manor House is now labelled as the Medieval Village of Brauncewell and seems to have expanded somewhat. There are a lot of drains surrounding the site to the east and southeast and West Pastures is no longer present.	
1986	1993	Data Gap	
1994		No significant change	
1995	1999	Data Gap	
2000		No significant change	

Date from	Date to	Historical Land Use (off-site)
2001	2021	Data Gap
	2022	There is now a pond located immediately south-west of the zone (B5).
Relevant information sources: Historical OS maps <input checked="" type="checkbox"/> Town plans <input type="checkbox"/> Information from the Local Planning Authority <input type="checkbox"/> Aerial photography <input type="checkbox"/> Previous reports <input type="checkbox"/>		
<i>Note: Reference to published historical maps provides invaluable information regarding the land use history of the site, but historical evidence may be incomplete for the period pre-dating the first edition and between successive maps.</i>		

With the exception of the roads, there has been a minimal level of development on the zone, and therefore it has not been subject to significant contaminative land use in this respect.

It is presumed that the land functioned as arable farmland, and if this is the case then there may be some level of contamination associated with agricultural industry and the use of pesticides, herbicides and fertilisers.

The stone quarries identified in zones B10 and B14 are presumed to have been infilled with inert and/or natural material, however there lies the potential for more onerous material to have been used.

5.2 Information from environmental database report

Relevant environmental permits and incidents detailed within the environmental database report (see [Appendix D2](#)) are summarised below in **Table 10**.

Table 10 Summary of environmental permits, landfills and incidents – Zone B

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Agency and hydrological				
Environmental permits – incorporating Integrated Pollution Prevention and Control, Integrated Pollution Controls, Local Authority Integrated Pollution Prevention and Control	0	0	0	N/A
Enforcement and prohibition notices	0	0	0	N/A

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Pollution incidents to controlled waters, Prosecutions relating to controlled waters, Substantiated pollution incident register, Water Industry Act referrals	0	0	0	N/A
Discharge consents	0	0	1	922 m S: Anglian Water Services Limited, Red Annnf10370, Issued 19/07/1995, sewage discharges – pumping station – water company – receiving water – Trib Ruskington Beck.
Registered radioactive substances	0	0	0	N/A
Landfill and waste				
Active landfills	0	0	0	N/A
Historic / closed landfills	0	0	0	N/A
Other waste management licences	0	0	1	9 m W: Brauncwell Quarry, license number 73008, landfills taking non-biodegradable wastes (not construction), issued 12/04/2001.
Potentially in-filled land (pit, quarry, pond, marsh, river, stream, dock etc)	0	0	0	N/A
Hazardous substances/ industrial land uses				
Control of Major Accident Hazards (COMAH) sites	0	0	0	N/A

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Explosives sites, Notification of Installations Handling Hazardous Substances (NIHHS), Planning hazardous substance consents/ enforcements	0	0	0	N/A
Contaminated land Part 2A register entries and notices	0	0	0	N/A
Contemporary trade directory entries	0	0	0	N/A
Fuel station entries	0	0	0	N/A
<i>Note: Entries have only been included within the table where they are located within a 250 m radius of the site or, where they fall outside of this radius but are considered to comprise a significant entry.</i>				





Similar to Zone A, the environmental database report has identified a licensed waste management facility directly adjacent to the southwestern corner of Zone B (Brauncewell Quarry). The report lists a number of different licenses, presumably associated with different parts or cells of the landfill. The landfill appears to have been licensed to accept non-biodegradable wastes, with these licenses having expired by 2007. Part of the landfill appears to currently be active and licensed to accept “inert and excavation waste TS + treatment”.


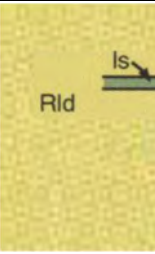
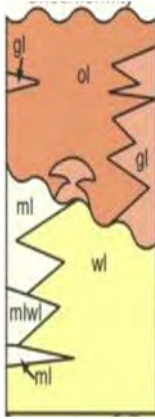
5.3 Site geology

5.3.1 Anticipated geological sequence

Published records (British Geological Survey, 2022) for Zone B and available historical borehole logs indicate the geology of the site to be characterised by the succession recorded in **Table 11**.

Table 11 Site geology – Zone B

Strata	Description	Estimated thickness	Permeability	Map Legend
Head (south of the site only)	Poorly sorted and poorly stratified, angular rock debris and/or clayey hillwash and soil creep, mantling a hillslope and deposited by solifluction and gelifluction processes.	Variable	Variable	
Sleaford Sand and Gravel (south of the site only)	Sand and gravel	Variable	Permeable	
Cornbrash Formation (east of the site only)	Limestone, medium to fine grained, predominantly bioclastic wackestone and packstone with sporadic peloids. Thin argillaceous partings or interbeds of argillaceous mudstone may occur	Typically 2 – 4 m	Permeable	
Blisworth Clay Formation (east of the site only)	Silicate-mudstone, grey, commonly variegated purplish red, yellow and green, poorly bedded to blocky. Mudstone weathers to a highly plastic clay.	Typically 2 – 4 m	Impermeable	

Strata	Description	Estimated thickness	Permeability	Map Legend
Blisworth Limestone Member (east of the site only)	Pale grey to off-white or yellowish limestones with thin marls and mudstones, fossiliferous, bioturbated peloidal, ooidal and shell-fragmental more-or-less argillaceous packstones and wackestones, subordinate cross-bedded ooidal shell-fragmented grainstones.	Typically 6 – 7 m	Permeable	
Rutland Formation (east of the site only)	Grey marine mudstone passing up into non-marine mudstone and siltstone, with a greenish-grey rootlet bed at the top. Occasional limestone beds (ls)	Typically 8 – 12 m	Permeable	
Upper Lincolnshire Limestone Member (widespread across the site)	Limestone, mainly coarse grained ooidal grainstones (ol), with subsidiary limestones of other types (gl) including fine to medium grained grainstone, recrystallized limestone and possible reef knolls	Typical ~15 m	Permeable	
Relevant information sources: BGS Geoindex <input checked="" type="checkbox"/> BGS borehole logs <input type="checkbox"/> Previous SI reports <input type="checkbox"/>				

With reference to the historical data the majority of the site has never been developed, and therefore widespread Made Ground would not be anticipated. There may be some Made Ground or reworked in the vicinity of the Stone Pit in zones B10 and B14 as well as any roads running through the zone.

The zone would be expected to be directly underlain by a limited thickness of topsoil.

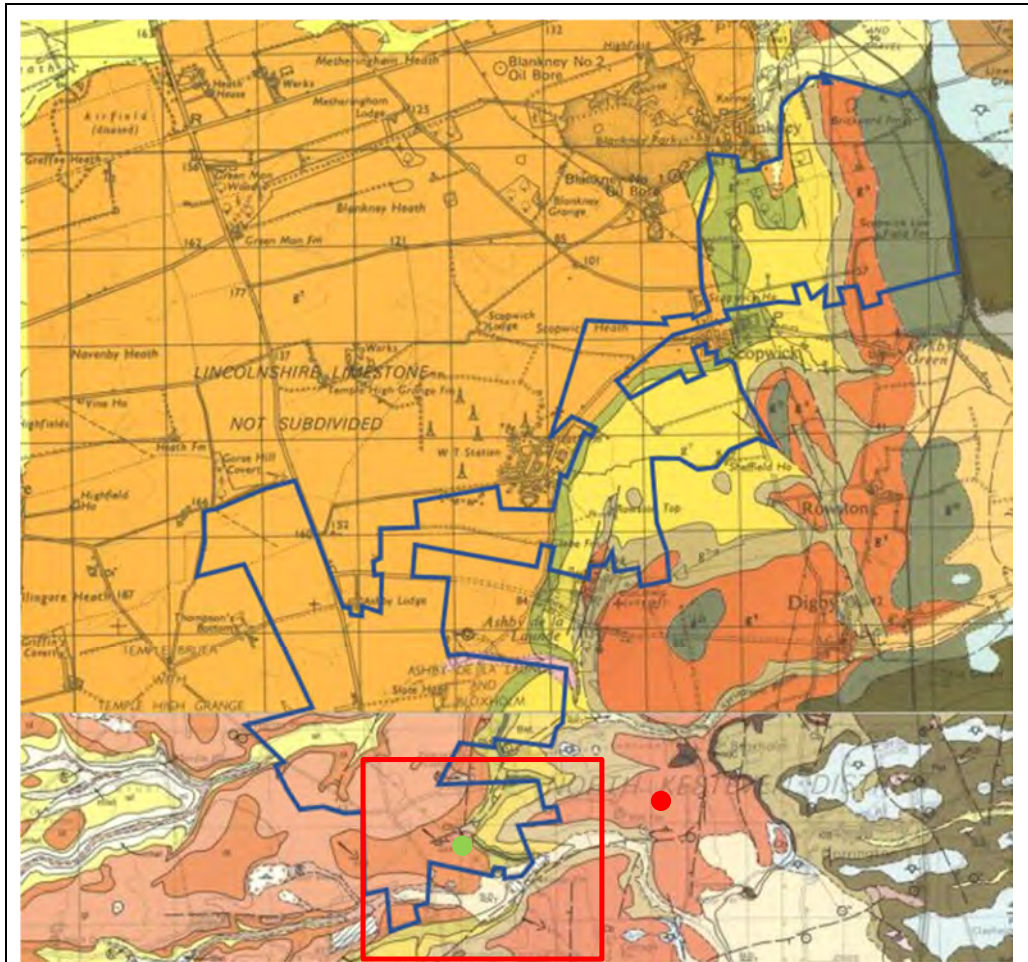


Image 5: Anticipated Geology – Zone B

Whilst not located on the site, a historical BGS borehole located approximately 1.2 km to the east of the zone (TF05 SE/30) provides a detailed stratigraphical description to 55 m bgl. A summary of nearby BGS borehole records on and near the zone are provided in **Table 12** below.

Table 12 Summary of BGS borehole records – Zone B

Stratum	Description	Depth to base (m)
TF05 SE/30	55.00	●
TF05 SW/05	36.00	●

A copy of these borehole logs is presented in [Appendix E](#).

5.3.2 Radon

The environmental database report indicates that the zone is located within an area where more than 1% of homes are above the Action Level (termed an ‘Affected Area’) and indicates that radon protection measures are required. The report indicates that 5-10% of homes are at or above the Action Level of 200 Bq m⁻³. Although the radon data used in production of the ukradon.org indicative atlas comes from measurements in homes, the maps indicate the likely extent of the local radon hazard in all buildings.

In Affected Areas radon concentrations are generally low in well-ventilated workplaces such as workshops, but problems have been found in some more confined workplaces, such as offices, where rates of ventilation are relatively slow. HSE guidance suggests that where a premise is in an Affected Area, the employer should take a precautionary approach and undertake measurements in all premises located within an Affected Area. Based on the information in the database report, it would be prudent to arrange monitoring of any poorly ventilated areas to determine if there is a current risk to site staff. If the zone is considered for future residential development, further assessment will be required, in line with the guidance provided in BRE publication 211 “Radon: Guidance on Protective Measures for New Dwellings (2015)”.

5.4 Mining and quarrying

Evidence has been sought to identify any mining, quarrying, landfilling and land reclamation operations, past and present, which have taken place within 500 m of the site.

5.4.1 Areas of other (rock or mineral) mining

The site lies in an area with a known history of quarrying of limestone from the Lincolnshire Limestone Member, and there are two known Old Stone Pits on the site (B10 and B14), with multiple pits surrounding the site. The quarrying site adjacent to the south is now the Brauncewell Quarry and appears to currently still be operating.

5.5 Hydrogeology

A summary of the hydrogeological setting of Zone B, with respect to the anticipated geological sequence, is presented below in **Table 13**.

Table 13 Summary of hydrogeological setting – Zone B

Condition	Description
Aquifer characteristics	Zone B is underlain by a principal aquifer relating to the Upper Lincolnshire Limestone Member and the Blisworth Limestone Formation, a secondary B aquifer relating to the Rutland Formation, a secondary A aquifer relating to the Cornbrash Formation, and unproductive strata relating to the Blisworth Clay Formation.
Depth to groundwater and flow	The anticipated depth to the groundwater table is in the order of 30 m below ground level estimated from BGS logs. Shallow groundwater in the zone area is anticipated to flow in a south-easterly direction, in line with local topography.

Condition	Description
Groundwater recharge/attenuation	Most of the zone is currently unsurfaced and will therefore drain to ground.
Licensed groundwater abstractions	The environmental database report indicates that there are no current licensed groundwater abstractions located within 1 km of the zone.
Source protection zones	Information available in the Envirocheck report and MAGIC website indicates that the majority of the zone lies within Zone 3 of the groundwater Source Protection Zone (SPZ). The very north of the zone does not lie within a SPZ. The public supply borehole to which this SPZ relates is not within the boundary of the maps.

5.6 Hydrology

A summary of the hydrology within the site area is summarised in **Table 14**.

Table 14 Summary of hydrology in site area – Zone B

Condition	Description
Surface watercourses/features	There is a pond 20 m south of the site in the west, and there are multiple drainage ditches to the east of the site. The nearest identified surface watercourses to the site are unnamed drains adjacent to the eastern boundary that run towards the east, in the direction of the River Witham.
Surface water abstractions	There are no surface water abstractions identified by the environmental database, within a 1 km radius of the zone.
Site drainage	Surface drainage from the zone appears to be discharged directly to the ground.
Preliminary flood risk assessment	The indicative floodplain map for the area, shows that the zone does not lie within any designated floodplain.

5.7 Sensitive land uses

Table 15 provides a summary of any environmentally sensitive areas identified within 250 m of the zone based on the environmental database report.

Table 15 Environmentally sensitive areas – Zone B

Feature	Present within 250 m of site?	Details	Likely pathways from site?
International designations – Ramsar wetland, Special Area of Conservation (SAC), Special Protection Area (SPA)	No	N/A	N/A
National designations – Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), ancient woodland	No	N/A	N/A
Local designations – Local Nature Reserve, Site of Importance for Nature Conservation (SINC)	No	N/A	N/A
Nearest high sensitivity development, e.g. residential	Yes	Residential Housing: Manor House and Church Cottages are located in zone B11, immediately beyond the southern boundary of the zone.	Wind-blown migration of potential contaminants. Leaching.

6 DESK-BASED ASSESSMENT – ZONE C

Zone C does not encompass any of the site itself, beginning 800 m to the east of the site boundary and including the remaining 200 m of the 1 km search buffer. Due to this, only the historical development of the land has been deemed relevant to the site assessment.

6.1 Site history

6.1.1 Historical development record

The development history of Zone C (technically the 'surrounding area' of the site) based upon assessment of historical plans and records is detailed in **Table 16**. The historical maps reviewed are shown within the environmental database report in [Appendix D3](#).

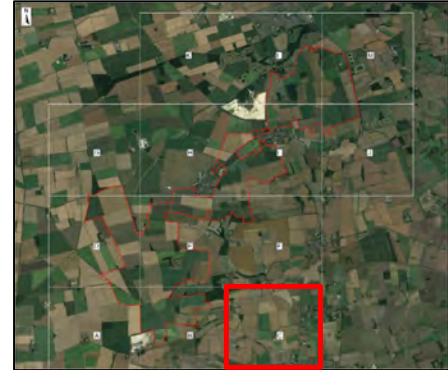


Table 16 Summary of historical development – Zone C

Date from	Date to	Historical Land Use (off-site)	Distance (m) and orientation
1887		The area is predominantly fields. There is a forested area called The Laurels located approximately 750 m north-east of the site, and Brauncewell Plantation is located 900 m south-east of the site. There is a forested area and some built structures present associated with Hill Farm which is 500 m east of the site.	
1888	1905		Data Gap
	1906		No Change
1907	1946		Data Gap
1947	1950		No Change
1951	1955		Data Gap
	1956		No Change
1957	1984		Data Gap
	1985	There are multiple drains labelled east of the site, in what are most likely drainage ditches. There is now a pond associated with Brauncewell Plantation 900 m south-east of the site, and the drains from Hill Farm outfall here.	
1986	1999		Data Gap
	2000		No Change
2001	2021		Data Gap
	2022		No Change
Relevant information sources: Historical OS maps <input checked="" type="checkbox"/> Town plans <input type="checkbox"/> Information from the Local Planning Authority <input type="checkbox"/> Aerial photography <input type="checkbox"/> Previous reports <input type="checkbox"/>			
<i>Note: Reference to published historical maps provides invaluable information regarding the land use history of the site, but historical evidence may be incomplete for the period pre-dating the first edition and between successive maps.</i>			

It is presumed that the land functioned as arable farmland, and if this is the case then there may be some level of contamination associated with agricultural industry and the use of pesticides, herbicides and fertilisers which could subsequently impact the site itself.

6.2 Information from environmental database report

Relevant environmental permits and incidents detailed within the environmental database report (see [Appendix D3](#)) are summarised below in **Table 17**.

Table 17 Summary of environmental permits, landfills and incidents – Zone C

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Agency and hydrological				
Environmental permits – incorporating Integrated Pollution Prevention and Control, Integrated Pollution Controls, Local Authority Integrated Pollution Prevention and Control	0	0	0	N/A
Enforcement and prohibition notices	0	0	0	N/A
Pollution incidents to controlled waters, Prosecutions relating to controlled waters, Substantiated pollution incident register, Water Industry Act referrals	0	0	0	N/A
Discharge consents	0	0	0	N/A
Registered radioactive substances	0	0	0	N/A
Landfill and waste				
Active landfills	0	0	0	N/A
Historic / closed landfills	0	0	0	N/A
Other waste management licences	0	0	0	N/A

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Potentially in-filled land (pit, quarry, pond, marsh, river, stream, dock etc)	0	0	0	N/A
Hazardous substances/ industrial land uses				
Control of Major Accident Hazards (COMAH) sites	0	0	0	N/A
Explosives sites, Notification of Installations Handling Hazardous Substances (NIHHS), Planning hazardous substance consents/ enforcements	0	0	0	N/A
Contaminated land Part 2A register entries and notices	0	0	0	N/A
Contemporary trade directory entries	0	0	0	N/A
Fuel station entries	0	0	0	N/A
<i>Note: Entries have only been included within the table where they are located within a 250 m radius of the site or, where they fall outside of this radius but are considered to comprise a significant entry.</i>				

No potential sources of contamination have been identified from the environmental database report for Zone C.

7 DESK-BASED ASSESSMENT – ZONE D

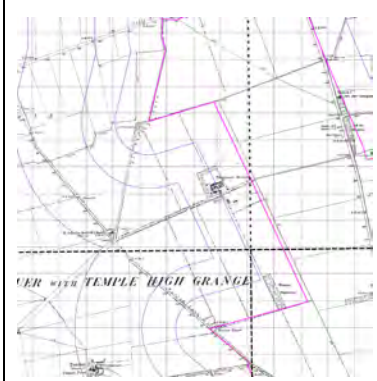
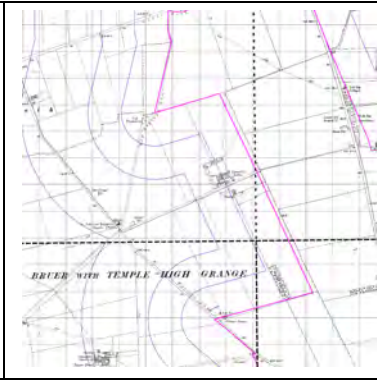
7.1 Site history


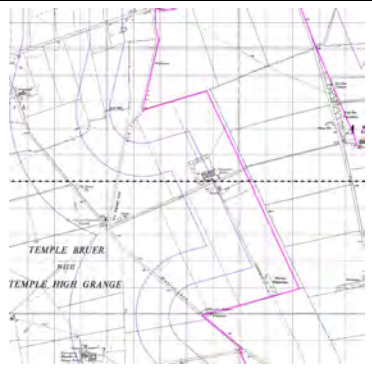
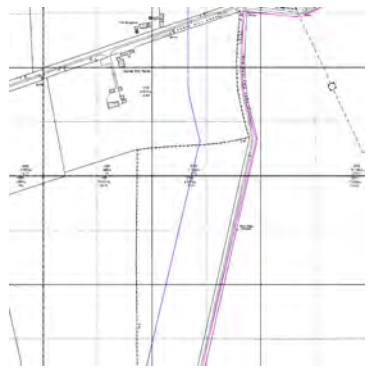
7.1.1 Historical development record


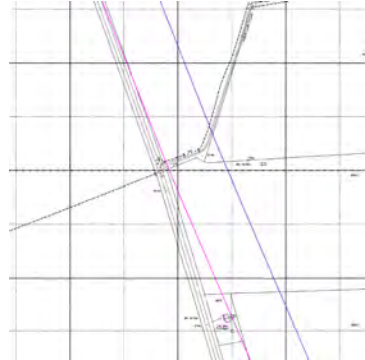

The development history of Zone D and the surrounding area based upon assessment of historical plans and records is detailed in **Table 18**. The historical maps reviewed are shown within the environmental database report in [Appendix D4](#).




Table 18 Summary of historical development – Zone D

Date from	Date to	Historical Land Use (on-site)	Area of site
1887	1888	Zone D is predominantly fields. At the south-western boundary of the zone (D3) there are some terraced buildings named Warren Houses, which are presumably residential homes, and there is a well immediately south of the buildings. There is an Old Stone Pit, located in zone D4 within a forested area, and a Stone Pit located in D12 adjacent to Toll Bar Plantation. There are multiple roads around the site, one is called Warren Lane running southeast to northwest in zone D3, one is unnamed and is running east to west across D11 and D12, and another is running north-to-south through the east of the zone through zones D16 and D12. Toll Bar Cottages (D16) and Toll Bar Plantation (D12) are located on the north-eastern boundary of the zone.	
1889	1904	Data Gap	
1905	1906	There is well located at Toll Bar Cottages (D16). No other significant change.	
1907	1946	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
1947	1951	No Change	
1952	1955	Data Gap	
	1956	Multiple windpumps have been constructed across the zone, one in zone D14, one located in the south of the zone near the Old Stone Pit in D4, and another one at Warren Houses in D3. The road running south to north going in the east of the zone is now labelled as the A15.	
1957	1978	Data Gap	
	1979	The windpumps at Warren Houses (D3) and along the north western boundary of the zone (D14) are now disused, and pylons have been constructed on the zone along the western boundary. Some houses have been built on the eastern boundary of the zone in the north, associated with Ashby Lodge.	
1980	1984	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
1985		The stone pit associated with Toll Bar Cottages is now disused (D12). No other significant change.	
1986	1993	Data Gap	
1994		No Change	
1995	1999	Data Gap	
2000		No Change	
2001	2021	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
2022		No Change	

Date from	Date to	Historical Land Use (off-site)
1887	1888	Thompsons Bottom is an estate located 200 m west of the western zone boundary in zone D11. Temple Farm is located approximately 750 m west of the western boundary in the south of the zone, and it includes the remains of a preceptory and a church. There also appears to be a tank on the site of Temple Farm. Warren Plantation is located just off the northern boundary of the site in the south running through zone D3 and D7, and there is a gravel pit located 800 m west of the western boundary, as well as St John the Baptists Church and a school. Adjacent to the school and gravel pit is a convergence of roads/tracks, and approximately 350 m northwest of this crossroads is another small gravel pit. Cat Plantation is located immediately west of the western boundary in zone D10, and there is another gravel pit located 900 m west of here. There is a road running east to west just beyond the northern boundary of the zone called Gorse Hill Lane (D14), and there are some structures built immediately east of the eastern site boundary in zone D12.
1889	1904	Data Gap
1905	1906	The gravel pit that was located 900 m west of the western boundary beyond Cat Plantation is gone, and there is now a built structure in its place. The gravel pit that is located 350 m north of the crossroads is now disused. Thompsons Bottom (D11) has a smithy forming part of the area. There is a small pond located 500 m west of the site, approximately 250 m past Thompsons Bottom.
1907	1946	Data Gap
1947	1951	There are some structures which have been built 200 m west of the western boundary in the north of the site, just south of Gorse Hill Lane in zone D14.
1952	1955	Data Gap
1956		Some more structures have been built at the site of what was the gravel pit located 900 m west of the western boundary, and a windpump has also been built. There is another built structure immediately east of the eastern boundary in the north of the site, in zone D12.
1957	1978	Data Gap
1979		There are pylons constructed along the western boundary of the site. Cat Plantation is no longer present west of the site, and some structures have been added to

Date from	Date to	Historical Land Use (off-site)
		Thompsons Bottom (D11). The structures that were built just south of Gorse Hill Lane to the west of the site are now labelled as Gorse Hill Farm (D14).
1980	1984	Data Gap
1985		There appears to have been a small amount of construction at the remains of the old preceptory, with some residential homes named The White Cottages being present. The structures present 900 m west of the western boundary in the north of the site are now named New England Farm, and some more buildings have been added. There is no longer a school located at the crossroads, but a Hall is now present.
1986	1993	Data Gap
	1994	No Change
1995	1999	Data Gap
	2000	No Change
2001	2021	Data Gap
	2022	No Change
Relevant information sources: Historical OS maps <input checked="" type="checkbox"/> Town plans <input type="checkbox"/> Information from the Local Planning Authority <input type="checkbox"/> Aerial photography <input type="checkbox"/> Previous reports <input type="checkbox"/>		
<i>Note: Reference to published historical maps provides invaluable information regarding the land use history of the site, but historical evidence may be incomplete for the period pre-dating the first edition and between successive maps.</i>		

With reference to the historical data, the majority of the site has never been developed, therefore widespread Made Ground would not be anticipated. There may be some Made Ground in the vicinity of the Old Stone Pits in zones D4 and D12 and the roads running through the site.

The stone quarries identified in zones D4 and D12 are presumed to have been infilled with inert and/or natural material, however there lies the potential for more onerous material to have been used.

7.2 Information from environmental database report

Relevant environmental permits and incidents detailed within the environmental database report (see [Appendix D4](#)) are summarised below in **Table 19**.

Table 19 Summary of environmental permits, landfills and incidents – Zone D

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Agency and hydrological				
Environmental permits – incorporating Integrated Pollution Prevention and Control, Integrated Pollution Controls, Local Authority Integrated Pollution Prevention and Control	0	0	0	N/A
Enforcement and prohibition notices	0	0	0	N/A
Pollution incidents to controlled waters, Prosecutions relating to controlled waters, Substantiated pollution incident register, Water Industry Act referrals	0	0	0	N/A
Discharge consents	0	0	0	N/A
Registered radioactive substances	0	0	0	N/A
Landfill and waste				
Active landfills	0	0	0	N/A
Historic / closed landfills	0	0	0	N/A
Other waste management licences	0	0	0	N/A
Potentially in-filled land (pit, quarry, pond, marsh, river, stream, dock etc)	0	0	0	N/A
Hazardous substances/ industrial land uses				
Control of Major Accident Hazards (COMAH) sites	0	0	0	N/A

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Explosives sites, Notification of Installations Handling Hazardous Substances (NIHHS), Planning hazardous substance consents/ enforcements	0	0	0	N/A
Contaminated land Part 2A register entries and notices	0	0	0	N/A
Contemporary trade directory entries	0	2	0	12 m E: Timmart Electrical Services, Ashby Lodge Cottages, Electrical Engineers, Inactive 224 m NW: D F Bell Haulage, Gorse Hill Lane, Road Haulage Services, Inactive
Fuel station entries	0	0	0	N/A
<i>Note: Entries have only been included within the table where they are located within a 250 m radius of the site or, where they fall outside of this radius but are considered to comprise a significant entry.</i>				

No potential sources of contamination have been identified from the environmental database report for Zone D.

7.3 Information from regulatory authorities

7.3.1 Site services

Buried utility services and their backfill can provide preferential pathways for gas, vapour or groundwater to migrate along to another part of the site or to a receptor. They can also represent significant constraints to development.


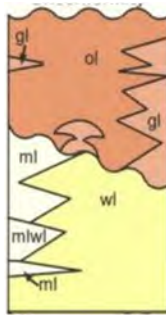
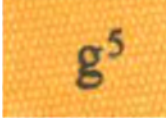
Obtaining a full set of service plans was outside the scope of this report. Services identified on-site during the walkover are detailed in section 17.

7.4 Site geology

7.4.1 Anticipated geological sequence

Published records (British Geological Survey, 2022) for the area and available historical borehole logs indicate the geology of the site to be characterised by the succession recorded in **Table 20**.

Table 20 Site geology – Zone D





Strata	Description	Estimated thickness	Permeability	Map Legend
Head (south west of the site only)	Poorly sorted and poorly stratified, angular rock debris and/or clayey hillwash and soil creep, mantling a hillslope and deposited by solifluction and gelifluction processes.	Variable	Variable	
Upper Lincolnshire Limestone Member	Limestone, mainly coarse grained ooidal grainstones (ol), with subsidiary limestones of other types (gl) including fine to medium grained grainstone, recrystallized limestone and possible reef knolls	Up to 15 m	Permeable	
Lower Lincolnshire Limestone Member	Limestones, dominated by low-energy calcilutite and peloidal wackestone (wl) and packstone. With subsidiary carbonate mudstone (ml).	Up to 20 m	Permeable	
Relevant information sources: BGS Geindex <input checked="" type="checkbox"/> BGS borehole logs <input type="checkbox"/> Previous SI reports <input type="checkbox"/>				

With reference to the historical data the majority of the site has never been developed, therefore minimal Made Ground would be anticipated.

The site would be expected to be directly underlain by a limited thickness of topsoil.

A summary of historical BGS borehole records within and near the zone are provided in **Table 21** below.

Table 21 Summary of BGS borehole records – Zone D

Borehole ref	Depth (m)	Map Legend
TF05 NW/14	26.00	
TF05 NW/17	28.00	
TF05 SW/8	23.00	
TF05 NW/38	28.71	

A copy of these borehole logs is presented in [Appendix E](#).

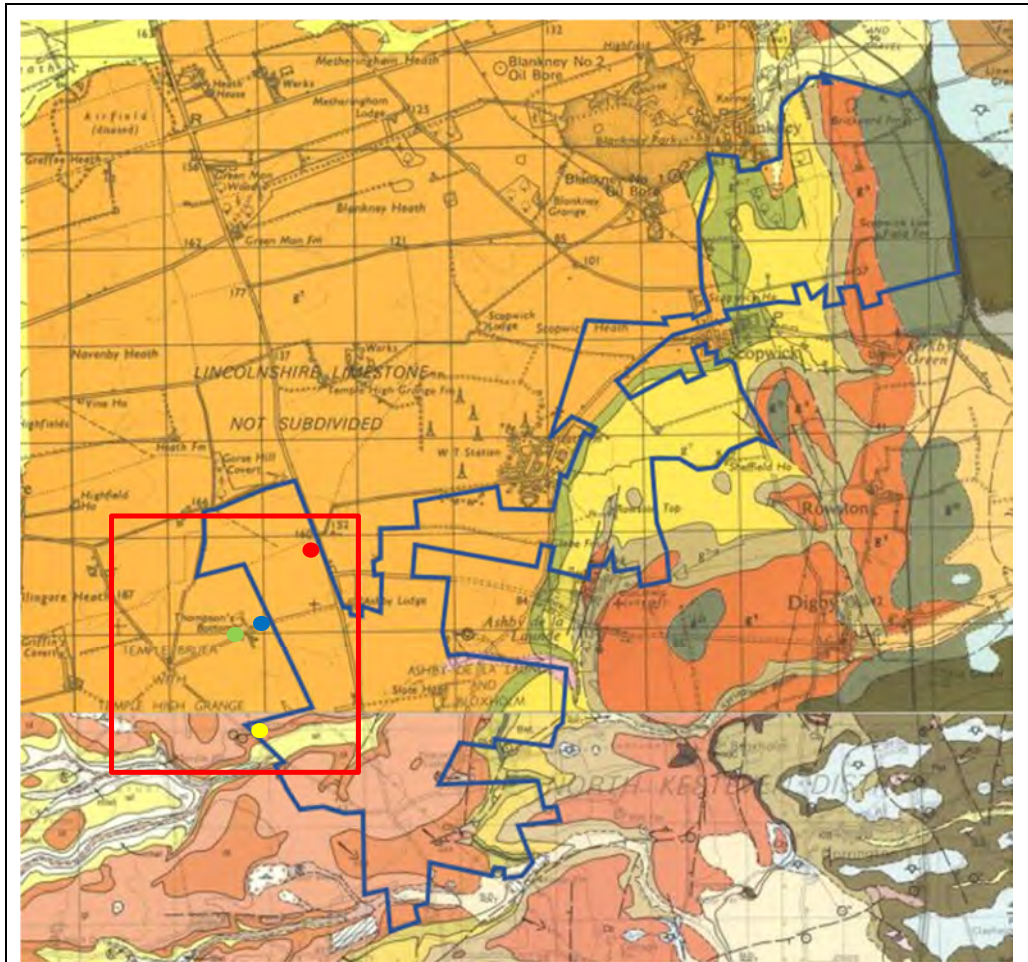


Image 6: Anticipated Geology – Zone D

7.4.2 Radon

The environmental database report indicates that the zone is located within an area where more than 1% of homes are above the Action Level (termed an 'Affected Area') and indicates that radon protection measures are required. The report indicates that 10-30% of homes are at or above the Action Level of 200 Bq m⁻³. Although the radon data used in production of the ukradon.org indicative atlas comes from measurements in homes, the maps indicate the likely extent of the local radon hazard in all buildings.

In Affected Areas radon concentrations are generally low in well-ventilated workplaces such as workshops, but problems have been found in some more confined workplaces, such as offices, where rates of ventilation are relatively slow. HSE guidance suggests that where a premise is in an Affected Area, the employer should take a precautionary approach and undertake measurements in all premises located within an Affected Area. Based on the information in the database report, it would be prudent to arrange monitoring of any poorly ventilated areas to determine if there is a current risk to site staff. If the zone is considered for future residential development, further assessment will be required, in

line with the guidance provided in BRE publication 211 “Radon: Guidance on Protective Measures for New Dwellings (2015)”.

7.5 Mining and quarrying

Evidence has been sought to identify any mining, quarrying, landfilling and land reclamation operations, past and present, which have taken place within 500m of the zone.

7.5.1 Areas of other (rock or mineral) mining

Zone D lies in an area with a known history of quarrying of limestone from the Lincolnshire Limestone Member, and historically there were two stone pits within the zone, one in the southeast in zone D4 and another in the northeast in zone D12, although they are both now disused.

7.6 Hydrogeology

A summary of the hydrogeological setting of the zone, with respect to the anticipated geological sequence, is presented below in **Table 22**.

Table 22 Summary of hydrogeological setting – Zone D

Condition	Description
Aquifer characteristics	Zone D is underlain by a secondary undifferentiated aquifer relating to the superficial Head Deposits in the southwest of the site only, and a principal aquifer relating to the Upper Lincolnshire Limestone Member.
Depth to groundwater and flow	The anticipated depth to the groundwater table is in the order of 25 m below ground level estimated from historic borehole logs in the area. Shallow groundwater in the zone is anticipated to flow in a south-easterly direction, i.e. in line with the local topography.
Groundwater recharge/attenuation	Most of the zone is currently unsurfaced and will therefore drain directly to ground.
Historical implications for hydrogeology	Historically there was a well present at Warren Houses, and there are historic boreholes located at Warren Houses, Thompsons Bottom, and another in the centre of the zone.
Licensed groundwater abstractions	The environmental database report indicates that there are 5No current licensed groundwater abstractions, of which none are public water supply boreholes within a 1km radius of the zone.
Source protection zones	Information available in the Envirocheck report indicates that the zone does not lie within a currently designated groundwater Source Protection Zone (SPZ).

7.7 Hydrology

A summary of the hydrology within the zone area is summarised in **Table 23**.

Table 23 Summary of hydrology in site area – Zone D

Condition	Description
Surface watercourses/features	There are no surface watercourses/features on the zone, however there is a small pond approx. 200 m west of Thompsons Bottom.
Surface water abstractions	There are no surface water abstractions identified by the environmental database, within a 1 km radius of the zone.
Site drainage	There is no visible surface drainage within the zone, and water will drain to the ground.
Preliminary flood risk assessment	The floodplain map for the area shows that the zone does not lie within any designated floodplain.

7.8 Sensitive land uses

Table 24 provides a summary of any environmentally sensitive areas identified within 250 m of the zone based on the environmental database report.

Table 24 Environmentally sensitive areas – Zone D

Feature	Present within 250 m of site?	Details	Likely pathways from site?
International designations – Ramsar wetland, Special Area of Conservation (SAC), Special Protection Area (SPA)	0	0	N/A
National designations – Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), ancient woodland	0	0	N/A
Local designations – Local Nature Reserve, Site of Importance for Nature Conservation (SINC)	0	0	N/A

Feature	Present within 250 m of site?	Details	Likely pathways from site?
Nearest high sensitivity development, e.g. residential	Yes	Toll Bar Cottages located on the eastern boundary of the site, and Thompsons Bottom located 200m west of the site.	Direct contact, migration of contaminants.

8 DESK-BASED ASSESSMENT – ZONE E


8.1 Site history




8.1.1 Historical development record

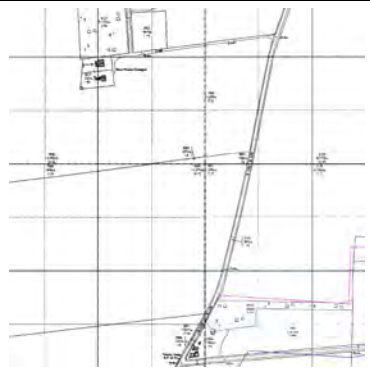


The development history of Zone E and the surrounding area based upon assessment of historical plans and records is detailed in **Table 25**. The historical maps reviewed are shown within the environmental database report in [Appendix D5](#).

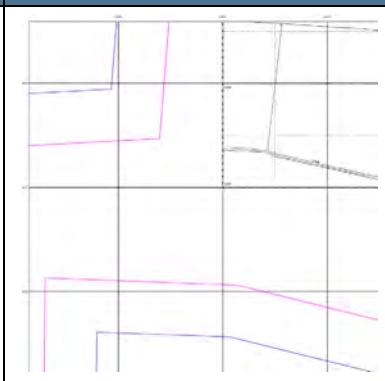




Table 25 Summary of historical development – Zone E

Date from	Date to	Historical Land Use (on-site)	Area of site
1887	1888	Zone E is predominantly fields. Glebe Farm is partially on the zone, located in the northeast and adjacent to the boundary in zones E15 and E16. A forested area named Keepers Covert is located in the southeast of the zone (E6), and Sixty Acre Plantation is located in the southwest in zone E1. There is a gravel pit located in the southern portion of the zone (E7), and an Old Stone Pit is located in the northern portion of the zone adjacent to an eastern boundary in zone E10. There is a road running north-to-south in the southwest of the zone (E2, E6), and another road called Navenby Lane running east-to-west in the north of the zone (E9). Some of the grounds associated with Ashby Lodge to the west (E9) encroach onto the site. A watercourse called Springwell Brooke is located in the southern portion of the zone along a northern boundary, adjacent to the east of Springwell Plantation and running through zone E7.	
1889	1904	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
1905	1906	<p>Keepers Covert (E6) is now labelled as a Pheasantry. There is a windpump located approximately 300 m east of Ashby Lodge in zone E9. There is a small pond located within a forested area, north of Hall Farm in zone E3.</p>	
1907	1949	Data Gap	
1950	1951	<p>There is a small pond to the south of Springwell Plantation in zone E7.</p>	
1952	1955	Data Gap	
	1956	<p>There is a windpump in the northeastern corner of the site in E16, and there are now some buildings present here.</p>	
1957	1978	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
1979		Pylons are now present in the southwest corner of the site.	
1980	1984	Data Gap	
1985		There are some drains labelled in the southeast portion of the site (E3 and E7), which appear to drain into Springwell Brook. There is a sewage works located 310 m east of the site (E11).	
1986	1993	Data Gap	
1994		No Change	
1995		Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
1996		No Change	
1997	1999	Data Gap	
2000		No Change	
2001	2021	Data Gap	
2022		No Change	

Date from	Date to	Historical Land Use (off-site)	Distance (m) and orientation
1887	1888	Whilst Slate House is located within the footprint of the site (in zone E6), it is not included within the official redline site boundary and does not form a part of 'the site' in this report. The village of Ashby de la Launde is located approximately 500 m east of the zone. There are numerous forested areas, namely Ashby Thorns and Sod Wall Plantation which are both located in E8, and Flaxen Wood located on E7, and The Mount approximately 150m east of the site in zone E4. There is a fish pond located in the centre of Ashby de la Launde, a drinking fountain in the south of	

Date from	Date to	Historical Land Use (off-site)	Distance (m) and orientation
		the village and a school and a smithy in the west of the village. St Hybald's Church is located 500 m east of the zone, just beyond Ashby Thorns. There is an Old Stone Pit located 250 m east of the zone along Navenby Lane, and a Gravel Pit in the southern portion of the zone, along the northern boundary at Springwell Plantation. Top Farm is located 20 m south of the zone in the southeast corner, and the property has a Dovecot. Peacock Lodge is located immediately east of the zone in the south, and there is also an Old Stone Pit here. Peacock Lodge is located in the south-east corner of the zone.	
1889	1904	Data Gap	
1905	1906	There has been some construction next to the school in Ashby de la Launde (E11), and Top Farm (E3) is now named Hall Farm. There is now a pump at Slate House (E6), and a small structure has been added to south of the Slate House estate.	
1907	1949	Data Gap	
1950	1951	A structure has been built just south of the Slate House estate. No other significant change.	
1952	1955	Data Gap	
1956		Some houses have been built approximately 50m north of Hybald's Church in zone E8. There is a windpump on the Slate House Estate in zone E6.	
1957	1978	Data Gap	
1979		Hall Farm in zone E3 is now called Mount Farm, and the zone has been redeveloped/reconfigured. There is a pump house located approx. 100 m west of Mount Farm. There has been some development within the village, more structures are present and there is now a Water Tower and two pumps are labelled in zone E12, and there is a sewage works located in zone E11 approximately 300 m north of the south portion of the site. There has been some residential development north east of the zone immediately above the northern boundary in zone E15. The structures south of the original Slate House buildings are labelled as Slate House Cottages, and there has been some development and reconfiguration at Slate House itself.	
1980	1984	Data Gap	
1985		Drains are now labelled in the south east of the site. No other significant changes.	
1986	1993	Data Gap	
1994		No Change	
1995	1999	Data Gap	
2000		Another building has been constructed at Mount Farm in zone E3, and it appears as though some more houses have been built in the village just north of St Hybald's Church.	
2001	2021	Data Gap	
2022		No Change	
Relevant information sources: Historical OS maps <input checked="" type="checkbox"/> Town plans <input type="checkbox"/> Information from the Local Planning Authority <input type="checkbox"/> Aerial photography <input type="checkbox"/> Previous reports <input type="checkbox"/>			

Date from	Date to	Historical Land Use (off-site)	Distance (m) and orientation
<i>Note: Reference to published historical maps provides invaluable information regarding the land use history of the site, but historical evidence may be incomplete for the period pre-dating the first edition and between successive maps.</i>			

There has never been any significant development on the site with the exception of the road construction. The most likely source of any potential contamination would be associated with the agricultural land use of the site, and the use of herbicides, pesticides and fertilisers. The most significant off-site source of potential contamination would be the sewage works located in zone E11, as well as the farms around the site boundary.

The gravel pit and stone quarry identified in zones E7 and E10 respectively are presumed to have been infilled with inert and/or natural material, however there lies the potential for more onerous material to have been used.

8.2 Information from environmental database report

Relevant environmental permits and incidents detailed within the environmental database report (see [Appendix D5](#)) are summarised below in **Table 26**.

Table 26 Summary of environmental permits, landfills and incidents – Zone E

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Agency and hydrological				
Environmental permits – incorporating Integrated Pollution Prevention and Control, Integrated Pollution Controls, Local Authority Integrated Pollution Prevention and Control	0	0	0	N/A
Enforcement and prohibition notices	0	0	0	N/A
Pollution incidents to controlled waters, Prosecutions relating to controlled waters, Substantiated pollution incident register, Water Industry Act referrals	0	0	0	N/A

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Discharge consents	1	1	1	<p>On site NE: Mr D H Cutmore, Proposed Annex Glebe Farm, Ref. Pr3lf928, 26/10/1988 – 16/05/1997, Land/Soakaway, Into Land.</p> <p>24 m SE: North Kesteven District Council, Domestic Property, Ref. Pr3lfu31, 10/02/1966 – 01/10/1996, Onto Land.</p> <p>310 m E: Anglian Water Services Limited, Sewage Treatment Works, Ref. Aw3nff671, 14/12/1984, Sewage Discharges, Freshwater Stream/River, Springwell Brook River Witham.</p> <p>489 m E: Anglian Water Services Limited, Pumping Station on Sewerage Network, Aw3nff700, 30/05/1968, Freshwater Stream/River, Springwell Beck.</p>
Registered radioactive substances	0	0	0	N/A
Landfill and waste				
Active landfills	0	0	0	N/A

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Historic / closed landfills	0	0	0	N/A
Other waste management licences	0	0	0	N/A
Potentially in-filled land (pit, quarry, pond, marsh, river, stream, dock etc)	0	0	0	N/A
Hazardous substances/ industrial land uses				
Control of Major Accident Hazards (COMAH) sites	0	0	0	N/A
Explosives sites, Notification of Installations Handling Hazardous Substances (NIHHS), Planning hazardous substance consents/ enforcements	0	0	0	N/A
Contaminated land Part 2A register entries and notices	0	0	0	N/A
Contemporary trade directory entries	0	2	0	42 m S: Ray Wright (Feeds) Ltd, Pet Foods & Animal Feeds, Inactive 45 m NE: Wrinkle Free Laundry, Ironing & Home Laundry Services, Inactive
Fuel station entries	0	0	0	N/A
<i>Note: Entries have only been included within the table where they are located within a 250 m radius of the site or, where they fall outside of this radius but are considered to comprise a significant entry.</i>				


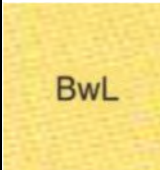
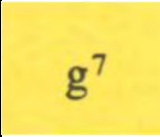
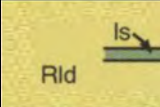
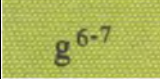
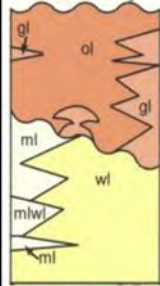

No potential sources of contamination have been identified from the environmental database report for Zone E.

8.3 Site geology

8.3.1 Anticipated geological sequence

Published records (British Geological Survey, 2022) for the area and available historical borehole logs indicate the geology of Zone E to be characterised by the succession recorded in **Table 27**.

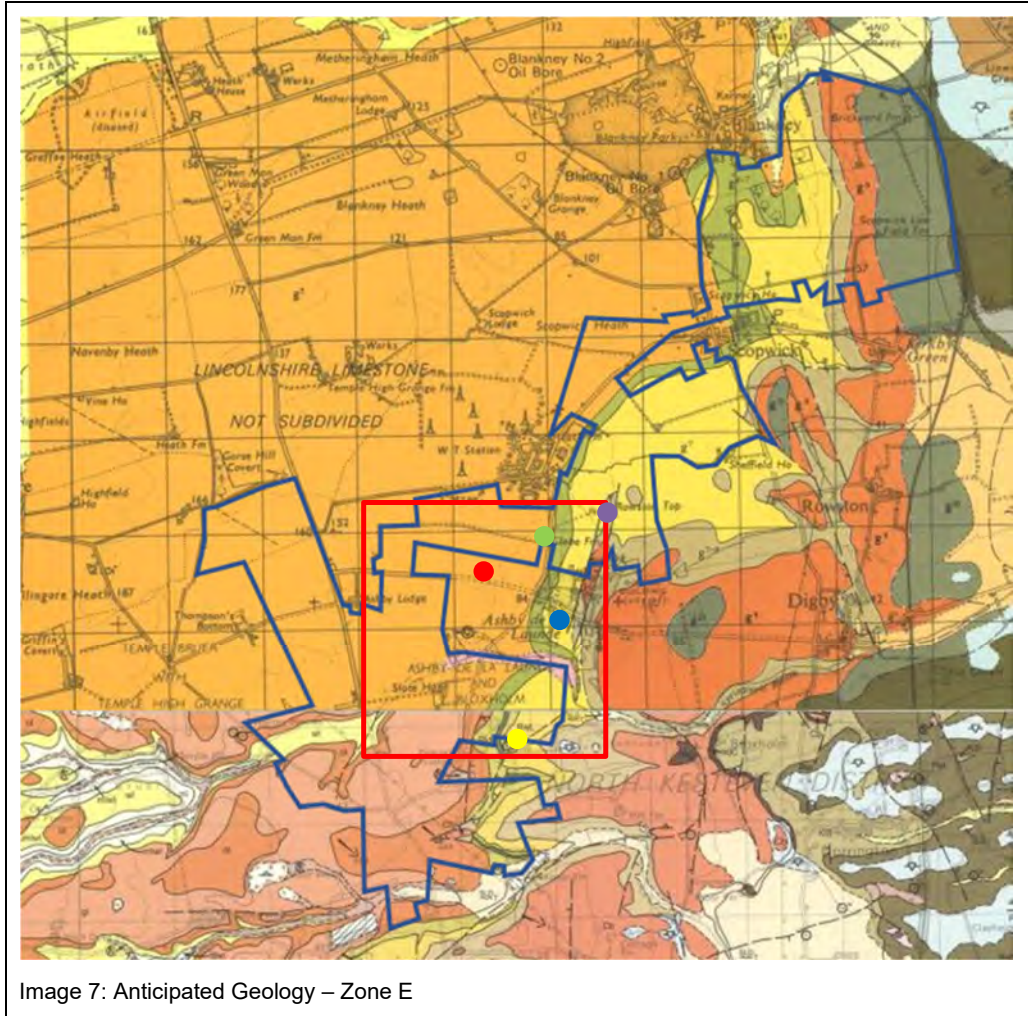
Table 27 Site geology – Zone E

Strata	Description	Estimated thickness	Permeability	Map Legend
Sleaford Sand and Gravel (central west portion of the site)	Sand and Gravel	Variable	Permeable	
Blisworth Limestone Member	Pale grey to off-white or yellowish limestones with thin marls and mudstones, fossiliferous, bioturbated peloidal, ooidal and shell-fragmental more-or-less argillaceous packstones and wackestones, subordinate cross-bedded ooidal shell-fragmented grainstones.	Typically 6 – 7 m	Permeable	
				
Rutland Formation	Grey marine mudstone passing up into non-marine mudstone and siltstone, with a greenish-grey rootlet bed at the top. Occasional limestone beds (ls)	Typically 8 – 12 m	Permeable	
				
Upper Lincolnshire Limestone Member	Limestone, mainly coarse grained ooidal grainstones (ol), with subsidiary limestones of other types (gl) including fine to medium grained grainstone, recrystallized limestone and possible reef knolls	Up to 15 m	Permeable	
Lower Lincolnshire Limestone Member	Limestones, dominated by low-energy calcilutite and peloidal wackestone (wl) and packstone. With subsidiary carbonate mudstone (ml).	Up to 20 m	Permeable	
Relevant information sources: BGS Geindex <input checked="" type="checkbox"/> BGS borehole logs <input type="checkbox"/> Previous SI reports <input type="checkbox"/>				

With reference to the historical data the majority of the site has never been developed, and therefore widespread Made Ground would not be anticipated. There may be some

Made Ground in the vicinity of the Old Stone Pit in E10 and the Gravel Pit in E7, as well as around the roads.


The site would be expected to be directly underlain by a limited thickness of topsoil.



A summary of historical BGS borehole records within and near the zone are provided in **Table 28** below.

Table 28 Summary of BGS borehole records – Zone E

Borehole ref	Depth (m)	Map Legend
TF05 NW19	11.00	●
TF05 NE10/A	38.00	●
TF05 SW2	27.43	●
TF05 NW40	25.12	●

Borehole ref	Depth (m)	Map Legend
TF05 NE4	34.00	

A copy of these borehole logs is presented in [Appendix E](#).

8.3.2 Radon

The environmental database report indicates that the zone is located within an area where more than 1% of homes are above the Action Level (termed an ‘Affected Area’) and indicates that radon protection measures are required. The report indicates that 5-10% of homes are at or above the Action Level of 200 Bq m⁻³. Although the radon data used in production of the ukradon.org indicative atlas comes from measurements in homes, the maps indicate the likely extent of the local radon hazard in all buildings.

In Affected Areas radon concentrations are generally low in well-ventilated workplaces such as workshops, but problems have been found in some more confined workplaces, such as offices, where rates of ventilation are relatively slow. HSE guidance suggests that where a premise is in an Affected Area, the employer should take a precautionary approach and undertake measurements in all premises located within an Affected Area. Based on the information in the database report, it would be prudent to arrange monitoring of any poorly ventilated areas to determine if there is a current risk to site staff. If the zone is considered for future residential development, further assessment will be required, in line with the guidance provided in BRE publication 211 “Radon: Guidance on Protective Measures for New Dwellings (2015)”.

8.4 Mining and quarrying

Evidence has been sought to identify any mining, quarrying, landfilling and land reclamation operations, past and present, which have taken place within 500 m of the zone.

8.4.1 Areas of other (rock or mineral) mining

The site lies in an area with a known history of quarrying of limestone from the Lincolnshire Limestone Member, and historically there were two pits within the zone, one Gravel Pit in the southeast of the zone (E7) and one Old Stone Pit in the northeast of the zone (E10).

8.5 Hydrogeology

A summary of the hydrogeological setting of the zone, with respect to the anticipated geological sequence set out in Section 4.3 is presented below in **Table 29**.

Table 29 Summary of hydrogeological setting – Zone E

Condition	Description
Aquifer characteristics	Zone E is underlain by a Secondary A Aquifer relating to the Sleaford Sand and Gravel, and a Principal Aquifer relating to the Lincolnshire Limestone Member.

Condition	Description
Depth to groundwater and flow	The anticipated depth to the groundwater table is in the order of 14 m below ground level estimated from historic borehole logs in the area. Shallow groundwater in the site area is anticipated to flow in a south-easterly direction, i.e. in line with the local topography. Localised shallow groundwater may be present within superficial granular deposits such as the Sleaford Sand and Gravel.
Groundwater recharge/attenuation	Most of the zone is currently unsurfaced and will therefore drain directly to ground.
Licensed groundwater abstractions	The environmental database report indicates that there are no current licensed groundwater abstractions within a 1 km radius of the zone.
Source protection zones	Information available in the Envirocheck report indicates that the zone does not lie within a currently designated groundwater Source Protection Zone (SPZ).

8.6 Hydrology

A summary of the hydrology within the zone is summarised in **Table 30**.

Table 30 Summary of hydrology in site area – Zone E

Condition	Description
Surface watercourses/features	The nearest surface watercourse to the zone is Springwell Brook located within the zone in the east, along the northern boundary and adjacent to Springwell Plantation. This seems to form part of a drainage network.
Surface water abstractions	There are no surface water abstractions identified by the environmental database, within a 1 km radius of the zone.
Site drainage	Some drainage ditches around the zone connect to Springwell Brook.
Preliminary flood risk assessment	The floodplain map for the area shows that the southeastern portion of the zone, east of the B1191, lies within flood zones 2 and 3. This indicates that the zone may be subject to flooding and extreme flooding from rivers without defences.

8.7 Sensitive land uses

Table 31 provides a summary of any environmentally sensitive areas identified within 250 m of the zone based on the environmental database report.

Table 31 Environmentally sensitive areas – Zone E

Feature	Present within 250 m of site?	Details	Likely pathways from site?
International designations – Ramsar wetland, Special Area of Conservation (SAC), Special Protection Area (SPA)	0	0	N/A
National designations – Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), ancient woodland	0	0	N/A
Local designations – Local Nature Reserve, Site of Importance for Nature Conservation (SINC)	0	0	N/A
Nearest high sensitivity development, e.g. residential	Yes	Slate House, Mount Farm, Ashby Lodge and Glebe Farm.	Direct contact, migration of contaminants.

9 DESK-BASED ASSESSMENT – ZONE F

9.1 Site history

9.1.1 Historical development record

The development history of Zone F and the surrounding area based upon assessment of historical plans and records is detailed in **Table 32**. The historical maps reviewed are shown within the environmental database report in [Appendix D6](#).

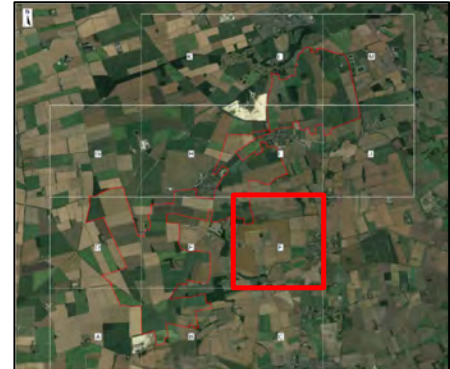











Table 32 Summary of historical development – Zone F

Date from	Date to	Historical Land Use (on-site)	Area of site
1887	1888	Zone F is predominantly fields. There is an Old Stone Pit in the centre of the zone (F13), and a forested area called The Gorse located west of the Old Stone Pit but also within zone F13. There is an estate called Rowston Top in the northwest of the site (which is not included within the site redline boundary and will be considered as off-site moving forward). There is a small forested area in the north east of the zone, and there is a small pond located adjacent to it, all also within zone F13.	
1889	1904	Data Gap	
1905	1906	No Change	
1907	1946	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
1947	1951	No Change	
1952	1955	Data Gap	
	1956	The Gorse is no longer present as a forested area.	
1957	1978	Data Gap	
	1979	There is track leading to/from Rowston Top, and there is a drain running alongside it. There is a pond in the centre of the zone where the Old Stone Pit used to be.	
1980	1984	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
1985		No Change	
1986	1993	Data Gap	
1994		The forested area in the east of the site is gone.	
1995	1999	Data Gap	
2000		No Change	
2001	2021	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
2022		Rowston Top has been renamed The Maltings.	

Date from	Date to	Historical Land Use (off-site)	Distance (m) and orientation
1887	1888	The surrounding area is predominantly fields and plantations. There is a road running east to west approximately 600 m south of the zone, and there is a vicarage located 650 m southwest of the zone with some buildings. There is another road running north to south approximately 1 km east of the zone, named Lincoln Road. The hamlet of Bloxholm is located approximately 1.5 km south of the zone and the village of Digby is located approximately 1.5 km southeast. There is a small forested area located immediately adjacent to the south eastern boundary of the zone, and within this area there is a small pond. There is another small pond located 500 m east of the zone. Marshall Hill Plantation is located approximately 750 m northeast of the zone.	
1889	1904		Data Gap
1905	1906		No Change
1907	1949		Data Gap
1950	1951		No Change
1952	1955		Data Gap
1956		The site of a Roman Building is located approximately 350 m south of the zone. No other significant change.	
1957	1978		Data Gap
1979			No Change
1980	1984		Data Gap
1985		There are drains labelled on the maps east of the zone, 900 m southeast, and also running parallel alongside the road located 600 m south of the zone.	
1986	1993		Data Gap
1994			No Change
1995	1999		Data Gap
2000		A track is running from the south east corner of the zone boundary running in a north to south direction.	

Date from	Date to	Historical Land Use (off-site)	Distance (m) and orientation
2001	2021	Data Gap	
2022		No Change	
Relevant information sources: Historical OS maps <input checked="" type="checkbox"/> Town plans <input type="checkbox"/> Information from the Local Planning Authority <input type="checkbox"/> Aerial photography <input type="checkbox"/> Previous reports <input type="checkbox"/>			
<i>Note: Reference to published historical maps provides invaluable information regarding the land use history of the site, but historical evidence may be incomplete for the period pre-dating the first edition and between successive maps.</i>			

There has been no historical development within the zone, and therefore the primary source of any potential contamination would be associated with the agricultural land use of the site, although there is also a small Old Stone Pit on the site which represents some level of historic quarrying.

The stone quarry identified in zone F13 is presumed to have been infilled with inert and/or natural material, however there lies the potential for more onerous material to have been used.

9.2 Information from environmental database report

Relevant environmental permits and incidents detailed within the environmental database report (see [Appendix D6](#)) are summarised below in **Table 33**.

Table 33 Summary of environmental permits, landfills and incidents – Zone F

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Agency and hydrological				
Environmental permits – incorporating Integrated Pollution Prevention and Control, Integrated Pollution Controls, Local Authority Integrated Pollution Prevention and Control	0	0	0	N/A
Enforcement and prohibition notices	0	0	0	N/A
Pollution incidents to controlled waters, Prosecutions relating to controlled waters, Substantiated pollution incident register, Water Industry Act referrals	0	0	0	N/A

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Discharge consents	1	0	0	On Site: Miss L Pickett & Mr S Purdie, Domestic Property, The Maltings & The Granary & The Hayloft, Ref. Prnnf18151, 16/06/2004, Sewage Discharges (final treated effluent), into freshwater stream.
Registered radioactive substances	0	0	0	N/A
Landfill and waste				
Active landfills	0	0	0	N/A
Historic / closed landfills	0	0	0	N/A
Other waste management licences	0	0	0	N/A
Potentially in-filled land (pit, quarry, pond, marsh, river, stream, dock etc)	0	0	0	N/A
Hazardous substances/ industrial land uses				
Control of Major Accident Hazards (COMAH) sites	0	0	0	N/A
Explosives sites, Notification of Installations Handling Hazardous Substances (NIHHS), Planning hazardous substance consents/ enforcements	0	0	0	N/A
Contaminated land Part 2A register entries and notices	0	0	0	N/A

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Contemporary trade directory entries	0	0	0	N/A
Fuel station entries	0	0	0	N/A
<i>Note: Entries have only been included within the table where they are located within a 250 m radius of the site or, where they fall outside of this radius but are considered to comprise a significant entry.</i>				

No potential sources of contamination have been identified from the environmental database report for Zone F.

9.3 Information from regulatory authorities

9.3.1 Site services

Buried utility services and their backfill can provide preferential pathways for gas, vapour or groundwater to migrate along to another part of the site or to a receptor. They can also represent significant constraints to development.

Obtaining a full set of service plans was outside the scope of this report. Services identified on-site during the walkover are detailed in section 17.


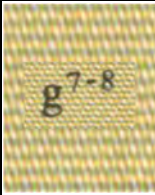
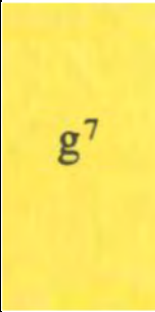
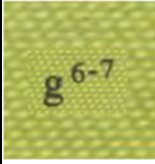

9.4 Site geology

9.4.1 Anticipated geological sequence

Published records (British Geological Survey, 2022) for the area and available historical borehole logs indicate the geology of the site to be characterised by the succession recorded in **Table 34**.

Table 34 Site geology – Zone F

Strata	Description	Estimated thickness	Permeability	Map Legend
No Superficial Deposits				

Strata	Description	Estimated thickness	Permeability	Map Legend
Cornbrash Formation (south of the site only)	Limestone, medium to fine grained, predominantly bioclastic wackestone and packstone with sporadic peloids. Thin argillaceous partings or interbeds of argillaceous mudstone may occur.	2 m – 4 m	Permeable	
Blisworth Clay Formation	Silicate-mudstone, grey, commonly variegated purplish red, yellow and green, poorly bedded to blocky. Mudstone weathers to a highly plastic clay.	2 m – 4 m	Impermeable	
Blisworth Limestone Member	Pale grey to off-white or yellowish limestones with thin marls and mudstones, fossiliferous, bioturbated peloidal, ooidal and shell-fragmental more-or-less argillaceous packstones and wackestones, subordinate cross-bedded ooidal shell-fragmented grainstones.	Typically 6 – 7 m	Permeable	
Rutland Formation	Grey marine mudstone passing up into non-marine mudstone and siltstone, with a greenish-grey rootlet bed at the top.	Typically 8 – 12 m	Permeable	
Upper Lincolnshire Limestone Member	Limestone, mainly coarse grained ooidal grainstones, with subsidiary limestones of other types including fine to medium grained grainstone, recrystallized limestone and possible reef knolls	Up to 15 m	Permeable	
Lower Lincolnshire Limestone Member	Limestones, dominated by low-energy calcilutite and peloidal wackestone and packstone. With subsidiary carbonate mudstone.	Up to 20 m	Permeable	
Relevant information sources: BGS Geindex <input checked="" type="checkbox"/> BGS borehole logs <input type="checkbox"/> Previous SI reports <input type="checkbox"/>				

With reference to the historical data the majority of the site has never been developed, and therefore widespread Made Ground would not be anticipated. There may be some Made Ground in the vicinity of the Old Stone Pit located in zone F13.

The site would be expected to be directly underlain by a limited thickness of topsoil.

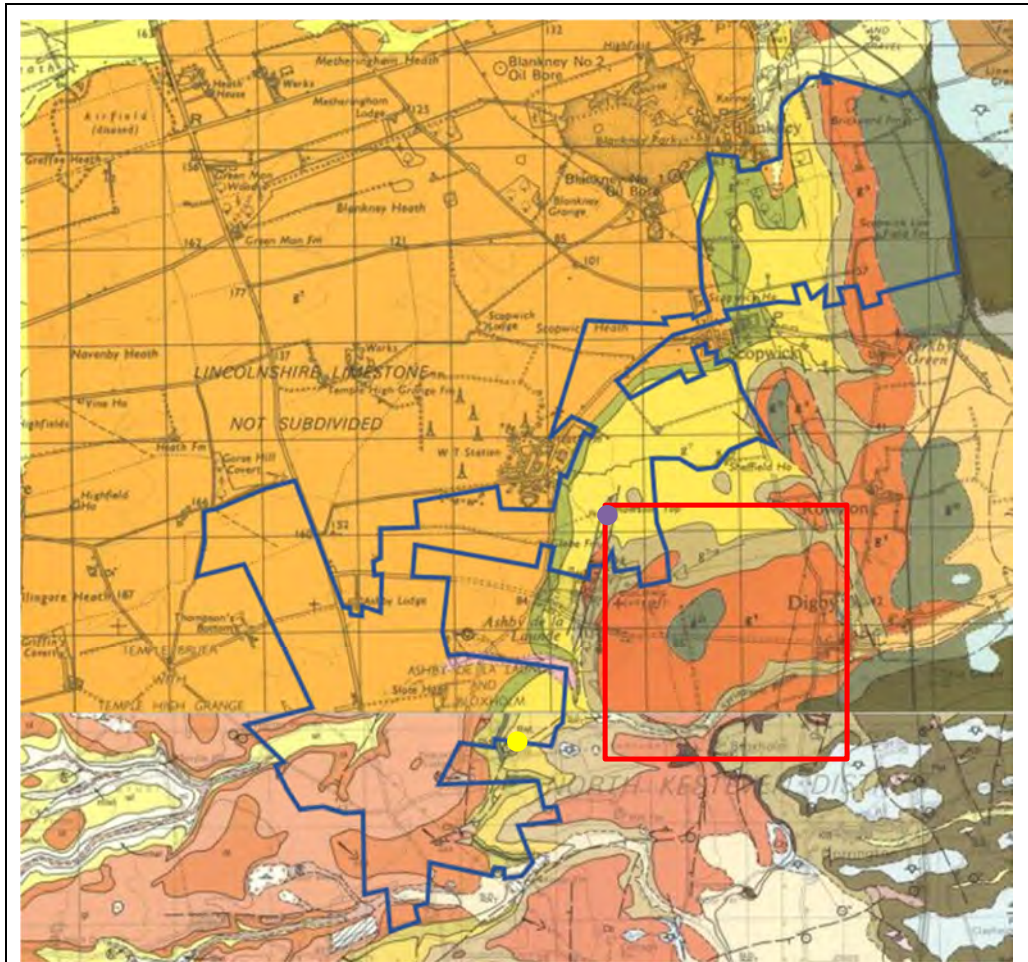



Image 8: Anticipated Geology – Zone F

A summary of pertinent historical BGS borehole records within and near the zone are provided in **Table 35** below.

Table 35 Summary of BGS borehole records – Zone F

Borehole ref	Depth (m)	Map Legend
TF05 NE4	34.00	

A copy of this borehole log is presented in [Appendix E](#).

9.4.2 Radon

The environmental database report indicates that the zone is located within an area where more than 1% of homes are above the Action Level (termed an ‘Affected Area’) and indicates that radon protection measures are required. The report indicates that 3-5% of homes are at or above the Action Level of 200 Bq m⁻³. Although the radon data used in production of the ukradon.org indicative atlas comes from measurements in homes, the maps indicate the likely extent of the local radon hazard in all buildings.

In Affected Areas radon concentrations are generally low in well-ventilated workplaces such as workshops, but problems have been found in some more confined workplaces, such as offices, where rates of ventilation are relatively slow. HSE guidance suggests that where a premise is in an Affected Area, the employer should take a precautionary approach and undertake measurements in all premises located within an Affected Area. Based on the information in the database report, it would be prudent to arrange monitoring of any poorly ventilated areas to determine if there is a current risk to site staff. If the zone is considered for future residential development, further assessment will be required, in line with the guidance provided in BRE publication 211 “Radon: Guidance on Protective Measures for New Dwellings (2015)”.

9.5 Mining and quarrying

Evidence has been sought to identify any mining, quarrying, landfilling and land reclamation operations, past and present, which have taken place within 500m of the zone.

9.5.1 Areas of other (rock or mineral) mining

The zone lies in an area with a known history of quarrying of limestone from the Lincolnshire Limestone Member and the Blisworth Limestone Member, and historically there was an Old Stone Pit in the centre of the zone (F13).

9.6 Hydrogeology

A summary of the hydrogeological setting of the zone, with respect to the anticipated geological sequence, is presented below in **Table 36**.

Table 36 Summary of hydrogeological setting – Zone F

Condition	Description
Aquifer characteristics	Zone F is underlain by a Secondary A Aquifer relating to the Cornbrash Formation, a Principal aquifer relating to the Blisworth Limestone Formation, and unproductive strata relating to the Blisworth Clay Formation. The potential presence of low permeability clay at relatively shallow depths beneath the zone, while restricting downwards migration, may increase the potential for lateral migration of shallow groundwater (and therefore mobile contamination, if present).
Depth to groundwater and flow	The anticipated depth to groundwater is in the order of 13m below ground level estimated from BGS Logs. Shallow groundwater in the zone area is anticipated to flow in an easterly direction, i.e. in line with local topography and in the direction of the River Witham.
Groundwater recharge/attenuation	Most of the zone is currently unsurfaced and will therefore drain directly to ground.
Historical implications	There are multiple small ponds on and around the zone (two within the zone and two off site), and there are two historic boreholes which are located within the zone at The Maltings.

Condition	Description
for hydrogeology	
Licensed groundwater abstractions	The environmental database report indicates that there are no groundwater abstractions within a 1 km radius of the zone.
Source protection zones	Information available in the Envirocheck report indicates that the zone does not lie within a currently designated source protection zone (SPZ).

9.7 Hydrology

A summary of the hydrology within the zone area is summarised in **Table 37**.

Table 37 Summary of hydrology in site area – Zone F

Condition	Description
Surface watercourses/features	There are two ponds within the zone and another two ponds located 10 m southeast and 500 m east of the zone respectively. There are drainage ditches located within the zone and to the east of the zone.
Surface water abstractions	The environmental database report indicates that there are no surface water abstractions within a 1 km radius of the zone.
Site drainage	Evidence from the Envirocheck report indicated that drainage ditches/streams are present on the zone and in the surrounding area.
Preliminary flood risk assessment	The indicative floodplain map for the area shows that the zone does not lie within any designated floodplains.

9.8 Sensitive land uses

Table 38 provides a summary of any environmentally sensitive areas identified within 250 m of the zone based on the environmental database report.

Table 38 Environmentally sensitive areas – Zone F

Feature	Present within 250 m of site?	Details	Likely pathways from site?
International designations – Ramsar wetland, Special Area of Conservation (SAC), Special Protection Area (SPA)	0	0	N/A

Feature	Present within 250 m of site?	Details	Likely pathways from site?
National designations – Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), ancient woodland	0	0	N/A
Local designations – Local Nature Reserve, Site of Importance for Nature Conservation (SINC)	0	0	N/A
Nearest high sensitivity development, e.g. residential	1	The Maltings, located on site in the north west.	Direct contact, migration of potential contaminants.

10 DESK-BASED ASSESSMENT – ZONE G



10.1 Site history



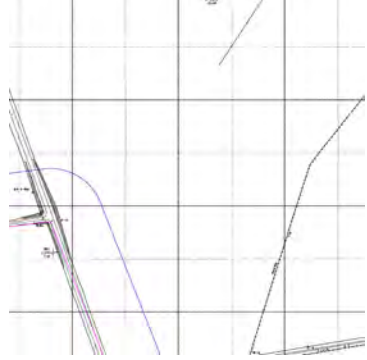
10.1.1 Historical development record


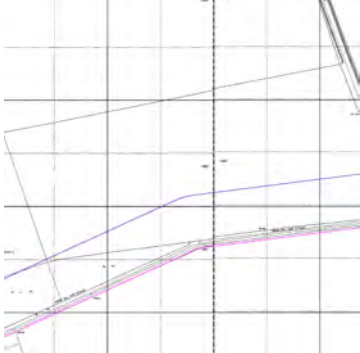

The development history of Zone G and the surrounding area based upon assessment of historical plans and records is detailed in **Table 39**. The historical maps reviewed are shown within the environmental database report in [Appendix D7](#).




Table 39 Summary of historical development – Zone G

Date from	Date to	Historical Land Use (on-site)	Area of site
1887	1888	Zone G is predominantly fields. There is an old quarry located in the northeast corner of the site in zone G4, as well as a guidepost.	
1889	1904	Data Gap	
1905	1906	No Change	
1907	1946	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
1947	1951	No Change	
1952	1955	Data Gap	
	1956	No Change	
1957	1979	Data Gap	
	1980	The quarry located in the northeast corner of the site in zone G4 is no longer present.	
1980	1984	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
1985		No Change	
1986	1993	Data Gap	
1994		No Change	
1995	1999	Data Gap	
2000		No Change	
2001	2021	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
2022		No Change	

Date from	Date to	Historical Land Use (off-site)	Distance (m) and orientation
1887	1888	The surrounding land is predominantly fields. Gorse Hill Covert is located immediately adjacent to the zone to the north in zones G2 and G3, and there is one road located immediately adjacent to the zone to the east (G4), running in a north-to-south direction (G4), one running east-to-west called Gorse Hill Lane immediately beyond the northern boundary of the zone, and another also running in a north to south direction immediately to the west of the zone called Gorse Lane (G2). There is a small quarry located approximately 100 m northeast of the zone (G4). Another Glebe Farm (not the same as mentioned in Zone E) is located 800 m northwest of the zone, and there is also a Gravel Pit located here, immediately south of the buildings. There is a farm called Temple High Grange Farm located 1 km northeast of the zone, which constitutes multiple buildings and associated landscaping.	
1889	1904		Data Gap
1905	1906		No Change
1907	1946		Data Gap
1947	1951		No Change
1952	1955		Data Gap
	1956		No Change
1957	1978		Data Gap
1979	1980	There are now pylons running in a north to south direction northwest of the zone.	
1981	1984		Data Gap
	1985	Glebe Farm is now called Heath Farm and has been reconfigured/redeveloped. No other significant changes.	
1986	1993		Data Gap
	1994		No Change
1995	1999		Data Gap
	2000		No Change

2001	2021	Data Gap
2022		No Change
Relevant information sources: Historical OS maps <input checked="" type="checkbox"/> Town plans <input type="checkbox"/> Information from the Local Planning Authority <input type="checkbox"/> Aerial photography <input type="checkbox"/> Previous reports <input type="checkbox"/>		
<i>Note: Reference to published historical maps provides invaluable information regarding the land use history of the site, but historical evidence may be incomplete for the period pre-dating the first edition and between successive maps.</i>		

There has been no historical development on site, and any potential contamination on this site would likely be associated with its agricultural land use, or perhaps with the Old Quarry in zone G4.

The stone quarry identified in zone G4 is presumed to have been infilled with inert and/or natural material, however there lies the potential for more onerous material to have been used.

10.2 Information from environmental database report

Relevant environmental permits and incidents detailed within the environmental database report (see [Appendix D7](#)) are summarised below in **Table 40**.

Table 40 Summary of environmental permits, landfills and incidents – Zone G

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Agency and hydrological				
Environmental permits – incorporating Integrated Pollution Prevention and Control, Integrated Pollution Controls, Local Authority Integrated Pollution Prevention and Control	0	0	0	N/A
Enforcement and prohibition notices	0	0	0	N/A
Pollution incidents to controlled waters, Prosecutions relating to controlled waters, Substantiated pollution incident register, Water Industry Act referrals	0	0	0	N/A
Discharge consents	0	0	0	N/A
Registered radioactive substances	0	0	0	N/A

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Landfill and waste				
Active landfills	0	0	0	N/A
Historic / closed landfills	0	0	0	N/A
Other waste management licences	0	0	0	N/A
Potentially in-filled land (pit, quarry, pond, marsh, river, stream, dock etc)	0	0	0	N/A
Hazardous substances/ industrial land uses				
Control of Major Accident Hazards (COMAH) sites	0	0	0	N/A
Explosives sites, Notification of Installations Handling Hazardous Substances (NIHHS), Planning hazardous substance consents/ enforcements	0	0	0	N/A
Contaminated land Part 2A register entries and notices	0	0	0	N/A
Contemporary trade directory entries	0	2	0	N/A
Fuel station entries	0	0	0	N/A
<i>Note: Entries have only been included within the table where they are located within a 250 m radius of the site or, where they fall outside of this radius but are considered to comprise a significant entry.</i>				

No potential sources of contamination have been identified from the environmental database report for Zone G.

10.3 Information from regulatory authorities

10.3.1 Site services

Buried utility services and their backfill can provide preferential pathways for gas, vapour or groundwater to migrate along to another part of the site or to a receptor. They can also represent significant constraints to development.


Obtaining a full set of service plans was outside the scope of this report. Services identified on-site during the walkover are detailed in section 17.

10.4 Site geology

10.4.1 Anticipated geological sequence

Published records (British Geological Survey, 2022) for the area and available historical borehole logs indicate the geology of the site to be characterised by the succession recorded in **Table 41**.

Table 41 Site geology – Zone G

Strata	Description	Estimated thickness	Permeability	Map Legend
No Superficial Deposits				
Upper Lincolnshire Limestone Member	Limestone, overwhelmingly dominated by high-energy ooidal and shell fragmental grainstones, but includes secondarily recrystallised and micritized lithologies.	Up to 15 m	Permeable	
Lower Lincolnshire Limestone Member	Limestones, dominated by low-energy calcilitite and peloidal wackestone and packstone. With subsidiary carbonate mudstone.	Up to 20 m	Permeable	
Relevant information sources: BGS Geoindex <input checked="" type="checkbox"/> BGS borehole logs <input type="checkbox"/> Previous SI reports <input type="checkbox"/>				

With reference to the historical data the site has never been developed, and therefore widespread Made Ground would not be anticipated. There may be some Made Ground in the vicinity of the Old Quarry located in zone G4.

The site would be expected to be directly underlain by a limited thickness of topsoil.

A summary of historical BGS borehole records within and near the zone are provided in **Table 42** below.

Table 42 Summary of BGS borehole records – Zone G

Borehole ref	Depth (m)	Map Legend
TF05 NW38	28.71	●

A copy of these borehole logs is presented in [Appendix E](#).

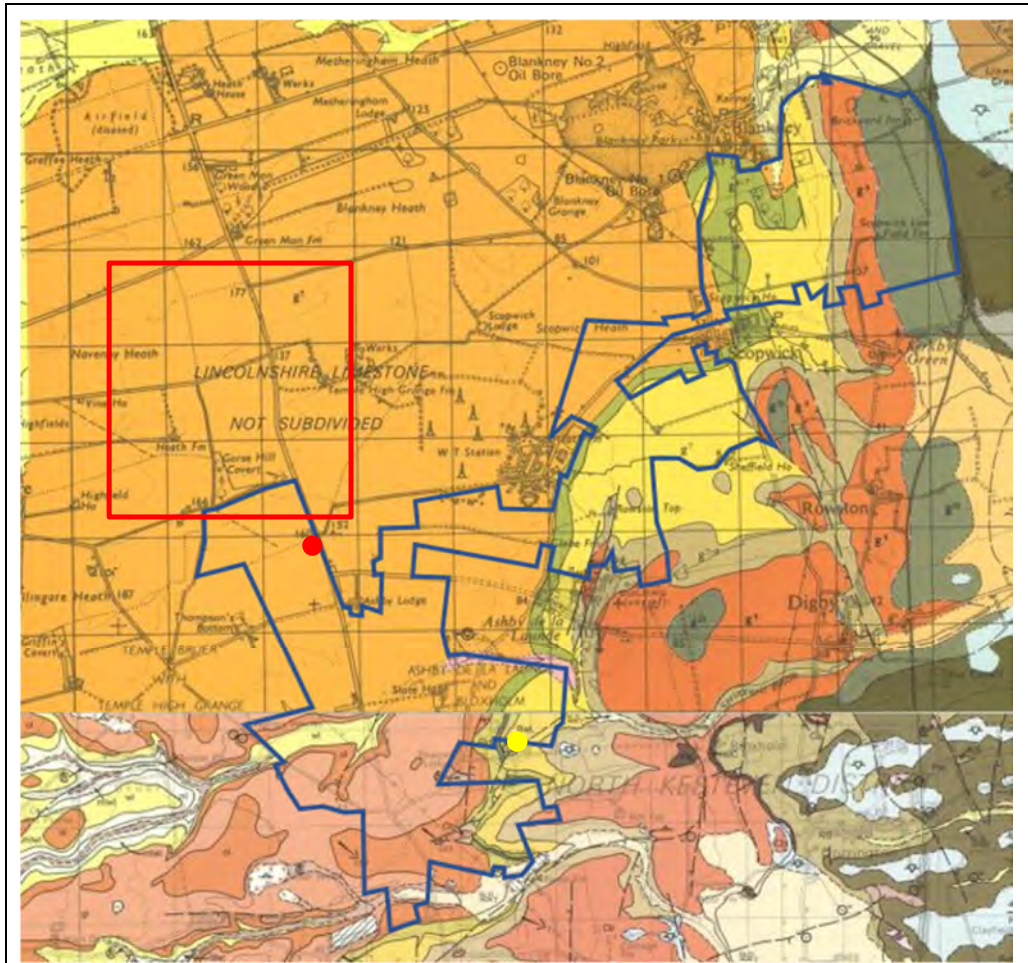


Image 9: Anticipated Geology – Zone G

10.4.2 Radon

The environmental database report indicates that the zone is located within an area where more than 1% of homes are above the Action Level (termed an 'Affected Area') and indicates that radon protection measures are required. The report indicates that 10-30% of homes are at or above the Action Level of 200 Bq m⁻³. Although the radon data used in production of the ukradon.org indicative atlas comes from measurements in homes, the maps indicate the likely extent of the local radon hazard in all buildings.

In Affected Areas radon concentrations are generally low in well-ventilated workplaces such as workshops, but problems have been found in some more confined workplaces,

such as offices, where rates of ventilation are relatively slow. HSE guidance suggests that where a premise is in an Affected Area, the employer should take a precautionary approach and undertake measurements in all premises located within an Affected Area. Based on the information in the database report, it would be prudent to arrange monitoring of any poorly ventilated areas to determine if there is a current risk to site staff. If the zone is considered for future residential development, further assessment will be required, in line with the guidance provided in BRE publication 211 “Radon: Guidance on Protective Measures for New Dwellings (2015)”.

10.5 Mining and quarrying

Evidence has been sought to identify any mining, quarrying, landfilling and land reclamation operations, past and present, which have taken place within 500 m of the zone.

10.5.1 Areas of other (rock or mineral) mining

Zone G lies in an area with a known history of quarrying of limestone from the Lincolnshire Limestone Member and the Blisworth Limestone Formation, and historically there was an Old Quarry within zone G4, as well as an Old Quarry 100 m northeast of the zone.

10.6 Hydrogeology

A summary of the hydrogeological setting of the zone, with respect to the anticipated geological sequence, is presented below in **Table 43**.

Table 43 Summary of hydrogeological setting – Zone G

Condition	Description
Aquifer characteristics	Zone G is underlain by a Principal Aquifer relating to the Upper Lincolnshire Limestone Member. The potential presence of low permeability clay at relatively shallow depths beneath the zone, while restricting downwards migration, may increase the potential for lateral migration of shallow groundwater (and therefore mobile contamination, if present).
Depth to groundwater and flow	The anticipated depth to groundwater is in the order of 26 m below ground level estimated from BGS Logs. Shallow groundwater in the zone area is anticipated to flow in a southeasterly direction, i.e. in line with local topography and in the direction of the River Witham.
Groundwater recharge/attenuation	Most of the zone is currently unsurfaced and will therefore drain directly to ground.
Licensed groundwater abstractions	The environmental database report indicates that there is one groundwater abstraction within a 1km radius of the zone, which is used for general farming and domestic purposes.
Source protection zones	Information available in the Envirocheck report indicates that the zone does not lie within a currently designated source protection zone (SPZ).

10.7 Hydrology

A summary of the hydrology within the zone area is summarised in **Table 44**.

Table 44 Summary of hydrology in site area – Zone G

Condition	Description
Surface watercourses/features	There are no watercourses or water features on or adjacent to the zone, with the closest watercourse most likely being a stream running through the village of Scopwick, located approximately 4 km to the east.
Surface water abstractions	The environmental database report indicates that there are no surface water abstractions within a 1 km radius of the zone.
Site drainage	There are no drains shown on the maps for this area, and therefore the zone is anticipated to drain directly to the ground.
Preliminary flood risk assessment	The indicative floodplain map for the area shows that the site does not lie within any designated floodplains.

10.8 Sensitive land uses

Table 45 provides a summary of any environmentally sensitive areas identified within 250 m of the zone based on the environmental database report.

Table 45 Environmentally sensitive areas – Zone G

Feature	Present within 250 m of site?	Details	Likely pathways from site?
International designations – Ramsar wetland, Special Area of Conservation (SAC), Special Protection Area (SPA)	0	0	N/A
National designations – Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), ancient woodland	0	0	N/A
Local designations – Local Nature Reserve, Site of Importance for Nature Conservation (SINC)	0	0	N/A
Nearest high sensitivity development, e.g. residential	1	The Maltings, located within the zone to the north west.	Direct contact, migration of potential contaminants.

11 DESK-BASED ASSESSMENT – ZONE H

11.1 Site history

11.1.1 Historical development record

The development history of Zone H and the surrounding area based upon assessment of historical plans and records is detailed in **Table 46**. The historical maps reviewed are shown within the environmental database report in [Appendix D8](#).

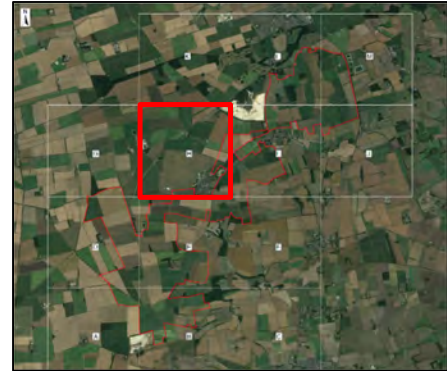





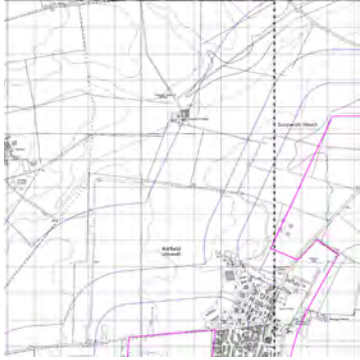





Table 46 Summary of historical development – Zone H

Date from	Date to	Historical Land Use (on-site)	Area of site
1887	1888	The zone boundary cuts through Rowston Plantation, and a small pond feature is located south of Rowston Plantation, both within zone H4.	
1889	1904	Data Gap	
1905	1906	No significant change	
1907	1946	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
1947	1951	<p>There are some unidentified structures located in the south of the zone (H4), east of Rowston Plantation.</p>	
1952	1955	Data Gap	
	1956	<p>The unidentified structures are labelled as a sewage works. These sewage works are not included within the site redline boundary and will subsequently be referred to as an offsite feature going forward.</p>	
1957	1978	Data Gap	
1979	1980	<p>No significant change</p>	
1981	1984	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
1985		No significant change	
1986	1993	Data Gap	
1994		No significant change	
1995	1999	Data Gap	
2000		No significant change	
2001	2021	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
2022		No significant change	

Date from	Date to	Historical Land Use (off-site)	Distance (m) and orientation
1887	1888	A small quarry pit is located just outside the zone boundary in the southeast in zone H8, and Stone Pit Plantation is located in zone H4 which has a stone pit in the south. There is another quarry located 600 m north of the zone, which will later become part of Longwood Quarries.	
1889	1904	Data Gap	
1905	1906	No Change	
1907	1946	Data Gap	
1947	1951	The quarry in zone H8 has been significantly enlarged.	
1956		Airfield shown outside zone boundary (may have been there during previous map edition but not displayed due to the war effort). There is a sewage works located in zone H4 immediately adjacent to the site.	
1957	1978	Data Gap	
1979	1980	Map shows large scale development associated with the RAF base. (H7) Airfield shown as disused. (H8) map shows quarry has expanded significantly.	
1981	1984	Data Gap	
1985		There has been a large amount of development to the west of the site in zone H3, which is now RAF Digby. The Airfield is labelled as disused, and the quarry in H8 is now marked as disused.	
1986	1999	Data Gap	
2000		There are a series of masts shown within the disused airfield.	
2001	2021	Data Gap	
2022		No Change	
Relevant information sources: Historical OS maps <input checked="" type="checkbox"/> Town plans <input type="checkbox"/> Information from the Local Planning Authority <input type="checkbox"/> Aerial photography <input type="checkbox"/> Previous reports <input type="checkbox"/>			
Note: Reference to published historical maps provides invaluable information regarding the land use history of the site, but historical evidence may be incomplete for the period pre-dating the first edition and between successive maps.			

There has been a minimal level of development on and around Zone H, and therefore it has not been subject to significant contaminative land use in this respect.

It is not clear whether the land functioned as arable farmland, however if this is the case then there may be some level of contamination associated with agricultural industry and the use of pesticides, herbicides and fertilisers.

The most significant source of contamination identified from the historic maps would be associated with the RAF airfield, which appeared to extend up to the western boundary of zone H8.

The sewage works, which is present as an 'off-site enclave' within zone H4, would also represent another potential source of contamination.

11.2 Information from environmental database report

Relevant environmental permits and incidents detailed within the environmental database report (see [Appendix D8](#)) are summarised below in **Table 47**.

Table 47 Summary of environmental permits, landfills and incidents – Zone H

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Agency and hydrological				
Environmental permits – incorporating Integrated Pollution Prevention and Control, Integrated Pollution Controls, Local Authority Integrated Pollution Prevention and Control	0	0	0	N/A
Enforcement and prohibition notices	0	0	0	N/A
Pollution incidents to controlled waters, Prosecutions relating to controlled waters, Substantiated pollution incident register, Water Industry Act referrals	0	1	0	212 m SW: Lincoln District, Unknown Pollutant, Underground Strata, 30/10/1992, Ref. 1496, Potential Groundwater, Unknown Cause, Cat 2 Significant Incident.

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Discharge consents	1	1	0	On Site: Severn Trent Services Defence Limited, RAF Digby Sewage Treatment Works, Ref. Cdnnf09631, 23/12/1996, Sewage Discharges (Final/Treated Effluent), Freshwater Stream/River, Scopwick Beck. 154 m SE: Autism Care, Hospital, Pm1f12144, 14/12/2011, Sewage Discharges (Final/Treated Effluent) Land/Soakaway.
Registered radioactive substances	0	0	0	N/A
Landfill and waste				
Active landfills	0	0	0	N/A
Historic / closed landfills	0	0	0	N/A
Other waste management licences	0	0	0	N/A
Potentially in-filled land (pit, quarry, pond, marsh, river, stream, dock etc)	0	0	0	N/A
Hazardous substances/ industrial land uses				
Control of Major Accident Hazards (COMAH) sites	0	0	0	N/A

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Explosives sites, Notification of Installations Handling Hazardous Substances (NIHHS), Planning hazardous substance consents/ enforcements	0	0	0	N/A
Contaminated land Part 2A register entries and notices	0	0	0	N/A
Contemporary trade directory entries	0	0	0 of relevance	N/A
Fuel station entries	0	1	0	61 m SE: Digby Aerodrome Post Office and Filling Station, Obsolete.
<i>Note: Entries have only been included within the table where they are located within a 250 m radius of the site or, where they fall outside of this radius but are considered to comprise a significant entry.</i>				

No potential sources of contamination have been identified from the environmental database report for Zone H except for potential tanks associated with the adjacent RAF base to the west.

11.3 Information from regulatory authorities

11.3.1 Site services

Buried utility services and their backfill can provide preferential pathways for gas, vapour or groundwater to migrate along to another part of the site or to a receptor. They can also represent significant constraints to development.

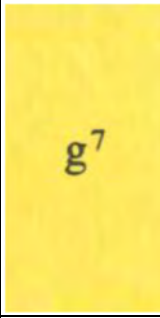
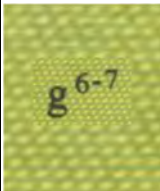

Obtaining a full set of service plans was outside the scope of this report. Services identified on-site during the walkover are detailed in section 17.

11.4 Site geology

11.4.1 Anticipated geological sequence

Published records (British Geological Survey, 2022) for the area and available historical borehole logs indicate the geology of the site to be characterised by the succession recorded in **Table 48**.

Table 48 Site geology – Zone H


Strata	Description	Estimated thickness	Permeability	Map Legend
No Superficial Deposits				
Blisworth Limestone Member	Pale grey to off-white or yellowish limestones with thin marls and mudstones, fossiliferous, bioturbated peloidal, ooidal and shell-fragmental more-or-less argillaceous packstones and wackestones, subordinate cross-bedded ooidal shell-fragmented grainstones.	Typically 6 – 7 m	Permeable	
Rutland Formation	Grey marine mudstone passing up into non-marine mudstone and siltstone, with a greenish-grey rootlet bed at the top. Occasional limestone beds (ls)	Typically 8 – 12 m	Permeable	
Upper Lincolnshire Limestone Member	Limestone, mainly coarse grained ooidal grainstones (ol), with subsidiary limestones of other types (gl) including fine to medium grained grainstone, recrystallized limestone and possible reef knolls	Up to 15 m	Permeable	
Lower Lincolnshire Limestone Member	Limestones, dominated by low-energy calcilutite and peloidal wackestone (wl) and packstone. With subsidiary carbonate mudstone (ml).	Up to 20 m	Permeable	
Relevant information sources: BGS Geindex <input checked="" type="checkbox"/> BGS borehole logs <input type="checkbox"/> Previous SI reports <input type="checkbox"/>				

With reference to the historical data the majority of the site has never been developed, and therefore widespread Made Ground would not be anticipated. There may be some Made Ground in the vicinity of both the RAF airfield adjacent to zone H8 and the off-site Sewage Works within Zone H4.

The site would be expected to be directly underlain by a limited thickness of topsoil.

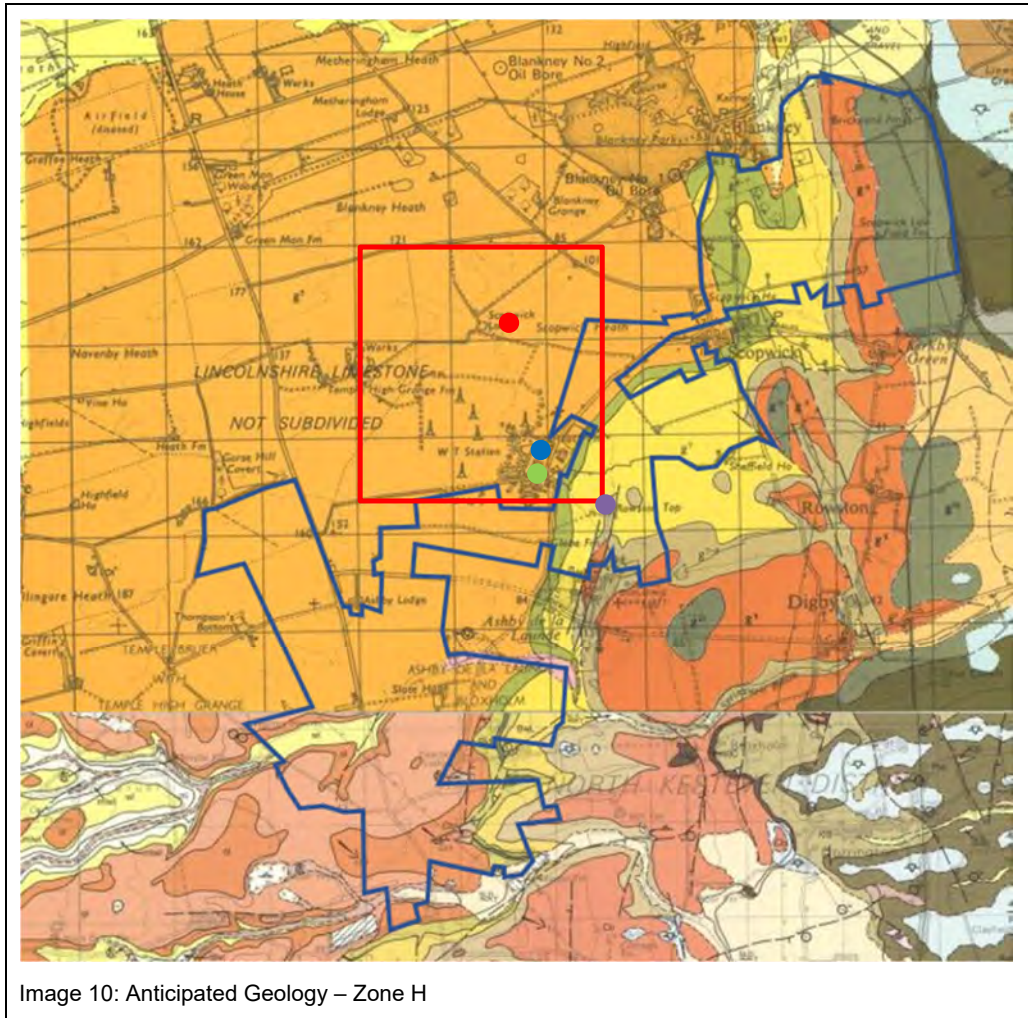
A summary of historical BGS borehole records within and near the zone are provided in **Table 49** below.

Table 49 Summary of BGS borehole records – Zone H

Borehole ref	Depth (m)	Map Legend
TF05 NW44	17.00	

Borehole ref	Depth (m)	Map Legend
TF05 NW7/A	37.03	●
TF05 NW13	16.46	●
TF05 NE4	34.00	●

A copy of these borehole logs is presented in [Appendix E](#).



11.4.2 Radon

The environmental database report indicates that the zone is located within an area where more than 1% of homes are above the Action Level (termed an 'Affected Area') and indicates that radon protection measures are required. The report indicates that 10-30% of homes are at or above the Action Level of 200 Bq m⁻³. Although the radon data used in production of the ukradon.org indicative atlas comes from measurements in homes, the maps indicate the likely extent of the local radon hazard in all buildings.

The environmental database report stated that less affected radon areas were present within the boundary of the zone, however the 10-30% classification has been chosen to represent the most conservative assessment.

In Affected Areas radon concentrations are generally low in well-ventilated workplaces such as workshops, but problems have been found in some more confined workplaces, such as offices, where rates of ventilation are relatively slow. HSE guidance suggests that where a premise is in an Affected Area, the employer should take a precautionary approach and undertake measurements in all premises located within an Affected Area. Based on the information in the database report, it would be prudent to arrange monitoring of any poorly ventilated areas to determine if there is a current risk to site staff. If the zone is considered for future residential development, further assessment will be required, in line with the guidance provided in BRE publication 211 “Radon: Guidance on Protective Measures for New Dwellings (2015)”.

11.5 Mining and quarrying

Evidence has been sought to identify any mining, quarrying, landfilling and land reclamation operations, past and present, which have taken place within 500 m of the zone.

11.5.1 Areas of other (rock or mineral) mining

The zone lies in an area with a known history of quarrying of limestone from the Lincolnshire Limestone Member and the Blisworth Limestone Formation. There is no history of quarrying within the zone itself, but there was a quarry located adjacent to the southwest of the zone (in zone H8), a Stone Pit adjacent to the southwest (in zone H4), and another quarry approximately 600 m northwest. The quarry 600 m northwest later forms part of the Longwood Quarry.

11.6 Hydrogeology

A summary of the hydrogeological setting of the site, with respect to the anticipated geological sequence, is presented below in **Table 50**.

Table 50 Summary of hydrogeological setting – Zone H

Condition	Description
Aquifer characteristics	Zone H is underlain by a Secondary B aquifer relating to the Rutland Formation and a Principal aquifer relating to the Lincolnshire Limestone Member and the Blisworth Limestone Formation. The potential presence of low permeability clay at relatively shallow depths beneath the site, while restricting downwards migration, may increase the potential for lateral migration of shallow groundwater (and therefore mobile contamination, if present).
Depth to groundwater and flow	The anticipated depth to groundwater is in the order of 13 m below ground level estimated from BGS Logs. Shallow groundwater in the site area is anticipated to flow in an easterly direction, i.e. in line with local topography and in the direction of the River Witham.

Condition	Description
Groundwater recharge/attenuation	Most of the zone is currently unsurfaced and will therefore drain directly to ground.
Licensed groundwater abstractions	The environmental database report indicates that there are two groundwater abstractions within a 1km radius of the zone, both of which are for private water supply (Crown Property/Government Department) purposes.
Source protection zones	Information available in the Envirocheck report indicates that the north of the zone lies within zone I (Inner Zone) of a source protection zone, relating to the private supply borehole located just north of Heath Road (B1181) northwest of the zone.

11.7 Hydrology

A summary of the hydrology within the zone area is summarised in **Table 51**.

Table 51 Summary of hydrology in site area – Zone H

Condition	Description
Surface watercourses/features	There is a drain located 20 m southeast of the zone, and there is another drain leading to/from the sewage works.
Surface water abstractions	The environmental database report indicates that there are no surface water abstractions within a 1 km radius of the zone.
Site drainage	Evidence from the Envirocheck report indicates that drainage ditches/streams are present within the zone and in the surrounding area.
Preliminary flood risk assessment	The indicative floodplain map for the area shows that the zone does not lie within any designated floodplains.

11.8 Sensitive land uses

Table 52 provides a summary of any environmentally sensitive areas identified within 250 m of the zone based on the environmental database report.

Table 52 Environmentally sensitive areas – Zone H

Feature	Present within 250 m of site?	Details	Likely pathways from site?
International designations – Ramsar wetland, Special Area of Conservation (SAC), Special Protection Area (SPA)	International designations – Ramsar wetland, Special Area of Conservation (SAC), Special Protection Area (SPA)	No	N/A
National designations – Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), ancient woodland	National designations – Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), ancient woodland	No	N/A
Local designations – Local Nature Reserve, Site of Importance for Nature Conservation (SINC)	Local designations – Local Nature Reserve, Site of Importance for Nature Conservation (SINC)	No	N/A
Nearest high sensitivity development, e.g. residential	Nearest high sensitivity development, e.g. residential	Yes	Residential homes located on RAD Digby.

12 DESK-BASED ASSESSMENT – ZONE I



12.1 Site history




12.1.1 Historical development record


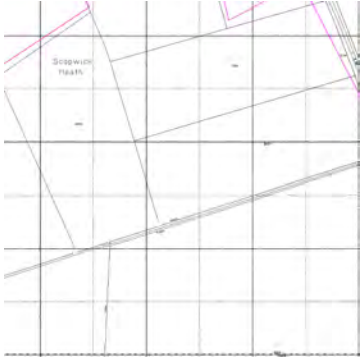

The development history of Zone I and the surrounding area based upon assessment of historical plans and records is detailed in **Table 53**. The historical maps reviewed are shown within the environmental database report in [Appendix D9](#).




Table 53 Summary of historical development – Zone I

Date from	Date to	Historical Land Use (on-site)	Area of site
1887	1888	Zone I is predominantly fields. In the northwest of the zone (I10), there are two quarries. One of the quarries falls within the zone completely, while the other is only partially within the zone and is an old quarry. A road named Trundle Lane is located in zone I15 in the northeast, running in an east-to-west direction, a road called Acre Lane is located in zone I16 in the northeast, running in a north-to-south direction, and another road (later the B1188) is running in a north-to-south direction running through the centre of zones I14, I10 and I7. There are also multiple small ponds, three are located in the northeast area of the zone (I16), and two are located in the southwest area of the zone (I1 and I5).	
1889	1904	Data Gap	
1905	1906	There are two structures located in I14 and I15 in the north-eastern portion of the zone, and they are labelled as pumps. There is another pump located 50 m away from these structures to the east (I15). The quarry in I10 is now disused.	
1907	1946	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
1947	1951	No Change	
1952	1955	Data Gap	
	1956	There is a structure located centrally within the southwestern portion of the site in zone I5, which is labelled as a windpump.	
1957	1978	Data Gap	
	1979	There are drains located across the zone. Pylons have been constructed across the north-eastern portion of the zone (I14 and I15), running in a southeast-to-northwest direction.	
1980	1984	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
1985		<p>The windpump in zone I5 has been expanded. The old quarry in zone I10 which partially encroached onto the site now has a structure built upon it, and there is a cemetery adjacent to the east which also encroaches slightly onto the zone (I10).</p>	
1986	1993	Data Gap	
1994		No Change	
1995	1999	Data Gap	
2000		No Change	
2001	2021	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
2022		No Change	

Date from	Date to	Historical Land Use (off-site)	Distance (m) and orientation
1887	1888	The village of Scopwick is located immediately south and east of the zone (I10 and I11), where a pump is located 150 m south of the Old Quarry, and there is a school and a chapel in the east of the village. There is also an unnamed watercourse, believed to be Scopwick Beck, running through the centre of town and flowing to the east. Scopwick Corn Mill is located in zone I5 in the west of the zone, and there are some residential properties called Mill Cottages approximately 250 m northeast of the Mill itself. Sheffield House is located immediately across a southern boundary in the south of the zone (I2), and there is an Old Fish Pond which has some surrounding cuttings/embankments, located in the south-eastern corner of the zone. There are multiple roads around the zone, some of which cross onto the zone at various locations. One road (the B1188) is running in a north-to-south direction through the centre of the zone, one is running east-to-west (B1191) through the centre of the zone, and another is Bloxholm Lane running east-to-west approximately 300 m northwest of the zone. An estate called The Firs is located immediately west of the zone (I14), and there is a stone pit located approximately 100 m northwest of this which is also visible within zone I14. There is also a disused Corn Mill located 500 m south of the zone (I12) along Scopwick Beck. Cobblers Lane runs from the boundary in the southwestern portion of the zone in an east-to-west direction. There are six small ponds located south and east of the zone, one of which is located in the village.	
1889	1904		Data Gap
1905	1906		No Change
1907	1946		Data Gap
1947	1951	There has been some development in the west and east of the village, zones I10 and I11. No other significant change.	
1952	1955		Data Gap
1956		There is a wind pump located along Scopwick Beck southeast of the village. Pylons have been constructed that run in a southeast-to-northwest direction, intersecting the zone in I14 and I15.	
1957	1978		Data Gap
1979	1980	No Change	

Date from	Date to	Historical Land Use (off-site)	Distance (m) and orientation
1981	1984	Data Gap	
1985		Drains are now labelled across the east of the zone, and there has been some more minor development within the village. There is now a caravan park east of the village in zone I12.	
1986	1993	Data Gap	
1994		The Firs has been renamed Scopwick House, and there are associated buildings called Scopwick House Cottage and The Paddock. No other significant change.	
1995	1999	Data Gap	
2000		There is a Stone Quarry located approximately 500 m northwest of the zone, which forms part of Longwood Quarry.	
2001	2021	Data Gap	
2022		No Change	
Relevant information sources: Historical OS maps <input checked="" type="checkbox"/> Town plans <input type="checkbox"/> Information from the Local Planning Authority <input type="checkbox"/> Aerial photography <input type="checkbox"/> Previous reports <input type="checkbox"/>			
<i>Note: Reference to published historical maps provides invaluable information regarding the land use history of the site, but historical evidence may be incomplete for the period pre-dating the first edition and between successive maps.</i>			

There has not been a significant amount of development on site, and any potential contamination is most likely to be associated with either its agricultural land use or the pumping station located in zone I5.

The stone quarries identified in zone I10 are presumed to have been infilled with inert and/or natural material, however there lies the potential for more onerous material to have been used.

It is not clear whether the land functioned as arable farmland, however if this is the case then there may be some level of contamination associated with agricultural industry and the use of pesticides, herbicides and fertilisers.

12.2 Information from environmental database report

Relevant environmental permits and incidents detailed within the environmental database report (see [Appendix D9](#)) are summarised below in **Table 54**.

Table 54 Summary of environmental permits, landfills and incidents – Zone I

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Agency and hydrological				

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Environmental permits – incorporating Integrated Pollution Prevention and Control, Integrated Pollution Controls, Local Authority Integrated Pollution Prevention and Control	0	0	0	N/A
Enforcement and prohibition notices	0	0	0	N/A
Pollution incidents to controlled waters, Prosecutions relating to controlled waters, Substantiated pollution incident register, Water Industry Act referrals	0	2	0	194 m N: Road, Oils (petrol), 22/01/1998, Ref. 2916, Freshwater Stream/River, Leaking Bales/Bags, Cat 3 Minor Incident 204 m NE: Other General Premises, Miscellaneous, 03/03/1994, Ref. 1825, Freshwater Stream/River, Other Cause, Cat 3 Minor Incident

Discharge consents	2	1	1	<p>On Site W: Paul E Scholey, Waste Water Treatment Works, Walnut Cottage, Ref. Pr3lfu504, 11/03/1971 to 09/06/1997, Unknown Type, Onto Land.</p> <p>On Site SW: North Kesteven District Council, Domestic Property (Multiple), LN4 3PA, Ref. Pr3lfu32, 10/02/1966 to 01/10/1996, Unknown Type, Onto Land.</p> <p>240 m NE: Anglian Water Services Limited, Pumping Station on Sewerage Network, Ref. Aw3nff984, 09/03/1973, Sewage Discharges, Freshwater Stream/River, Unknown Tributary.</p> <p>268 m NE: North Kesteven District Council, WWTW, Ref. Pr3nfa0872, 29/051963 to 30/03/1992, Sewage Discharges, Freshwater Stream/River, Unknown Tributary.</p>
Registered radioactive substances	0	0	0	N/A

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Landfill and waste				
Active landfills	0	0	1	393 m NW: Longwood Quarry, Licence Number 70908, Landfills Taking Non-Biodegradable Wastes (not construction), Issued 27/02/1987, Licence Status CLOSURE.
Historic / closed landfills	0	0	0	N/A
Other waste management licences	0	0	1	321 m NW: Longwood Quarry, Licence Number 400444, Treatment of Waste to Produce Soil <75,000 TPY, Issued 14/08/2013.
Potentially in-filled land (pit, quarry, pond, marsh, river, stream, dock etc)	0	0	0	N/A
Hazardous substances/ industrial land uses				
Control of Major Accident Hazards (COMAH) sites	0	0	0	N/A
Explosives sites, Notification of Installations Handling Hazardous Substances (NIHHS), Planning hazardous substance consents/ enforcements	0	0	0	N/A
Contaminated land Part 2A register entries and notices	0	0	0	N/A
Contemporary trade directory entries	0	1	0	93 m NW: L Brackenbury & Son Ltd, Garage Services, Active

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Fuel station entries	0	1	0	101 m NW: L Brackenbury & Sons Garage, Wcf, Petrol Station, Open.
<i>Note: Entries have only been included within the table where they are located within a 250 m radius of the site or, where they fall outside of this radius but are considered to comprise a significant entry.</i>				

The environmental database report has identified a licensed waste management facility within 400 m of the northwestern boundary of the zone (Longwood Quarry). The report suggests that part of the quarry is used as a waste treatment facility (maximum 75,000 tonnes per year) and another part as a registered landfill site, authorised to accept agricultural waste and “Lincs Category A – Solid Inert”.

12.3 Information from regulatory authorities

12.3.1 Site services

Buried utility services and their backfill can provide preferential pathways for gas, vapour or groundwater to migrate along to another part of the site or to a receptor. They can also represent significant constraints to development.

Obtaining a full set of service plans was outside the scope of this report. Services identified on-site during the walkover are detailed in section 17.


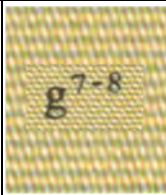
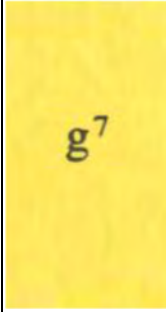
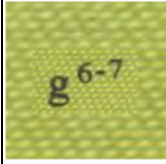

12.4 Site geology

12.4.1 Anticipated geological sequence

Published records (British Geological Survey, 2022) for the area and available historical borehole logs indicate the geology of the site to be characterised by the succession recorded in **Table 55**.

Table 55 Site geology – Zone I

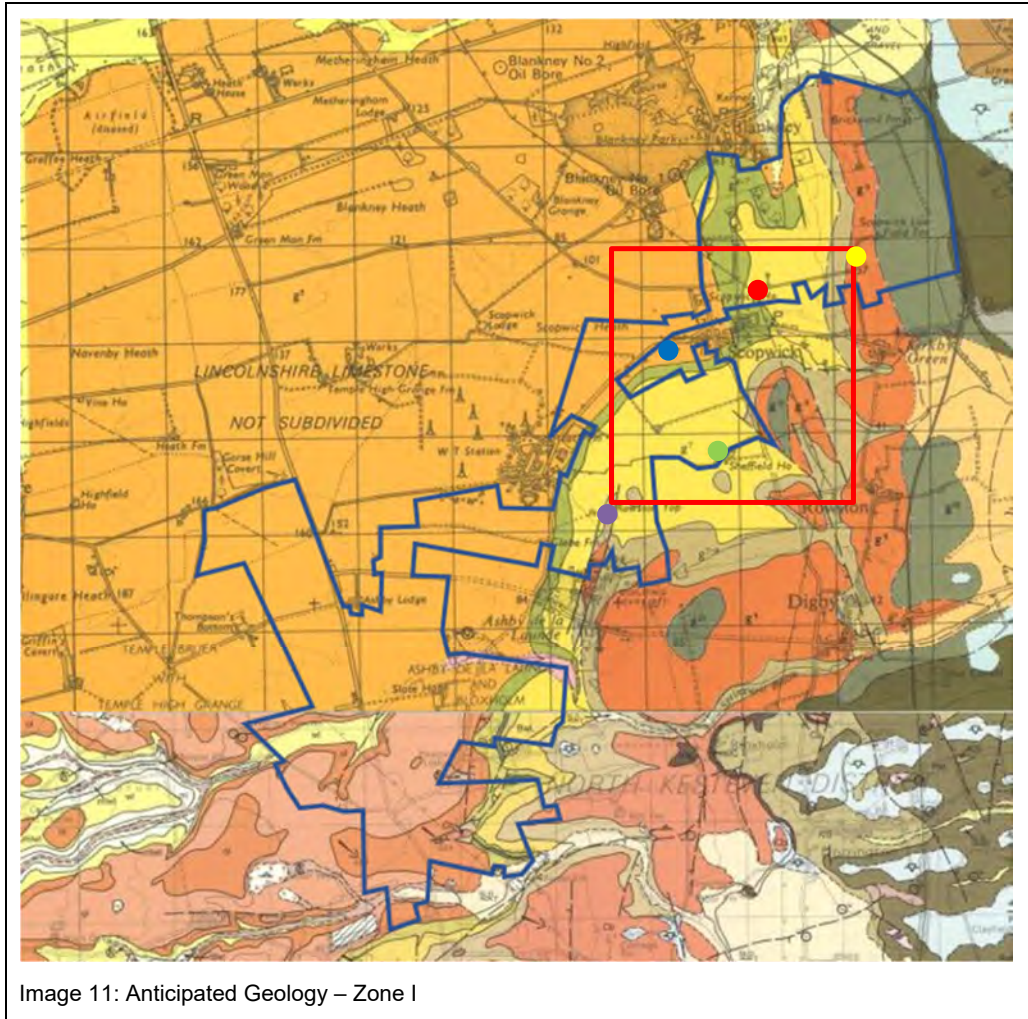
Strata	Description	Estimated thickness	Permeability	Map Legend
No Superficial Deposits				

Strata	Description	Estimated thickness	Permeability	Map Legend
Cornbrash Formation (east of the site only)	Limestone, medium to fine grained, predominantly bioclastic wackestone and packstone with sporadic peloids. Thin argillaceous partings or interbeds of argillaceous mudstone may occur.	Typically 2 – 4 m	Permeable	
Blisworth Clay Formation (southwest and northeast of the site only)	Silicate-mudstone, grey, commonly variegated purplish red, yellow and green, poorly bedded to blocky. Mudstone weathers to a highly plastic clay.	2 m – 4 m	Impermeable	
Blisworth Limestone Member	Pale grey to off-white or yellowish limestones with thin marls and mudstones, fossiliferous, bioturbated peloidal, ooidal and shell-fragmental more-or-less argillaceous packstones and wackestones, subordinate cross-bedded ooidal shell-fragmented grainstones.	Typically 6 – 7 m	Permeable	
Rutland Formation	Grey marine mudstone passing up into non-marine mudstone and siltstone, with a greenish-grey rootlet bed at the top.	Typically 8 – 12 m	Permeable	
Upper Lincolnshire Limestone Member	Limestone, mainly coarse grained ooidal grainstones, with subsidiary limestones of other types including fine to medium grained grainstone, recrystallized limestone and possible reef knolls	Up to 15 m	Permeable	
Lower Lincolnshire Limestone Member	Limestones, dominated by low-energy calcilutite and peloidal wackestone and packstone. With subsidiary carbonate mudstone.	Up to 20 m	Permeable	

Relevant information sources: BGS Geindex BGS borehole logs Previous SI reports






With reference to the historical data the majority of the site has never been developed, and therefore widespread Made Ground would not be anticipated. There may be some Made Ground in the vicinity of the Old Quarry located in I10 and the roads running through the site.

The site would be expected to be directly underlain by a limited thickness of topsoil.



A summary of historical BGS borehole records within and near the zone are provided in **Table 56** below.

Table 56 Summary of BGS borehole records – Zone I

Borehole ref	Depth (m)	Map Legend
TF05 NE5	31.00	
TF05 NE2	31.00	
TF05 NE15	60.00	
TF05 NE4	34.00	
TF05 NE22	59.00	

12.4.2 Radon

The environmental database report indicates that the zone is located within an area where more than 1% of homes are above the Action Level (termed an ‘Affected Area’) and indicates that radon protection measures are required. The report indicates that 3-5% of homes are at or above the Action Level of 200 Bq m⁻³. Although the radon data used in production of the ukradon.org indicative atlas comes from measurements in homes, the maps indicate the likely extent of the local radon hazard in all buildings.

In Affected Areas radon concentrations are generally low in well-ventilated workplaces such as workshops, but problems have been found in some more confined workplaces, such as offices, where rates of ventilation are relatively slow. HSE guidance suggests that where a premise is in an Affected Area, the employer should take a precautionary approach and undertake measurements in all premises located within an Affected Area. Based on the information in the database report, it would be prudent to arrange monitoring of any poorly ventilated areas to determine if there is a current risk to site staff. If the site is considered for future residential development, further assessment will be required, in line with the guidance provided in BRE publication 211 “Radon: Guidance on Protective Measures for New Dwellings (2015)”.

12.5 Mining and quarrying

Evidence has been sought to identify any mining, quarrying, landfilling and land reclamation operations, past and present, which have taken place within 500m of the zone.

12.5.1 Areas of other (rock or mineral) mining

Zone I lies in an area with a known history of quarrying of limestone from the Lincolnshire Limestone Member and the Blisworth Limestone Formation, and historically there was one quarry within zone I10.

12.6 Hydrogeology

A summary of the hydrogeological setting of the zone, with respect to the anticipated geological sequence, is presented below in **Table 57**.

Table 57 Summary of hydrogeological setting – Zone I

Condition	Description
Aquifer characteristics	<p>Zone I is underlain by a Secondary A Aquifer relating to the Cornbrash Formation, a Secondary B Aquifer relating to the Rutland Formation and unproductive strata relating to the Blisworth Clay Formation, as well as a Principal Aquifer relating to the Blisworth Limestone Formation and the Lincolnshire Limestone Member.</p> <p>The potential presence of low permeability clay at relatively shallow depths beneath the site, while restricting downwards migration, may increase the potential for lateral migration of shallow groundwater (and therefore mobile contamination, if present).</p>

Condition	Description
Depth to groundwater and flow	The anticipated depth to groundwater is in the order of 3 m below ground level estimated from BGS Logs. Shallow groundwater in the zone area is anticipated to flow in an easterly direction, i.e. in line with local topography and in the direction of the River Witham.
Groundwater recharge/attenuation	Most of the zone is currently unsurfaced and will therefore drain directly to ground.
Historical implications for hydrogeology	There are multiple small ponds on and around the zone.
Licensed groundwater abstractions	The environmental database report indicates that there are 7 groundwater abstractions within a 1 km radius of the zone, one of which is for private household use including drinking.
Source protection zones	Information available in the Envirocheck report indicates that some of the site lies within zone 1 of the groundwater source protection zone for the private supply borehole located just north of Heath Road (B1181) in the west of the zone.

12.7 Hydrology

A summary of the hydrology within the zone area is summarised in **Table 58**.

Table 58 Summary of hydrology in site area – Zone I

Condition	Description
Surface watercourses/features	There are five small ponds within the zone site and another six ponds located within 1 km of the zone to the south and the east. There are multiple drainage ditches located on and around the zone, and there is a stream running through the village of Scopwick which flows to the east.
Surface water abstractions	The environmental database report indicates that there are no surface water abstractions within a 1 km radius of the zone.
Site drainage	Evidence from the Envirocheck report indicated that drainage ditches/streams are present within the zone and in the surrounding area.
Preliminary flood risk assessment	The indicative floodplain map for the area shows that the majority of the site does not lie within any designated floodplains, with the exception of a small area in the central west of the site, which is in zone 2 (extreme flooding from Rivers without defence).

12.8 Sensitive land uses

Table 59 provides a summary of any environmentally sensitive areas identified within 250 m of the zone based on the environmental database report.

Table 59 Environmentally sensitive areas – Zone I

Feature	Present within 250 m of site?	Details	Likely pathways from site?
International designations – Ramsar wetland, Special Area of Conservation (SAC), Special Protection Area (SPA)	0	N/A	N/A
National designations – Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), ancient woodland	0	N/A	N/A
Local designations – Local Nature Reserve, Site of Importance for Nature Conservation (SINC)	0	N/A	N/A
Nearest high sensitivity development, e.g. residential	Yes	Residential properties close to the zone boundary in the village of Scopwick, Sheffield House, Mill Cottages, Scopwick House.	Lateral migration of potential contaminants.

13 DESK-BASED ASSESSMENT – ZONE J



13.1 Site history


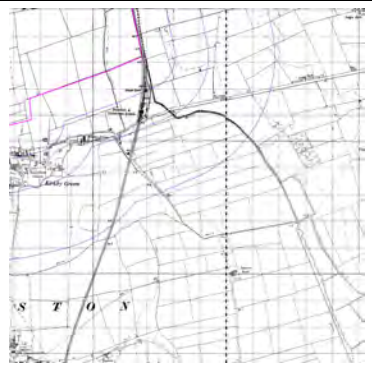
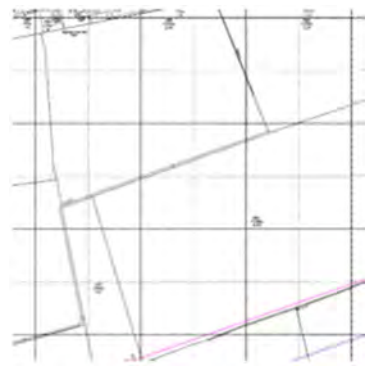
13.1.1 Historical development record

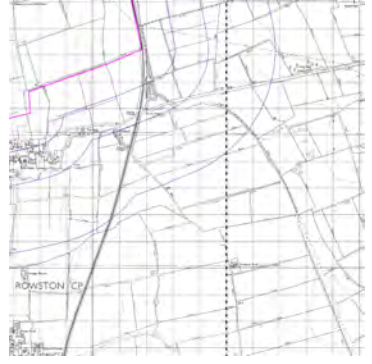
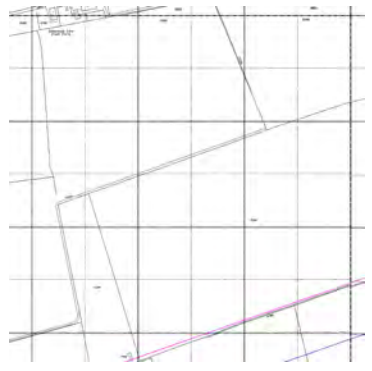

The development history of Zone J and the surrounding area based upon assessment of historical plans and records is detailed in **Table 60**. The historical maps reviewed are shown within the environmental database report in [Appendix D10](#).



Table 60 Summary of historical development – Zone J

Date from	Date to	Historical Land Use (on-site)	Area of site
1887	1888	Zone J is predominantly fields, although there is a farm building located in the northwest of the zone (J13). This building is not included within the site redline boundary and will be discussed as an off-site feature going forwards.	
1889	1904	Data Gap	
1905	1906	There is a small pond on the southern boundary of the zone (J13). No other significant change.	
1907	1946	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
1947		No Change	
1948	1955	Data Gap	
1956		No change	
1957	1978	Data Gap	
1979		No change	
1980	1984	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
1985		There are multiple drains located on the site.	
1986	1993	Data Gap	
1994		No Change	
1995	1999	Data Gap	
2000		There is a small forested area present in the central south of the site.	
2001	2021	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
2022		No Change	

Date from	Date to	Historical Land Use (off-site)	Distance (m) and orientation
1887	1888	The surrounding area is predominantly fields, although the village of Kirkby Green is located 250 m southwest of the zone (J9), and constitutes residential homes, a well, a pond and a church. There is a farm building located in the northwest of the zone (J13), which is not included within the site redline boundary. There is a watercourse called Scopwick Beck running through the village flowing in an easterly direction, and Kirkby Green Water Mill is located on the south bank of the stream. There is a small quarry located approximately 200 m south of the zone and just north of the village. The Great Northern & Great Eastern Joint Railway line is located immediately beyond the eastern boundary of the zone (J14), and it is running in a north-to-south direction. Running parallel to the railway in the north is a watercourse which splits off from the railway line to move to the south. There is a goods shed associated with the railway located 250 m southeast of the zone (J14), and Scopwick and Timberland Station is located 500 m southeast. There is a windmill located 700 m southeast of the zone. A forested area called Kirkby Gorse is located 750 m south of the zone, and there are various small ponds located east and south of the zone. There is a road (B1191) running in an east-to-west direction that runs through the village 300 m south of the zone.	
1889	1904	Data Gap	
1905	1906	There is a well located at the farm house in the northwest of the zone (J13). No other significant change.	
1907	1946	Data Gap	
1947		There has been some small development within the village. No other significant change.	
1948	1955	Data Gap	
1956		Kirkby Gorse is no longer present.	
1957	1978	Data Gap	
1979	1980	The farmhouse in the northwest of the zone (J13) has expanded and is labelled as Scopwick Low Field Farm. There has been some development around the Goods Shed, there are more buildings and there are some circular structures which could represent tanks (J14). There has also been development within the village, with more structures being present and Manor Farm being labelled.	

Date from	Date to	Historical Land Use (off-site)	Distance (m) and orientation
1981	1984	Data Gap	
1985		The new buildings around the previous Goods Shed in zone J14 are now labelled as Poultry Houses, and the train station no longer appears on the map. There is a sewage works located 1.1 km southwest of the zone, and there are many drains labelled around the zone to the south and the east.	
1986	1993	Data Gap	
1994		No Change	
1995	1999	Data Gap	
2000		There is a pumping house located approximately 450 m southwest of the zone. No other significant changes.	
2001	2021	Data Gap	
2022		No Change	
Relevant information sources: Historical OS maps <input checked="" type="checkbox"/> Town plans <input type="checkbox"/> Information from the Local Planning Authority <input type="checkbox"/> Aerial photography <input type="checkbox"/> Previous reports <input type="checkbox"/>			
<i>Note: Reference to published historical maps provides invaluable information regarding the land use history of the site, but historical evidence may be incomplete for the period pre-dating the first edition and between successive maps.</i>			

The most significant sources of potential contamination are associated with the agricultural land use of the site, the railway line running immediately adjacent to the site in the east, and the off-site goods shed which later becomes poultry houses.

It is not clear whether the land functioned as arable farmland, however if this is the case then there may be some level of contamination associated with agricultural industry and the use of pesticides, herbicides and fertilisers.

13.2 Information from environmental database report

Relevant environmental permits and incidents detailed within the environmental database report (see [Appendix D10](#)) are summarised below in **Table 61**.

Table 61 Summary of environmental permits, landfills and incidents – Zone J

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Agency and hydrological				

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Environmental permits – incorporating Integrated Pollution Prevention and Control, Integrated Pollution Controls, Local Authority Integrated Pollution Prevention and Control	0	0	1	252 m SE: Thames Valley Foods Ltd, Scopwick Free Range, Ref. PP3336FJ, 26/03/2012, Effective, Intensive Farming >40,000 Poultry.
Enforcement and prohibition notices	0	0	0	N/A
Pollution incidents to controlled waters, Prosecutions relating to controlled waters, Substantiated pollution incident register, Water Industry Act referrals	0	0	1	790 m S: Construction, Scopwick, Oils (Diesel), 05/05/1997, Ref. 2723, Freshwater Stream/River, Poor Operational Practice, Cat 3 Minor Incident.

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Discharge consents	0	0	3	<p>338 m SW: Mr F Pachler, Domestic Property (Single), Ref. Pr3lfu566, 08/06/1972 to 10/06/1997, Sewage Discharges (Final/Treated Effluent), Land/Soakaway.</p> <p>386 m E: Mrs Anna Watt, Domestic Property (Single), Ref. Eprcb3895wc, 11/08/2015, Sewage Discharges (Final/Treated Effluent) Freshwater Stream/River, Ditch Leading to Car Dyke.</p> <p>454 m SW: Anglian Water Services Ltd, Pumping Station on Sewerage Network, Ref. Aw3nff983, 09/03/1973, Sewage Discharges, Freshwater Stream/River, Unknown Tributary.</p>
Registered radioactive substances	0	0	0	N/A
Landfill and waste				
Active landfills	0	0	0	N/A

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Historic / closed landfills	0	0	0	N/A
Other waste management licences	0	0	0	N/A
Potentially in-filled land (pit, quarry, pond, marsh, river, stream, dock etc)	0	0	0	N/A
Hazardous substances/ industrial land uses				
Control of Major Accident Hazards (COMAH) sites	0	0	0	N/A
Explosives sites, Notification of Installations Handling Hazardous Substances (NIHHS), Planning hazardous substance consents/ enforcements	0	0	0	N/A
Contaminated land Part 2A register entries and notices	0	0	0	N/A
Contemporary trade directory entries	0	0	0	N/A
Fuel station entries	0	0	0	N/A
<i>Note: Entries have only been included within the table where they are located within a 250 m radius of the site or, where they fall outside of this radius but are considered to comprise a significant entry.</i>				

No potential sources of contamination have been identified from the environmental database report for Zone J.

13.2.1 Site services

Buried utility services and their backfill can provide preferential pathways for gas, vapour or groundwater to migrate along to another part of the site or to a receptor. They can also represent significant constraints to development.

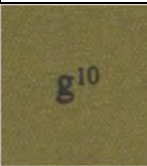


Obtaining a full set of service plans was outside the scope of this report. Services identified on-site during the walkover are detailed in section 17.

13.3 Site geology

13.3.1 Anticipated geological sequence

Published records (British Geological Survey, 2022) for the area and available historical borehole logs indicate the geology of the site to be characterised by the succession recorded in **Table 62**.

Table 62 Site geology – Zone J




Strata	Description	Estimated thickness	Permeability	Map Legend
No Superficial Deposits				
Oxford Clay Formation	Silicate-mudstone, grey, generally smooth to slightly silty, with sporadic beds of argillaceous limestone nodules.	50 – 70 m	Impermeable	
Kellaways Formation	Mudstone, grey, commonly silici-silty or silici-sandy, with beds of generally calcareous siltstone and sandstone.	5 – 8 m	Permeable	
Cornbrash Formation (west of the site only)	Limestone, medium to fine grained, predominantly bioclastic wackestone and packstone with sporadic peloids. Thin argillaceous partings or interbeds of argillaceous mudstone may occur.	Typically 2 – 4 m	Permeable	
Relevant information sources: BGS Geoindex <input checked="" type="checkbox"/> BGS borehole logs <input type="checkbox"/> Previous SI reports <input type="checkbox"/>				

With reference to the historical data the majority of the site has never been developed, and therefore widespread Made Ground would not be anticipated. There may be some Made Ground in the vicinity of the railway line in the east of the site (J14).

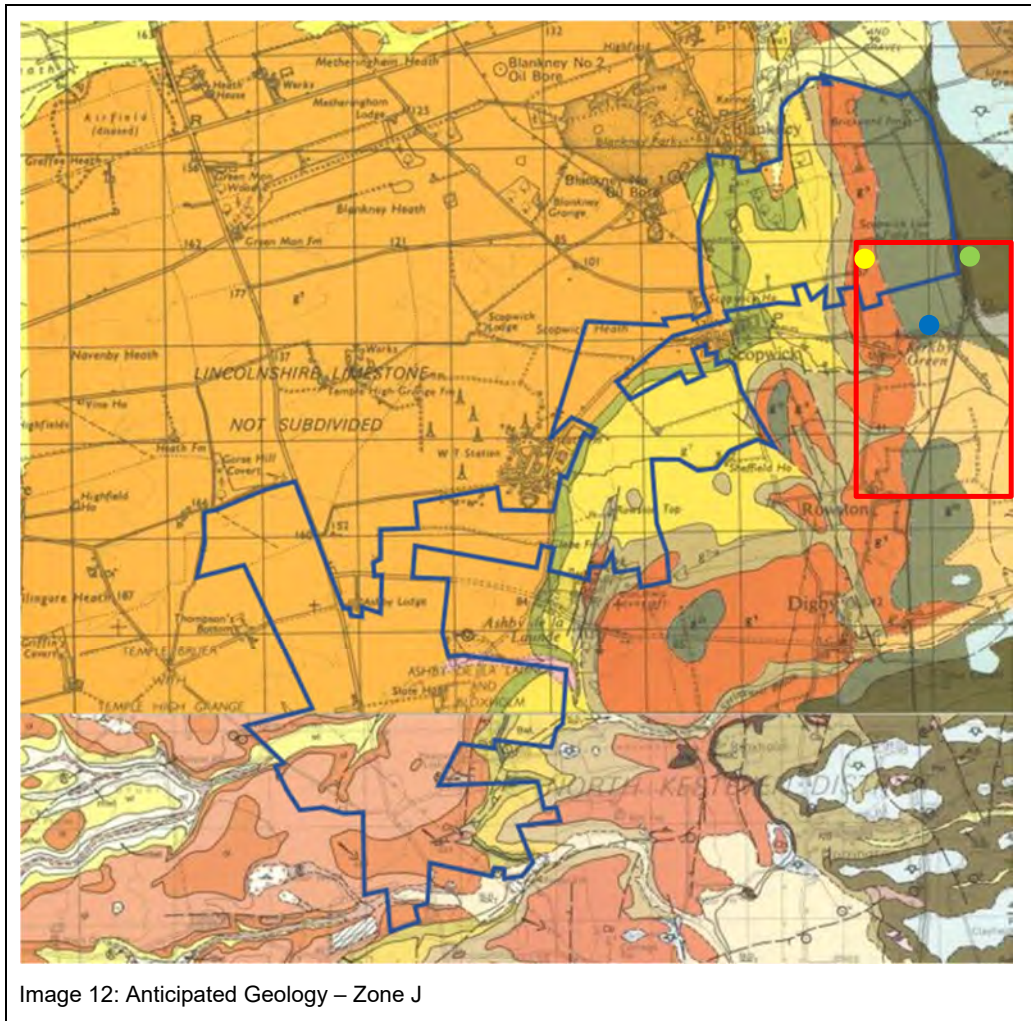
The site would be expected to be directly underlain by a limited thickness of topsoil.

A summary of historical BGS borehole records within and near the zone are provided in **Table 63** below.

Table 63 Summary of BGS borehole records – Zone J

Borehole ref	Depth (m)	Map Legend
TF05 NE17	18.00	
TF05 NE24	67.00	
TF05 NE22	59.00	

A copy of these borehole logs is presented in [Appendix E](#).



13.3.2 Radon

The environmental database report indicates that the zone is located within an area where more than 1% of homes are above the Action Level (termed an 'Affected Area') and indicates that radon protection measures are required. The report indicates that 1-3% of homes are at or above the Action Level of 200 Bq m⁻³. Although the radon data used in production of the ukradon.org indicative atlas comes from measurements in homes, the maps indicate the likely extent of the local radon hazard in all buildings.

In Affected Areas radon concentrations are generally low in well-ventilated workplaces such as workshops, but problems have been found in some more confined workplaces, such as offices, where rates of ventilation are relatively slow. HSE guidance suggests that where a premise is in an Affected Area, the employer should take a precautionary approach and undertake measurements in all premises located within an Affected Area. Based on the information in the database report, it would be prudent to arrange monitoring of any poorly ventilated areas to determine if there is a current risk to site staff. If the zone

is considered for future residential development, further assessment will be required, in line with the guidance provided in BRE publication 211 “Radon: Guidance on Protective Measures for New Dwellings (2015)”.

13.4 Mining and quarrying

Evidence has been sought to identify any mining, quarrying, landfilling and land reclamation operations, past and present, which have taken place within 500m of the zone.

13.4.1 Areas of other (rock or mineral) mining

Zone J lies in an area with a known history of quarrying of limestone from the Lincolnshire Limestone Member. While there is no evidence of pits or quarries on site, there was an old quarry located 200m south of the zone.

13.5 Hydrogeology

A summary of the hydrogeological setting of the zone, with respect to the anticipated geological sequence, is presented below in **Table 64**.

Table 64 Summary of hydrogeological setting – Zone J

Condition	Description
Aquifer characteristics	Zone J is underlain by a Secondary A Aquifer relating to the Kellaways Formation and the Cornbrash Formation, and unproductive strata relating to the Oxford Clay Formation. The potential presence of low permeability clay at relatively shallow depths beneath the site, while restricting downwards migration, may increase the potential for lateral migration of shallow groundwater (and therefore mobile contamination, if present).
Depth to groundwater and flow	The anticipated depth to groundwater is in the order of 3 m below ground level estimated from BGS Logs. Shallow groundwater in the zone area is anticipated to flow in an easterly direction, i.e. in line with local topography and in the direction of the River Witham.
Groundwater recharge/attenuation	Most of the zone is currently unsurfaced and will therefore drain directly to ground.
Licensed groundwater abstractions	The environmental database report indicates that there are 2 groundwater abstractions within a 1 km radius of the zone, none of which are licenced for public potable water supply.
Source protection zones	Information available in the Envirocheck report indicates that the zone does not lie within a designated source protection zone.

13.6 Hydrology

A summary of the hydrology within the site area is summarised in **Table 65**.

Table 65 Summary of hydrology in site area – Zone J

Condition	Description
Surface watercourses/features	There are multiple small ponds located within 1 km of the zone to the south and the east, as well as many drainage ditches located within and around the zone. There is a stream running through the village of Kirkby Green which flows to the east.
Surface water abstractions	The environmental database report indicates that there are no surface water abstractions within a 1 km radius of the zone.
Site drainage	Evidence from the Envirocheck report indicates that drainage ditches/streams are present within the zone and in the surrounding area.
Preliminary flood risk assessment	The indicative floodplain map for the area shows that the majority of the zone does not lie within any designated floodplains, with the exception of a small area in the east of the zone, which is in zones 2 and 3 (flooding/extreme flooding from Rivers without defences).

13.7 Sensitive land uses

Table 66 provides a summary of any environmentally sensitive areas identified within 250 m of the site based on the environmental database report.

Table 66 Environmentally sensitive areas – Zone J

Feature	Present within 250 m of site?	Details	Likely pathways from site?
International designations – Ramsar wetland, Special Area of Conservation (SAC), Special Protection Area (SPA)	0	N/A	N/A
National designations – Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), ancient woodland	0	N/A	N/A
Local designations – Local Nature Reserve, Site of Importance for Nature Conservation (SINC)	0	N/A	N/A
Nearest high sensitivity development, e.g. residential	Yes	Scopwick Low Field Farm and residential homes in Kirkby Green	Lateral migration of potential contaminants.

14 DESK-BASED ASSESSMENT – ZONE K

Zone K does not encompass any of the site itself, beginning 900 m to the north and west of the site and including the remaining 100 m of the 1 km search buffer. Due to this, only the historical development of the land has been deemed relevant to the site assessment.

14.1 Site history

14.1.1 Historical development record

The development history of Zone K and the surrounding area based upon assessment of historical plans and records is detailed in **Table 67**. The historical maps reviewed are shown within the environmental database report in [Appendix D11](#).



Table 67 Summary of historical development – Zone K

Date from	Date to	Historical Land Use (off-site)	Distance (m) and orientation
1887	1888	There is a road/track running in a southwest-to-northeast direction approximately 900 m north of the zone, as well as another road running in a southeast-to-northwest direction called Bloxholm Lane approximately 500 m north of the zone.	
1889	1904	Data Gap	
1905	1906	No Change	
1907	1946	Data Gap	
1947	1956	No Change	
1957	1972	Data Gap	
1973	1979	No Change	
1980	1984	Data Gap	
1985		No Change	
1986	1993	Data Gap	
1994		No Change	
1995	1999	Data Gap	
2000		No Change	
2001	2021	Data Gap	
2022		The road running southwest-to-northeast is named as Long Wood Lane.	
Relevant information sources: Historical OS maps <input checked="" type="checkbox"/> Town plans <input type="checkbox"/> Information from the Local Planning Authority <input type="checkbox"/> Aerial photography <input type="checkbox"/> Previous reports <input type="checkbox"/>			
<i>Note: Reference to published historical maps provides invaluable information regarding the land use history of the site, but historical evidence may be incomplete for the period pre-dating the first edition and between successive maps.</i>			

The most significant sources of potential contamination are associated with the agricultural land use of the site.

14.2 Information from environmental database report

Relevant environmental permits and incidents detailed within the environmental database report (see [Appendix D11](#)) are summarised below in **Table 68**.

Table 68 Summary of environmental permits, landfills and incidents – Zone K

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Agency and hydrological				
Environmental permits – incorporating Integrated Pollution Prevention and Control, Integrated Pollution Controls, Local Authority Integrated Pollution Prevention and Control	0	0	0	N/A
Enforcement and prohibition notices	0	0	0	N/A
Pollution incidents to controlled waters, Prosecutions relating to controlled waters, Substantiated pollution incident register, Water Industry Act referrals	0	0	0	N/A
Discharge consents	0	0	0	N/A
Registered radioactive substances	0	0	0	N/A
Landfill and waste				
Active landfills	0	0	0	N/A
Historic / closed landfills	0	0	0	N/A
Other waste management licences	0	0	0	N/A

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Potentially in-filled land (pit, quarry, pond, marsh, river, stream, dock etc)	0	0	0	N/A
Hazardous substances/ industrial land uses				
Control of Major Accident Hazards (COMAH) sites	0	0	0	N/A
Explosives sites, Notification of Installations Handling Hazardous Substances (NIHHS), Planning hazardous substance consents/ enforcements	0	0	0	N/A
Contaminated land Part 2A register entries and notices	0	0	0	N/A
Contemporary trade directory entries	0	0	0	N/A
Fuel station entries	0	0	0	N/A
<i>Note: Entries have only been included within the table where they are located within a 250 m radius of the site or, where they fall outside of this radius but are considered to comprise a significant entry.</i>				

No potential sources of contamination have been identified from the environmental database report for Zone K.

15 DESK-BASED ASSESSMENT – ZONE L

15.1 Site history

15.1.1 Historical development record

The development history of Zone L and the surrounding area based upon assessment of historical plans and records is detailed in **Table 69**. The historical maps reviewed are shown within the environmental database report in [Appendix D12](#).

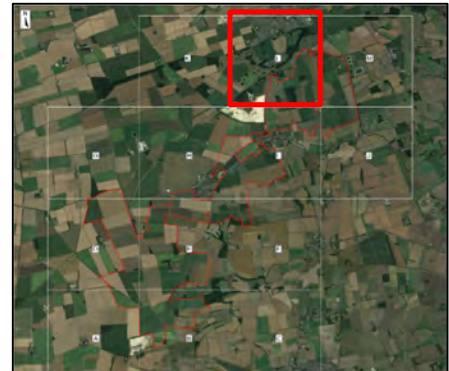











Table 69 Summary of historical development – Zone L

Date from	Date to	Historical Land Use (on-site)	Area of site
1887	1888	Zone L is predominantly fields, although Blankney Dairy is located in the west of the zone (L7), and brickyard plantation, which has a structure built in its centre, is located in the southwest of the zone (L2). There seem to be multiple small ponds located around the zone. There is a track/road running alongside the boundary of the zone in the northeast. There are some other wooded areas on the zone named Ash Holt and Catton's Holt, located in the southwest (L3) and the northeast (L12) of the zone respectively.	
1889	1904	Data Gap	
1905	1906	No Change	
1907	1946	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
1947		There is a small structure which has been built in the southeast of the zone (L8). No other significant change.	
1948	1955	Data Gap	
1956		No Change	
1957	1978	Data Gap	
1979		The Blankney Dairy in zone L7 is now called Hall Farm and has undergone some development.	
1980	1984	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
1985		There is no longer a built structure within Brickyard Planation in zone L8. Numerous drains are now labelled across the zone.	
1986	1993	Data Gap	
1994		No Change	
1995	1999	Data Gap	
2000		No Change	
2001	2021	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
2022		No Change	

Date from	Date to	Historical Land Use (off-site)	Distance (m) and orientation
1887	1888	The village of Blankney is located within 100 m northwest of the zone, and the village of Metheringham is located 500 m north. There is a road immediately west of the western boundary of the zone, running in a north-to-south direction. There is a Quarry, Old Quarry and Old Stone Pit located approximately 500 m southwest of the zone, one quarry is located on the western boundary in zone L11 in the north of the zone and 250 m northwest of the zone. The Great Northern & Great Eastern Joint Railway line is located 300 m north of the zone running in a southeast-to-northwest direction, and there are two pumps and a well located 150 m west of the zone and 400 m north of the zone, adjacent to the northbound road. There is a small fish pond located 50 m north of the zone (L7). Blankney Park is located 200 m west of the zone (L6), and there are various forested areas surrounding the zone. There is a watercourse located approximately 200 m north of the zone flowing in an easterly direction.	
1889	1904	Data Gap	
1905	1906	No Significant Change	
1907	1946	Data Gap	
1947	1950	The quarry located southwest of the zone has expanded, and this later becomes Longwood Quarries. There has been some small level of development in the villages of Blankney and Metheringham. A power line is running in a southeast to the northwest direction approximately 250 m southwest of the zone.	
1951	1955	Data Gap	
1956		No Significant Change	
1957	1972	Data Gap	
1973	1979	There has been some more development within Blankney village. The Old Quarry located on the western boundary in the north of the site is no longer present. There has been a significant amount of residential development in Metheringham.	
1980	1984	Data Gap	
1985		The quarry located southwest of the site has undergone some development and expansion. There is a golf course located 250 m west of the site.	

Date from	Date to	Historical Land Use (off-site)	Distance (m) and orientation
1986	1993	Data Gap	
1994		No Significant Change	
1995	1999	Data Gap	
2000		Many drains are labelled across the site and in the surrounding area.	
2001	2021	Data Gap	
2022		No Change	
Relevant information sources: Historical OS maps <input checked="" type="checkbox"/> Town plans <input type="checkbox"/> Information from the Local Planning Authority <input type="checkbox"/> Aerial photography <input type="checkbox"/> Previous reports <input type="checkbox"/>			
<i>Note: Reference to published historical maps provides invaluable information regarding the land use history of the site, but historical evidence may be incomplete for the period pre-dating the first edition and between successive maps.</i>			

The most significant sources of potential contamination are associated with the agricultural land use of the site. It should be noted that while Blankney Dairy is shown within the site boundary in the historical maps, in reality it is located outside the site redline boundary and would be considered an off-site feature.

It is not clear whether the land functioned as arable farmland, however if this is the case then there may be some level of contamination associated with agricultural industry and the use of pesticides, herbicides and fertilisers.

15.2 Information from environmental database report

Relevant environmental permits and incidents detailed within the environmental database report (see [Appendix D12](#)) are summarised below in **Table 70**.

Table 70 Summary of environmental permits, landfills and incidents – Zone L

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Agency and hydrological				
Environmental permits – incorporating Integrated Pollution Prevention and Control, Integrated Pollution Controls, Local Authority Integrated Pollution Prevention and Control	0	0	1	511 m SW: Longwood Quarries Ltd, IPPC/2004/9, PG3/8 quarry processes including roadstone plants and the size reduction of bricks, tiles and concrete, authorised.

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Pollution incidents to controlled waters, Prosecutions relating to controlled waters, Substantiated pollution incident register, Water Industry Act referrals	0	1	0 of relevance	99 m NE: Property Type Not Given, Oils (Diesel), Tributary of Carr Dyke, 24/08/1996, Ref. 2552, Unknown Cause, Cat 3 Minor Incident.
Discharge consents	0	0	1 of relevance	701 NE: Anglian Water Services Limited, WWTW, Ref. Aw3nff821, 22/12/2021, Sewage Discharges (Final/Treated Effluent), Freshwater Stream/River, Tributary of Carr Dyke.
Landfill and waste				
Active landfills	0	0	0	N/A
Historic / closed landfills	0	0	1	393 m SW: Longwood Quarry, Licence No. 70908, Landfills Taking Non-Biodegradable Wastes (Not Construction), Issued 27/02/1987, Closure.
Other waste management licences	0	0	0 of relevance	N/A
Potentially in-filled land (pit, quarry, pond, marsh, river, stream, dock etc)	0	0	0	N/A

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Hazardous substances/ industrial land uses				
Explosives sites, Notification of Installations Handling Hazardous Substances (NIHHS), Planning hazardous substance consents/ enforcements	0	0	0	N/A
Contaminated land Part 2A register entries and notices	0	0	0	N/A
Contemporary trade directory entries	0	0	2 of relevance	364 m W: A & J A Roberts, Fishing & Angling Equipment, Inactive. 519 m SW: Longwood Quarries, Quarries, Active.
Fuel station entries	0	0	1	Bypass Service Station, Texaco, Petrol Station, Open.
<i>Note: Entries have only been included within the table where they are located within a 250 m radius of the site or, where they fall outside of this radius but are considered to comprise a significant entry.</i>				

Similar to Zone I, the environmental database report has identified a licensed waste management facility within 400 m of the western boundary of the zone (Longwood Quarry). The report suggests that part of the quarry is used as a waste treatment facility (maximum 75,000 tonnes per year) and another part as a registered landfill site, authorised to accept agricultural waste and “Lincs Category A – Solid Inert”.



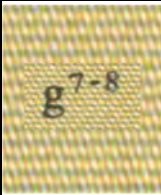
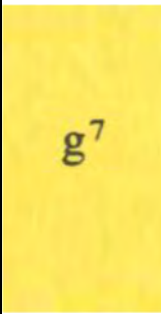
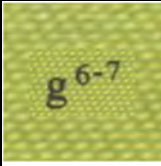

The pollution incident listed was categorised as a minor incident and is not considered to be a cause for concern.

15.3 Site geology

15.3.1 Anticipated geological sequence

Published records (British Geological Survey, 2022) for the area and available historical borehole logs indicate the geology of the site to be characterised by the succession recorded in **Table 71**.

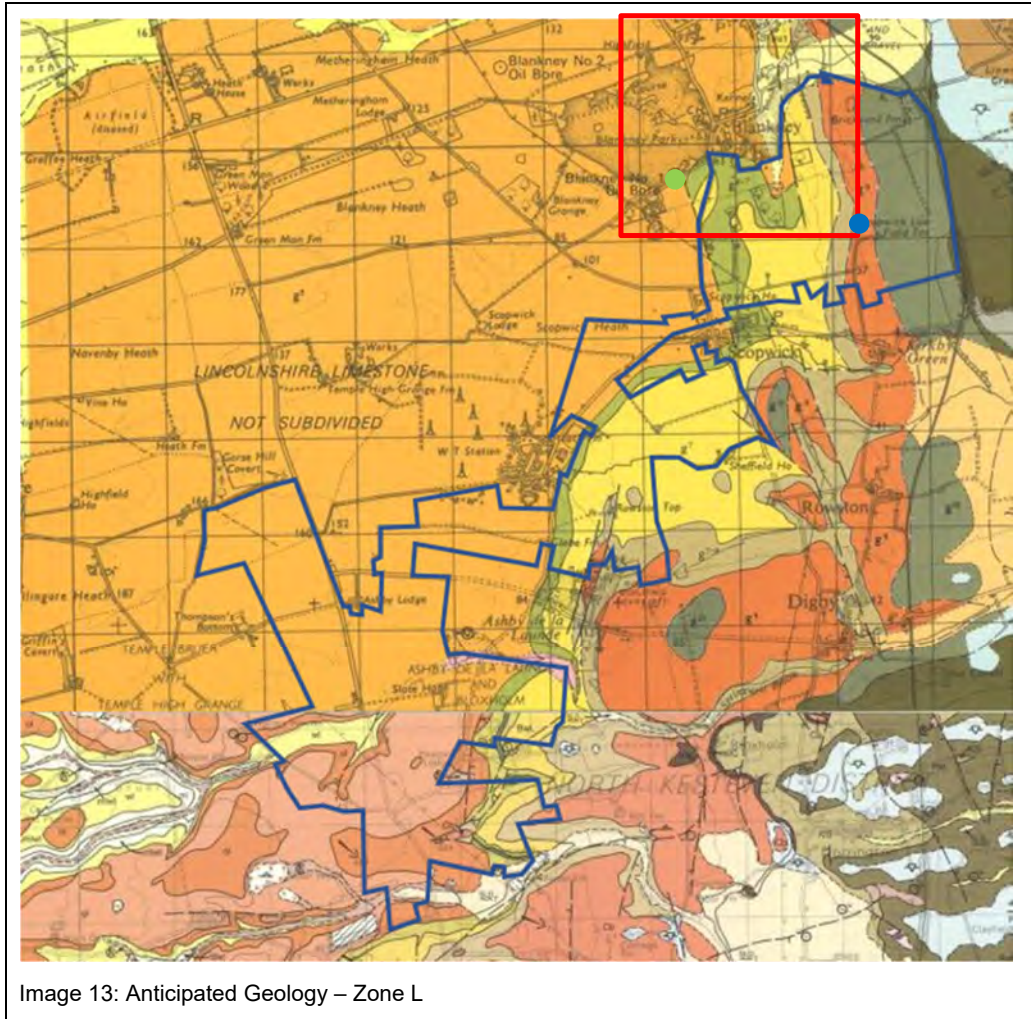
Table 71 Site geology – Zone L

Strata	Description	Estimated thickness	Permeability	Map Legend
Tidal Flat Deposits (north east of the site only)	Normally a consolidated soft silty clay with layers of peat, sand and a basal gravel. A stronger, desiccated surface zone is sometimes present.	Variable	Variable	
Cornbrash Formation (east of the site only)	Limestone, medium to fine grained, predominantly bioclastic wackestone and packstone with sporadic peloids. Thin argillaceous partings or interbeds of argillaceous mudstone may occur.	Typically 2 – 4 m	Permeable	
Blisworth Clay Formation (eastern part of the site only)	Silicate-mudstone, grey, commonly variegated purplish red, yellow and green, poorly bedded to blocky. Mudstone weathers to a highly plastic clay.	2 m – 4 m	Impermeable	
Blisworth Limestone Member	Pale grey to off-white or yellowish limestones with thin marls and mudstones, fossiliferous, bioturbated peloidal, ooidal and shell-fragmental more-or-less argillaceous packstones and wackestones, subordinate cross-bedded ooidal shell-fragmented grainstones.	Typically 6 – 7 m	Permeable	
Rutland Formation	Grey marine mudstone passing up into non-marine mudstone and siltstone, with a greenish-grey rootlet bed at the top.	Typically 8 – 12 m	Permeable	
Lincolnshire Limestone Formation	Limestone, typically calcilutites and peloidal wackestones and packstones in the lower part and high energy ooidal and shell fragmental grainstones in the upper part.	Typically 0 – 30 m	Permeable	

Relevant information sources: BGS Geindex BGS borehole logs Previous SI reports



With reference to the historical data the majority of the site has never been developed, and widespread Made Ground would not be anticipated, however there may be localised Made Ground at the structure located within Brickyard Plantation.

The site would be expected to be directly underlain by a limited thickness of topsoil.



A summary of historical BGS borehole records within and near the zone are provided in **Table 72** below.

Table 72 Summary of BGS borehole records – Zone L

Borehole ref	Depth (m)	Map Legend
TF05 NE1	940.00	
TF05 NE16	18.00	

A copy of these borehole logs is presented in [Appendix E](#).

15.3.2 Radon

The environmental database report indicates that the zone is located within an area where more than 1% of homes are above the Action Level (termed an ‘Affected Area’) and indicates that radon protection measures are required. The report indicates that 5-10% of

homes are at or above the Action Level of 200 Bq m⁻³. Although the radon data used in production of the ukradon.org indicative atlas comes from measurements in homes, the maps indicate the likely extent of the local radon hazard in all buildings.

In Affected Areas radon concentrations are generally low in well-ventilated workplaces such as workshops, but problems have been found in some more confined workplaces, such as offices, where rates of ventilation are relatively slow. HSE guidance suggests that where a premise is in an Affected Area, the employer should take a precautionary approach and undertake measurements in all premises located within an Affected Area. Based on the information in the database report, it would be prudent to arrange monitoring of any poorly ventilated areas to determine if there is a current risk to site staff. If the zone is considered for future residential development, further assessment will be required, in line with the guidance provided in BRE publication 211 “Radon: Guidance on Protective Measures for New Dwellings (2015)”.

15.4 Mining and quarrying

Evidence has been sought to identify any mining, quarrying, landfilling and land reclamation operations, past and present, which have taken place within 500m of the zone.

15.4.1 Areas of other (rock or mineral) mining

Zone L lies in an area with a known history of quarrying of limestone from the Lincolnshire Limestone Member. While there is no evidence of pits or quarries within the zone, there is a large quarry located immediately adjacent to the zone to the southwest (Longwood Quarries).

15.5 Hydrogeology

A summary of the hydrogeological setting of the zone, with respect to the anticipated geological sequence, is presented below in **Table 73**.

Table 73 Summary of hydrogeological setting – Zone L

Condition	Description
Aquifer characteristics	Zone L is underlain by a Secondary A Aquifer relating to the Cornbrash Formation, a Secondary B Aquifer relating to the Rutland Formation and unproductive strata relating to the Blisworth Clay Formation, as well a Principal Aquifer relating to the Blisworth Limestone Formation and the Lincolnshire Limestone Formation. The potential presence of low permeability clay at relatively shallow depths beneath the site, while restricting downwards migration, may increase the potential for lateral migration of shallow groundwater (and therefore mobile contamination, if present).
Depth to groundwater and flow	The anticipated depth to groundwater is in the order of 12 m below ground level estimated from BGS Logs. Shallow groundwater in the zone area is anticipated to flow in an easterly direction, i.e. in line with local topography and in the

Condition	Description
	direction of the River Witham. Localised shallow groundwater may be present within superficial granular deposits such as the Tidal Flat Deposits.
Groundwater recharge/attenuation	Most of the site is currently unsurfaced and will therefore drain to ground.
Licensed groundwater abstractions	The environmental database report indicates that there are 2 groundwater abstractions within a 1 km radius of the zone, none of which are licenced for public potable water supply.
Source protection zones	Information available in the Envirocheck report indicates that the zone does not lie within a designated source protection zone.

15.6 Hydrology

A summary of the hydrology within the zone area is summarised in **Table 74**.

Table 74 Summary of hydrology in site area – Zone L

Condition	Description
Surface watercourses/features	There are some small ponds located within and around the zone, as well as multiple drainage ditches within and around the zone. There is a stream running through the village of Blankney which flows to the east.
Surface water abstractions	The environmental database report indicates that there are 9 surface water abstractions within a 1 km radius of the zone.
Site drainage	Evidence from the Envirocheck report indicates that drainage ditches/streams are present within the zone and in the surrounding area.
Preliminary flood risk assessment	The indicative floodplain map for the area shows that the majority of the zone does not lie within any designated floodplains, with the exception of a small area in the east of the zone, which is in zones 2 and 3 (flooding/extreme flooding from Rivers without defences).

15.7 Sensitive land uses

Table 75 provides a summary of any environmentally sensitive areas identified within 250 m of the zone based on the environmental database report.

Table 75 Environmentally sensitive areas – Zone L

Feature	Present within 250 m of site?	Details	Likely pathways from site?
International designations – Ramsar wetland, Special Area of Conservation (SAC), Special Protection Area (SPA)	0	N/A	N/A
National designations – Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), ancient woodland	0	N/A	N/A
Local designations – Local Nature Reserve, Site of Importance for Nature Conservation (SINC)	0	N/A	N/A
Nearest high sensitivity development, e.g. residential	Yes	Residential: Blankney Hall	Lateral migration of potential contamination.

16 DESK-BASED ASSESSMENT – ZONE M



16.1 Site history




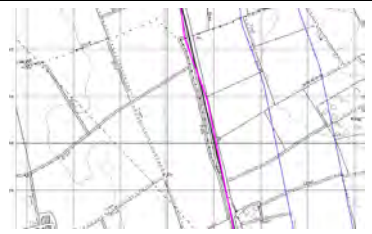
16.1.1 Historical development record

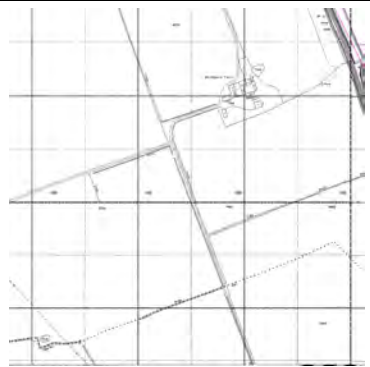

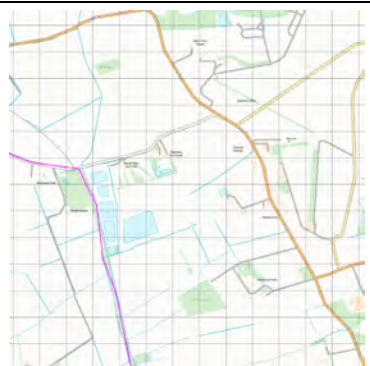
The development history of Zone M and the surrounding area based upon assessment of historical plans and records is detailed in **Table 76**. The historical maps reviewed are shown within the environmental database report in [Appendix D13](#).



Table 76 Summary of historical development – Zone M

Date from	Date to	Historical Land Use (on-site)	Area of site
1887	1888	Blankney Farm and Blankney Brickyard are located in the northeast of the zone (M5 and M9), and there are some small ponds in the brickyard. Blankney Gorse is located in the centre of the zone (M5), and there are other small ponds located around the zone in the west. Scopwick Lodge Farm is located in the southwest of the zone (M1). Blankey Farm, Blankney Brickyard and Scopwick Lodge are all technically outside the site redline boundary and therefore treated as off-site features going forward.	
1889	1904	Data Gap	
1905	1906	No Change	
1907	1946	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
1947	1950	No Change	
1951	1955	Data Gap	
1956		Blankney Gorse is no longer present on the site.	
1957	1978	Data Gap	
1979		No Change	
1980	1984	Data Gap	
1985		There are many drains labelled within the zone. No other significant change.	
1986	1993	Data Gap	

Date from	Date to	Historical Land Use (on-site)	Area of site
1994		No Change	
1995	1999	Data Gap	
2000		No Change	
2001	2021	Data Gap	
2022		No Change	

Date from	Date to	Historical Land Use (off-site)	Distance (m) and orientation
1887	1888	<p>The surrounding area is primarily fields, presumably used for agricultural purposes. The Great Northern and Great Eastern Joint Railway is located along the eastern boundary of the zone, and there is a road running in an east-to-west direction along the northern boundary of the zone. There are some small ponds located around the zone to the north and the east, and there is a Gravel Pit and an Old Gravel Pit located approximately 850 m north of the zone. A forested area called Pigeon Holt is located 500 m southeast, and Barf Holt is located 750 m north, just south of the</p>	

Date from	Date to	Historical Land Use (off-site)	Distance (m) and orientation
		Old Gravel Pit. Moor Lane is located 800 m north of the zone. There is a watercourse running alongside the railway line, which splits off in a north-easterly direction at the northern boundary of the zone. The water is flowing in a north-bound direction. Moor Farm is located approximately 1.1 km southeast of the zone.	
1889	1904	Data Gap	
1905	1906	No Significant Change	
1907	1946	Data Gap	
1947	1950	No Significant Change	
1951	1955	Data Gap	
1956		Moor Farm has been developed and has expanded to be within 1 km of the zone in the southeast. There is now an airfield located 1 km northeast of the zone, and some structures have been built 1 km east of the zone, possibly associated with the airfield. There is a small building located 500 m northwest of the zone.	
1957	1972	Data Gap	
1973	1979	No Significant Change	
1980	1984	Data Gap	
1985		There has been a large amount of development around the airfield, although this may not be associated with it directly. Pigeon Holt is now named as King's Covert, and Moor Farm is now named Westmoor Farm. There are many drains labelled across the zone.	
1986	1993	Data Gap	
1994		No Significant Change	
1995	1999	Data Gap	
2000		The airfield is marked as disused. There are five reservoirs located immediately adjacent to the north-eastern boundary of the site, and beyond these there is a golf course where there are some structures which are presumably buildings associated with the golf course.	
2001	2021	Data Gap	
2022		Blankney Koi Centre is located east of the golf course. No other significant change.	
Relevant information sources: Historical OS maps <input checked="" type="checkbox"/> Town plans <input type="checkbox"/> Information from the Local Planning Authority <input type="checkbox"/> Aerial photography <input type="checkbox"/> Previous reports <input type="checkbox"/>			
Note: Reference to published historical maps provides invaluable information regarding the land use history of the site, but historical evidence may be incomplete for the period pre-dating the first edition and between successive maps.			

The most significant sources of potential contamination are associated with the agricultural land use of the site. It should be noted that while Blankney Farm, Blankney Brickyard and Scopwick Lodge are all shown within the site boundary in the historical maps, in reality they are located outside the site redline boundary and would be considered off-site features.

It is not clear whether the land functioned as arable farmland, however if this is the case then there may be some level of contamination associated with agricultural industry and the use of pesticides, herbicides and fertilisers.

16.2 Information from environmental database report

Relevant environmental permits and incidents detailed within the environmental database report (see [Appendix D13](#)) are summarised below in **Table 77**.

Table 77 Summary of environmental permits, landfills and incidents – Zone M

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Agency and hydrological				
Environmental permits – incorporating Integrated Pollution Prevention and Control, Integrated Pollution Controls, Local Authority Integrated Pollution Prevention and Control	0	0	0	N/A
Enforcement and prohibition notices	0	0	0	N/A
Pollution incidents to controlled waters, Prosecutions relating to controlled waters, Substantiated pollution incident register, Water Industry Act referrals	0	0	0	N/A

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Discharge consents	1	0	2	<p>On site: British Railways Eastern Region, Ref. Pr3lfu437, 08/01/1970 to 01/10/1996, Unknown Type, Onto Land.</p> <p>338 m N: Martin Moor Golf Club Ltd, Ref. Prnnf18569, Issued 06/06/2006, Sewage and Trade Combined, Freshwater Stream/River, Tributary New Cut Drain.</p> <p>941 m SE: Edward P F Scoley, WWTW, Prnnf12126, 15/09/1197, Sewage Discharges (Final/Treated Effluent), Freshwater Stream/River, Unnamed Ditch Tributary Queen.</p>
Registered radioactive substances	0	0	0	N/A
Landfill and waste				
Active landfills	0	0	0	N/A
Historic / closed landfills	0	0	0	N/A

Data type	Entries on-site	Entries <250 m from site	Entries >250 m from site of relevance	Details
Other waste management licences	0	0	0	N/A
Potentially in-filled land (pit, quarry, pond, marsh, river, stream, dock etc)	0	0	0	N/A
Hazardous substances/ industrial land uses				
Control of Major Accident Hazards (COMAH) sites	0	0	0	N/A
Explosives sites, Notification of Installations Handling Hazardous Substances (NIHHS), Planning hazardous substance consents/ enforcements	0	0	0	N/A
Contaminated land Part 2A register entries and notices	0	0	0	N/A
Contemporary trade directory entries	0	0	0	N/A
Fuel station entries	0	0	0	N/A
<i>Note: Entries have only been included within the table where they are located within a 250 m radius of the site or, where they fall outside of this radius but are considered to comprise a significant entry.</i>				

16.3 Information from regulatory authorities

16.3.1 Site services

Buried utility services and their backfill can provide preferential pathways for gas, vapour or groundwater to migrate along to another part of the site or to a receptor. They can also represent significant constraints to development.

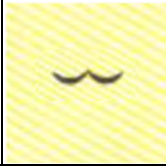


Obtaining a full set of service plans was outside the scope of this report. Services identified on-site during the walkover are detailed in section 17.

16.4 Site geology

16.4.1 Anticipated geological sequence

Published records (British Geological Survey, 2022) for the area and available historical borehole logs indicate the geology of the site to be characterised by the succession recorded in **Table 78**.




Table 78 Site geology – Zone M

Strata	Description	Estimated thickness	Permeability	Map Legend
Tidal Flat Deposits (north east of the site only)	Normally a consolidated soft silty clay with layers of peat, sand and a basal gravel. A stronger, desiccated surface zone is sometimes present.	Variable	Variable	
Kellaways Formation	Mudstone, grey, commonly silici-silty or silici-sandy, with (predominantly in the upper part) beds of generally calcareous siltstone and sandstone.	Typically 5 – 8m	Permeable	
Cornbrash Formation (east of the site only)	Limestone, medium to fine grained, predominantly bioclastic wackestone and packstone with sporadic peloids. Thin argillaceous partings or interbeds of argillaceous mudstone may occur.	Typically 2 – 4m	Permeable	
Relevant information sources: BGS Geindex <input checked="" type="checkbox"/> BGS borehole logs <input type="checkbox"/> Previous SI reports <input type="checkbox"/>				

With reference to the historical data the majority of the site has never been developed, and widespread Made Ground would not be anticipated.

The site would be expected to be directly underlain by a limited thickness of topsoil.

Table 79 Summary of BGS borehole records – Zone M

Borehole ref	Depth (m)	Map Legend
TF06 SE20	69.22	
TF05 NE17	18.00	
TF05 NE22	59.00	

A copy of these borehole logs is presented in [Appendix E](#).

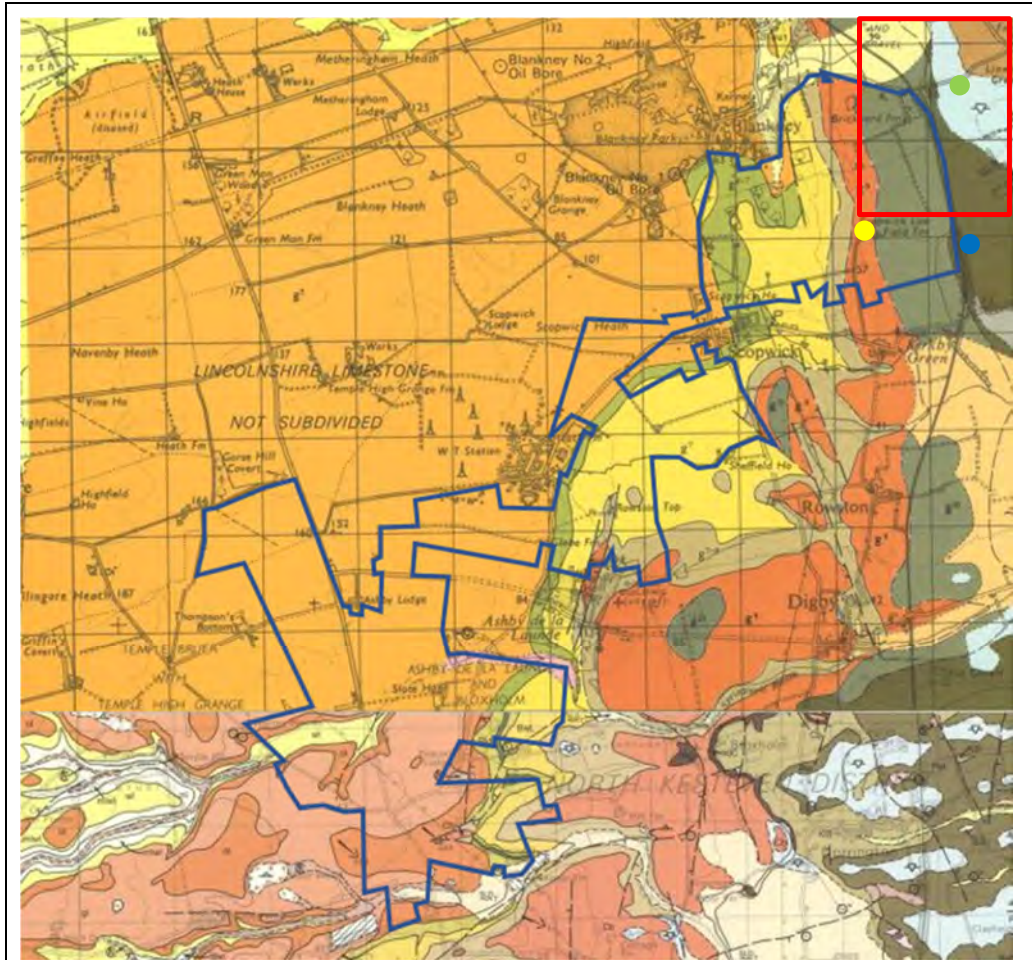


Image 14: Anticipated Geology – Zone M

16.4.2 Radon

The environmental database report indicates that the zone is located within an area where more than 1% of homes are above the Action Level (termed an ‘Affected Area’) and indicates that radon protection measures are required. The report indicates that 5-10% of homes are at or above the Action Level of 200 Bq m⁻³. Although the radon data used in production of the ukradon.org indicative atlas comes from measurements in homes, the maps indicate the likely extent of the local radon hazard in all buildings.

In Affected Areas radon concentrations are generally low in well-ventilated workplaces such as workshops, but problems have been found in some more confined workplaces, such as offices, where rates of ventilation are relatively slow. HSE guidance suggests that where a premise is in an Affected Area, the employer should take a precautionary approach and undertake measurements in all premises located within an Affected Area.

Based on the information in the database report, it would be prudent to arrange monitoring of any poorly ventilated areas to determine if there is a current risk to site staff. If the site is considered for future residential development, further assessment will be required, in line with the guidance provided in BRE publication 211 “Radon: Guidance on Protective Measures for New Dwellings (2015)”.

16.5 Mining and quarrying

Evidence has been sought to identify any mining, quarrying, landfilling and land reclamation operations, past and present, which have taken place within 500 m of the site.

16.5.1 Areas of other (rock or mineral) mining

Zone M lies in an area with a known history of quarrying of limestone from the Lincolnshire Limestone Member. While there is no evidence of pits or quarries within the zone, historically there were some gravel pits located approximately 850 m north of the zone.

16.6 Hydrogeology

A summary of the hydrogeological setting of the zone, with respect to the anticipated geological sequence, is presented below in **Table 80**.

Table 80 Summary of hydrogeological setting – Zone M

Condition	Description
Aquifer characteristics	Zone M is underlain by a Secondary A Aquifer relating to the Kellaways Formation and the Cornbrash Formation. The potential presence of low permeability clay at relatively shallow depths beneath the zone, while restricting downwards migration, may increase the potential for lateral migration of shallow groundwater (and therefore mobile contamination, if present).
Depth to groundwater and flow	The anticipated depth to groundwater is in the order of 16.6 m below ground level estimated from BGS Logs. Shallow groundwater in the zone area is anticipated to flow in an easterly direction, i.e. in line with local topography and in the direction of the River Witham. Localised shallow groundwater may be present within superficial granular deposits such as the Tidal Flat Deposits.
Groundwater recharge/attenuation	Most of the zone is currently unsurfaced and will therefore drain directly to ground.
Licensed groundwater abstractions	The environmental database report indicates that there are 2 groundwater abstractions within a 1 km radius of the zone, none of which are licenced for public potable water supply.
Source protection zones	Information available in the Envirocheck report indicates that the zone does not lie within a designated source protection zone.

16.7 Hydrology

A summary of the hydrology within the zone area is summarised in **Table 81**.

Table 81 Summary of hydrology in site area – Zone M

Condition	Description
Surface watercourses/features	There are some small ponds located within and around the zone, as well as multiple drainage ditches on and around the site. There is a stream running alongside the railway line on the eastern boundary of the site, flowing in a northerly direction.
Surface water abstractions	The environmental database report indicates that there are no surface water abstractions within a 1 km radius of the zone.
Site drainage	Evidence from the Envirocheck report indicates that drainage ditches/streams are present within the zone and in the surrounding area.
Preliminary flood risk assessment	The indicative floodplain map for the area shows that the northeast of the zone lies within flood zones 2 and 3 (flooding/extreme flooding from Rivers without defences).

16.8 Sensitive land uses

Table 82 provides a summary of any environmentally sensitive areas identified within 250 m of the site based on the environmental database report.

Table 82 Environmentally sensitive areas – Zone M

Feature	Present within 250 m of site?	Details	Likely pathways from site?
International designations – Ramsar wetland, Special Area of Conservation (SAC), Special Protection Area (SPA)	0	N/A	N/A
National designations – Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), ancient woodland	0	N/A	N/A
Local designations – Local Nature Reserve, Site of Importance for Nature Conservation (SINC)	0	N/A	N/A
Nearest high sensitivity development, e.g. residential	Yes		

17 SITE RECONNAISSANCE FINDINGS

A site reconnaissance survey was completed between the 20th and 21st October 2022 by RSK. The characteristics of the site observed during the walkover and from current ordnance Survey maps are summarised in **Table 83**.

A site plan showing the photograph locations is provided in [Figure 6](#) with photographic records included in [Appendix F](#) detailing the main features identified below.

Whilst the walkover summary includes consideration of current operations and housekeeping on the site as potential sources of contamination, it does not constitute a comprehensive environmental audit of the site, as covered under ISO 14001.

Table 83 Site reconnaissance findings

Feature	Description
Physical characteristics	
Access constraints	The site comprises many fields which do not all have easy access points. Many are accessible from main roads, while others are only accessible via adjoining fields.
Site topography	Due to the nature of the site, the ground was often uneven, however the majority of the site was essentially flat, with some exceptions. In general, across the entirety of the site the ground slopes downwards to the east, and in the west of the site (Zone D), the site was sloping downwards to the south.
Surface cover	The vast majority of the site was unsurfaced. There were some small areas of hardstanding found in various areas, including; zone A16 (central), zone E16 (northeast) and zone M5 (northeast) and zones J13 and M1. These hardstanding areas are all associated with agricultural activity around the site, and appear to be for stockpiling (A16, E16, M5) or there are buildings in the particular area (J13 and M1).
Site drainage	Many drainage ditches were noted across the site, some of which had outfall points. It is likely that the site is draining to lesser watercourses such as Scopwick Beck and Springwell Brook, with all watercourses ultimately discharging into the River Witham in the east. There were areas of waterlogging noted around the site, however the site walkover was conducted on two days of heavy rainfall.
Surface water	There were multiple drainage ditches on and adjacent to the site. No visual evidence of contamination was noted in any watercourses. The nearest major watercourse to the site is the River Witham to the east.
Trees and hedges	Most of the fields are divided by trees, hedges or shrubs, and there are multiple forested areas across the site, found in zones B10, B14, D4, E6, H4, L3, L8 and L12.
Invasive species	Based upon the walkover survey obvious evidence of Japanese Knotweed or other invasive species has not been identified on-site. However, it should be noted that a detailed survey of the possible presence or absence of invasive species is outside of the scope of

Feature	Description
	investigation and consideration should be given to commissioning a specialist survey, as necessary.
Existing buildings on-site	The site contains multiple buildings associated with its agricultural land use, including; Scopwick Low Field Farm (J13 and M1), two barns (both located in M5, one in the southwest and one in the northeast), and two residential homes (both located in M9, one in the central south and one in the southeast).
Retaining walls and adjacent buildings on or close to site boundary	No retaining walls observed. There are some buildings which are located within the outer site boundary site but are not within the overall site redline boundary. These include a sewage works facility located within H4, a residential home and equestrian facility within F13, the Slate House estate in E2 and E6 and a dilapidated barn located in I5.
Basements on-site	No evidence of existing or infilled basements was observed.
Made ground, earthworks and quarrying	None observed
Potentially unstable slopes on or close to site	None observed
Buried and overhead services present	Overhead services were noted in multiple locations across the site, including; L12, L8, M5, J14, M9, I9, I15, I16, M1, L6, E16, E15, B13, D4. There were several manhole covers noted on site within zones M5, M2, I16, I15, I9 and E9. Additionally, there was a gas pipeline marker observed in zone I6, and gas taps were noted in zone E, specifically running in an east-to-west direction across E15, E14, E13.
Environmental characteristics	
Underground/ above ground storage tanks and pipework	There was a storage tank noted within zone M5, although technically this does not fall within the site redline boundary. The absence of bunding, staining or any other pumping infrastructure suggests this is probably used as water storage. No other storage tanks observed.
Potentially hazardous materials storage and use	None observed, however, considering the agricultural land use of the site there are likely to be chemicals and other materials stored on site which were not directly observed during the reconnaissance survey.
Asbestos-containing materials	No obvious asbestos construction materials were observed but a detailed survey of the buildings would be required to confirm the presence or otherwise of asbestos-containing materials.
Waste storage	None observed
Fly-tipping	None observed
Electricity sub-stations/ transformers	None observed

Feature	Description
Evidence of possible land contamination on-site	None observed
Potential off-site sources of ground contamination	There are quarries located adjacent to the site in the southwest (A8 and B5) and the northeast (L1, L2, I13, I14), there is RAF Digby Sewage Treatment Works located in H4 and there is a petrol filling station located in I10. These sites represent the most likely off-site sources of contamination due to their industrial activities and their close proximity to the site.

No potentially significant on-site land contamination or geotechnical issues were identified during the site reconnaissance survey.

RAF Digby, the sewage treatment works and quarries directly adjacent to the site boundaries may be considered potential sources of off-site contamination.

Due to the size of the site, the reconnaissance survey was generally limited to the external perimeter of the site and therefore a number of the former ponds and quarries were not directly observed.

18 PRELIMINARY GEOTECHNICAL CONSTRAINTS

18.1 Design class

BS EN 1997-1 defines three different Geotechnical Categories that structures may fall into, which are summarised as follows:

- Category 1: Small and relatively simple structures for which it is possible to ensure that the fundamental requirements will be satisfied on the basis of experience and qualitative geotechnical investigations; with negligible risk
- Category 2: Conventional types of structure and foundation with no exceptional risk or difficult ground or loading conditions
- Category 3: Structures or part of structures, which fall outside limits of Geotechnical Categories 1 and 2. Examples include very large or unusual structures; structures involving abnormal risks, or unusual or exceptionally difficult ground or loading conditions; structures in highly seismic areas; structures in areas of probable site instability or persistent ground movements that require separate investigation or special measures.

Based on the information provided above on the proposed development and in view of the anticipated ground conditions, a Geotechnical Category of Category 2 has been assumed for the purposes of designing the geotechnical investigation. This should be reviewed at all stages of the investigation and revised where necessary.

18.2 Preliminary geotechnical hazards assessment

A summary of commonly occurring geotechnical hazards associated with the anticipated geology identified within each zone is given in **Table 84** together with an assessment of whether the site may be affected by each of the stated hazards.

Table 84 Summary of preliminary geotechnical risks that may affect site

Hazard category	Zone of site likely to be affected based on desk study findings and proposed development*	Engineering considerations if hazard affects site
Sudden lateral changes in ground conditions	A, B, E, F, H, I, J, L, M These zones underlain by multiple geological strata from surface	Likely to affect ground engineering and foundation design and construction
Shrinkable clay soils	A, B, D, F, I, J, L, M Relates to all strata except unweathered limestone	Design to NHBC Standards Chapter 4 or similar

Hazard category	Zone of site likely to be affected based on desk study findings and proposed development*	Engineering considerations if hazard affects site
Highly compressible and low bearing capacity soils, (including peat and soft clay)	A, B, D, L, M Relates to Superficial Head Deposits and Tidal Flat Deposits	Likely to affect ground engineering and foundation design and construction
Silt-rich soils susceptible to rapid loss of strength in wet conditions	A, B, D, E, F, H, I, J, L, M Relates to all strata except unweathered limestone	Likely to affect ground engineering and foundation design and construction
Running sand at and below water table	A, B, D, E, F, G, H, I, J, L, M Potentially relates to all saturated granular soils (including weathered limestones)	Likely to affect ground engineering and foundation design and construction
Karstic dissolution features (including 'swallow holes' in Chalk terrain)	A, B, D, E, F, G, H, I, J, L, M Relates to multiple Limestone strata	May affect ground engineering and foundation design and construction – refer to Section 4.1.2
Evaporite dissolution features and/or subsidence	Unlikely to be present due to anticipated absence of evaporite deposits	May affect ground engineering and foundation design and construction
Ground subject to or at risk from landslides	Unlikely to be present due to gentle topography	Likely to require special stabilisation measures
Ground subject to peri-glacial valley cambering with gulls possibly present	Unlikely to be present due to gentle topography	Likely to affect ground engineering and foundation design and construction
Ground subject to or at risk from coastal or river erosion	Unlikely to be present	Likely to require special protection/stabilisation measures
High groundwater table (including waterlogged ground)	A, B, D, E, F, G, H, I, J, L, M Considered likely to be present across all areas of low-lying ground	May affect temporary and permanent works
Rising groundwater table due to diminishing abstraction in urban area	Unlikely to be present	May affect deep foundations, basements and tunnels
Geological faults, fissures and breaklines	A, B, D, E, F, G, H, I, J, L, M Potential exists for all areas	May affect ground engineering and foundation design and construction

Hazard category	Zone of site likely to be affected based on desk study findings and proposed development*	Engineering considerations if hazard affects site
Underground mining, including shafts and adits (e.g. coal, mineral)	A, B, D, E, F, G, H, I, J, L, M Potential exists for all areas	Likely to require further assessment including potentially special stabilisation measures
Effects of extreme temperature (e.g. cold stores or brick kilns/furnaces)	Unlikely to be present	Likely to affect ground engineering and foundation design and construction
Existing sub-structures (e.g. tunnels, foundations, basements, and adjacent sub-structures)	Unlikely to be present	Likely to affect ground engineering and foundation design and construction
Filled and made ground (including embankments, infilled ponds and quarries)	B, D, E, F, G, H, I, J, L, M Infilled ponds, stone pits and gravel pits. Possible overspill made ground from RAF airfield and sewage works.	Likely to affect ground engineering and foundation design and construction
Adverse ground chemistry (including expansive slags and weathering of sulphides to sulphates)	B, F, I, J, L, M Oxford Clay Formation, Blisworth Clay and Kellaway Formation is considered to be pyrite-rich	May affect ground engineering and foundation design and construction
Site topography	Not present – topography fairly gentle across site area	May affect ground engineering and foundation design and construction
<p>*Preliminary assessment must be confirmed by intrusive ground investigation</p> <p>Note: Seismicity is not included in the above table as this is not normally a design consideration in the UK.</p>		

19 UNEXPLODED ORDNANCE

A Stage 1 Unexploded Ordnance (UXO) Preliminary Risk Assessment has been carried out by Brimstone Site Investigation to highlight any sources of UXO with the potential to contaminate the site.

The Preliminary UXO Assessment is presented in full as [Appendix H](#).

The site was considered to be at a potential risk of UXO due to the proximity of RAF Digby, which may have been targeted by enemy aircraft during the second world war. In addition, the undeveloped and unoccupied nature of the site may have resulted in potential strikes going unrecorded.

A Detailed UXO Risk Assessment was recommended to further assess risks to the proposed development works.

20 INITIAL CONCEPTUAL SITE MODEL

In the UK land contamination is assessed using a risk-based approach taking account of the magnitude (severity of the hazard) and likelihood (probability) of occurrence. A ‘receptor’ is something that could be adversely affected by contamination (e.g. people, an ecological system, property or a water body). A ‘pathway’ is a route or means by which a receptor is or could be exposed to or affected by a contaminant. A ‘contaminant source’ is a hazard but it can only pose a risk to a receptor where a pathway is present. The relationship between sources, pathways and receptors are referred to as a conceptual site model. A risk can only be released where a contaminant source, pathway and receptor are all in place, referred to as a ‘pollutant linkage’.

In line with LCRM (Environment Agency, 2021) and BS 10175: 2011 + A2 2017 (BSI, 2017), RSK has used information in the preceding sections to identify hazards (sources of contaminants), receptors that may be impacted and plausible linking pathways. Where all three are present this is termed a potentially complete contaminant linkage and a qualitative risk estimation is made.

20.1 Potential soil, soil vapour and groundwater linkages

20.1.1 Potential sources of contamination

Potential sources of soil and groundwater contamination identified from current activities and the history of the site and surrounding area are presented in **Table 85**. Ground gas sources are addressed in the next section.

Table 85 Potential sources of soil and groundwater contamination

Potential sources	Contaminants of concern
On-site	
Made ground (anticipated to be localised to historical structures and roads)	Unknown fill material but potentially including brick, ash and clinker and containing toxic and phytotoxic metals, inorganics, polycyclic aromatic hydrocarbons (PAHs), asbestos
Former quarry or pit (c.1920s to 1960s) identified throughout site area in multiple zones	Unknown fill material but potentially including brick, ash and clinker and containing toxic and phytotoxic metals, inorganics, polycyclic aromatic hydrocarbons (PAHs), asbestos
Agricultural land use	Pesticides, herbicides, fertilisers, fuels, and oils.
Off-site	
Petrol filling station, from 100 m north, zone I	Petroleum hydrocarbons, fuel additives, PAHs, chlorinated solvents, asbestos
Landfills (Brauncewell and Longwood Quarry) and infilled former pits	Inert/ commercial/ industrial/ municipal waste. Landfill leachate including ammoniacal nitrogen, chloride,

Potential sources	Contaminants of concern
Railway, 5 m east of the site in zone M and zone J	Petroleum hydrocarbons, toxic and phytotoxic metals, inorganics, PAHs, asbestos, herbicides
Agricultural land use	Pesticides, herbicides, fertilisers, fuels, and oils.
Historical RAF airfield extending to the western boundary of H8	Aviation fuels such as kerosene in addition to standard total petroleum hydrocarbons (TPH), toxic and phytotoxic metals, inorganics, polycyclic aromatic hydrocarbons (PAH), asbestos. Potential unexploded ordnance (UXO)
Sewage works within zone H4	Toxic and phytotoxic metals, inorganics, polycyclic aromatic hydrocarbons (PAHs), asbestos, fuel oils, polychlorinated biphenyls (PCBs), micro-organisms (e.g. salmonella, typhus bacteria)

Potential contamination from the fuel station could form LNAPL.

20.1.2 Sensitive receptors and linking exposure/ migration pathways

Sensitive receptors identified at or in the vicinity of the site that could be affected by the potential sources identified above comprise:

- Future site users – Commercial/industrial workers [oral, dermal and inhalation exposure with impacted soil, soil vapour and dust, inhalation of vapours from groundwater]
- Current adjacent site users – residential, public open space users [migration of contamination via dust/fibre deposition, vapour or groundwater migration combined with inhalation]
- Future buildings and services [direct contact with contaminated soils or groundwater and chemical attack]
- Groundwater in secondary A and secondary B aquifers within superficial deposits [leaching from soils/ percolation to aquifer]
- Groundwater in principal aquifer within Lincolnshire Limestone and Blisworth Limestone bedrock deposits [percolation through permeable strata to aquifer]

Potential linking pathways are show in brackets for each item above.

Please note that construction workers and future maintenance workers have not been identified in the conceptual model as receptors because risks are considered to be managed through health and safety procedures according to the CDM Regulations.

Ecological receptors are only considered within the conceptual model in the context of statutory protected sites.

20.2 Potential ground gas linkages

20.2.1 Ground gas generation potential

Potential ground gas sources identified for the site and surrounding are shown in **Table 86**.

Table 86 Potential ground gas sources

Potential sources	Indicative ground gas generation potential (CIEH, 2008)	Additional information
On-site		
Natural carbonate soil and strata such as chalk and limestone	Very low	The bedrock geology across much of the site is limestone of the Lincolnshire Limestone Member or the Blisworth Limestone Formation.
Made ground with low degradable organic content (e.g. up to 5% organic material and no easily degradable waste).	Very low	There may be Made Ground associated with the roads that cross the site and some of the adjacent buildings, as well as some of the disused pits and quarries.
Infilled pond less than 15m diameter, infilled before 1930s to 1940s	Very low	Numerous former stone pits and gravel pits that have been infilled
Off-site		
Natural carbonate soil and strata such as chalk and limestone	Very low	Much of the bedrock geology surrounding the site is limestone of the Lincolnshire Limestone Member or the Blisworth Limestone Formation.
Made ground with low degradable organic content (e.g. up to 5% organic material and no easily degradable waste).	Very low	There is likely to be Made Ground associated with off site development.
Sewage sludge	Moderate	There are two sewage facilities adjacent to the site, one within H4 and another 300m outside Zone E.
Landfill mid-1960s to early 1990s – Inert	Low	Neither of the landfill facilities adjacent to the site are licensed to take biodegradable waste, and neither are they able to accept construction waste.
Landfill early 1990s onwards – Inert	Low	

The assessment has identified potential sources of ground gases, notably a number of infilled quarries and gravel pits across the site, a Sewage Works located within an off-site enclave in zone H4 and two landfill sites located adjacent to the site boundaries.

The on-site former quarries and gravel pits are fairly small in size, no more than 50 m and are presumed to have been backfilled with inert and/or natural materials. Individually,

especially given their distribution across the site, they are not considered to pose a significant source of ground gases.

The landfill sites to the southwest and centre-west (Brauncewell Quarry and Longwood Quarry respectively) were historically (and are currently) licensed to accept inert and non-biodegradable wastes. However, given their size and the proximity to the site area, these sources should be considered further as viable gas sources in the conceptual model.

The sewage works within the off-site enclave in zone H4 may have generated sewage sludge that is buried or spread on site. The size of the works suggests that any such material would be limited, and thus the potential for generation of ground gases would be considered to be limited.

20.2.2 Preferential pathways for ground gas migration

Credible preferential pathways potentially connecting the source and receptor through vertical and lateral migration are:

- geology of the superficial granular deposits and weathered limestones, all of which are likely to be permeable.
- faults/ fissures/ fractures in the underlying Lincolnshire Limestone Formation, Blisworth Limestone Formation, Cornbrash and Rutland Formation
- building foundations, piled foundations and vibro-stone columns
- construction joints and cracks within building structure
- utility routes and service penetrations into buildings

20.2.3 Sensitive receptors and linking pathways

Sensitive receptors identified at or in the vicinity of the site that could be affected by the potential ground gas sources identified above comprise:

- future site users – commercial/industrial workers [migration and ingress of ground gases into buildings, build-up in confined spaces and explosion/ asphyxiation]
- current/adjacent site users – residential users, commercial/industrial workers [migration and ingress of ground gases into buildings, build-up in confined spaces and explosion/ asphyxiation]
- current/future buildings and services [migration and ingress of ground gases into buildings, build-up in confined spaces and explosion].

The assessment has identified receptors to include building structures and proposed end-users.

Construction workers have not been identified as receptors for the purposes of this assessment. Risks may still be present to construction workers especially where works include the entry into excavations within the ground. Construction workers should undertake appropriate risk assessments and risks should be managed through health and safety procedures and the use of PPE.

20.3 Preliminary risk assessment

The preliminary risk assessment findings and potentially complete contaminant linkages are shown in **Table 87** overleaf. The risk classification based on the combination of hazard consequence and probability using a risk matrix from CIRIA C552 (Rudland et al., 2001), a summary of which is included in [Appendix G](#). This relates to Tier 1 preliminary risk assessment in LCRM (Environment Agency, 2021).

Table 87 Risk estimation for potentially complete contaminant linkages

Potential source	Potential receptor	Possible pathway	Likelihood	Severity	Potential risk	Justification
Contamination associated with localised areas of made ground or agricultural land use	Future site users	Direct contact, oral, dermal and inhalation exposure with impacted soil, soil vapour and dust, and inhalation of vapours from groundwater.	Unlikely	Medium	Low	The future land use will comprise photovoltaic panels throughout the fields, in what is likely to be an unmanned site. Any attendance by site workers is thought to be sporadic and most likely associated with the maintenance of the solar panels, thus reducing the potential for direct contact with soil. Additionally, due to the largely undeveloped nature of the site and the exclusion of areas with any development, Made Ground is not anticipated to be widespread or abundant except in localised areas.
	Adjacent site users		Unlikely	Medium	Low	Migration of contaminants via wind deposit on in sufficient quantities as to be harmful is considered unlikely, especially considering that significant quantities of Made Ground is not anticipated. Additionally, the depth to groundwater is anticipated to be in the order of 2.5 to 30 mbgl.

Potential source	Potential receptor	Possible pathway	Likelihood	Severity	Potential risk	Justification
Contamination associated with localised areas of made ground or agricultural land use	Future buildings, infrastructure and services	Direct contact with contaminated soils or groundwater, and chemical attack	Low Likelihood	Mild	Low	Any contamination or made ground is likely to be localised and limited in extent and may be removed as part of future earthworks.
	Groundwater within bedrock aquifers and subsequent potable borehole abstractions	Percolation through permeable strata to aquifer	Low likelihood	Mild Medium (Zone H and I only)	Low Moderate/Low (Zone H and I only)	The impact of potential contamination within near surface soils leaching and impacting groundwater will only be likely where groundwater levels are higher than 5 m. Across the majority of the site, groundwater is anticipated below 15 m depth. Ultimately, the only viable receptor is the localised SPZ1 located within zones H and I. Additional consideration to protection of groundwater resources may need to be given in these zones of the site.

Potential source	Potential receptor	Possible pathway	Likelihood	Severity	Potential risk	Justification
Contamination associated with localised areas of made ground or agricultural land use	Surface waters	Lateral migration of groundwater through soils/bedrock and field drains	Low likelihood	Medium	Low	Surface watercourses are present and run into larger watercourses to the east. Any sources of contamination could migrate to nearby watercourse through lateral migration in superficial deposits or surface water flow across possibly saturated ground. Sources of contamination are thought to be relatively small and localised and therefore possible impact to surface watercourses and downstream receptors may be limited.
Petrol filling station located 100m north of zone I	Future site users	Direct contact, oral, dermal and inhalation exposure with impacted soil, soil vapour and dust, and inhalation of vapours from groundwater.	Unlikely	Medium	Low	The site is not anticipated to be a manned facility and therefore prolonged exposure to any potential contaminants is considered unlikely. In addition, the depth to groundwater is anticipated to be in excess of 3 mbgl, and therefore exposure to impacted vapours is deemed unlikely.
Off-site Made Ground and potentially infilled quarries and pits Includes potential Sewage sludge associated with	Future site users	Lateral migration and oral, dermal and/or inhalation exposure with impacted soil, soil vapour and dust, and inhalation of vapours from groundwater.	Unlikely	Medium	Low	

Potential source	Potential receptor	Possible pathway	Likelihood	Severity	Potential risk	Justification
Sewage works in Zone H4.	Future site users and proposed structures	Asphyxiation or build up in confined spaces followed by explosion	Unlikely (no manned structures) Low likelihood (manned structures)	Medium	Low (no manned structures) Low to moderate (manned structures)	Whilst large landfill sites are located adjacent to the site boundaries, these were licensed to accept inert non-biodegradable waste. In addition, the proposed development is understood to comprise a primarily unmanned solar farm. Consideration to this risk may need to be given should manned structures be proposed within the affected areas of the site.

Risk matrix		Consequences			
		Severe	Medium	Mild	Minor
Probability	Highly likely	Very high	High	Moderate	Moderate/low
	Likely	High	Moderate	Moderate/low	Low
	Low likelihood	Moderate	Moderate/low	Low	Very low
	Unlikely	Moderate/low	Low	Very low	Very low

Potentially complete contaminant linkages with a potential risk of moderate to low or higher identified in **Table 87** comprise:

- Potential impact of shallow groundwater within SPZ1 via leaching of contaminated soils through the infiltration of rainwater – **Zones H and I only**
- Migration of ground gases from adjacent landfill sites and accumulation in enclosed spaces resulting in asphyxiation and/or explosion – **Zones A, B, I, L only and only if proposed development comprises manned and/or enclosed structures**

These potentially complete contaminant linkages need to be assessed further through appropriate site investigation to target the identified sources of potential contamination and assess the feasibility of identified pathways.

20.4 Data gaps and uncertainties

Key data gaps and uncertainties identified in the CSM at desk study stage include:

- gaps in available historical OS maps 1889 to 1904, 1907 to 1946, 1952 to 1955, 1957 to 1977, 1981 to 1984, 1986 to 1993, 1996 – 1999 and 2001 to 2021.
- access not available to some areas within zone B (B5, B6, B9, B10, B11), D (D14, D15, D16) and G (G3 and G4), as these were added for to the desk-study after the site reconnaissance survey had taken place
- Due to the large nature of the site, it is highly likely that areas of the site were not observed by the RSK engineer during the site reconnaissance survey
- status of the observed gas pipe line is not known
- there are no previous investigations available for the site, therefore no information on actual concentrations of contaminants in soil and groundwater at this stage
- groundwater depth and flow direction are conceptual at this stage

21 CONCLUSIONS AND RECOMMENDATIONS

21.1 Site History

The site has largely remained undeveloped throughout its entire history, except for localised construction of minor structures, tracks, paths and access roads. Numerous stone pits, gravel pits and small quarries are shown to be distributed across the site area (notably RSK subzones B10, B14, D4, D12, E7, E10, F13, G4, I10).

The surrounding area is equally agricultural, although residential expansion occurred in surrounding villages. A sewage works was constructed within zone H4 (outside the redline site boundary) and a large RAF Base (RAF Digby) was constructed adjacent to the central part of the site to the west.

Two adjacent quarries (Brauncewell and Longwood) have been historically used as landfill sites and waste treatment facilities.

21.2 Likely ground and groundwater conditions

Given its agricultural setting, the site is likely to be primarily covered by a nominal to limited thickness of topsoil, with any made ground anticipated to be localised to distinct previously developed areas, such as former small structures, roads and paths. There may also be made ground 'overspill' from directly adjacent features such as the RAF airfield and sewage works.

As the site is so large, the geological sequence is highly varied. Superficial deposits are localised in the north of the site where a covering of Tidal Flat deposits encroaches upon the northern part of zones L and M. In the central (zone E) and southwestern (zones A, B and D) parts of the site, thin bands of Head Deposits and Sleaford Sand and Gravel are present directly over the bedrock.

The bedrock outcrops in a sequence presenting itself from east (youngest) to west (oldest) and comprises Oxford Clay, Kellaways Formation (clays and mudstones), Cornbrash Formation (limestone), Blisworth Clay (clays and mudstones), Blisworth Limestone, Rutland Formation (mudstone with limestone beds) and the Lincolnshire Limestone Formation. An overall figure showing site-wide geology is presented as [Figure 5](#).

Through reference to historical BGS borehole records, depths to groundwater appear to vary across the site dependent upon the strata. Groundwater in some cases was recorded at shallow depths (2-3 mbgl) within weathered limestones and locally within superficial deposits. Groundwater was generally recorded within limestone units at depths between 12 and 30 mbgl.

21.3 Geo-environmental assessment

The PRA has identified no obvious potential sources of on-site contamination, except for perhaps the use of pesticides and herbicides as a result of the site's agricultural history. The presence of made ground in some areas is likely although considered to be limited to minor previously developed areas such as small structures (i.e. wind pumps) and tracks, paths and access roads. There are a number of former stone/gravel pits as well as ponds

that have the potential to be infilled with onerous material, although it is likely that any infill comprised natural and/or inert soils.

Two off-site landfills at Brauncewell and Longwood Quarry were licensed to accept inert and non-biodegradable waste, though their proximity and currently active status means that risks may exist for affected zones, but only if the proposed development in these areas comprises manned structures or un-manned enclosed structures where gases could accumulate.

Identified potential pollutant linkages were identified, associated with:

- Potential impactation of shallow groundwater within SPZ1 via leaching of contaminated soils through the infiltration of rainwater – **Zones H and I only**; and
- Migration of ground gases from adjacent landfill sites and accumulation in enclosed spaces resulting in asphyxiation and/or explosion – **Zones A, B, I, L only and only if proposed development comprises manned and/or enclosed structures.**

21.4 Geotechnical assessment

The key findings of the initial geotechnical assessment are as follows:

- Silt rich and shrinkable clay soils associated with all strata except granular superficial soils and unweathered limestone;
- Potential compressible and low bearing capacity soils associated with superficial Head Deposits and Tidal Flat Deposits;
- Potential running sand associated with saturated granular deposits;
- Karstic dissolution features within limestone strata;
- Potentially waterlogged ground and/or localised high groundwater table ;
- Potential for geological faults within underlying bedrock geology;
- Infilled ponds, quarries and gravel pits as well as potential for unrecorded extraction pits, shafts and adits;
- Adverse ground chemistry associated with Oxford Clay, Blisworth Clay and Kellaway Formation; and
- Lateral variation in ground conditions

21.5 Recommendations

The following recommendations are made for further assessment of the site to investigate the risks identified above and/or to address remaining uncertainties:

- Sitewide shallow intrusive works (likely trial pitting and drive-in sampler boreholes) to determine ground and groundwater conditions across each zone of the site and target potential areas of made ground (i.e. in locations of former structures and infilled pits/ponds)

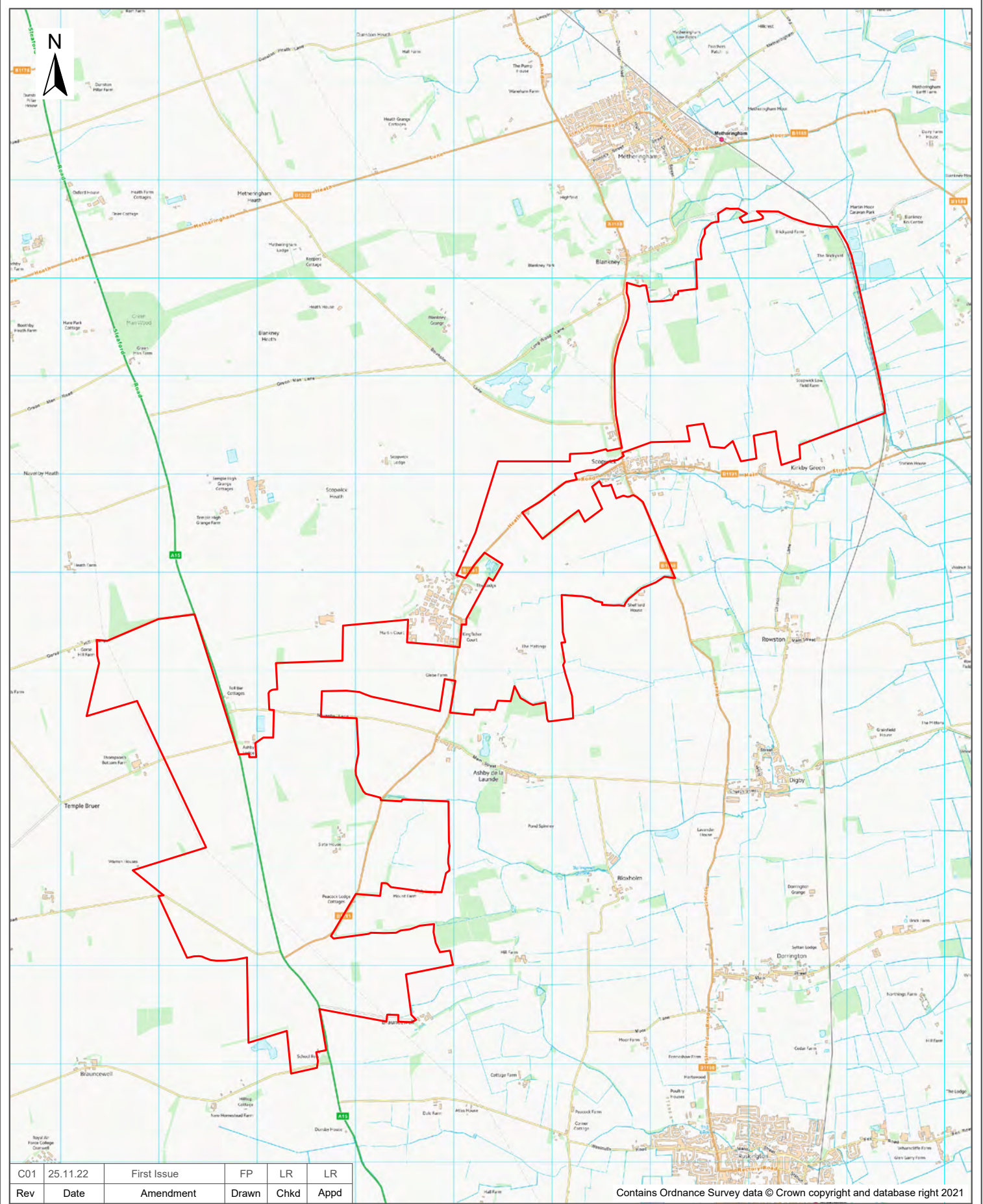
- Gas monitoring may be required in areas of the site adjacent to the identified landfill sites to assess baseline concentrations of ground gas, especially if enclosed and/or manned structures are proposed in these parts of the site
- Deeper boreholes may be required to either prove depth to bedrock and/or provide information for use in piled foundation design
- The findings of the Unexploded Ordnance (UXO) Preliminary Risk Assessment were that a Detailed UXO Risk Assessment be carried out to assess the risks to the proposed development works.

It is understood that a ground investigation specification is currently being drafted by others.

FIGURES



FIGURE 1 SITE LOCATION PLAN



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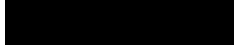
C01	25.11.22	First Issue	FP	LR	LR
Rev	Date	Amendment	Drawn	Chkd	Appd



RSK
GEOSCIENCES

18 Frogmore Road
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Tel: +44(0)1442 437500



Client
Springwell Solar Farm Limited

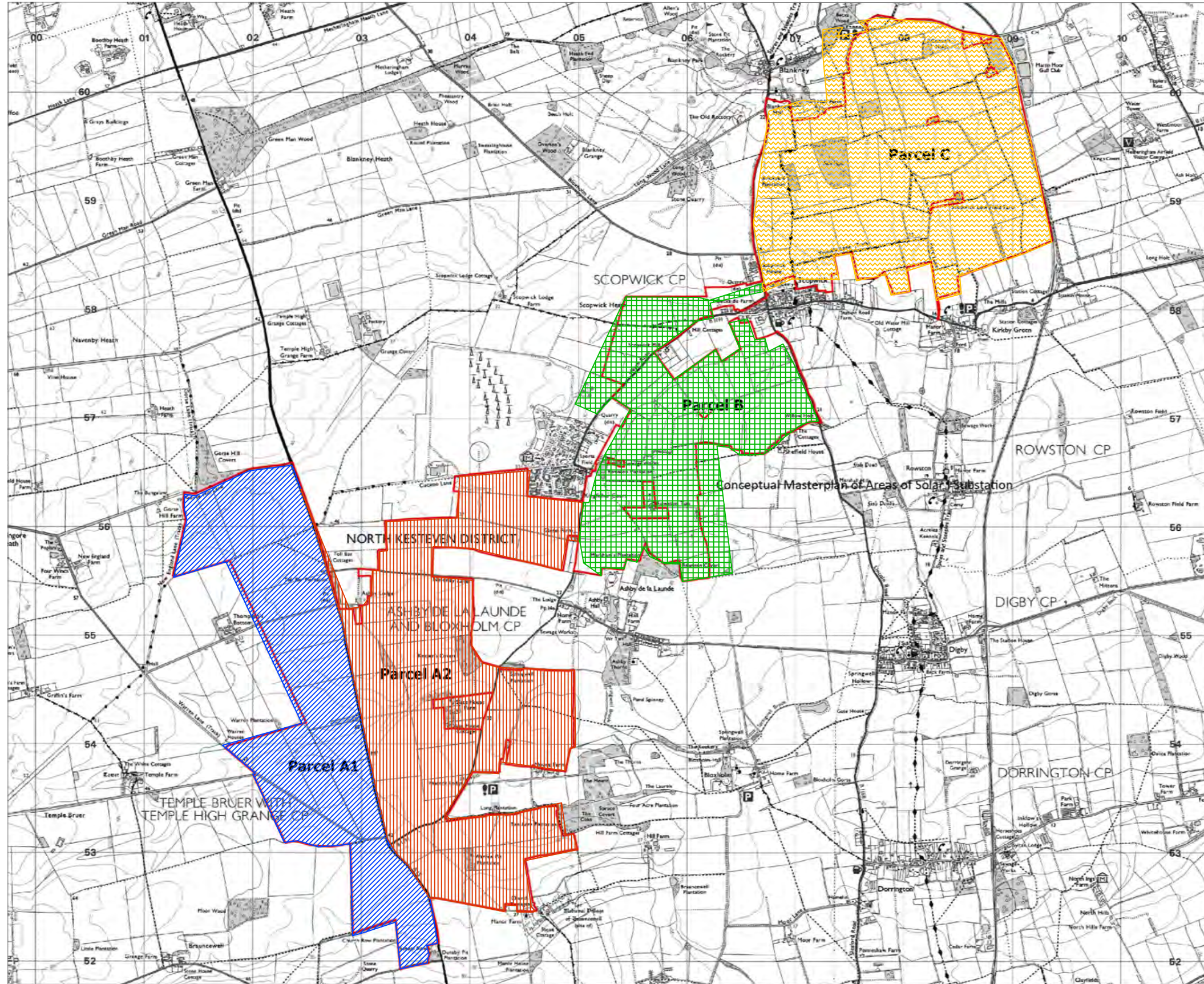
Project Name
Springwell Solar Farm

Description
Site Location Plan

Dimension	Size	Scale	Geolocation	Project ID	Drawing no.	Rev	File name
m	A4	1:50,000	506461,357475	1922604	11101	C01	1922604-HH-111-SS-M-C-11101-C01



FIGURE 2 SITE PARCEL PLAN



LEGEND

- Parcel A1
- Parcel A2
- Parcel B
- Parcel C

Notes:

Base plan provided by Landmark Information Group

C01	25.11.22	First Issue	AS	LR	LR
Rev	Date	Amendment	Drawn	Chkd	Appd

18 Frogmore Road
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Tel: +44(0)1442 437500

Client
Springwell Solar Farm Ltd

Project Name
Springwell Solar Farm

Description
Site Parcel Plan

Project ID 1922604	Drawing no. 11201	Revision C01
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File name
1922604-HH-112-SS-M-C-11201-C01

Dimensions m	Scale 1:40000	Size A3
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FIGURE 3 SITE ZONING PLAN (ENVIRONMENTAL ASSESSMENT)



LEGEND

— Site boundary

Notes:

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 Provided by: RSK Landmark

Rev	Date	Amendment	Drawn	Chkd	Appd
C01	16.11.22	First Issue	FP	LR	LR



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Client
 Springwell Solar Farm Ltd

Project Name
 Springwell Solar Farm

Description
 Area Zoning Plan 1

Project ID	Drawing no.	Revision
1922604	24001	C01

File name
 1922604-HH-240-SS-D-C-24001-C01

Dimensions	Scale	Size
m	1:40000	A3



FIGURE 4 SITE ADDITIONAL ZONING PLAN



LEGEND

— Site boundary

Notes:

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C01	16.11.22	First Issue	FP	LR	LR



18 Frogmore Road
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HP3 9RT

Tel: +44(0)1442 437500

Client
Springwell Solar Farm Ltd

Project Name
Springwell Solar Farm

Description
Area Zoning Plan 2

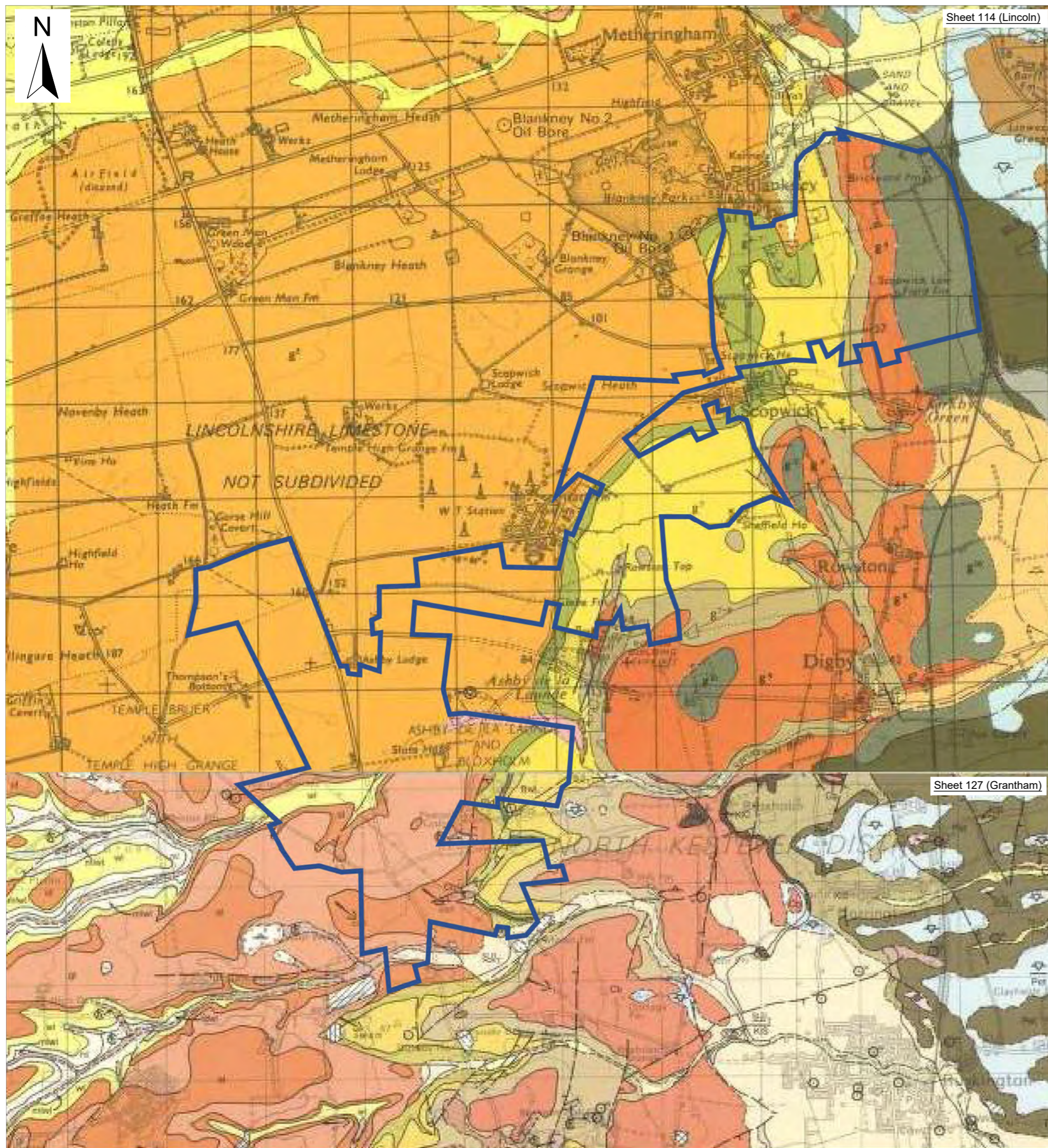
Project ID	Drawing no.	Revision
1922604	24002	C01

File name
1922604-HH-240-SS-D-C-24002-C01

Dimensions	Scale	Size
m	1:40000	A3



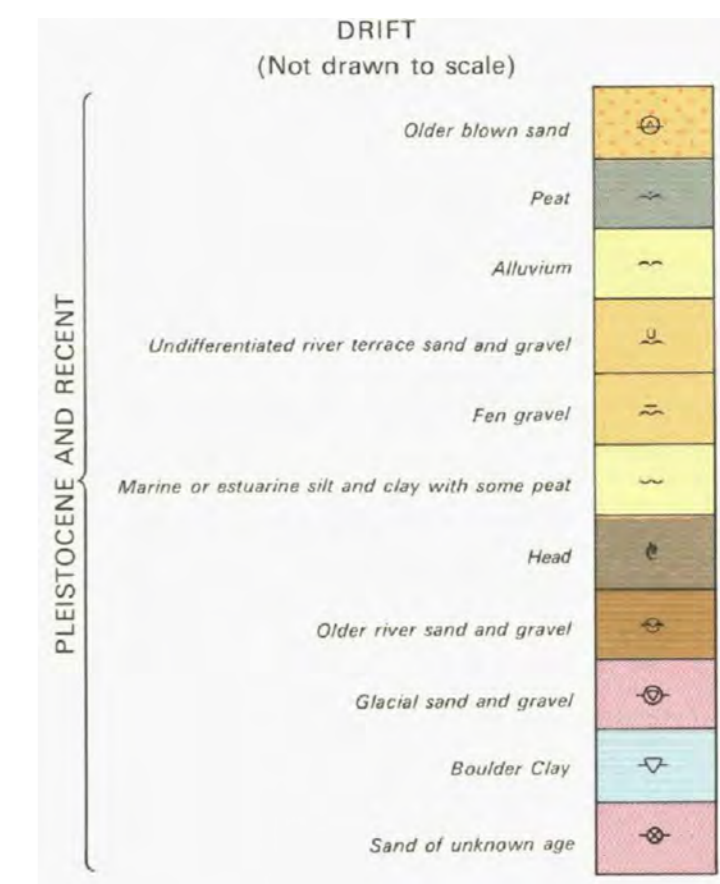
FIGURE 5 SITE-WIDE GEOLOGY PLANS



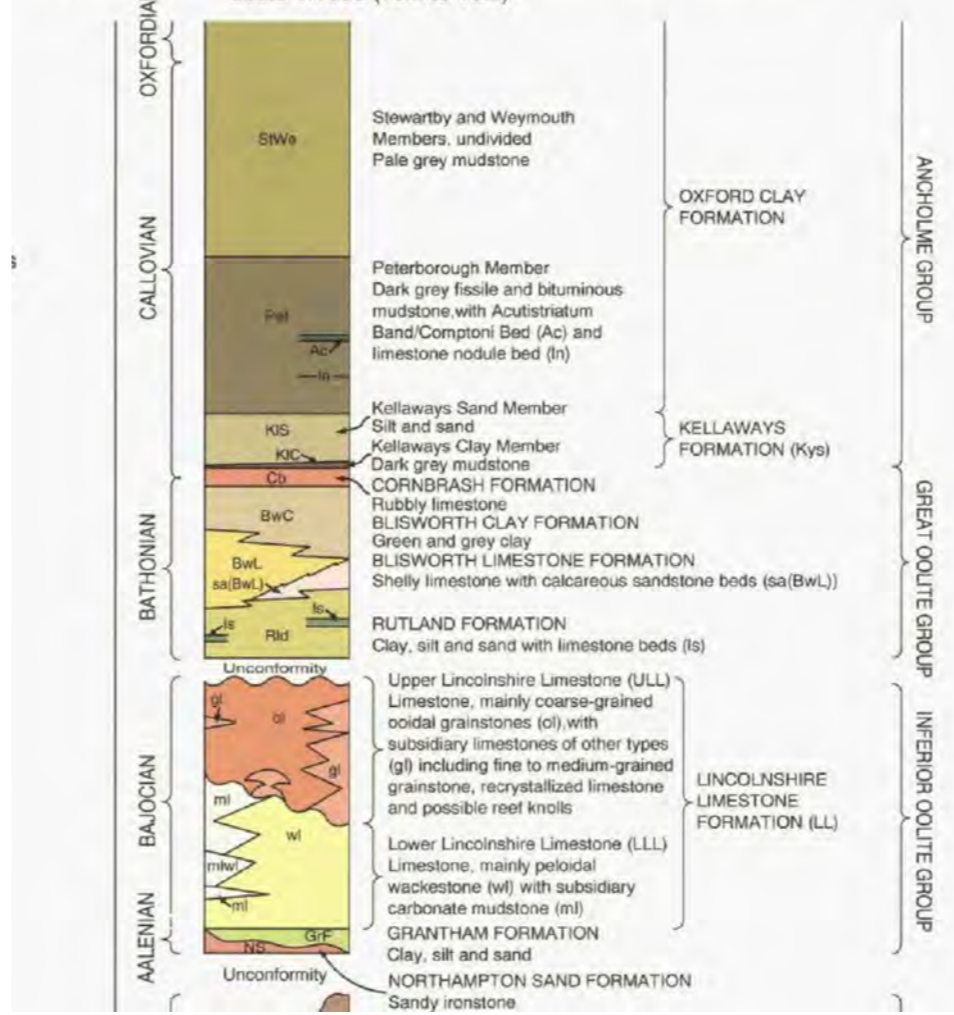
LEGEND FOR SHEET 127



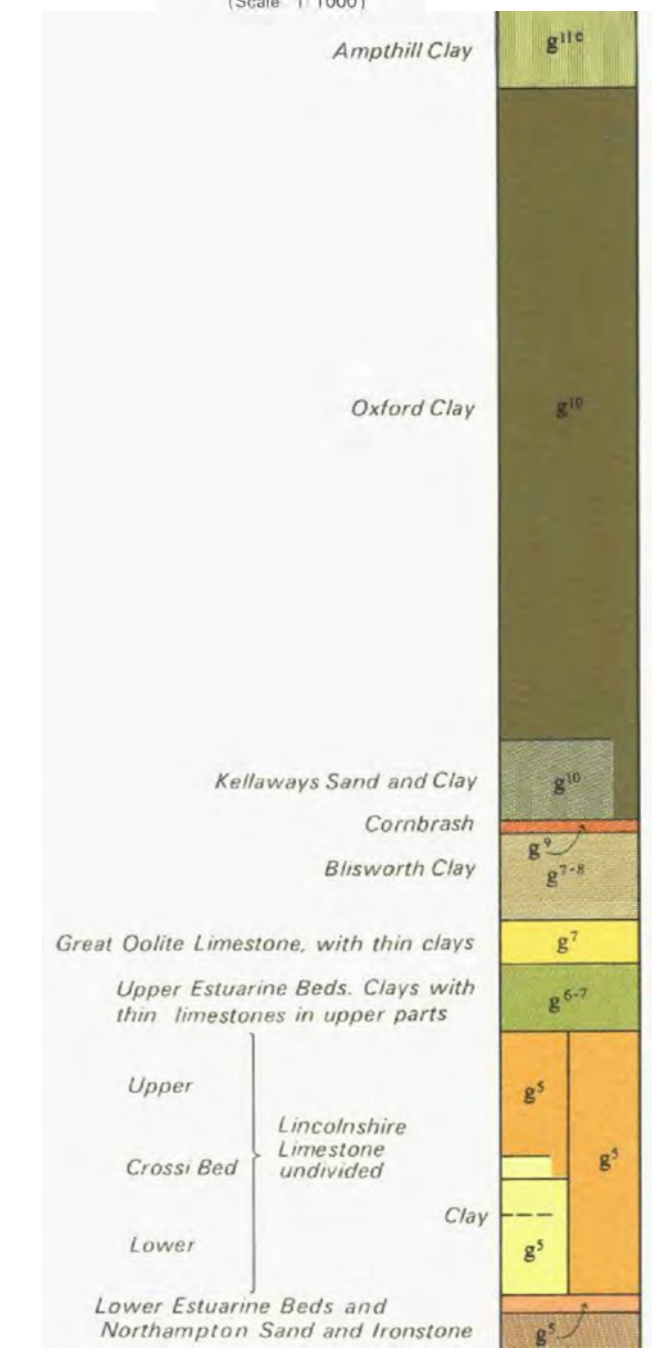
LEGEND FOR SHEET 114



GENERALIZED VERTICAL SECTION OF STRATA AT OUTCROP
Scale 1:1000 (1cm to 10m)



SOLID
GENERALIZED VERTICAL SECTION
(Scale: 1:1000)



C01	25.11.22	First Issue	AS	LR	LR
Rev	Date	Amendment	Drawn	Chkd	Appd

Notes:
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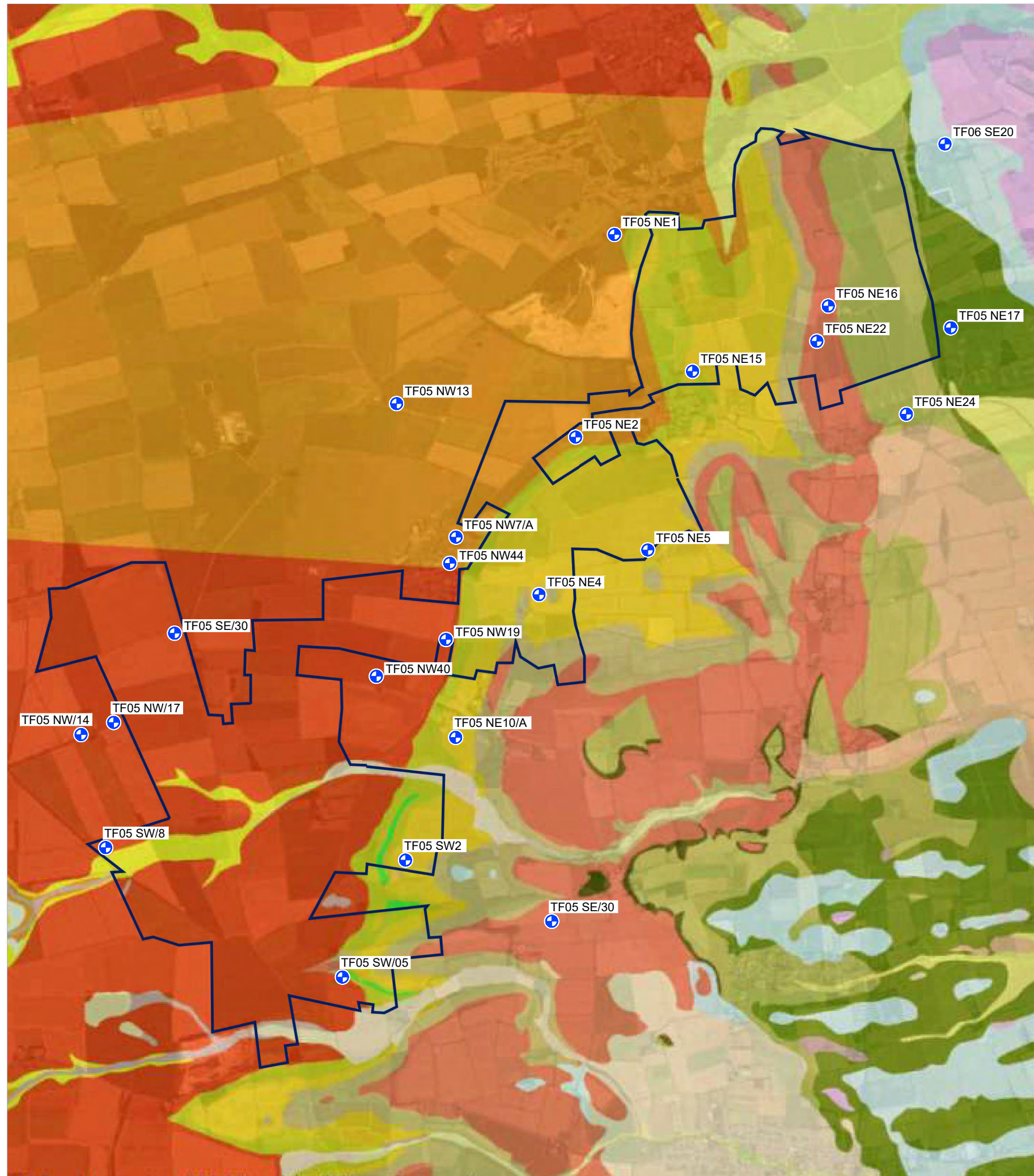
LEGEND

— Site boundary

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Tel: +44(0)1442 437500

Client Springwell Solar Farm Limited			
Project Name Springwell Solar Farm			
Description Site Geology - Scanned BGS Maps			
Dimension m	Scale NTS	Size A2	Project ID 1922604
			Drawing no. 15901
			Revision C01
			File name 1922604-HH-159-SS-M-C-15901-C01



LEGEND

- Site boundary
- ⊕ Historical BGS Boreholes
- Superficial
 - Head Deposits
 - Sleaford Sand and Gravel
 - Tidal Flat Deposits
 - Till, Mid Pleistocene
- Bedrock
 - Oxford Clay Formation
 - Kellaways Formation
 - Cornbrash Formation
 - Blisworth Clay Formation
 - Blisworth Limestone Formation
 - Rutland Formation
 - Rutland Formation (limestone band)
 - Upper Lincolnshire Limestone Member
 - Lincolnshire Limestone Formation

Notes:

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Rev	Date	Amendment	Drawn	Chkd	Appd
C01	25.11.22	First Issue	AS	LR	LR



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Tel: +44(0)1442 437500

Client
Springwell Solar Farm Ltd

Project Name
Springwell Solar Farm

Description
Site Geology - online BGS viewer including BGS Boreholes

Project ID	Drawing no.	Revision
1922604	15902	C01

File name
1922604-HH-159-SS-M-C-15902-C01

Dimensions	Scale	Size
m	1:40000	A3



FIGURE 6 SITE RECONNAISSANCE PHOTOGRAPH PLAN



LEGEND

— Site boundary

Notes:

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Rev	Date	Amendment	Drawn	Chkd	Appd
C01	22.11.22	First Issue	FP	LR	LR



18 Frogmore Road
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Hertfordshire
HP3 9RT

Tel: +44(0)1442 437500

Client
Springwell Solar Farm Ltd

Project Name
Springwell Solar Farm

Description
Site Reconnaissance Photo Locations

Project ID	Drawing no.	Revision
1922604	11401	C01

File name
1922604-HH-114-SS-M-C-11401-C01

Dimensions	Scale	Size
m	NTS	A3

APPENDICES

APPENDIX A SERVICE CONSTRAINTS

1. This report and the site investigation carried out in connection with the report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) for Springwell Solar Farm Limited (the "Client") in accordance with the terms of a consultancy services agreement between RSK and the Client, dated 8 August 2022. The Services were performed by RSK with the reasonable skill and care ordinarily exercised by an environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the Client.
2. Other than that, expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.
3. Unless otherwise agreed in writing, the Services were performed by RSK exclusively for the purposes of the Client. RSK is not aware of any interest of or reliance by any party other than the Client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. **Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.**
4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK 's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date of this report, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.
5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the Client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.
6. The observations and conclusions described in this report are based solely upon the Services which were provided pursuant to the agreement between the Client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off site of asbestos, invasive plants, electromagnetic fields, lead paint, heavy metals, radon gas, persistent, bioaccumulative or toxic chemicals (including PFAS/ PFOS) or other radioactive or hazardous materials, unless specifically identified in the Services.
7. The Services are based upon RSK's observations of existing physical conditions at the Site gained from a visual inspection of the site together with RSK's interpretation of information, including documentation, obtained from third parties and from the Client on the history and usage of the site, unless specifically identified in the Services or accreditation system (such as UKAS ISO 17020:2012 clause 7.1.6):
 - a. The Services were based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely.
 - b. The Services were limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the visual inspection.

- c. The Services did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services.

RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the Client and RSK.

8. The intrusive environmental site investigation aspects of the Services are a limited sampling of the site at pre-determined locations based on the known historic / operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the properties of the materials adjacent and local conditions, together with the position of any current structures and underground utilities and facilities, and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters (as stipulated in the scope between the client and RSK, based on an understanding of the available operational and historical information) and it should not be inferred that other chemical species are not present.
9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (intrusive and sample locations etc) annotated on site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for setting out and should be considered indicative only.
10. The comments given in this report and the opinions expressed are based on the ground conditions encountered during the site work and on the results of tests made in the field and in the laboratory. However, there may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account. In particular, it should be noted that there may be areas of made ground not detected due to the limited nature of the investigation or the thickness and quality of made ground across the site may be variable. In addition, groundwater levels and ground gas concentrations and flows, may vary from those reported due to seasonal, or other, effects and the limitations stated in the data should be recognised.
11. Asbestos is often observed to be present in soils in discrete areas. Whilst asbestos-containing materials may have been locally encountered during the fieldworks or supporting laboratory analysis, the history of brownfield and demolition sites indicates that asbestos fibres may be present more widely in soils and aggregates, which could be encountered during more extensive ground works.
12. Unless stated otherwise, only preliminary geotechnical recommendations are presented in this report and these should be verified in a Geotechnical Design Report, once proposed construction and structural design proposals are confirmed.

APPENDIX B SUMMARY OF LEGISLATION AND POLICY RELATING TO LAND CONTAMINATION

Part IIA of the Environmental Protection Act 1990

Part IIA of the Environmental Protection Act 1990 (Part IIA) and its associated Contaminated Land Regulations 2000 (SI 2000/227), which came into force in England on 1 April 2000, formed the basis for the current regulatory framework and the statutory regime for the identification and remediation of contaminated land. Part IIA of the EPA 1990 defines contaminated land as 'any land which appears to the Local Authority in whose area it is situated to be in such a condition by reason of substances in, on or under the land, that significant harm is being caused, or that there is significant possibility of significant harm being caused, or that pollution of controlled waters is being or is likely to be caused'. Controlled waters are considered to include all groundwater, inland waters and estuaries.

In August 2006, the Contaminated Land (England) Regulations 2006 (SI 2006/1380) were implemented, which extended the statutory regime to include Part IIA of the EPA as originally introduced on 1 April 2000, together with changes intended chiefly to address land that is contaminated by virtue of radioactivity. These have been replaced subsequently by the Contaminated Land (England) (Amendment) Regulations 2012, which now exclude land that is contaminated by virtue of radioactivity.

The intention of Part IIA is to deal with contaminated land issues that are considered to cause significant harm on land that is not undergoing development (see Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance, April 2012). This document replaces Annex III of Defra Circular 01/2006, published in September 2006 (the remainder of this document is now obsolete).

Planning Policy

Contaminated land is often dealt with through planning because of land redevelopment. This approach was documented in Planning Policy Statement: Planning and Pollution Control PPS23, which states that it remains the responsibility of the landowner and developer to identify land affected by contamination and carry out sufficient remediation to render the land suitable for use. PPS23 was withdrawn early in 2012 and has been replaced by much reduced guidance within the National Planning Policy Framework (NPPF), reference ISBN: 978-1-5286-1033-9, February 2019.

The new framework has only limited guidance on contaminated land, as follows:

Chapter 11. Making effective use of land

- 117 Planning policies and decisions should promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions. Strategic policies should set out a clear strategy for accommodating objectively assessed needs, in a way that makes as much use as possible of previously-developed or 'brownfield' land.
118. Planning policies and decisions should:
- c) give substantial weight to the value of using suitable brownfield land within settlements for homes and other identified needs, and support appropriate opportunities to remediate despoiled, degraded, derelict, contaminated or unstable land.

Chapter 15. Conserving and enhancing the natural environment

170. Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and

f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

Ground conditions and pollution

178. Planning policies and decisions should ensure that:

a) a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation);

b) after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990; and

c) adequate site investigation information, prepared by a competent person, is available to inform these assessments.

179. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

Water Resources Act (WRA)

The Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009 updated the Water Resources Act 1991, which introduced the offence of causing or knowingly permitting pollution of controlled waters. The Act provides the Environment Agency with powers to implement remediation necessary to protect controlled waters and recover all reasonable costs of doing so.

Water Framework Directive (WFD)

The Water Framework Directive 2000/60/EC is designed to:

- enhance the status and prevent further deterioration of aquatic ecosystems and associated wetlands that depend on the aquatic ecosystems
- promote the sustainable use of water
- reduce pollution of water, especially by 'priority' and 'priority hazardous' substances
- ensure progressive reduction of groundwater pollution.

The WFD requires a management plan for each river basin be developed every six years.

Groundwater Directive (GWD)

The 1980 Groundwater Directive 80/68/EEC and the 2006 Groundwater Daughter Directive 2006/118/EC of the WFD are the main European legislation in place to protect groundwater. The 1980 Directive is due to be repealed in December 2013. The European legislation has been transposed into national legislation by regulations and directions to the Environment Agency.

Priority Substances Directive (PSD)

The Priority Substances Directive 2008/105/EC is a 'Daughter' Directive of the WFD, which sets out a priority list of substances posing a threat to or via the aquatic environment. The PSD establishes environmental quality standards for priority substances, which have been set at concentrations that are safe for the aquatic environment and for human health. In addition, there is a further aim of reducing (or eliminating) pollution of surface water (rivers, lakes, estuaries and coastal waters) by pollutants on the list. The WFD requires that countries establish a list of dangerous substances that are being discharged and EQS for them. In England and Wales, this list is provided in the River Basin Districts Typology, Standards and Groundwater threshold values (Water Framework Directive) (England and Wales) Directions 2010. In order to achieve the objectives of the WFD, classification schemes are used to describe where the water environment is of good quality and where it may require improvement.

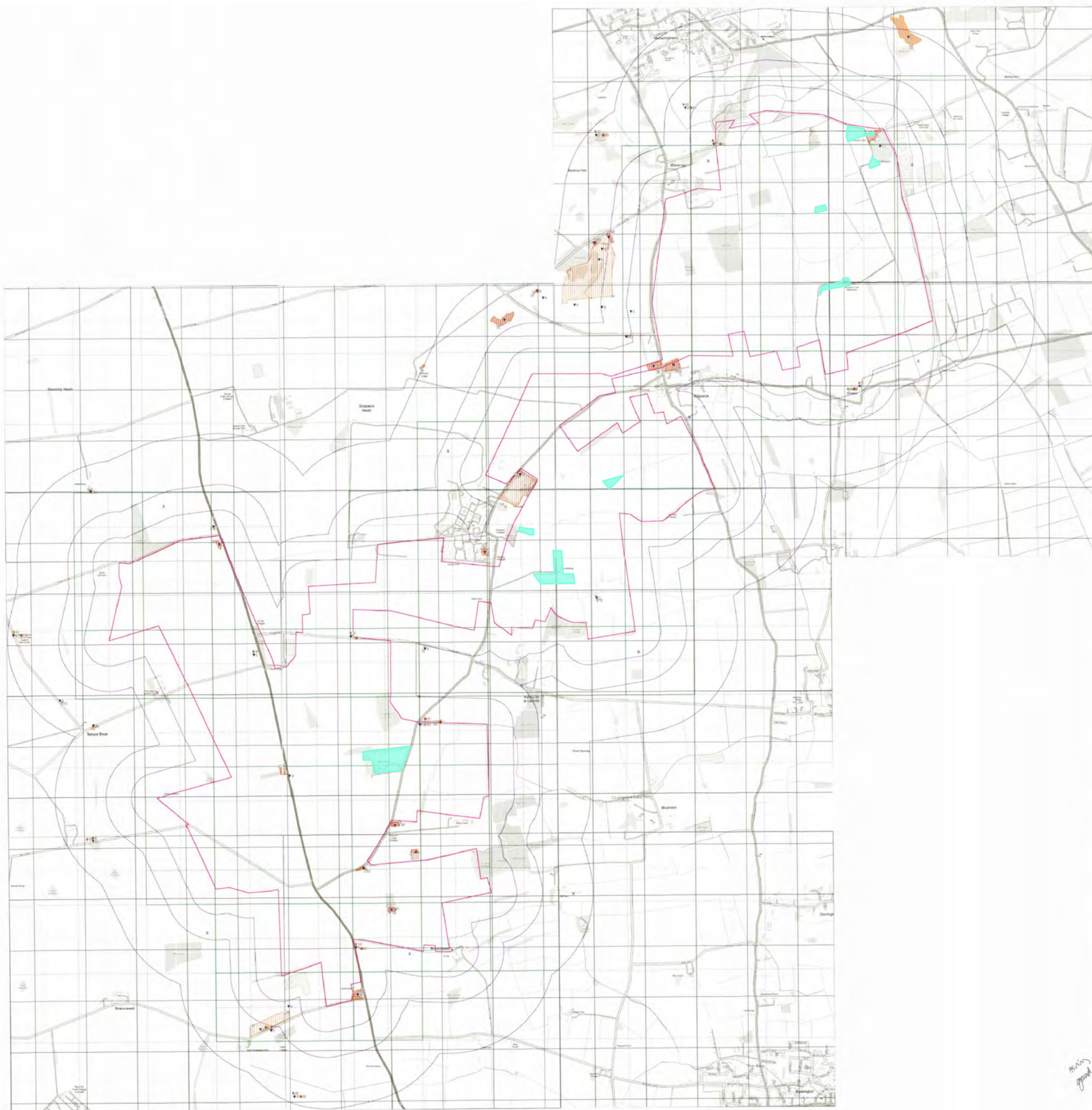
Environmental Permitting Regulations (EPR)

The Environmental Permitting (England and Wales) Regulations 2016 (as amended) provide a single regulatory framework that streamlines and integrates waste management licensing, pollution prevention and control, water discharge consenting, groundwater authorisations, and radioactive substances regulation. Schedule 22, paragraph 6 of EPR 2016 states: 'the regulator must, in exercising its relevant functions, take all necessary measures - (a) to prevent the input of any hazardous substance to groundwater; and (b) to limit the input of non-hazardous pollutants to groundwater so as to ensure that such inputs do not cause pollution of groundwater.'

Notes:

- 1. The above information is provided for background but does not constitute site-specific advice*
- 2. The above summary applies to England only. Variations exist within other countries of the United Kingdom*

APPENDIX C SITE-WIDE HISTORICAL MAPS AND PLANS



LEGEND

- Site boundary
- Excluded Zones

Notes:

Base plan provided by Landmark Information Group

Rev	Date	Amendment	Drawn	Chkd	Appd
C01	25.11.22	First Issue	AS	LR	LR


18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT
Tel: +44(0)1442 437500

Client
Springwell Solar Farm Ltd

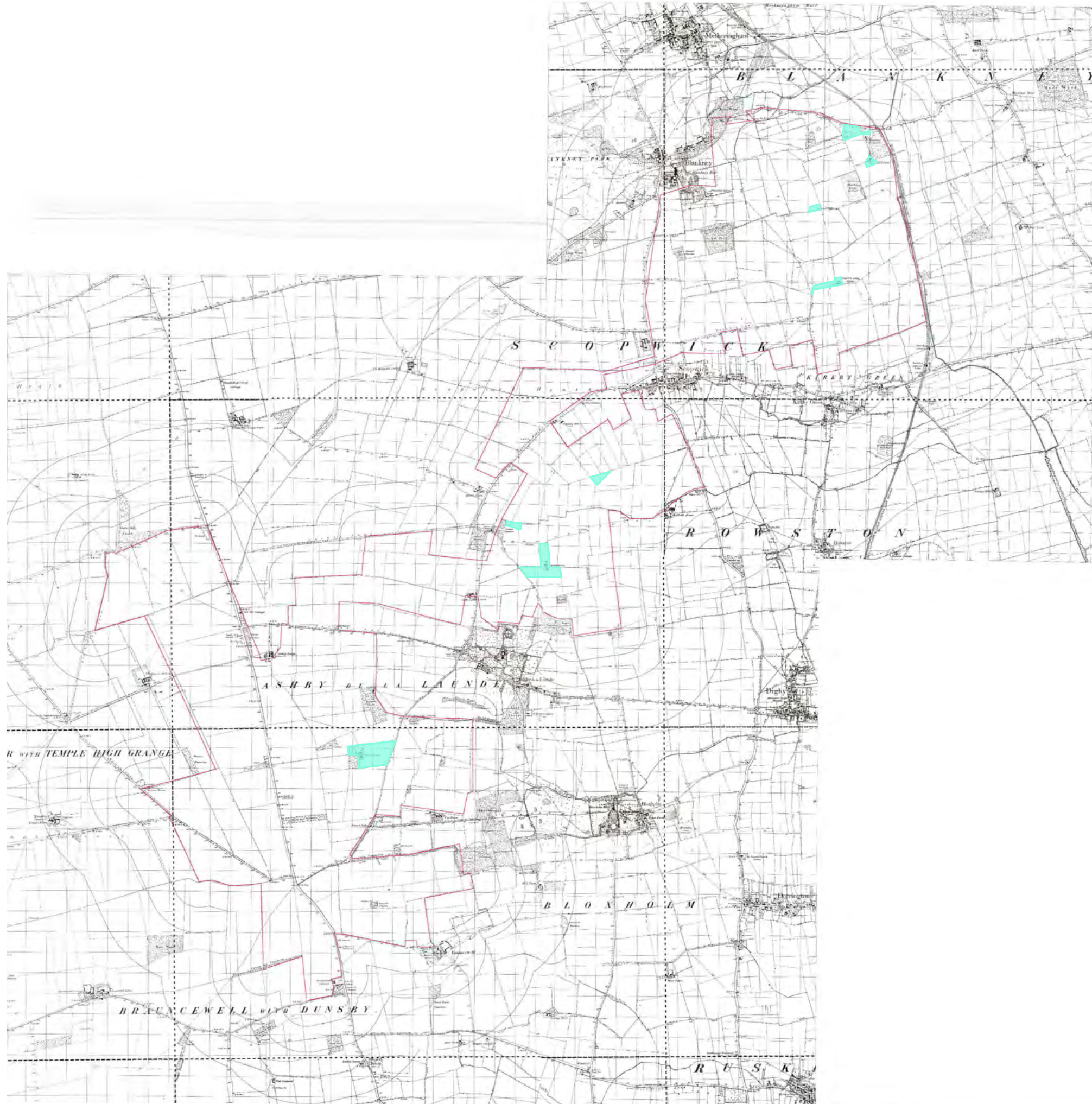
Project Name
Springwell Solar Farm

Description
Potentially Infilled Land and Quarrying Activity

Project ID	Drawing no.	Revision
1922604	12201	C01

File name
1922604-HH-122-SS-M-C-12201-C01

Dimensions	Scale	Size
m	1:40000	A3



LEGEND

- Site boundary
- Excluded Zones

Notes:

Base plan provided by Landmark Information Group

Rev	Date	Amendment	Drawn	Chkd	Appd
C01	25.11.22	First Issue	FP	LR	LR



18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Tel: +44(0)1442 437500

Client
Springwell Solar Farm Ltd

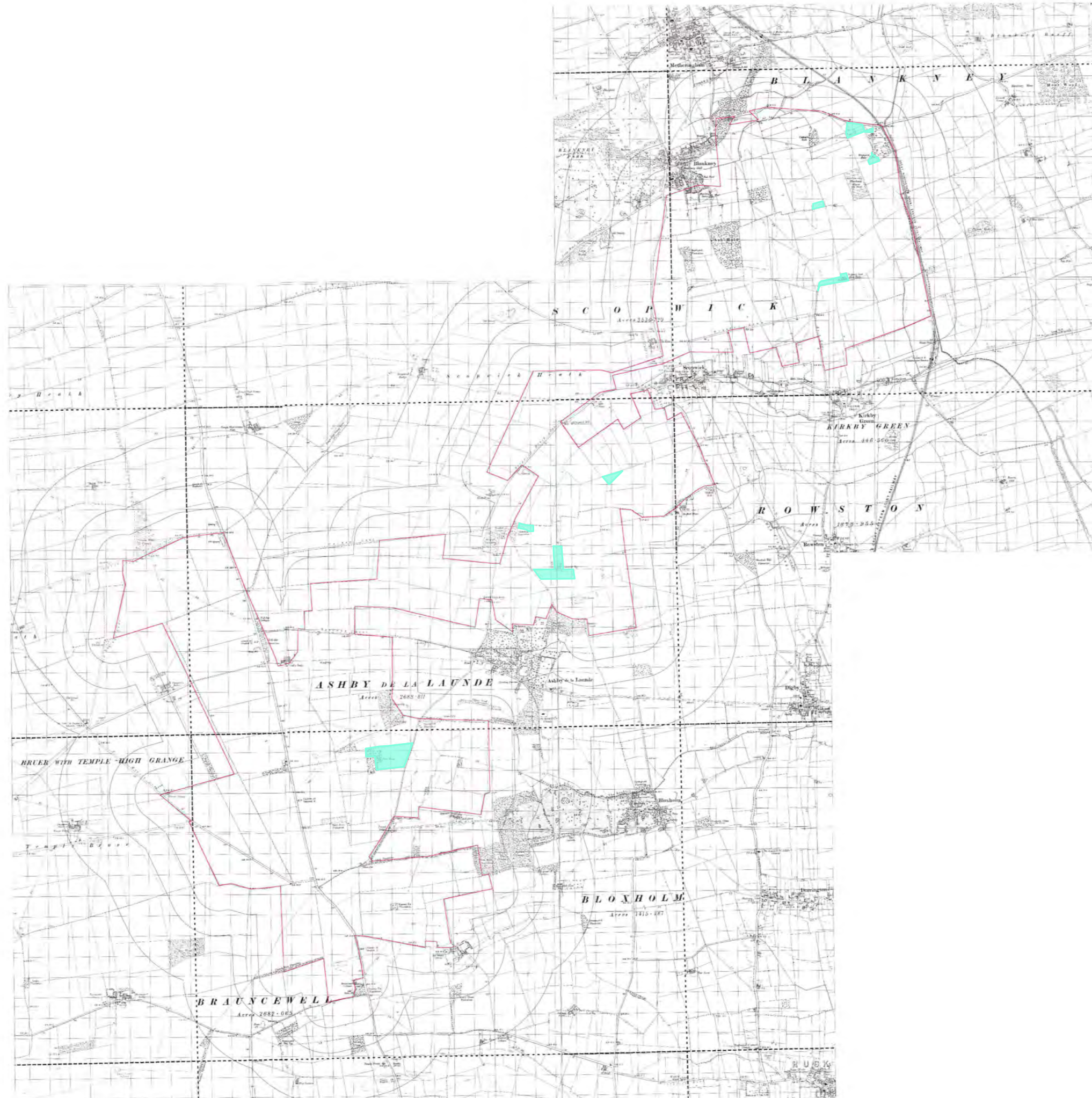
Project Name
Springwell Solar Farm

Description
Historical Map - 1887

Project ID	Drawing no.	Revision
1922604	12601	C01

File name
1922604-HH-126-SS-M-C-12601-C01

Dimensions	Scale	Size
m	1:40000	A3



LEGEND

- Site boundary
- Excluded Zones

Notes:

Base plan provided by Landmark Information Group

Rev	Date	Amendment	Drawn	Chkd	Appd
C01	25.11.22	First Issue	FP	LR	LR



18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Tel: +44(0)1442 437500

Client
Springwell Solar Farm Ltd

Project Name
Springwell Solar Farm

Description
Historical Map - 1906

Project ID	Drawing no.	Revision
1922604	12602	C01

File name
1922604-HH-126-SS-M-C-12602-C01

Dimensions	Scale	Size
m	1:40000	A3



LEGEND

- Site boundary
- Excluded Zones

Notes:

Base plan provided by Landmark Information Group

C01	25.11.22	First Issue	FP	LR	LR
Rev	Date	Amendment	Drawn	Chkd	Appd



18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Tel: +44(0)1442 437500

Client
Springwell Solar Farm Ltd

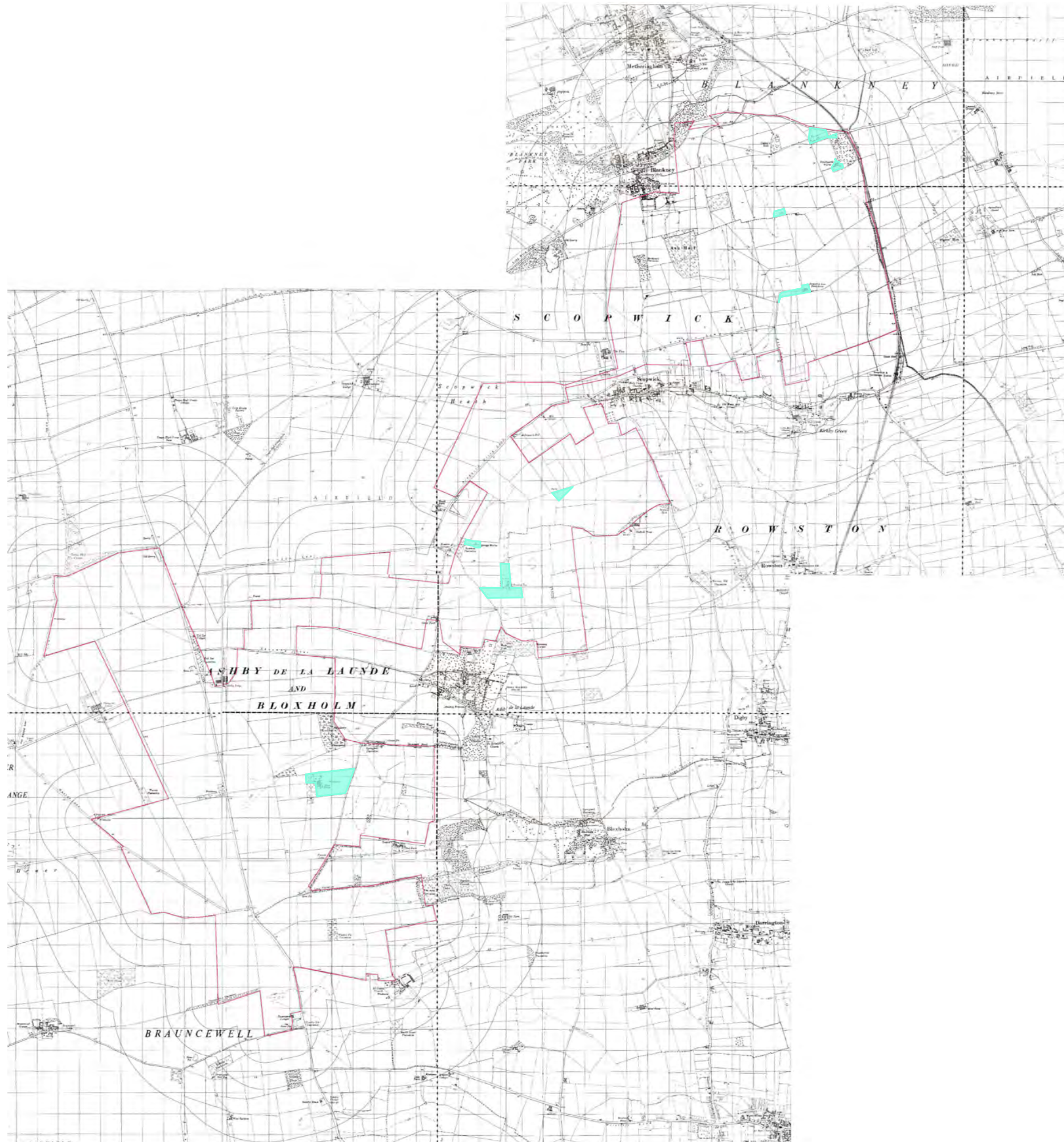
Project Name
Springwell Solar Farm

Description
Historical Map - 1947 - 1950

Project ID	Drawing no.	Revision
1922604	12603	C01

File name
1922604-HH-126-SS-M-C-12603-C01

Dimensions	Scale	Size
m	1:40000	A3



LEGEND

- Site boundary
- Excluded Zones

Notes:

Base plan provided by Landmark Information Group

Rev	Date	Amendment	Drawn	Chkd	Appd
C01	25.11.22	First Issue	FP	LR	LR

18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Tel: +44(0)1442 437500

Client
Springwell Solar Farm Ltd

Project Name
Springwell Solar Farm

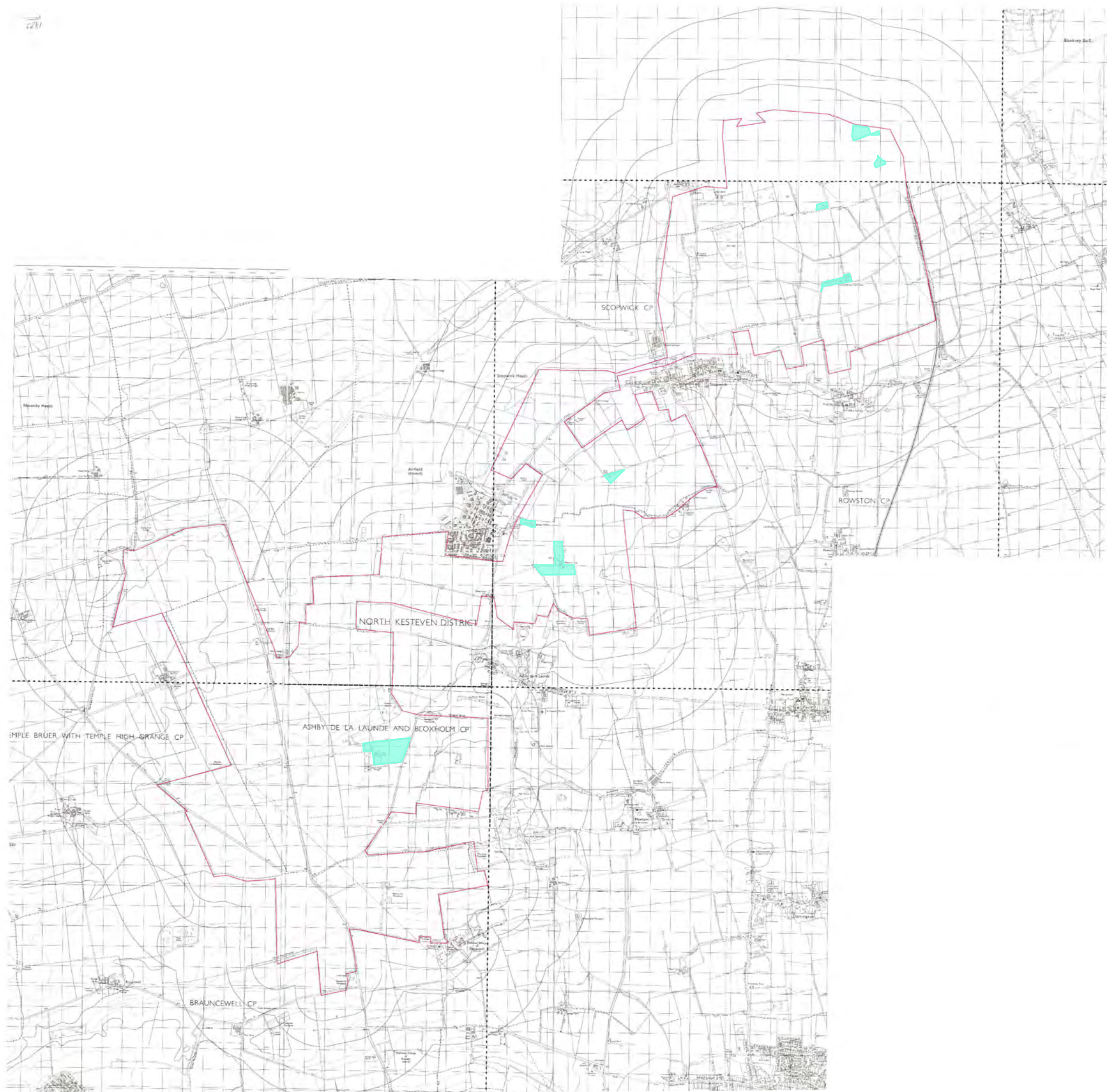
Description
Historical Map - 1956

Project ID	Drawing no.	Revision
1922604	12604	C01

File name
1922604-HH-126-SS-M-C-12604-C01

Dimensions	Scale	Size
m	1:40000	A3

1956



LEGEND

- Site boundary
- Excluded Zones

Notes:

Base plan provided by Landmark Information Group

Rev	Date	Amendment	Drawn	Chkd	Appd
C01	25.11.22	First Issue	FP	LR	LR



18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Tel: +44(0)1442 437500

Client
Springwell Solar Farm Ltd

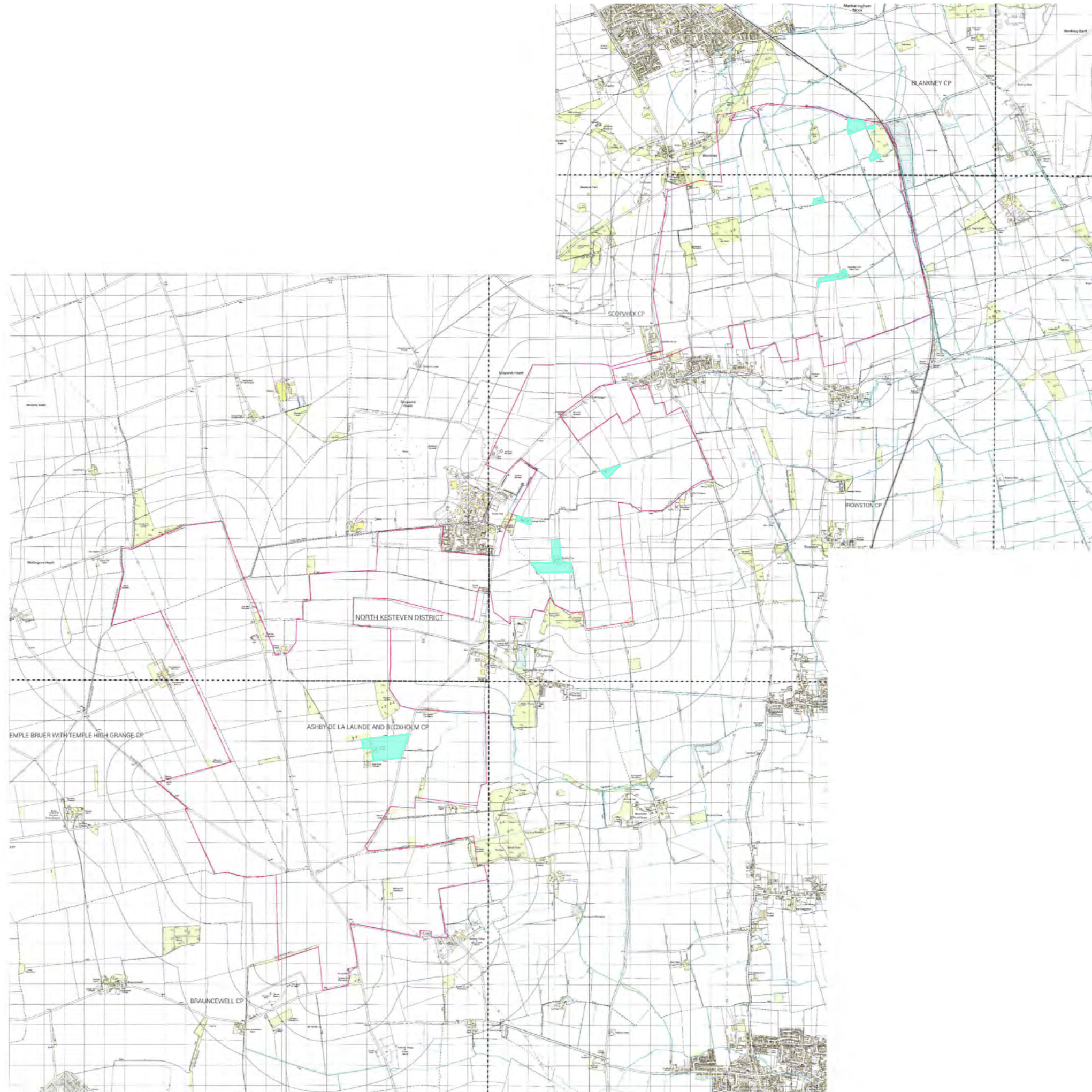
Project Name
Springwell Solar Farm

Description
Historical Map - 1985

Project ID	Drawing no.	Revision
1922604	12605	C01

File name
1922604-HH-126-SS-M-C-12605-C01

Dimensions	Scale	Size
m	1:40000	A3



LEGEND

- Site boundary
- Excluded Zones

Notes:

Base plan provided by Landmark Information Group

Rev	Date	Amendment	FP	LR	LR
C01	25.11.22	First Issue	FP	LR	LR



18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Tel: +44(0)1442 437500

Client
Springwell Solar Farm Ltd

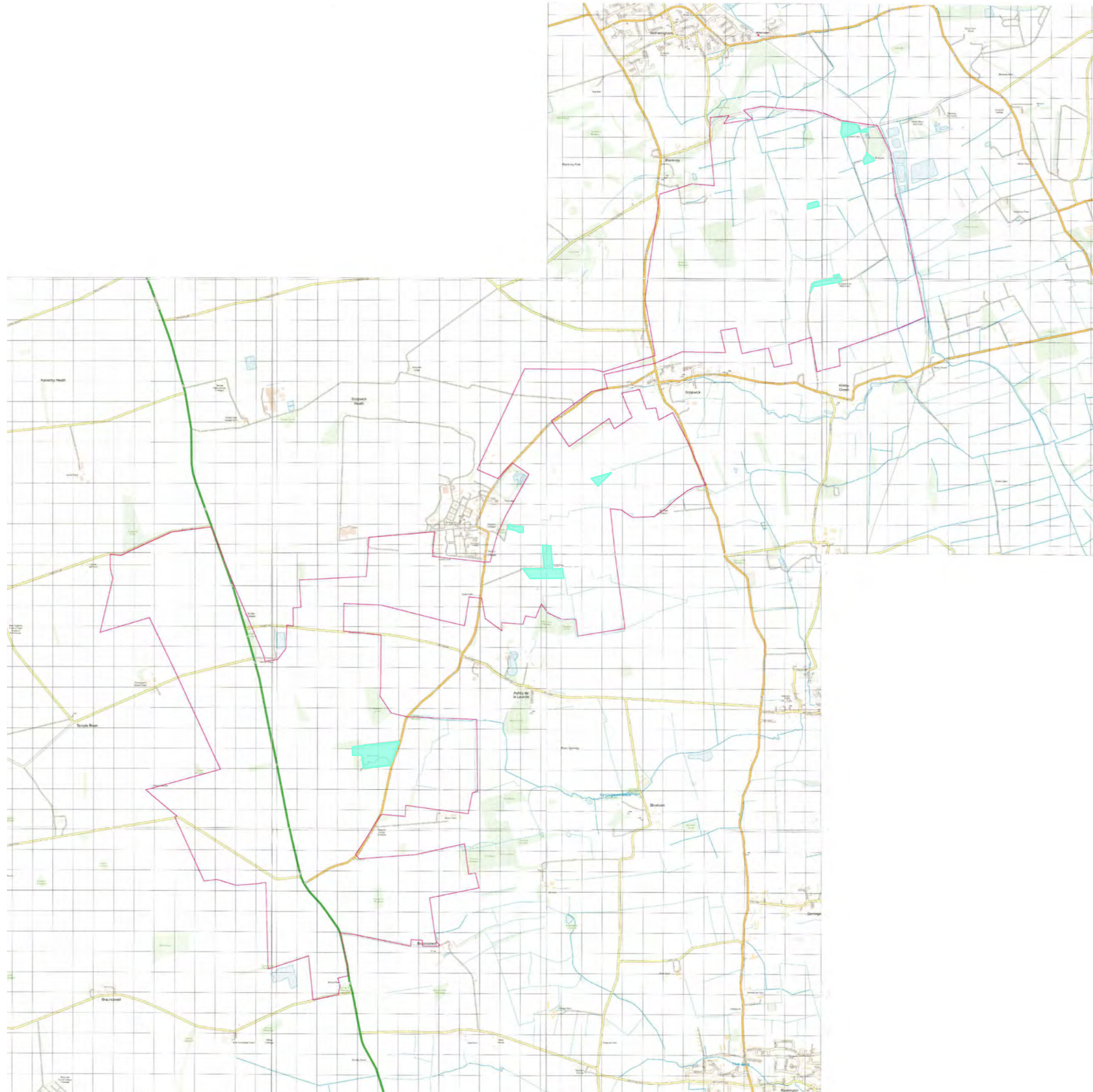
Project Name
Springwell Solar Farm

Description
Historical Map - 2000

Project ID	Drawing no.	Revision
1922604	12606	C01

File name
1922604-HH-126-SS-M-C-12606-C01

Dimensions	Scale	Size
m	1:40000	A3



LEGEND

- Site boundary
- Excluded Zones

Notes:

Base plan provided by Landmark Information Group

Rev	Date	Amendment	Drawn	Chkd	Appd
C01	25.11.22	First Issue	FP	LR	LR


18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT
Tel: +44(0)1442 437500

Client
Springwell Solar Farm Ltd

Project Name
Springwell Solar Farm

Description
Historical Map - 2022

Project ID	Drawing no.	Revision
1922604	12607	C01

File name
1922604-HH-126-SS-M-C-12607-C01

Dimensions	Scale	Size
m	1:40000	A3



APPENDIX D1 ENVIRONMENTAL DATABASE REPORT – ZONE A



Envirocheck[®] Report:

Datasheet

Order Details:

Order Number:

303381609_1_1

Customer Reference:

P02130089

National Grid Reference:

502200, 352660

Slice:

A

Site Area (Ha):

1774.17

Search Buffer (m):

1000

Site Details:

All Areas New

Client Details:

Mr B Winch
RSK Environment Ltd
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Report Section	Page Number
Summary	-
Agency & Hydrological	1
Waste	11
Hazardous Substances	-
Geological	13
Industrial Land Use	15
Sensitive Land Use	16
Data Currency	17
Data Suppliers	21
Useful Contacts	22

Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination. For this reason, Landmark's Site Sensitivity maps and Datasheet(s) place great emphasis on statutory data provided by the Environment Agency/Natural Resources Wales and the Scottish Environment Protection Agency; it also incorporates data from Natural England (and the Scottish and Welsh equivalents) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the Landmark database to a distance defined by the client from a site boundary provided by the client. In this datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

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Report Version v53.0

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
BGS Groundwater Flooding Susceptibility	pg 1	Yes	Yes	Yes	n/a
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 3				6
Prosecutions Relating to Controlled Waters			n/a	n/a	n/a
Enforcement and Prohibition Notices					
Integrated Pollution Controls					
Integrated Pollution Prevention And Control	pg 4				1
Local Authority Integrated Pollution Prevention And Control					
Local Authority Pollution Prevention and Controls	pg 4				3
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 5		Yes		
Pollution Incidents to Controlled Waters					
Prosecutions Relating to Authorised Processes					
Registered Radioactive Substances					
River Quality					
River Quality Biology Sampling Points					
Substantiated Pollution Incident Register					
River Quality Chemistry Sampling Points					
Water Abstractions	pg 5				(*1)
Water Industry Act Referrals					
Groundwater Vulnerability Map	pg 5	Yes	n/a	n/a	n/a
Groundwater Vulnerability - Soluble Rock Risk	pg 9	9	n/a	n/a	n/a
Bedrock Aquifer Designations	pg 9	Yes	n/a	n/a	n/a
Superficial Aquifer Designations	pg 9	Yes	n/a	n/a	n/a
Source Protection Zones	pg 10	1			
Extreme Flooding from Rivers or Sea without Defences				n/a	n/a
Flooding from Rivers or Sea without Defences				n/a	n/a
Areas Benefiting from Flood Defences				n/a	n/a
Flood Water Storage Areas				n/a	n/a
Flood Defences				n/a	n/a
OS Water Network Lines	pg 10				1

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Industrial Land Use					
Contemporary Trade Directory Entries	pg 15				1
Fuel Station Entries					
Gas Pipelines					
Underground Electrical Cables					
Sensitive Land Use					
Ancient Woodland					
Areas of Adopted Green Belt					
Areas of Unadopted Green Belt					
Areas of Outstanding Natural Beauty					
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves					
Marine Nature Reserves					
National Nature Reserves					
National Parks					
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones	pg 16	2			
Ramsar Sites					
Sites of Special Scientific Interest					
Special Areas of Conservation					
Special Protection Areas					
World Heritage Sites					

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	(E)	0	1	503500 352300
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A12SE (SE)	0	1	502800 352350
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A16NE (NE)	0	1	502650 353450
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	(NE)	0	1	502850 353950
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	(NE)	0	1	503200 354150
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	(NE)	0	1	503250 354150
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	(E)	0	1	503400 352500
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A16NW (NE)	0	1	502500 353350
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	(NE)	0	1	503000 354000
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	(E)	0	1	503100 352300
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	(SE)	0	1	503300 352150
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8NW (S)	0	1	502450 352050
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	(SE)	0	1	503250 352000
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	(E)	0	1	503250 352450
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	(E)	0	1	503500 352450
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A12SE (SE)	0	1	502850 352350
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A11NE (S)	0	1	502199 352663
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	(N)	0	1	502199 353750
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	(N)	0	1	502500 353800
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	(N)	0	1	502500 353850
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	(N)	0	1	502300 353850
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	(NE)	0	1	503050 354100

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	(NE)	0	1	503150 354100
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	(NE)	0	1	503200 354100
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	(N)	0	1	502300 353900
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A15NE (N)	0	1	501950 353600
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A16NE (NE)	0	1	502800 353600
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A8NE (SE)	24	1	502750 352050
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A12SE (SE)	68	1	502800 352400
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A8SE (SE)	99	1	502800 351600
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A8SE (SE)	116	1	502950 351850
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A12SW (E)	117	1	502600 352500
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A12SE (SE)	118	1	502750 352400
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A15NW (N)	122	1	501900 353600
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8NE (SE)	185	1	502900 352050
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8NE (SE)	193	1	502650 352150
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	(SE)	200	1	503000 352050
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A15NW (NW)	234	1	501800 353550
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8NW (S)	304	1	502400 352100
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8NE (SE)	310	1	502650 351950
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	(SE)	314	1	503000 351900
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A7SE (S)	339	1	502199 351900
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8SE (SE)	356	1	502750 351900
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8SE (SE)	385	1	502900 351850

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A8SW (SE)	402	1	502550 351850
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8SE (SE)	422	1	502700 351850
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8NW (S)	430	1	502400 351950
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A8SE (SE)	435	1	502750 351800
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A14NE (NW)	444	1	501550 353500
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8SE (SE)	468	1	502700 351800
1	Discharge Consents Operator: Mrs J Matthews Property Type: WWTW (NOT WATER CO) (NOT STP AT A PRIVATE PREMISES) Location: Brauncewell Hill Top Cottages, Brauncewell, Sleaford. Authority: Environment Agency, Anglian Region Catchment Area: Not Supplied Reference: Pr3lfu561 Permit Version: 1 Effective Date: 14th March 1972 Issued Date: 14th March 1972 Revocation Date: 1st October 1996 Discharge Type: Unknown Discharge: Onto Land Environment: Receiving Water: Land Status: Pre National Rivers Authority Legislation where issue date < 01/09/1989 Positional Accuracy: Located by supplier to within 100m	A4NE (SE)	632	2	502900 351500
1	Discharge Consents Operator: Mr D J George Property Type: WWTW (NOT WATER CO) (NOT STP AT A PRIVATE PREMISES) Location: Brauncewell Hill Top Cottages, Brauncewell, Sleaford. Authority: Environment Agency, Anglian Region Catchment Area: Not Supplied Reference: Pr3lfu5512 Permit Version: 1 Effective Date: 11th February 1966 Issued Date: 11th February 1966 Revocation Date: 30th May 1997 Discharge Type: Unknown Discharge: Onto Land Environment: Receiving Water: Land Status: Pre National Rivers Authority Legislation where issue date < 01/09/1989 Positional Accuracy: Located by supplier to within 100m	A4NE (SE)	632	2	502900 351500
2	Discharge Consents Operator: R T Mountain Farms Property Type: Arable Farming Location: Temple Farm Temple Bruer, Wellingore, Lincoln, Lincs, Ln5 0dp Authority: Environment Agency, Anglian Region Catchment Area: Catchment 29 Unknown Detail Reference: Gwnlf40489 Permit Version: 1 Effective Date: 1st April 1999 Issued Date: 20th July 2000 Revocation Date: Not Supplied Discharge Type: Trade Discharge - Agricultural And Surface Discharge: Onto Land Environment: Receiving Water: Groundwater Status: Deemed Groundwater Regulations Authorisation Positional Accuracy: Located by supplier to within 100m	A14NW (NW)	648	2	501200 353600

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
3	<p>Discharge Consents</p> <p>Operator: Ag Reserves Ltd Property Type: Arable Farming Location: Manor Farm Church End Wood, Walton, Huntingdon, Cambs, Pe17 5yz Authority: Environment Agency, Anglian Region Catchment Area: Catchment 29 Unknown Detail Reference: Gwnlf40713 Permit Version: 1 Effective Date: 1st April 1999 Issued Date: 19th July 2000 Revocation Date: Not Supplied Discharge Type: Trade Discharge - Agricultural And Surface Discharge: Onto Land Environment: Receiving Water: Groundwater Status: Deemed Groundwater Regulations Authorisation Positional Accuracy: Located by supplier to within 100m</p>	A8SW (S)	763	2	502500 351600
4	<p>Discharge Consents</p> <p>Operator: Hallsworth (Farmland Trust) Ltd Property Type: Domestic Property (Single) Location: New Homestead Farm Brauncewell, Sleaford., Lincs, Ng34 8rl Authority: Environment Agency, Anglian Region Catchment Area: Not Supplied Reference: Pr3lfu5511 Permit Version: 2 Effective Date: 14th December 2011 Issued Date: 14th December 2011 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Land/Soakaway Environment: Receiving Water: Land Status: Varied under EPR 2010 Positional Accuracy: Located by supplier to within 10m</p>	A4NW (S)	815	2	502553 351508
4	<p>Discharge Consents</p> <p>Operator: Hallsworth (Farmland Trust) Ltd Property Type: Domestic Property (Single) Location: New Homestead Farm Brauncewell, Sleaford., Lincs, Ng34 8rl Authority: Environment Agency, Anglian Region Catchment Area: Not Supplied Reference: Pr3lfu5511 Permit Version: 1 Effective Date: 11th February 1966 Issued Date: 11th February 1966 Revocation Date: 13th December 2011 Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Land/Soakaway Environment: Receiving Water: Land Status: Pre National Rivers Authority Legislation where issue date < 01/09/1989 Positional Accuracy: Located by supplier to within 10m</p>	A4NW (S)	815	2	502553 351508
5	<p>Integrated Pollution Prevention And Control</p> <p>Name: Brauncewell Quarries Location: Brauncewell, Sleaford, Lincolnshire, NG34 8RL Authority: Environment Agency, Anglian Region Permit Reference: YP3238LE Original Permit Ref: Yp3238le Effective Date: 31st March 2008 Status: Revoked Application Type: Application App. Sub Type: New Positional Accuracy: Automatically positioned to the address Activity Code: 5.2 A(1) (B) Activity Description: Waste Landfilling; Any Other Landfill To Which The 2002 Landfill Regulations Apply Primary Activity: Y Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N</p>	A8SE (SE)	555	2	502733 351713
6	<p>Local Authority Pollution Prevention and Controls</p> <p>Name: Brauncewell Quarries Ltd Location: Brauncewell, Ng34 7ef Authority: North Kesteven District Council, Environmental Health Department Permit Reference: IPPC/2004/7 Dated: 1st January 2005 Process Type: Local Authority Pollution Prevention and Control Description: PG3/8 Quarry processes including roadstone plants and the size reduction of bricks, tiles and concrete Status: Authorised Positional Accuracy: Manually positioned to the address or location</p>	A8SE (SE)	555	3	502733 351713

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
6	<p>Local Authority Pollution Prevention and Controls</p> <p>Name: Brauncewell Quarries Ltd Location: Brauncewell Quarry, Brauncewell, Sleaford, Lincolnshire, Ng34 8rl Authority: North Kesteven District Council, Environmental Health Department Permit Reference: Ag4700 Dated: 16th September 1992 Process Type: Local Authority Air Pollution Control Description: Processes registered under S. 9 of the Alkali Act 1906 and S. 5 of the Health & Safety at Work Act 1974 Status: Application Refused Or Cancelled Positional Accuracy: Manually positioned to the address or location</p>	A8SE (SE)	575	3	502735 351691
6	<p>Local Authority Pollution Prevention and Controls</p> <p>Name: Brauncewell Quarries Ltd Location: Brauncewell, LN5 0DH Authority: North Kesteven District Council, Environmental Health Department Permit Reference: Ippc/2004/7 Dated: Not Supplied Process Type: Local Authority Pollution Prevention and Control Description: PG3/8 Quarry processes including roadstone plants and the size reduction of bricks, tiles and concrete Status: Authorised Positional Accuracy: Manually positioned to the address or location</p>	A8SE (SE)	581	3	502722 351689
	Nearest Surface Water Feature	A8NE (SE)	27	-	502893 352195
	<p>Water Abstractions</p> <p>Operator: W. Banks Licence Number: 4/30/11/*g/079 Permit Version: Not Supplied Location: Brauncewell Grange Borehole, BRAUNCEWELL Authority: Environment Agency, Anglian Region Abstraction: Domestic & Agriculture Abstraction Type: Not Supplied Source: Well And Borehole Daily Rate (m3): 1 Yearly Rate (m3): 4550 Details: Central Lincolnshire Limestone; Status: Revoked Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m</p>	A6SW (SW)	1795	2	501100 351750
	<p>Groundwater Vulnerability Map</p> <p>Combined Classification: Secondary Bedrock Aquifer - High Vulnerability Combined Vulnerability: High Combined Aquifer: Productive Bedrock Aquifer, No Superficial Aquifer Pollutant Speed: Intermediate Bedrock Flow: Well Connected Fractures Dilution: <300 mm/year Baseflow Index: >70% Superficial Patchiness: <90% Superficial Thickness: <3m Superficial Recharge: No Data</p>	(SE)	0	4	503000 351754
	<p>Groundwater Vulnerability Map</p> <p>Combined Classification: Principle Bedrock Aquifer - High Vulnerability Combined Vulnerability: High Combined Aquifer: Productive Bedrock Aquifer, No Superficial Aquifer Pollutant Speed: High Bedrock Flow: Well Connected Fractures Dilution: <300 mm/year Baseflow Index: >70% Superficial Patchiness: <90% Superficial Thickness: <3m Superficial Recharge: No Data</p>	A11NE (S)	0	4	502199 352663

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	<p>Groundwater Vulnerability Map</p> <p>Combined Principle Bedrock Aquifer - High Vulnerability Classification: High Combined Vulnerability: High Combined Aquifer: Productive Bedrock Aquifer, No Superficial Aquifer Pollutant Speed: High Bedrock Flow: Well Connected Fractures Dilution: <300 mm/year Baseflow Index: >70% Superficial <90% Patchiness: <3m Superficial Thickness: No Data Superficial Recharge:</p>	(E)	0	4	503000 352663
	<p>Groundwater Vulnerability Map</p> <p>Combined Principle Bedrock Aquifer - High Vulnerability Classification: High Combined Vulnerability: High Combined Aquifer: Productive Bedrock Aquifer, No Superficial Aquifer Pollutant Speed: High Bedrock Flow: Well Connected Fractures Dilution: <300 mm/year Baseflow Index: >70% Superficial <90% Patchiness: <3m Superficial Thickness: No Data Superficial Recharge:</p>	(SE)	0	4	503000 352073
	<p>Groundwater Vulnerability Map</p> <p>Combined Principle Bedrock Aquifer - High Vulnerability Classification: High Combined Vulnerability: High Combined Aquifer: Productive Bedrock Aquifer, No Superficial Aquifer Pollutant Speed: High Bedrock Flow: Well Connected Fractures Dilution: <300 mm/year Baseflow Index: >70% Superficial <90% Patchiness: <3m Superficial Thickness: No Data Superficial Recharge:</p>	(N)	0	4	502000 354000
	<p>Groundwater Vulnerability Map</p> <p>Combined Principle Bedrock Aquifer - High Vulnerability Classification: High Combined Vulnerability: High Combined Aquifer: Productive Bedrock Aquifer, No Superficial Aquifer Pollutant Speed: High Bedrock Flow: Well Connected Fractures Dilution: <300 mm/year Baseflow Index: >70% Superficial <90% Patchiness: <3m Superficial Thickness: No Data Superficial Recharge:</p>	(N)	0	4	502199 354000

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	<p>Groundwater Vulnerability Map</p> <p>Combined Classification: Principle Bedrock Aquifer - High Vulnerability</p> <p>Combined Vulnerability: High</p> <p>Combined Aquifer: Productive Bedrock Aquifer, No Superficial Aquifer</p> <p>Pollutant Speed: High</p> <p>Bedrock Flow: Well Connected Fractures</p> <p>Dilution: <300 mm/year</p> <p>Baseflow Index: >70%</p> <p>Superficial Patchiness: <90%</p> <p>Superficial Thickness: <3m</p> <p>Superficial Recharge: No Data</p>	(NE)	0	4	503000 354000
	<p>Groundwater Vulnerability Map</p> <p>Combined Classification: Secondary Superficial Aquifer - High Vulnerability</p> <p>Combined Vulnerability: High</p> <p>Combined Aquifer: Productive Bedrock Aquifer, Productive Superficial Aquifer</p> <p>Pollutant Speed: High</p> <p>Bedrock Flow: Well Connected Fractures</p> <p>Dilution: <300 mm/year</p> <p>Baseflow Index: >70%</p> <p>Superficial Patchiness: <90%</p> <p>Superficial Thickness: <3m</p> <p>Superficial Recharge: No Data</p>	A15NE (N)	0	4	502084 353489
	<p>Groundwater Vulnerability Map</p> <p>Combined Classification: Secondary Superficial Aquifer - High Vulnerability</p> <p>Combined Vulnerability: High</p> <p>Combined Aquifer: Productive Bedrock Aquifer, Productive Superficial Aquifer</p> <p>Pollutant Speed: High</p> <p>Bedrock Flow: Well Connected Fractures</p> <p>Dilution: <300 mm/year</p> <p>Baseflow Index: >70%</p> <p>Superficial Patchiness: <90%</p> <p>Superficial Thickness: <3m</p> <p>Superficial Recharge: No Data</p>	(N)	0	4	502000 353687
	<p>Groundwater Vulnerability Map</p> <p>Combined Classification: Secondary Superficial Aquifer - High Vulnerability</p> <p>Combined Vulnerability: High</p> <p>Combined Aquifer: Productive Bedrock Aquifer, Productive Superficial Aquifer</p> <p>Pollutant Speed: High</p> <p>Bedrock Flow: Well Connected Fractures</p> <p>Dilution: <300 mm/year</p> <p>Baseflow Index: >70%</p> <p>Superficial Patchiness: <90%</p> <p>Superficial Thickness: <3m</p> <p>Superficial Recharge: No Data</p>	(SE)	0	4	503000 352210

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	<p>Groundwater Vulnerability Map</p> <p>Combined Classification: Secondary Superficial Aquifer - High Vulnerability</p> <p>Combined Vulnerability: High</p> <p>Combined Aquifer: Productive Bedrock Aquifer, Productive Superficial Aquifer</p> <p>Pollutant Speed: High</p> <p>Bedrock Flow: Well Connected Fractures</p> <p>Dilution: <300 mm/year</p> <p>Baseflow Index: >70%</p> <p>Superficial Patchiness: <90%</p> <p>Superficial Thickness: <3m</p> <p>Superficial Recharge: No Data</p>	(E)	0	4	503276 352267
	<p>Groundwater Vulnerability Map</p> <p>Combined Classification: Secondary Superficial Aquifer - High Vulnerability</p> <p>Combined Vulnerability: High</p> <p>Combined Aquifer: Productive Bedrock Aquifer, Productive Superficial Aquifer</p> <p>Pollutant Speed: High</p> <p>Bedrock Flow: Well Connected Fractures</p> <p>Dilution: <300 mm/year</p> <p>Baseflow Index: >70%</p> <p>Superficial Patchiness: <90%</p> <p>Superficial Thickness: <3m</p> <p>Superficial Recharge: No Data</p>	A11NE (SW)	0	4	502174 352608
	<p>Groundwater Vulnerability Map</p> <p>Combined Classification: Principle Bedrock Aquifer - High Vulnerability</p> <p>Combined Vulnerability: High</p> <p>Combined Aquifer: Productive Bedrock Aquifer, No Superficial Aquifer</p> <p>Pollutant Speed: Intermediate</p> <p>Bedrock Flow: Well Connected Fractures</p> <p>Dilution: <300 mm/year</p> <p>Baseflow Index: >70%</p> <p>Superficial Patchiness: <90%</p> <p>Superficial Thickness: <3m</p> <p>Superficial Recharge: No Data</p>	(SE)	0	4	503000 352000
	<p>Groundwater Vulnerability Map</p> <p>Combined Classification: Principle Bedrock Aquifer - High Vulnerability</p> <p>Combined Vulnerability: High</p> <p>Combined Aquifer: Productive Bedrock Aquifer, No Superficial Aquifer</p> <p>Pollutant Speed: High</p> <p>Bedrock Flow: Well Connected Fractures</p> <p>Dilution: <300 mm/year</p> <p>Baseflow Index: >70%</p> <p>Superficial Patchiness: <90%</p> <p>Superficial Thickness: <3m</p> <p>Superficial Recharge: No Data</p>	(N)	0	4	501813 353623

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Groundwater Vulnerability Map Combined Classification: Principle Bedrock Aquifer - High Vulnerability Combined Vulnerability: High Combined Aquifer: Productive Bedrock Aquifer, No Superficial Aquifer Pollutant Speed: High Bedrock Flow: Well Connected Fractures Dilution: <300 mm/year Baseflow Index: >70% Superficial Patchiness: <90% Superficial Thickness: <3m Superficial Recharge: No Data	A15SE (N)	0	4	502199 353000
	Groundwater Vulnerability Map Combined Classification: Principle Bedrock Aquifer - High Vulnerability Combined Vulnerability: High Combined Aquifer: Productive Bedrock Aquifer, No Superficial Aquifer Pollutant Speed: High Bedrock Flow: Well Connected Fractures Dilution: <300 mm/year Baseflow Index: >70% Superficial Patchiness: <90% Superficial Thickness: <3m Superficial Recharge: No Data	(NE)	0	4	503000 353000
	Groundwater Vulnerability - Soluble Rock Risk Classification: Very Significant Risk - Moderate Possibility	(SE)	0	4	503000 352000
	Groundwater Vulnerability - Soluble Rock Risk Classification: Significant Risk - Low Possibility	A11NE (S)	0	4	502199 352663
	Groundwater Vulnerability - Soluble Rock Risk Classification: Very Significant Risk - Moderate Possibility	(E)	0	4	503000 352663
	Groundwater Vulnerability - Soluble Rock Risk Classification: Significant Risk - Low Possibility	A15SE (NW)	0	4	502000 353000
	Groundwater Vulnerability - Soluble Rock Risk Classification: Significant Risk - Low Possibility	A15SE (N)	0	4	502199 353000
	Groundwater Vulnerability - Soluble Rock Risk Classification: Significant Risk - Low Possibility	(NE)	0	4	503000 353000
	Groundwater Vulnerability - Soluble Rock Risk Classification: Significant Risk - Low Possibility	(N)	0	4	502000 354000
	Groundwater Vulnerability - Soluble Rock Risk Classification: Significant Risk - Low Possibility	(N)	0	4	502199 354000
	Groundwater Vulnerability - Soluble Rock Risk Classification: Very Significant Risk - Moderate Possibility	(NE)	0	4	503000 354000
	Bedrock Aquifer Designations Aquifer Designation: Secondary Aquifer - B	A8SE (SE)	0	4	502818 351693
	Bedrock Aquifer Designations Aquifer Designation: Principal Aquifer	A11NE (S)	0	4	502199 352663
	Bedrock Aquifer Designations Aquifer Designation: Principal Aquifer	A8SE (SE)	0	4	502848 351605
	Superficial Aquifer Designations Aquifer Designation: Secondary Aquifer - A	(E)	0	4	503276 352267

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Superficial Aquifer Designations Aquifer Designation: Secondary Aquifer - Undifferentiated	A15NE (N)	0	4	502084 353489
	Superficial Aquifer Designations Aquifer Designation: Secondary Aquifer - Undifferentiated	A15NW (N)	0	4	501873 353602
	Superficial Aquifer Designations Aquifer Designation: Secondary Aquifer - Undifferentiated	A11NE (SW)	0	4	502174 352608
7	Source Protection Zones Name: Not Supplied Source: Environment Agency, Head Office Reference: Not Supplied Type: Zone III (Total Catchment): The total area needed to support the discharge from the protected groundwater source.	A11NE (S)	0	2	502199 352663
	Extreme Flooding from Rivers or Sea without Defences None				
	Flooding from Rivers or Sea without Defences None				
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				
8	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 947.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Witham Primacy: 1	A4NW (S)	780	5	502611 351360

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
9	<p>Licensed Waste Management Facilities (Landfill Boundaries)</p> <p>Name: Brauncewell Quarry Licence Number: 73008 Location: Brauncewell Quarry, Brauncewell, Sleaford, Lincolnshire, NG34 8RL Licence Holder: Brauncewell Quarries Ltd Authority: Environment Agency - Anglian Region, Northern Area Site Category: Landfills Taking Non-biodegradable Wastes (Not Construction) Max Input Rate: Not Supplied Licence Status: Modified Issued: 12th April 2001 Positional Accuracy: Positioned by the supplier Boundary Accuracy: As Supplied</p>	A8NE (SE)	9	2	502631 352151
10	<p>Licensed Waste Management Facilities (Landfill Boundaries)</p> <p>Name: Brauncewell Quarry Landfill Licence Number: 73320 Location: Brauncewell Quarry, Brauncewell, Sleaford, Lincolnshire, NG34 8RL Licence Holder: Brauncewell Quarries Ltd Authority: Environment Agency - Anglian Region, Northern Area Site Category: Landfills Taking Non-biodegradable Wastes (Not Construction) Max Input Rate: Not Supplied Licence Status: Inactive Issued: 19th March 2007 Positional Accuracy: Positioned by the supplier Boundary Accuracy: As Supplied</p>	A8SE (SE)	194	2	502741 351833
11	<p>Licensed Waste Management Facilities (Landfill Boundaries)</p> <p>Name: Brauncewell Quarry Landfill Licence Number: 73320 Location: Brauncewell Quarry, Brauncewell, Sleaford, Lincolnshire, NG34 8RL Licence Holder: Brauncewell Quarries Ltd Authority: Environment Agency - Anglian Region, Northern Area Site Category: Landfills Taking Non-biodegradable Wastes (Not Construction) Max Input Rate: Not Supplied Licence Status: Expired Issued: 19th March 2007 Positional Accuracy: Positioned by the supplier Boundary Accuracy: As Supplied</p>	A8SE (SE)	194	2	502741 351833
12	<p>Licensed Waste Management Facilities (Landfill Boundaries)</p> <p>Name: Brauncewell Quarry Licence Number: 70905 Location: Brauncewell Quarries Ltd, Brauncewell, Sleaford, Lincolnshire, NG34 8RL Licence Holder: Brauncewell Quarries Ltd Authority: Environment Agency - Anglian Region, Northern Area Site Category: Landfills Taking Non-biodegradable Wastes (Not Construction) Max Input Rate: Not Supplied Licence Status: Inactive Issued: 28th July 1986 Positional Accuracy: Positioned by the supplier Boundary Accuracy: As Supplied</p>	A8SE (SE)	354	2	502657 351861
13	<p>Licensed Waste Management Facilities (Landfill Boundaries)</p> <p>Name: Brauncewell Quarry Licence Number: 70905 Location: Brauncewell Quarries Ltd, Brauncewell, Sleaford, Lincolnshire, NG34 8RL Licence Holder: Brauncewell Quarries Ltd Authority: Environment Agency - Anglian Region, Northern Area Site Category: Landfills Taking Non-biodegradable Wastes (Not Construction) Max Input Rate: Not Supplied Licence Status: Expired Issued: 28th July 1986 Positional Accuracy: Positioned by the supplier Boundary Accuracy: As Supplied</p>	A8SE (SE)	354	2	502657 351861
14	<p>Licensed Waste Management Facilities (Locations)</p> <p>Licence Number: 101884 Location: Brauncewell Quarry, Brauncewell, Sleaford, Lincolnshire, NG34 8RL Operator Name: Brauncewell Quarries Ltd Operator Location: Not Supplied Authority: Environment Agency - Anglian Region, Northern Area Site Category: Inert & excavation Waste TS + treatment Licence Status: Modified Issued: 30th January 2012 Last Modified: 9th July 2021 Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m</p>	A8SE (SE)	468	2	502731 351808

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Local Authority Landfill Coverage Name: North Kesteven District Council - Had landfill data but passed it to the relevant environment agency		0	3	502199 352663
	Local Authority Landfill Coverage Name: Lincolnshire County Council - Had landfill data but passed it to the relevant environment agency		0	6	502199 352663
15	Registered Landfill Sites Licence Holder: Braucewell Quarries Ltd Licence Reference: EAWML73008 Site Location: Braucewell Quarry, Braucewell, SLEAFORD, Lincolnshire, NG34 8RL Licence Easting: 502900 Licence Northing: 351900 Operator Location: Braucewell Quarry, Braucewell, SLEAFORD, Lincolnshire, NG34 8RL Authority: Environment Agency - Anglian Region, Northern Area Site Category: Landfill Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year) Waste Source: No known restriction on source of waste Restrictions: Status: Operational as far as is known Dated: 12th April 2001 Preceded By: L 51 Licence: Superseded By: Not Given Licence: Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Inert Materials (As In Post'98 E.A.Lics And Equivalent To 21.00.00) Maximum Waste Permitted By Licence Prohibited Waste: Material With Any Haz.Code (H1, H2, H3a,H3b,H4,H5,H6,H7,H8,H9,H10,H11,H12,H13,H14) Other Waste / Waste Not Otherwise Specified	A8SE (SE)	335	2	502900 351900
15	Registered Landfill Sites Licence Holder: Braucewell Quarries Ltd Licence Reference: L 51 Site Location: Braucewell Quarry, Braucewell, SLEAFORD, Lincolnshire, NG34 8RL Licence Easting: 502900 Licence Northing: 351900 Operator Location: As Site Address Authority: Environment Agency - Anglian Region, Northern Area Site Category: Landfill Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year) Waste Source: No known restriction on source of waste Restrictions: Status: Site Closed Dated: 28th July 1986 Preceded By: Not Given Licence: Superseded By: EAWML73008 Licence: Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Lincs Cat.A Inert Waste Max.Waste Permitted By Licence Prohibited Waste: Liquid/Sludge Wastes Mat'L Likely To Become Windblown Waste N.O.S.	A8SE (SE)	335	2	502900 351900

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Inferior Oolite Group	A11NE (S)	0	1	502199 352663
	BGS 1:625,000 Solid Geology Description: Great Oolite Group	(SE)	0	1	502989 351751
16	BGS Recorded Mineral Sites Site Name: Braucewell Stone Pit Location: Braucewell, Cranwell, Sleaford, Lincolnshire Source: British Geological Survey, National Geoscience Information Service Reference: 136080 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Jurassic Geology: Upper Lincolnshire Limestone Member Commodity: Limestone Positional Accuracy: Located by supplier to within 10m	A8SE (SE)	543	1	502814 351703
17	BGS Recorded Mineral Sites Site Name: Braucewell Stone Pit Location: Braucewell, Cranwell, Sleaford, Lincolnshire Source: British Geological Survey, National Geoscience Information Service Reference: 136079 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Jurassic Geology: Upper Lincolnshire Limestone Member Commodity: Limestone Positional Accuracy: Located by supplier to within 10m	A8SE (SE)	565	1	502707 351713
18	BGS Recorded Mineral Sites Site Name: Temple Farm Stone Pit Location: Temple Bruer, Welbourn, Lincoln, Lincolnshire Source: British Geological Survey, National Geoscience Information Service Reference: 134924 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Jurassic Geology: Lower Lincolnshire Limestone Member Commodity: Limestone Positional Accuracy: Located by supplier to within 10m	A14NW (NW)	755	1	501085 353577
	Coal Mining Affected Areas In an area that might not be affected by coal mining				
	Non Coal Mining Areas of Great Britain No Hazard				
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A11NE (S)	0	1	502199 352663
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A11NE (S)	0	1	502199 352663
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A8SE (SE)	0	1	502818 351693
	Potential for Ground Dissolution Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	(N)	0	1	501781 353681
	Potential for Ground Dissolution Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A15NW (N)	0	1	501873 353602
	Potential for Ground Dissolution Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A11NE (S)	0	1	502199 352663
	Potential for Ground Dissolution Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A15NW (NW)	0	1	501819 353557

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Potential for Ground Dissolution Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A8NE (SE)	0	1	502868 351966
	Potential for Ground Dissolution Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A8SE (SE)	116	1	502848 351605
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A15NW (NW)	118	1	501715 353537
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A11NE (S)	0	1	502199 352663
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A11NE (S)	0	1	502199 352663
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A11NE (SW)	0	1	502174 352608
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A15NW (N)	0	1	501873 353602
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A15NE (N)	0	1	502084 353489
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A11NE (S)	0	1	502199 352663
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A11NE (SW)	0	1	502174 352608
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A15NE (N)	0	1	502084 353489
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A15NW (N)	0	1	501873 353602
	Radon Potential - Radon Affected Areas Affected Area: The property is in an Intermediate probability radon area (5 to 10% of homes are estimated to be at or above the Action Level). Source: British Geological Survey, National Geoscience Information Service	A15NE (N)	0	1	502150 353426
	Radon Potential - Radon Affected Areas Affected Area: The property is in an Intermediate probability radon area (5 to 10% of homes are estimated to be at or above the Action Level). Source: British Geological Survey, National Geoscience Information Service	A11NE (S)	0	1	502199 352663
	Radon Potential - Radon Affected Areas Affected Area: The property is in a Lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level). Source: British Geological Survey, National Geoscience Information Service	A11NE (N)	0	1	502199 352676
	Radon Potential - Radon Protection Measures Protection Measure: Basic radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A15NE (N)	0	1	502150 353426
	Radon Potential - Radon Protection Measures Protection Measure: Basic radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A11NE (S)	0	1	502199 352663
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A11NE (N)	0	1	502199 352676

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
19	<p>Contemporary Trade Directory Entries</p> <p>Name: Brauncewell Quarries Ltd Location: Brauncewell, Sleaford, NG34 8RL Classification: Quarries Status: Active Positional Accuracy: Automatically positioned to the address</p>	A8SE (SE)	555	-	502732 351713

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
20	Nitrate Vulnerable Zones Name: Lower Witham Nvz Description: Surface Water Source: Environment Agency, Head Office	A11NE (S)	0	4	502199 352663
21	Nitrate Vulnerable Zones Name: Lincolnshire Limestone Description: Groundwater Source: Environment Agency, Head Office	A11NE (S)	0	4	502199 352663

Agency & Hydrological	Version	Update Cycle
Contaminated Land Register Entries and Notices South Kesteven District Council - Environmental Health Environment Agency - Head Office North Kesteven District Council - Environmental Health Department	April 2015 June 2020 October 2017	Annual Rolling Update Annually Annual Rolling Update
Discharge Consents Environment Agency - Anglian Region	October 2022	Quarterly
Enforcement and Prohibition Notices Environment Agency - Anglian Region	March 2013	
Integrated Pollution Controls Environment Agency - Anglian Region	January 2009	
Integrated Pollution Prevention And Control Environment Agency - Anglian Region	July 2022	Quarterly
Local Authority Integrated Pollution Prevention And Control South Kesteven District Council - Environmental Health North Kesteven District Council - Environmental Health Department	April 2014 May 2014	Variable Variable
Local Authority Pollution Prevention and Controls South Kesteven District Council - Environmental Health North Kesteven District Council - Environmental Health Department	April 2014 May 2014	Annual Rolling Update Annual Rolling Update
Local Authority Pollution Prevention and Control Enforcements South Kesteven District Council - Environmental Health North Kesteven District Council - Environmental Health Department	April 2014 May 2014	Variable Variable
Nearest Surface Water Feature Ordnance Survey	August 2022	
Pollution Incidents to Controlled Waters Environment Agency - Anglian Region	September 1999	
Prosecutions Relating to Authorised Processes Environment Agency - Anglian Region	July 2015	
Prosecutions Relating to Controlled Waters Environment Agency - Anglian Region	March 2013	
Registered Radioactive Substances Environment Agency - Anglian Region	June 2016	As notified
River Quality Environment Agency - Head Office	November 2001	Not Applicable
River Quality Biology Sampling Points Environment Agency - Head Office	April 2012	
River Quality Chemistry Sampling Points Environment Agency - Head Office	April 2012	
Substantiated Pollution Incident Register Environment Agency - Anglian Region - Northern Area	July 2022	Quarterly
Water Abstractions Environment Agency - Anglian Region	October 2022	Quarterly
Water Industry Act Referrals Environment Agency - Anglian Region	October 2017	
Groundwater Vulnerability Map Environment Agency - Head Office	June 2018	As notified
Groundwater Vulnerability - Soluble Rock Risk Environment Agency - Head Office	June 2018	As notified
Bedrock Aquifer Designations Environment Agency - Head Office	January 2018	Annually
Superficial Aquifer Designations Environment Agency - Head Office	January 2018	Annually

Agency & Hydrological	Version	Update Cycle
Source Protection Zones Environment Agency - Head Office	September 2022	Bi-Annually
Extreme Flooding from Rivers or Sea without Defences Environment Agency - Head Office	August 2022	Quarterly
Flooding from Rivers or Sea without Defences Environment Agency - Head Office	August 2022	Quarterly
Areas Benefiting from Flood Defences Environment Agency - Head Office	August 2022	Quarterly
Flood Water Storage Areas Environment Agency - Head Office	August 2022	Quarterly
Flood Defences Environment Agency - Head Office	August 2022	Quarterly
OS Water Network Lines Ordnance Survey	July 2022	Quarterly
BGS Groundwater Flooding Susceptibility British Geological Survey - National Geoscience Information Service	May 2013	As notified
Waste	Version	Update Cycle
BGS Recorded Landfill Sites British Geological Survey - National Geoscience Information Service	November 2002	As notified
Historical Landfill Sites Environment Agency - Head Office	April 2022	Quarterly
Integrated Pollution Control Registered Waste Sites Environment Agency - Anglian Region	January 2009	Not Applicable
Licensed Waste Management Facilities (Landfill Boundaries) Environment Agency - Anglian Region - Northern Area	October 2022	Quarterly
Licensed Waste Management Facilities (Locations) Environment Agency - Anglian Region - Northern Area	July 2022	Quarterly
Local Authority Landfill Coverage Lincolnshire County Council North Kesteven District Council - Environmental Health Department South Kesteven District Council - Environmental Health	February 2003 February 2003 February 2003	Not Applicable Not Applicable Not Applicable
Local Authority Recorded Landfill Sites Lincolnshire County Council North Kesteven District Council - Environmental Health Department South Kesteven District Council - Environmental Health	October 2018 October 2018 October 2018	
Registered Landfill Sites Environment Agency - Anglian Region - Northern Area	March 2006	Not Applicable
Registered Waste Transfer Sites Environment Agency - Anglian Region - Northern Area	April 2018	
Registered Waste Treatment or Disposal Sites Environment Agency - Anglian Region - Northern Area	June 2015	

Hazardous Substances	Version	Update Cycle
Control of Major Accident Hazards Sites (COMAH) Health and Safety Executive	January 2022	Bi-Annually
Explosive Sites Health and Safety Executive	March 2017	Annually
Notification of Installations Handling Hazardous Substances (NIHHS) Health and Safety Executive	August 2001	
Planning Hazardous Substance Enforcements Lincolnshire County Council - Highways and Planning Department South Kesteven District Council North Kesteven District Council - Planning Department	August 2010 February 2016 October 2015	Variable Variable Variable
Planning Hazardous Substance Consents Lincolnshire County Council - Highways and Planning Department South Kesteven District Council North Kesteven District Council - Planning Department	August 2007 February 2016 October 2015	Variable Variable Variable
Geological	Version	Update Cycle
BGS 1:625,000 Solid Geology British Geological Survey - National Geoscience Information Service	January 2009	As notified
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	May 2022	Bi-Annually
CBSCB Compensation District Cheshire Brine Subsidence Compensation Board (CBSCB) Cheshire Brine Subsidence Compensation Board (CBSCB)	August 2011 November 2020	As notified
Coal Mining Affected Areas The Coal Authority - Property Searches	March 2014	Annual Rolling Update
Mining Instability Ove Arup & Partners	June 1998	Not Applicable
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	May 2015	Not Applicable
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	April 2020	As notified
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Radon Potential - Radon Affected Areas British Geological Survey - National Geoscience Information Service	July 2011	Annually
Radon Potential - Radon Protection Measures British Geological Survey - National Geoscience Information Service	July 2011	Annually

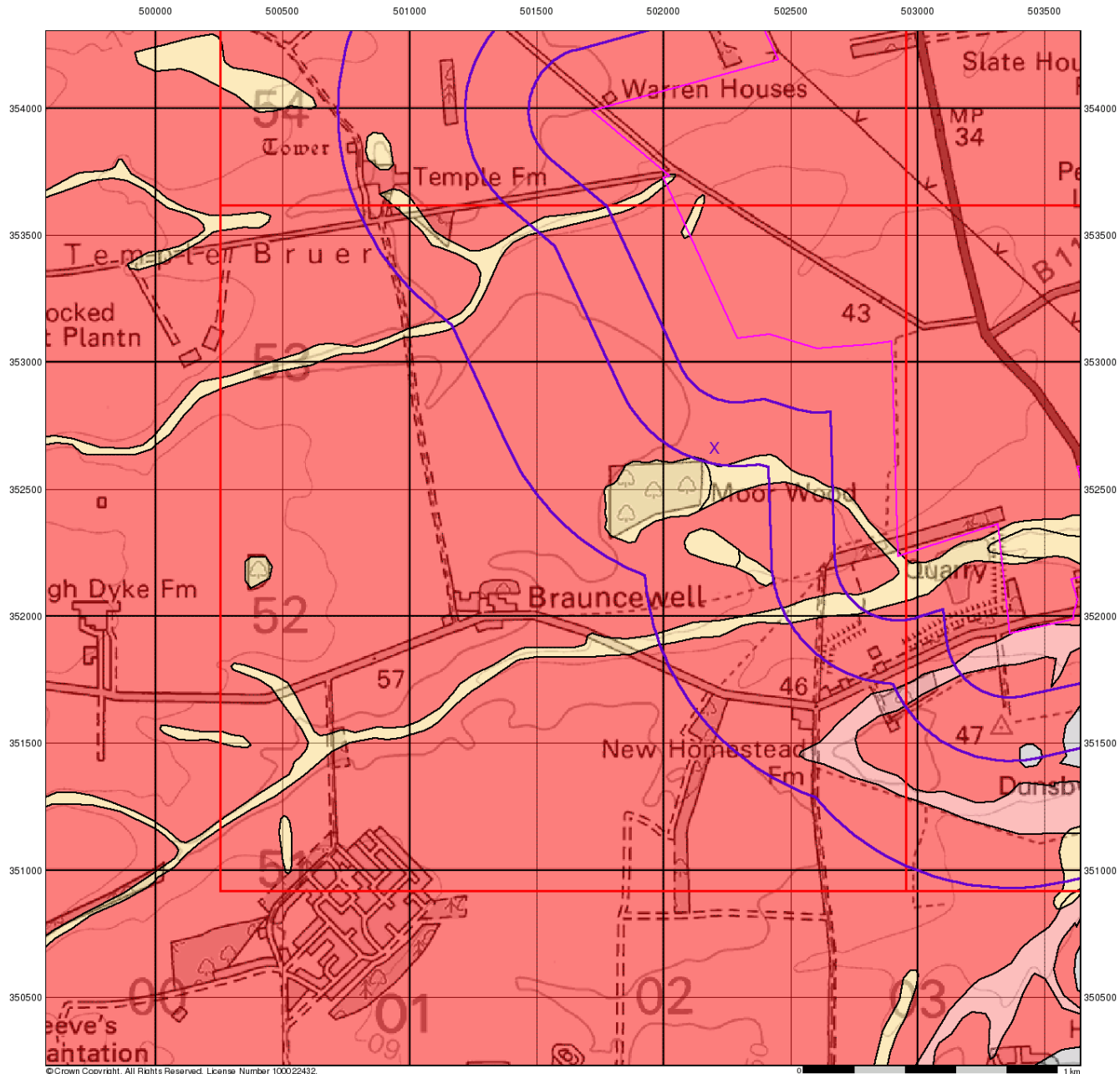
Industrial Land Use	Version	Update Cycle
Contemporary Trade Directory Entries Thomson Directories	October 2022	Quarterly
Fuel Station Entries Catalist Ltd - Experian	August 2022	Quarterly
Gas Pipelines National Grid	October 2021	Bi-Annually
Underground Electrical Cables National Grid	May 2021	Bi-Annually
Sensitive Land Use	Version	Update Cycle
Ancient Woodland Natural England	February 2021	Bi-Annually
Areas of Adopted Green Belt North Kesteven District Council South Kesteven District Council	July 2022 July 2022	Quarterly Quarterly
Areas of Unadopted Green Belt North Kesteven District Council South Kesteven District Council	July 2022 July 2022	Quarterly Quarterly
Areas of Outstanding Natural Beauty Natural England	August 2022	Bi-Annually
Environmentally Sensitive Areas Natural England	January 2017	
Forest Parks Forestry Commission	April 1997	Not Applicable
Local Nature Reserves Natural England	February 2021	Bi-Annually
Marine Nature Reserves Natural England	July 2019	Bi-Annually
National Nature Reserves Natural England	January 2021	Bi-Annually
National Parks Natural England	February 2018	Bi-Annually
Nitrate Sensitive Areas Natural England	April 2016	Not Applicable
Nitrate Vulnerable Zones Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA) Environment Agency - Head Office	April 2016 June 2017	Bi-Annually
Ramsar Sites Natural England	August 2020	Bi-Annually
Sites of Special Scientific Interest Natural England	February 2021	Bi-Annually
Special Areas of Conservation Natural England	July 2020	Bi-Annually
Special Protection Areas Natural England	February 2021	Bi-Annually

A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	
Environment Agency	
Scottish Environment Protection Agency	
The Coal Authority	
British Geological Survey	 British Geological Survey <small>NATURAL ENVIRONMENT RESEARCH COUNCIL</small>
Centre for Ecology and Hydrology	 Centre for Ecology & Hydrology <small>NATURAL ENVIRONMENT RESEARCH COUNCIL</small>
Natural Resources Wales	
Scottish Natural Heritage	
Natural England	
Public Health England	
Ove Arup	
Stantec UK Ltd	

Contact	Name and Address	Contact Details
1	British Geological Survey - Enquiry Service British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
2	Environment Agency - National Customer Contact Centre (NCCC) PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 03708 506 506 Email: enquiries@environment-agency.gov.uk
3	North Kesteven District Council - Environmental Health Department District Council Offices, Kesteven Street, Sleaford, Lincolnshire, NG34 7EF	Telephone: 01529 414155 Fax: 01529 413956 Website: www.n-kesteven.gov.uk
4	Environment Agency - Head Office Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, Avon, BS32 4UD	Telephone: 01454 624400 Fax: 01454 624409
5	Ordnance Survey Adanac Drive, Southampton, Hampshire, SO16 0AS	Telephone: 03456 05 05 05 Email: customerservices@ordnancesurvey.co.uk Website: www.ordnancesurvey.gov.uk
6	Lincolnshire County Council 4th Floor, City Hall, Lincoln, Lincolnshire, LN1 1DN	Telephone: 01522 552222 Fax: 01522 552288 Email: PublicRelations@lincolnshire.gov.uk Website: www.lincolnshire.gov.uk
7	Natural England County Hall, Spetchley Road, Worcester, WR5 2NP	Telephone: 0300 060 3900 Email: enquiries@naturalengland.org.uk Website: www.naturalengland.org.uk
-	Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards Chilton, Didcot, Oxfordshire, OX11 0RQ	Telephone: 01235 822622 Fax: 01235 833891 Email: radon@phe.gov.uk Website: www.ukradon.org
-	Landmark Information Group Limited Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk

Please note that the Environment Agency / Natural Resources Wales / SEPA have a charging policy in place for enquiries.



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Groundwater Vulnerability

General

- ◇ Specified Site
- ◇ Specified Buffer(s)
- X Bearing Reference Point
- Slice
- Map ID

Agency and Hydrological

Bedrock Aquifers

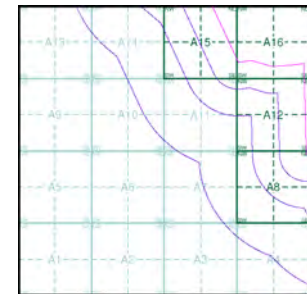
- High Vulnerability, Principal Aquifer
- High Vulnerability, Secondary Aquifer
- Medium Vulnerability, Principal Aquifer
- Medium Vulnerability, Secondary Aquifer
- Low Vulnerability, Principal Aquifer
- Low Vulnerability, Secondary Aquifer

Superficial Aquifers

- High Vulnerability, Principal Aquifer
- High Vulnerability, Secondary Aquifer
- Medium Vulnerability, Principal Aquifer
- Medium Vulnerability, Secondary Aquifer
- Low Vulnerability, Principal Aquifer
- Low Vulnerability, Secondary Aquifer

- Unproductive Aquifer
- Soluble Rock

Site Sensitivity Context Map - Slice A



Order Details

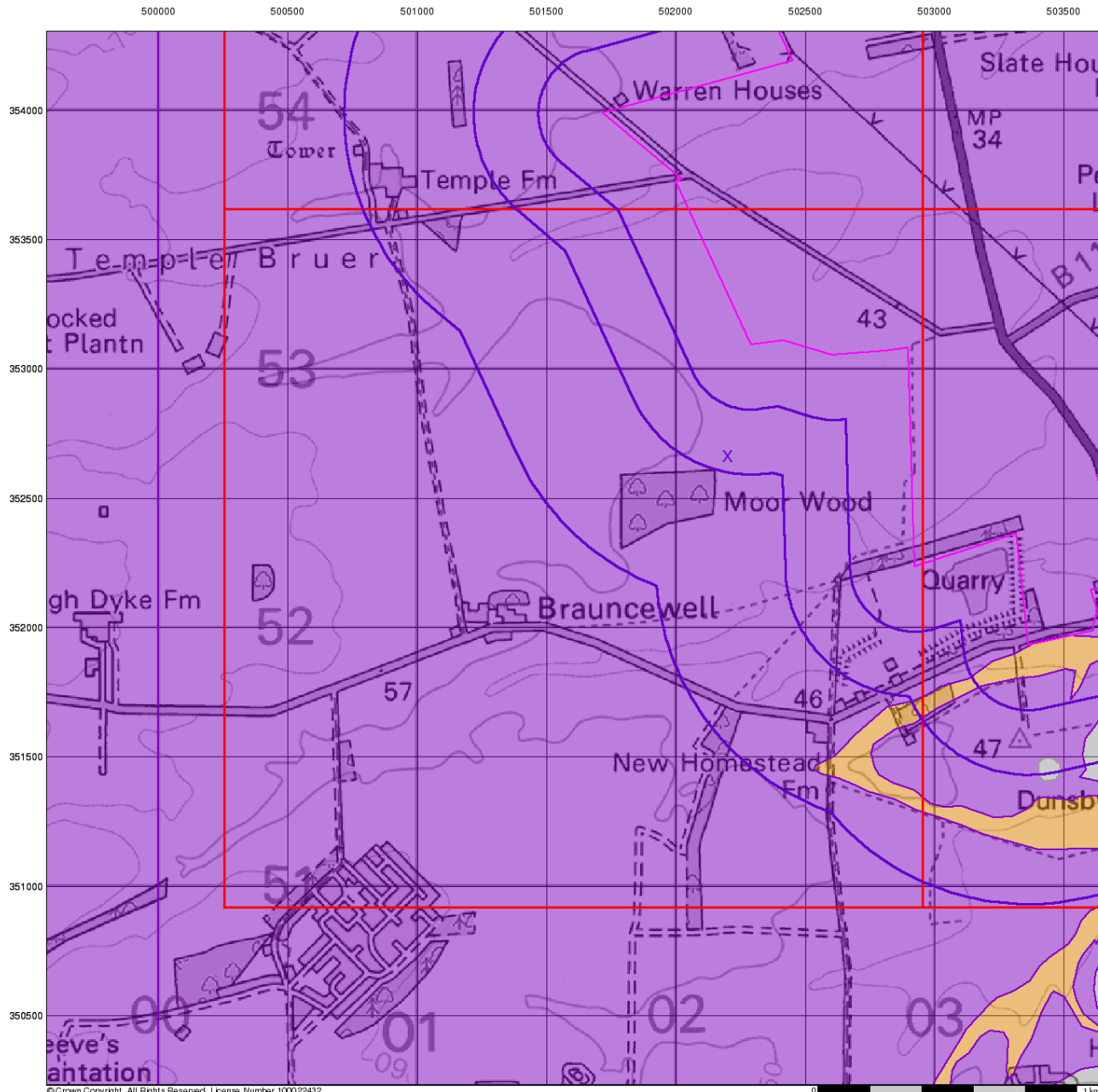
Order Number: 303381609_1_1
 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
 Search Buffer (m): 1000

Site Details

All Areas New



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0 1 km



Bedrock Aquifer Designation

General

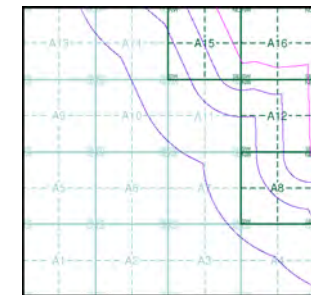
- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



Order Details

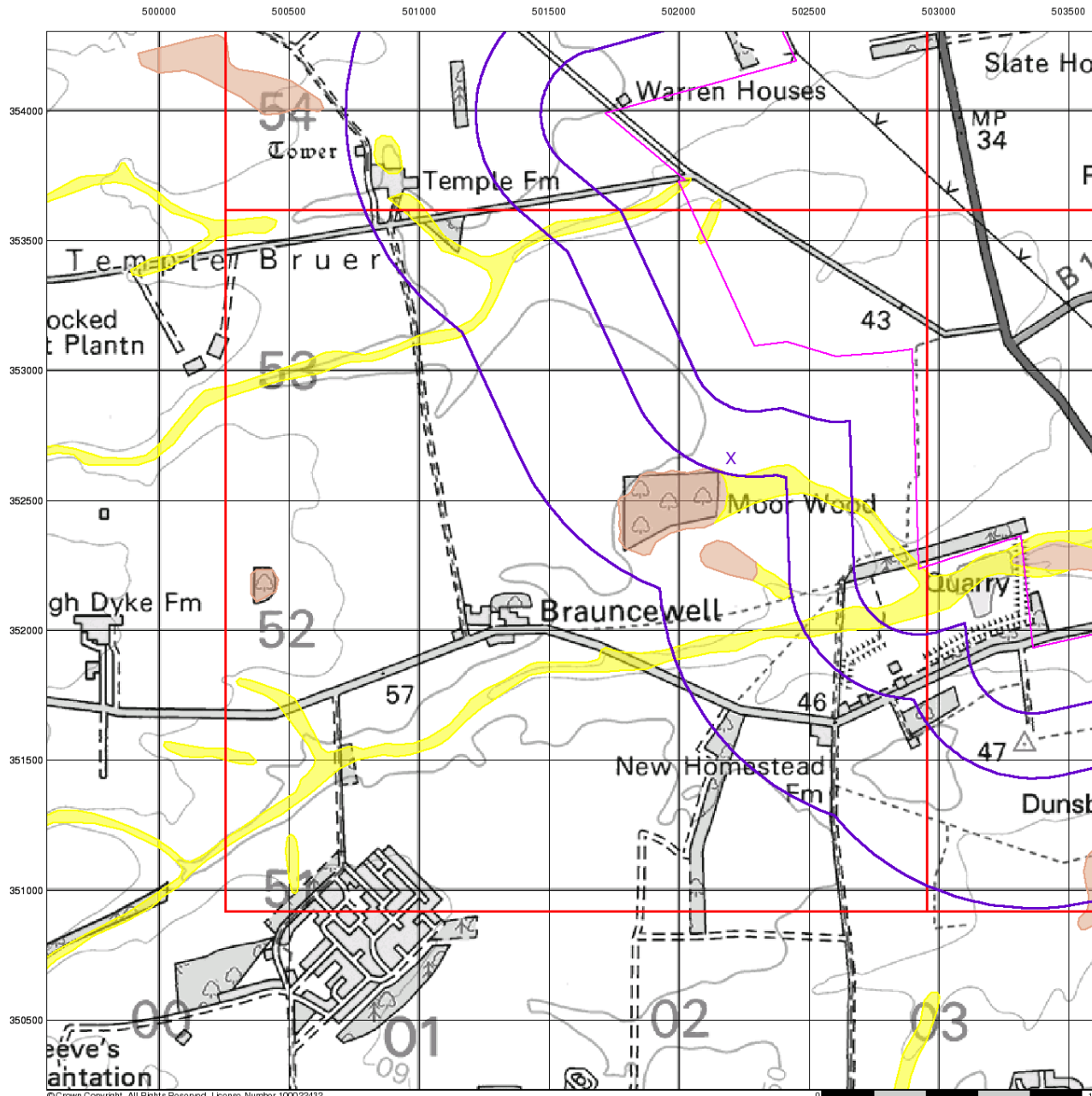
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Superficial Aquifer Designation

General

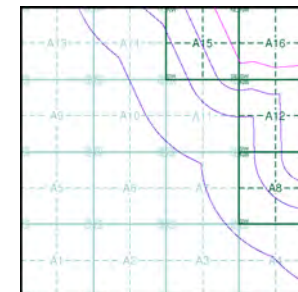
- ◇ Specified Site
- ⬭ Specified Buffer(s)
- X Bearing Reference Point
- Slice
- B Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



Order Details

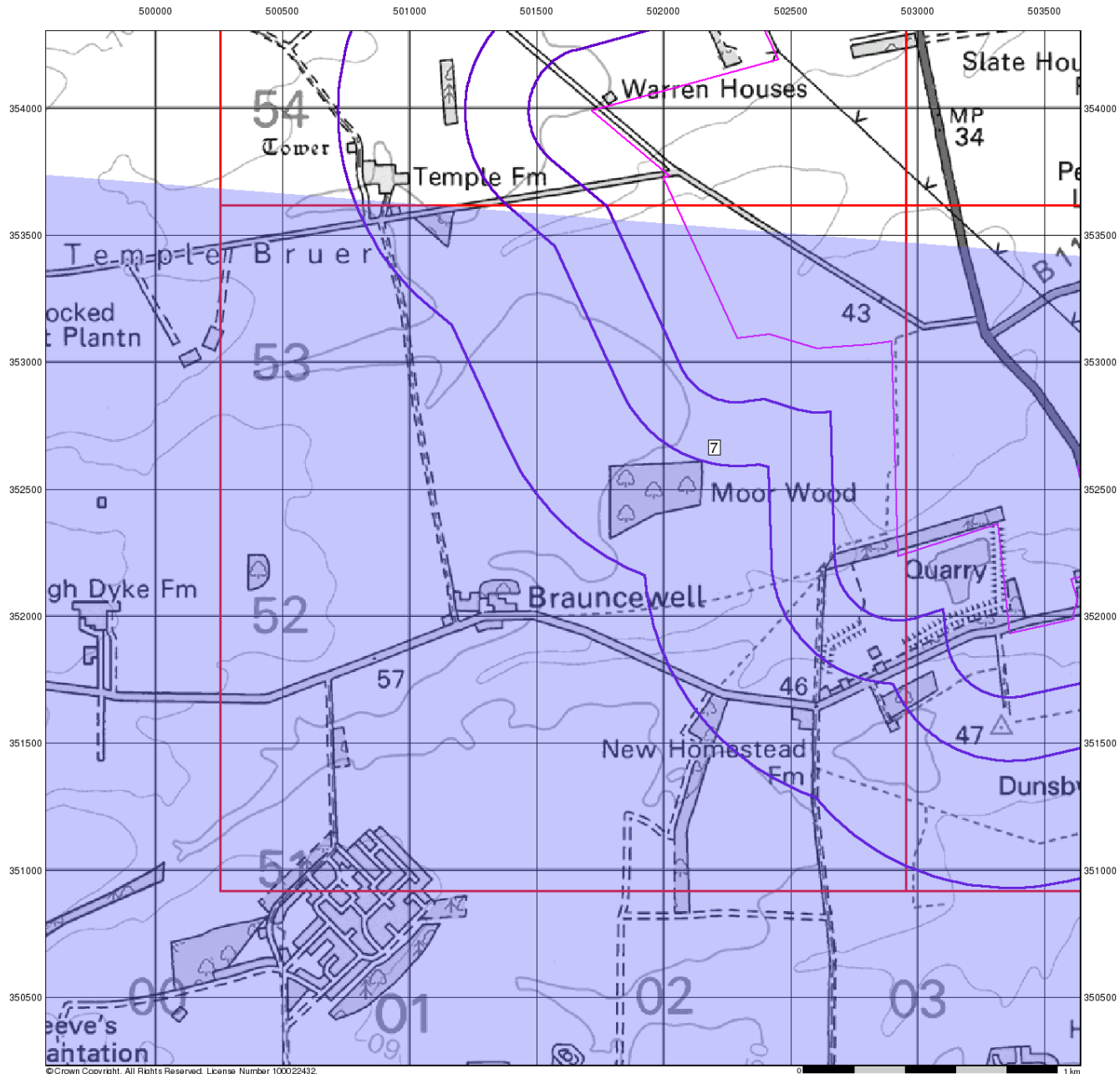
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0 1 km



Source Protection Zones

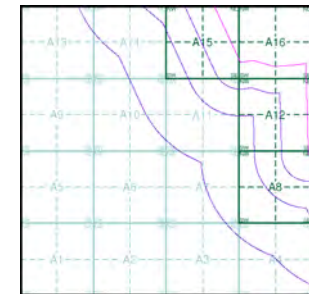
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Agency and Hydrological

- Inner zone (Zone 1)
- Inner zone - subsurface activity only (Zone 1c)
- Outer zone (Zone 2)
- Outer zone - subsurface activity only (Zone 2c)
- Total catchment (Zone 3)
- Total catchment - subsurface activity only (Zone 3c)
- Special interest (Zone 4)

Site Sensitivity Context Map - Slice A



Order Details

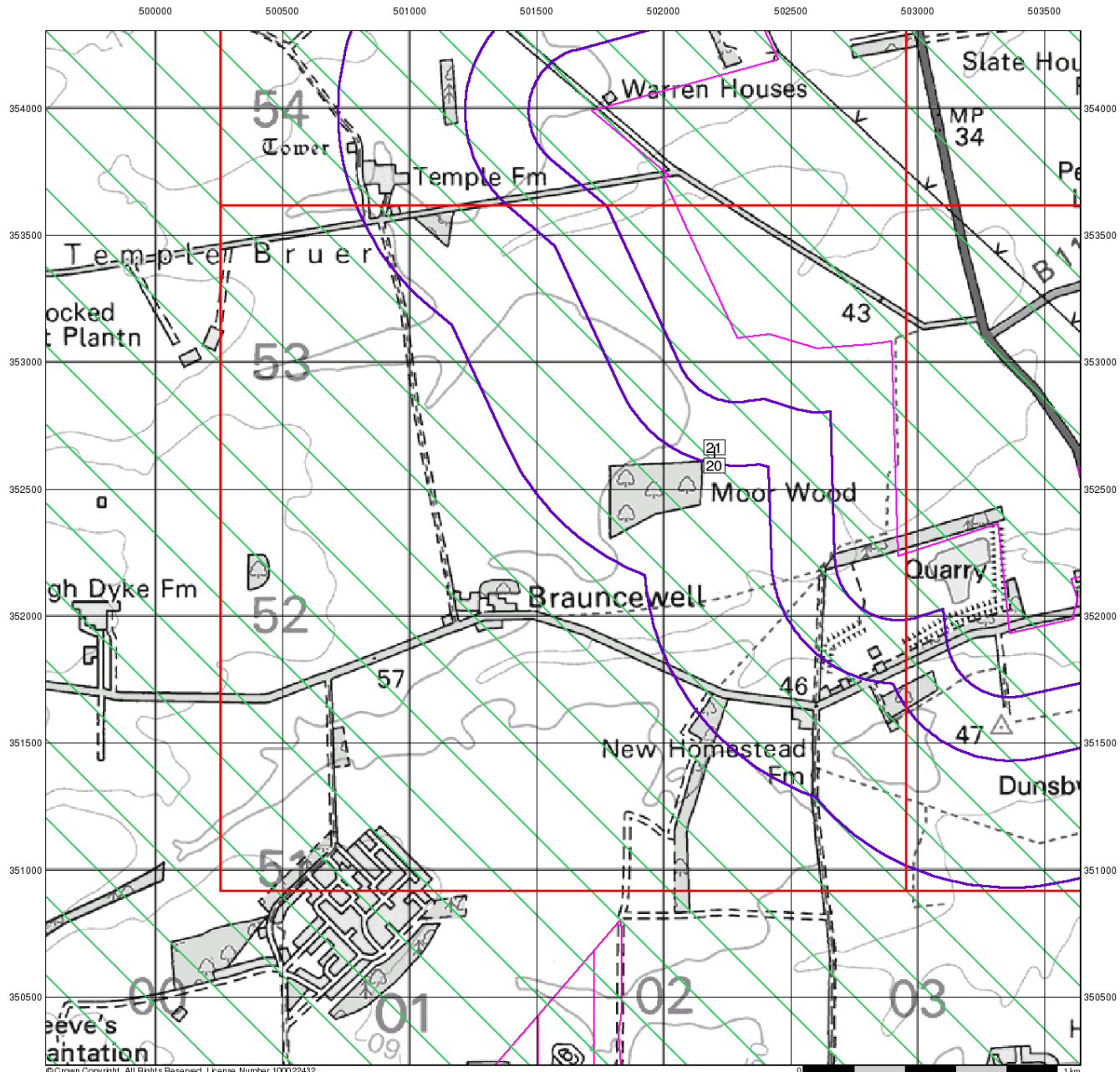
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Sensitive Land Uses

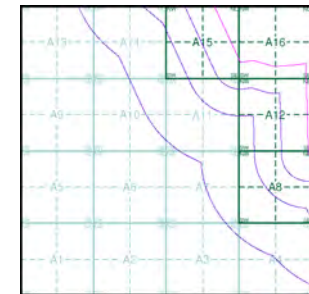
General

- ◇ Specified Site
- Specified Buffer(s)
- ✕ Bearing Reference Point
- Slice
- B Map ID

Sensitive Land Uses

- | | |
|---|--|
| Ancient Woodland | National Park |
| Area of Adopted Green Belt | Nitrate Sensitive Area |
| Area of Unadopted Green Belt | Nitrate Vulnerable Zone |
| Area of Outstanding Natural Beauty | Ramsar Site |
| Environmentally Sensitive Area | Site of Special Scientific Interest |
| Forest Park | Special Area of Conservation |
| Local Nature Reserve | Special Protection Area |
| Marine Nature Reserve | World Heritage Sites |
| National Nature Reserve | |

Site Sensitivity Context Map - Slice A



Order Details

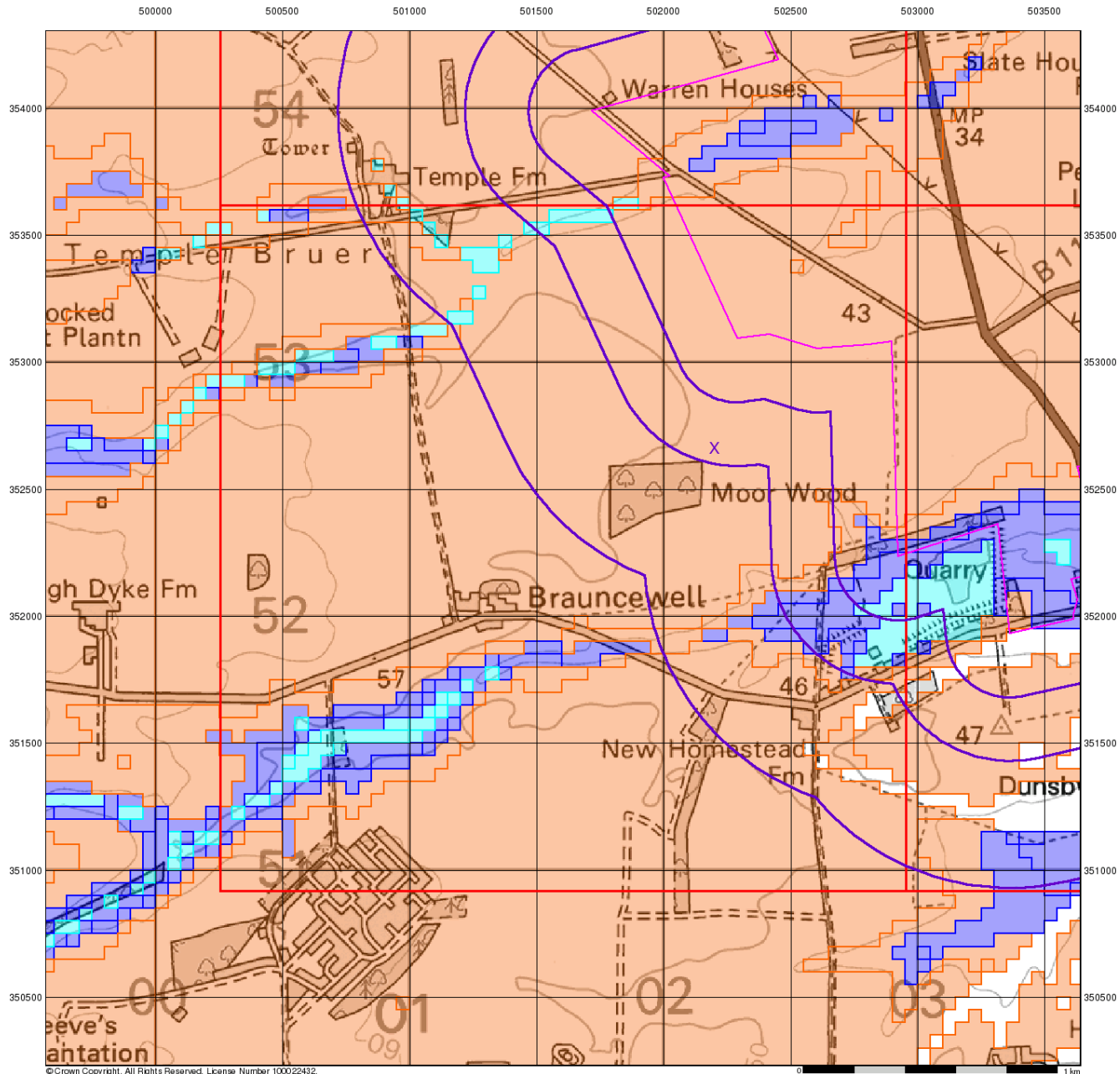
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 Search Buffer (m): 1000

Site Details

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BGS Flood GFS Data

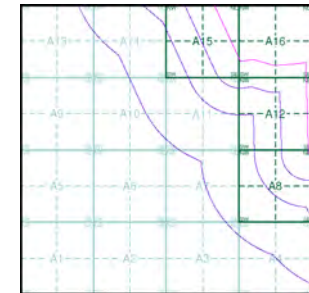
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice

Agency and Hydrological (Flood)

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Site Sensitivity Context Map - Slice A



Order Details

Order Number: 303381609_1_1
 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
 Search Buffer (m): 1000

Site Details

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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site (Buffered Point)
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

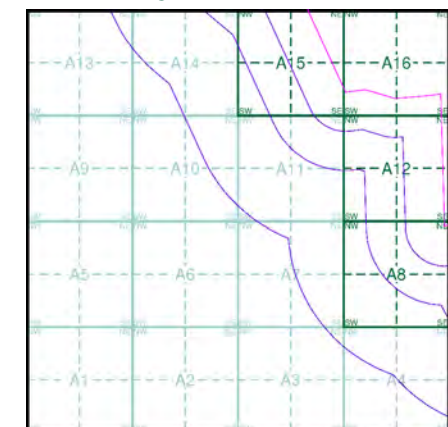
Geological

- BGS Recorded Mineral Site

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry
- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

Site Sensitivity Map - Slice A



Order Details

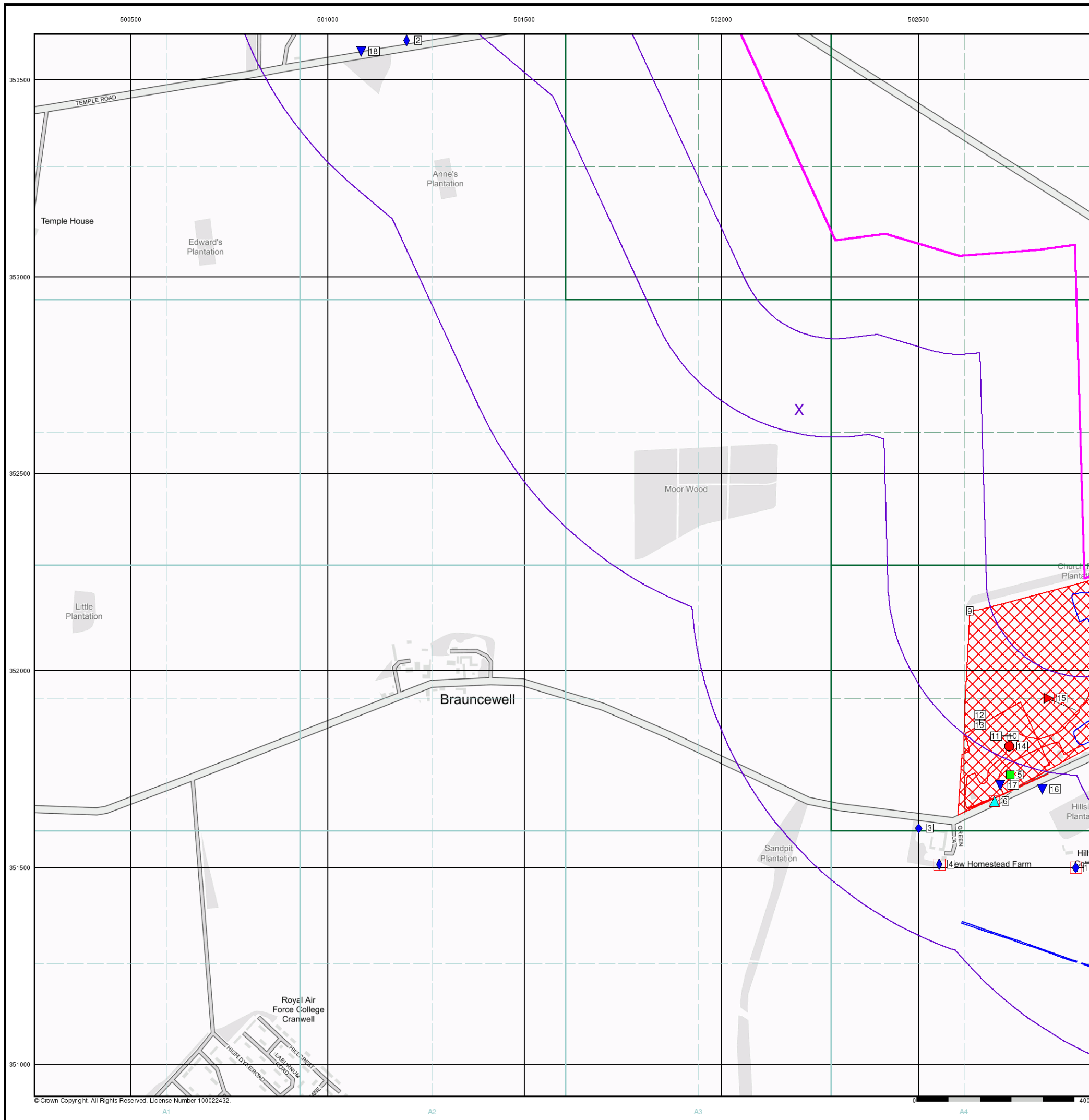
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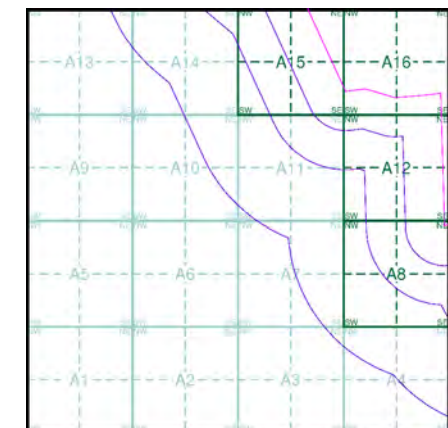
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

Agency and Hydrological (Flood)

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

Flood Map - Slice A



Order Details

Order Number: 303381609_1_1
 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
 Search Buffer (m): 1000

Site Details

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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location

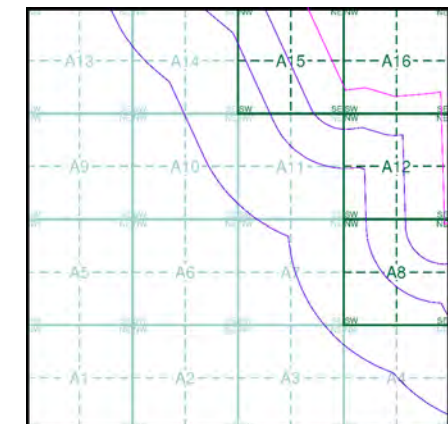
Agency and Hydrological (Boreholes)

- BGS Borehole Depth 0 - 10m
- BGS Borehole Depth 10 - 30m
- BGS Borehole Depth 30m +
- Confidential
- Other

For Borehole information please refer to the Borehole .csv file which accompanied this slice.

A copy of the BGS Borehole Ordering Form is available to download from the Support section of www.envirocheck.co.uk.

Borehole Map - Slice A



Order Details

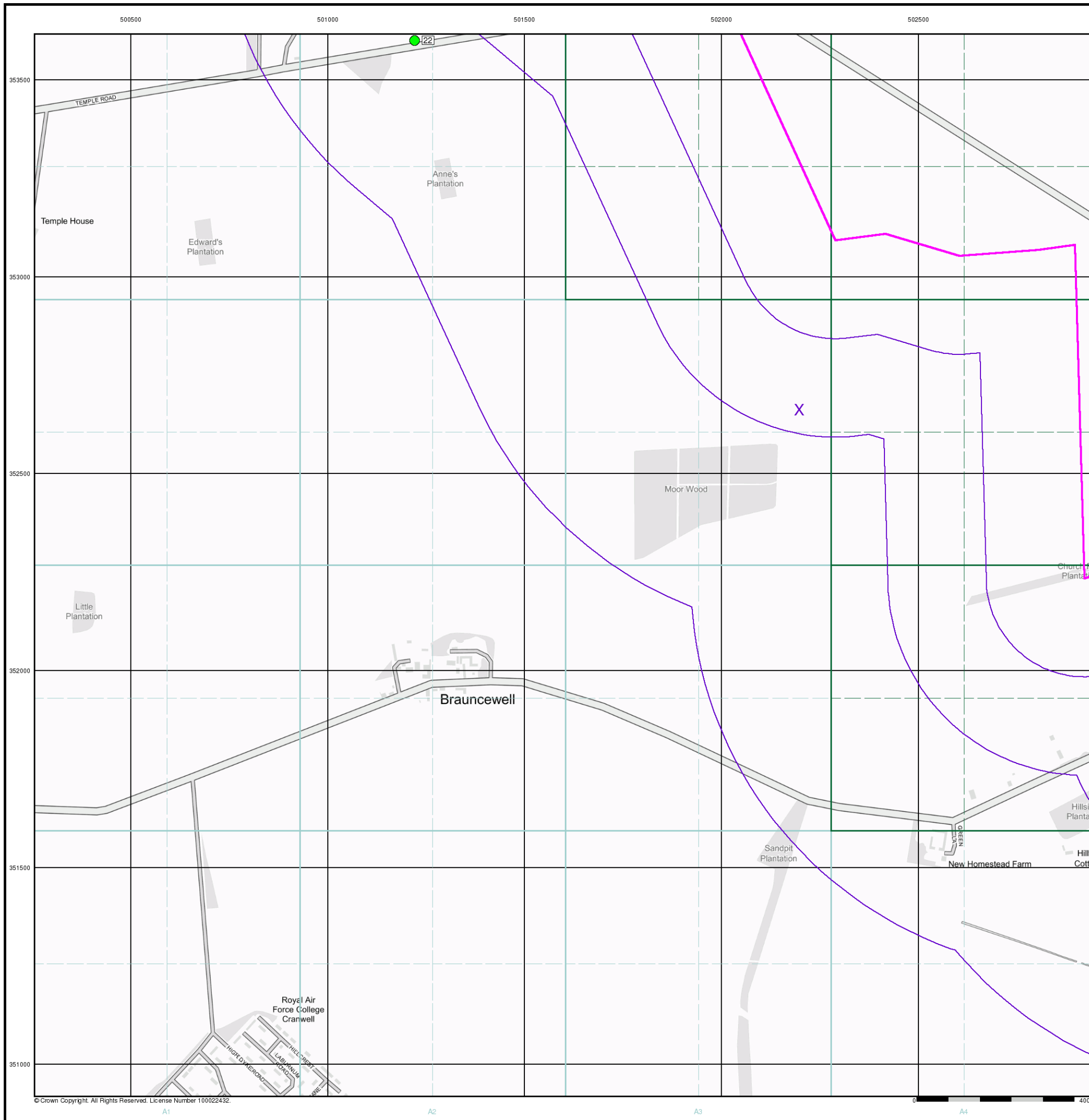
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 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
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 Site Area (Ha): 1774.17
 Search Buffer (m): 1000

Site Details

All Areas New



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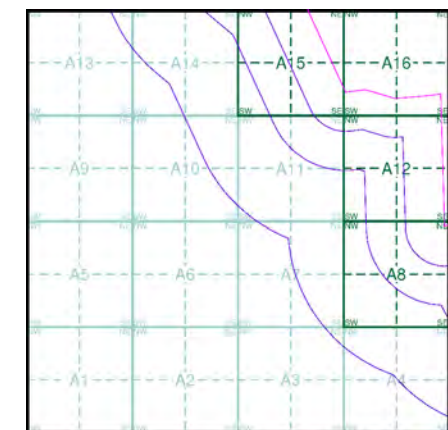
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

OS Water Network Data

- | | | | |
|--|--------------|--|-------------------------|
| | Canal | | Drain |
| | Reservoir | | Other |
| | Foreshore | | Lake |
| | Marsh | | Transfer |
| | Tidal River | | Lock Or Flight Of Locks |
| | Inland River | | Sea |

OS Water Network Map - Slice A



Order Details

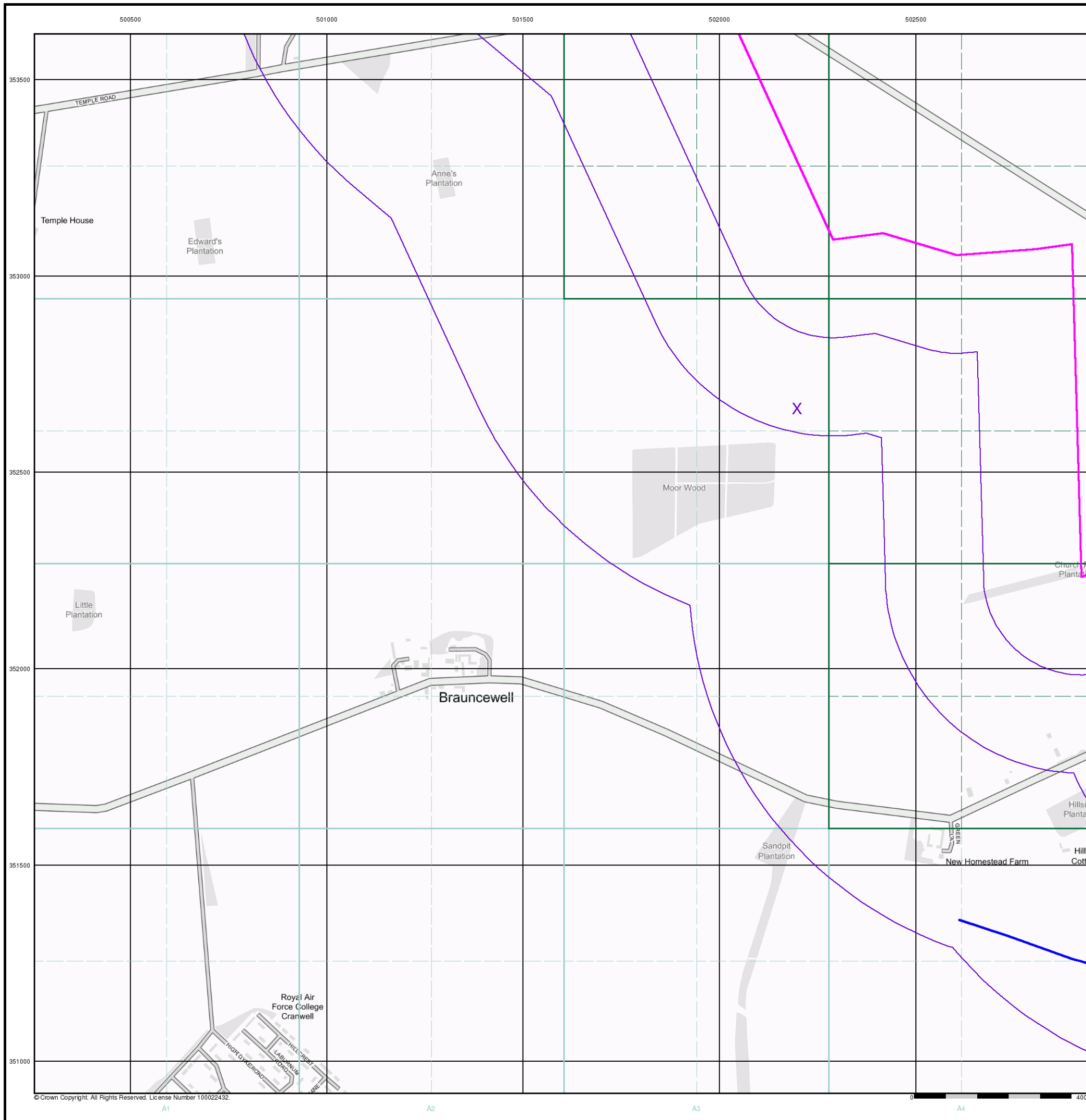
Order Number: 303381609_1_1
 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
 Search Buffer (m): 1000

Site Details

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Envirocheck[®] Report:

Mining and Ground Stability Datasheet

Order Details:

Order Number:

304263548_1_1

Customer Reference:

P02130089

National Grid Reference:

502200, 352660

Slice:

A

Site Area (Ha):

1774.17

Search Buffer (m):

1000

Site Details:

All Areas New

Client Details:

Miss K Bradfield
Landmark Staff WEB Logins
Imperium
Imperial Way
Reading
Berkshire
RG2 0TD

Report Section and Details	Page Number
Summary	-
<p>The Summary section provides an overview of the data contained within the report, detailing the number of data set features or the existence of a data set in relation to the buffer selected.</p> <p>For ease of reference, the report is broken down into 4 sections of data; Mining and Natural Cavities Data, Historical Land Use Information (1:2,500), Historical Land Use Information (1:10,000) and Ground Stability Data (1:50,000).</p>	
Mining and Natural Cavities Data	1
<p>The Mining and Natural Cavities Data section features data sets related to the existence of mining areas and their potential hazards; and details of naturally formed cavities.</p> <p>Data sets within this section are not plotted, with the exception of BGS Recorded Mineral Sites and Potential Mining Areas which feature on the Historical Land Use Information (1:10,000) map.</p>	
Historical Land Use Information (1:2,500)	-
<p>The Historical Land Use Information (1:2,500) section contains data captured from analysis carried out by Landmark of 1:1,250 and 1:2,500 scale historical Ordnance Survey mapping, identifying areas where, historically, the land uses were potentially contaminative.</p> <p>For the purpose of this Envirocheck module, only historical data relating to mining and ground stability has been included and plotted on the corresponding Historical Land Use Information (1:2,500) map. This section also includes the Subterranean Features data set, which details various man-made and man-used underground spaces obtained from the Subterranea Britannica society.</p>	
Historical Land Use Information (1:10,000)	2
<p>The Historical Land Use (1:10,000) section covers data captured from the systematic analysis carried out by Landmark of 1:10, 560 and 1:10,000 scale historical Ordnance Survey mapping dating back to the mid-19th century, identifying potentially contaminative past industrial land uses.</p> <p>For the purpose of this Envirocheck module, only data relating to mining and ground stability has been included and plotted on the accompanying Historical Land Use Information (1:10,000) map.</p>	
Ground Stability Data (1:50,000)	3
<p>The Ground Stability (1:50,000) section includes the BGS Geosure data suite, reporting features to 250m and plotted onto 3 separate maps. Also reported is brine subsidence, brine mining and salt mining data sets, of which Brine Pumping and Salt Mining Related Features are plotted, and subsidence insurance claims and insurance investigations data, which is not plotted.</p>	
Historical Map List	5
<p>The Historical Map List section details the historical mapping that has been analysed for your site, in relation to the Historical Land Use Information sections.</p>	
Data Currency	6
Data Suppliers	7
Useful Contacts	8

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The brine subsidence data relating to the Driotwich area as provided in this report is derived from JPB studies and physical monitoring undertaken annually over more than 35 years. For more detailed interpretation contact enquiries@jpb.co.uk. JPB retain the copyright and intellectual rights to this data and accept no liability for any loss or damage, including in direct or consequential loss, arising from the use of this data.

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Report Version v53.0

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m
Mining and Natural Cavities Data					
BGS Recorded Mineral Sites	pg 1				3
Coal Mining Affected Areas			n/a	n/a	n/a
Man Made Mining Cavities					
Mining Instability			n/a	n/a	n/a
Natural Cavities					
Non Coal Mining Areas of Great Britain				n/a	n/a
Potential Mining Areas					
Historical Land Use Information (1:2,500)					
Extractive Industries or Potential Excavations from 1855-1909 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1893-1915 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1906-1937 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1924-1949 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1950-1980 (100m)				n/a	n/a
Subterranean Features (100m)				n/a	n/a
Historical Land Use Information (1:10,000)					
Air Shafts					
Disturbed Ground					
General Quarrying	pg 2			1	2
Heap, unknown constituents					
Mineral Railway					
Mining & quarrying general					
Mining of coal & lignite					
Quarrying of sand & clay, operation of sand & gravel pits					
Former Marshes					
Potentially Infilled Land (Non-Water)	pg 2				2
Potentially Infilled Land (Water)					
Ground Stability Data (1:50,000)					
CBSCB Compensation District			n/a	n/a	n/a
Brine Pumping Related Features					
Brine Subsidence Solution Area					
Potential for Collapsible Ground Stability Hazards	pg 3	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards	pg 3	Yes		n/a	n/a
Potential for Ground Dissolution Stability Hazards	pg 3	Yes	Yes	n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 3	Yes	Yes	n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 3	Yes		n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 4	Yes	Yes	n/a	n/a
Salt Mining Related Features					

Report Version v53.0

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Braucewell Stone Pit Location: Braucewell, Cranwell, Sleaford, Lincolnshire Source: British Geological Survey, National Geoscience Information Service Reference: 136080 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Jurassic Geology: Upper Lincolnshire Limestone Member Commodity: Limestone Positional Accuracy: Located by supplier to within 10m</p>	A8SE (SE)	543	1	502814 351703
2	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Braucewell Stone Pit Location: Braucewell, Cranwell, Sleaford, Lincolnshire Source: British Geological Survey, National Geoscience Information Service Reference: 136079 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Jurassic Geology: Upper Lincolnshire Limestone Member Commodity: Limestone Positional Accuracy: Located by supplier to within 10m</p>	A8SE (SE)	565	1	502707 351713
3	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Temple Farm Stone Pit Location: Temple Bruer, Welbourn, Lincoln, Lincolnshire Source: British Geological Survey, National Geoscience Information Service Reference: 134924 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Jurassic Geology: Lower Lincolnshire Limestone Member Commodity: Limestone Positional Accuracy: Located by supplier to within 10m</p>	A14NW (NW)	755	1	501085 353577
	<p>Coal Mining Affected Areas</p> <p>In an area which may not be affected by coal mining</p>				
	<p>Non Coal Mining Areas of Great Britain</p> <p>No Hazard</p>				

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
4	General Quarrying Use: Not Supplied Date of Mapping: 1891 - 1985	A8SE (SE)	353	-	502636 351749
5	General Quarrying Use: Not Supplied Date of Mapping: 1891	A8SE (SE)	544	-	502815 351701
6	General Quarrying Use: Not Supplied Date of Mapping: 1890	A14NW (NW)	748	-	501084 353592
7	Potentially Infilled Land (Non-Water) Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1985	A8SE (SE)	546	-	502815 351700
8	Potentially Infilled Land (Non-Water) Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1985	A14NW (NW)	748	-	501084 353592

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	CBSCB Compensation District The site does not fall within the brine compensation area.				
	Brine Subsidence Solution Area The site does not fall within the brine subsidence solution area.				
9	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A11NE (S)	0	1	502199 352663
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A11NE (S)	0	1	502199 352663
10	Potential for Ground Dissolution Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	(N)	0	1	501781 353681
11	Potential for Ground Dissolution Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	(E)	0	1	503276 352267
12	Potential for Ground Dissolution Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A15NW (N)	0	1	501873 353602
13	Potential for Ground Dissolution Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A11NE (S)	0	1	502199 352663
14	Potential for Ground Dissolution Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A15NW (NW)	0	1	501819 353557
15	Potential for Ground Dissolution Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A8NE (SE)	0	1	502868 351966
16	Potential for Ground Dissolution Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A8SE (SE)	116	1	502848 351605
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	(NE)	0	1	503207 354161
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A8SE (SE)	0	1	502818 351693
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A15NW (NW)	118	1	501715 353537
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	(SE)	150	1	503671 351727
17	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A11NE (S)	0	1	502199 352663
18	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	(SE)	10	1	503173 352208
19	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A11NE (SW)	0	1	502174 352608
20	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A15NW (N)	0	1	501873 353602
21	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A15NE (N)	0	1	502084 353489
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A11NE (S)	0	1	502199 352663

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
22	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A11NE (SW)	0	1	502174 352608
23	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A15NE (N)	0	1	502084 353489
24	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A15NW (N)	0	1	501873 353602
25	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	(SE)	150	1	503671 351727
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A11NE (S)	0	1	502199 352663

The following mapping has been analysed for Historical Land Use Information (1:2,500):








1:2,500	Mapsheet	Published Date
Ordnance Survey Plan	TF0153	1979
Ordnance Survey Plan	TF0252	1979
Ordnance Survey Plan	TF0252	1979
Ordnance Survey Plan	TF0252	1979
Ordnance Survey Plan	TF0252	1979
Ordnance Survey Plan	TF0253	1979
Ordnance Survey Plan	TF0253	1979
Ordnance Survey Plan	TF0152	1980
Ordnance Survey Plan	TF0251	1980

The following mapping has been analysed for Historical Land Use Information (1:10,000):

1:10,560	Mapsheet	Published Date
Lincolnshire	096_NE	1890
Lincolnshire	097_NW	1891
Lincolnshire	097_SW	1891
Lincolnshire	096_SE	1892
Lincolnshire	096_NE	1905
Lincolnshire	096_SE	1905
Lincolnshire	097_NW	1906
Lincolnshire	097_SW	1906
Lincolnshire	096_NE	1947
Lincolnshire	096_SE	1947
Lincolnshire	097_NW	1950
Lincolnshire	097_SW	1950
Ordnance Survey Plan	TF05SW	1956
1:10,000	Mapsheet	Published Date
Ordnance Survey Plan	TF05SW	1985

Mining and Cavities Data	Version	Update Cycle
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	November 2022	Bi-Annually
Coal Mining Affected Areas The Coal Authority - Property Searches	March 2014	Annual Rolling Update
Man Made Mining Cavities Stantec UK Ltd	December 2021	Bi-Annually
Mining Instability Ove Arup & Partners	June 1998	Not Applicable
Natural Cavities Stantec UK Ltd	December 2021	Bi-Annually
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	May 2015	Not Applicable
Historical Land Use Information (1:2,500)	Version	Update Cycle
Subterranean Features Landmark Information Group Limited	June 2022	Bi-Annually
Ground Stability Data (1:50,000)	Version	Update Cycle
CBSCB Compensation District Cheshire Brine Subsidence Compensation Board (CBSCB) Cheshire Brine Subsidence Compensation Board (CBSCB)	August 2011 November 2020	As notified
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	April 2020	As notified
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Brine Subsidence Solution Area Johnson Poole & Bloomer	December 2020	Annual Rolling Update

A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	
British Geological Survey	
The Coal Authority	
Ove Arup	
Stantec UK Ltd	
Wardell Armstrong	
Johnson Poole & Bloomer	

Contact	Name and Address	Contact Details
1	British Geological Survey - Enquiry Service British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
-	Landmark Information Group Limited Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk

Historical Land Use Information (1:10,000)

General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point
- Map ID
- Several of Type at Location

Potentially Contaminative Industrial Uses (Past Land Uses - Mining)

	Point	Line	Polygon
Air Shafts	◆	—	
Disturbed Ground	◆	—	
General Quarrying	◆	—	
Heap, unknown constituents	◆	—	
Mineral Railway	◆	—	
Mining and Quarrying General	◆	—	
Mining of Coal & Lignite	◆	—	
Quarrying of Sand and Clay, Operation of Sand and Gravel Pits	◆	—	

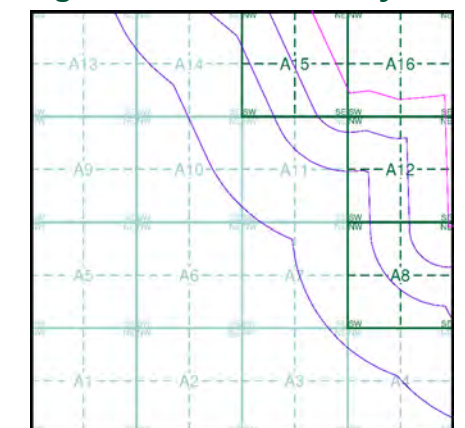
Historical Land Use

	Point	Line	Polygon
Potentially Infilled Land (Non-Water)	●	---	
Potentially Infilled Land (Water)	●	---	
Former Marsh	✕		

Mining Data

- Potential Mining Area
- ▼ BGS Recorded Mineral Site

Mining and Ground Stability - Slice A

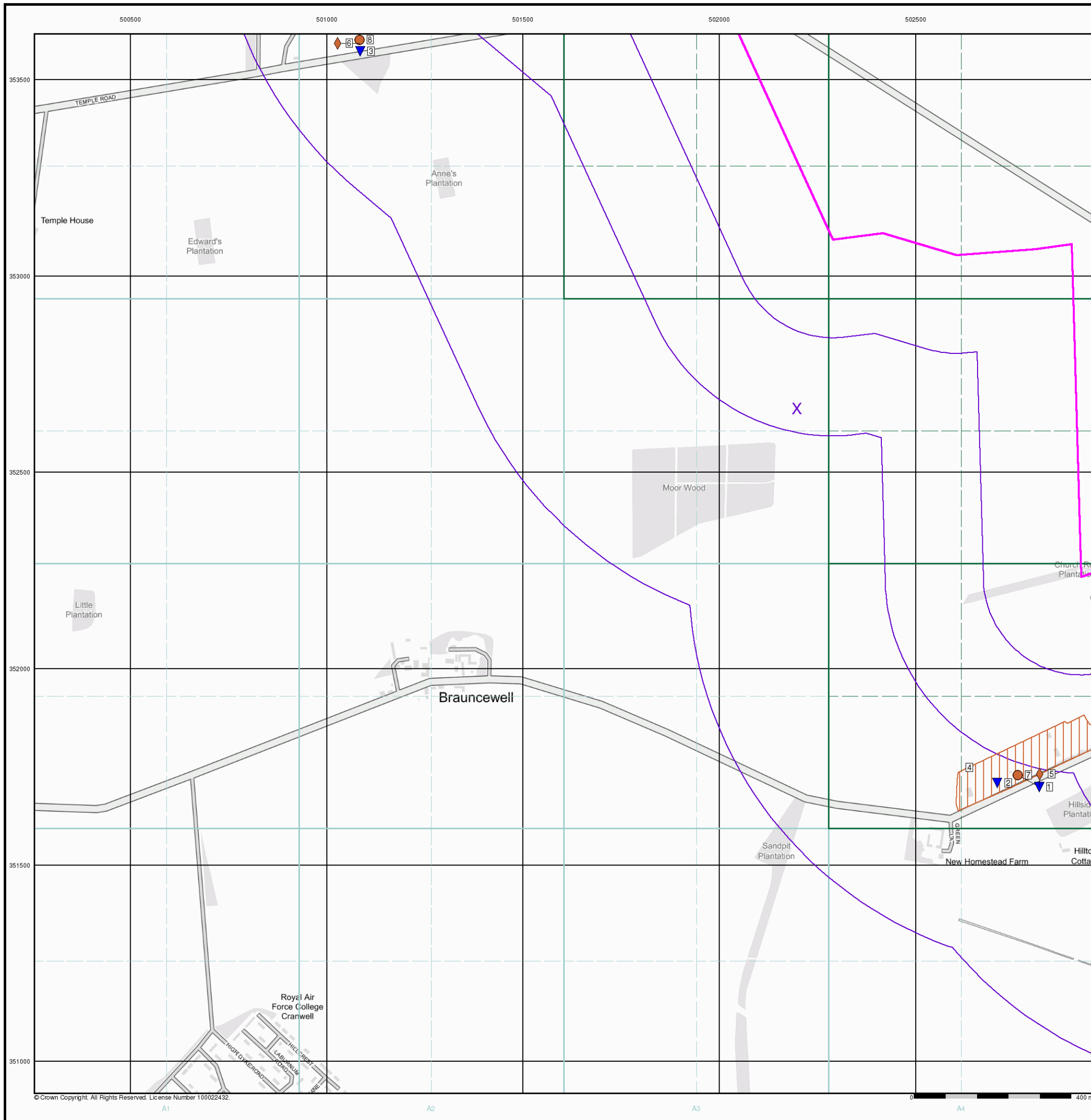


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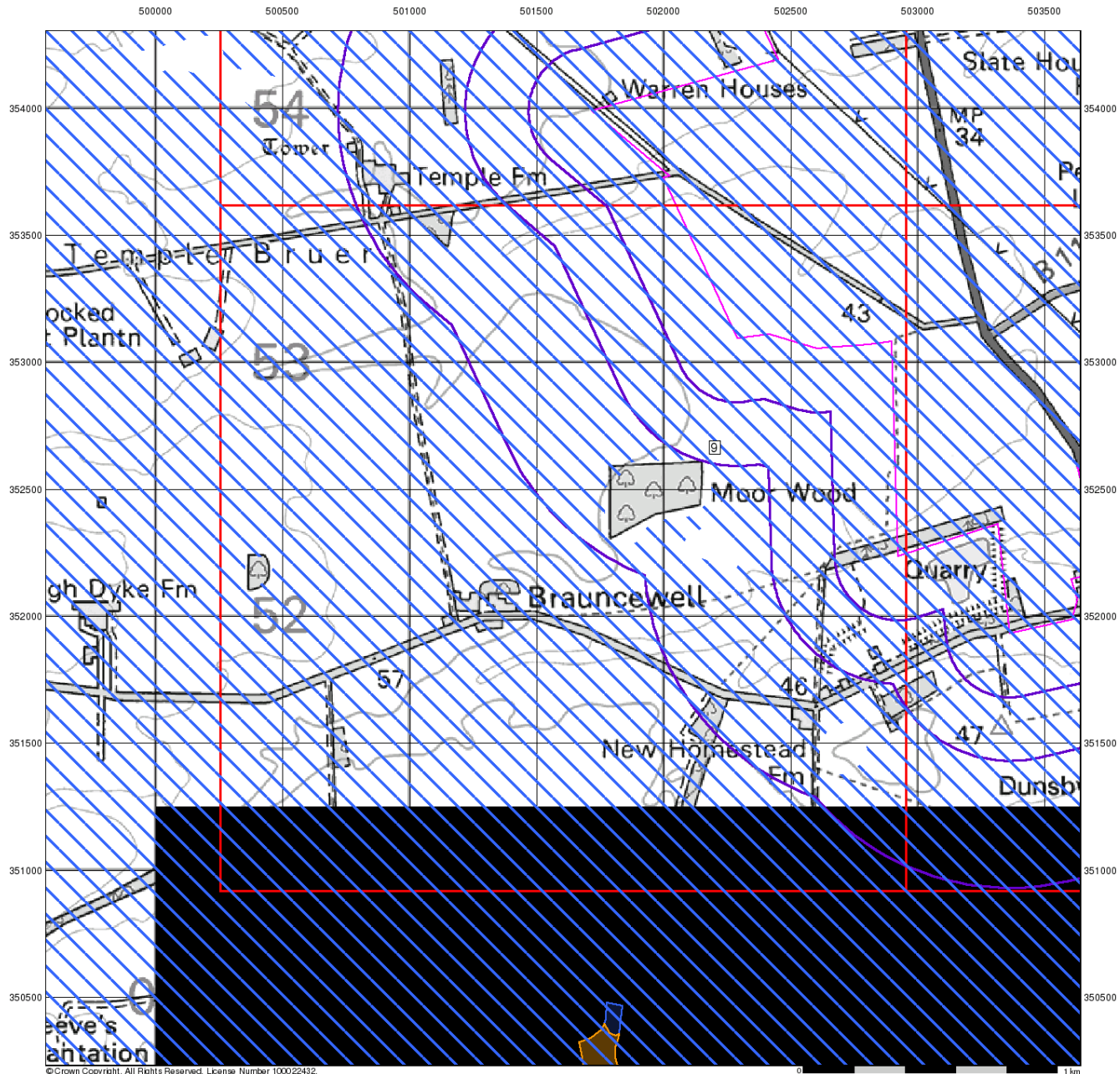
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 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
 Search Buffer (m): 1000

Site Details

All Areas New



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Ground Stability Data (1:50,000)

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Potential for Compressible Ground Stability Hazards

- High
- Low
- Moderate
- Very Low

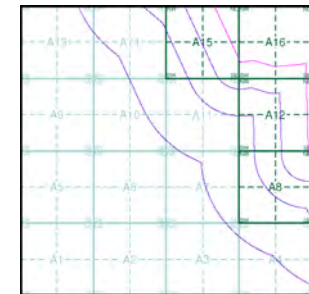
Potential for Collapsible Ground Stability Hazards

- High
- Low
- Moderate
- Very Low

Brine Pumping and Salt Mining

- | | Point | Polygon |
|-------------------------------|-------|---------|
| Brine Pumping Related Feature | | |
| Salt Mining Related Feature | | |

Mining and Ground Stability - Slice A



Order Details

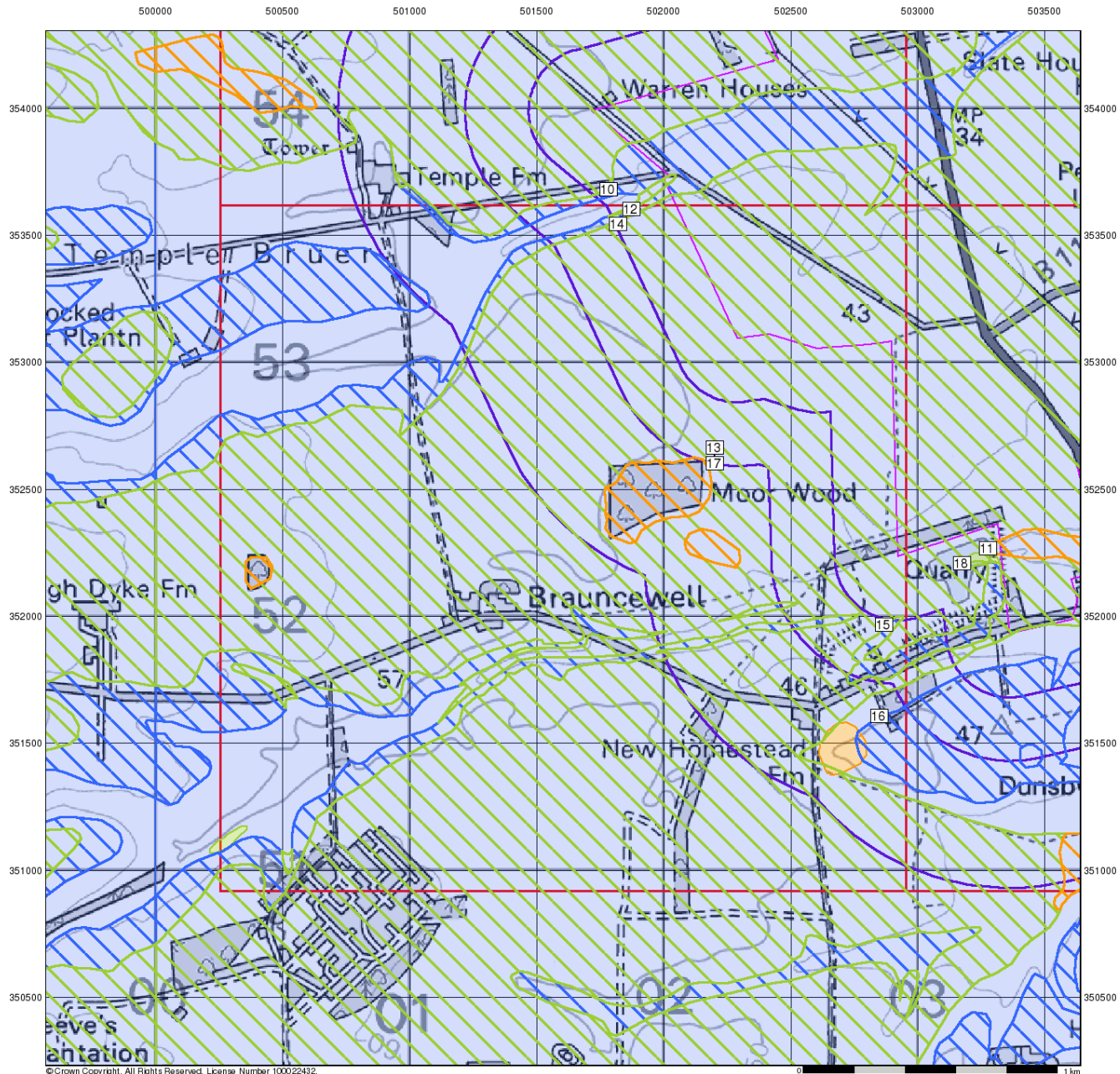
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 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
 Search Buffer (m): 1000

Site Details

All Areas New

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Ground Stability Data (1:50,000)

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

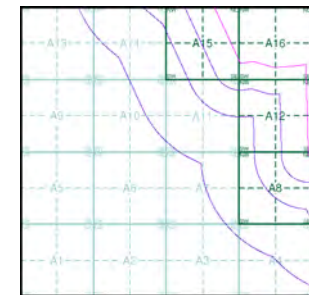
Potential for Landslide Ground Stability Hazards

- High
- Low
- Moderate
- Very Low

Potential for Ground Dissolution Stability Hazards

- High
- Low
- Moderate
- Very Low

Mining and Ground Stability - Slice A



Order Details

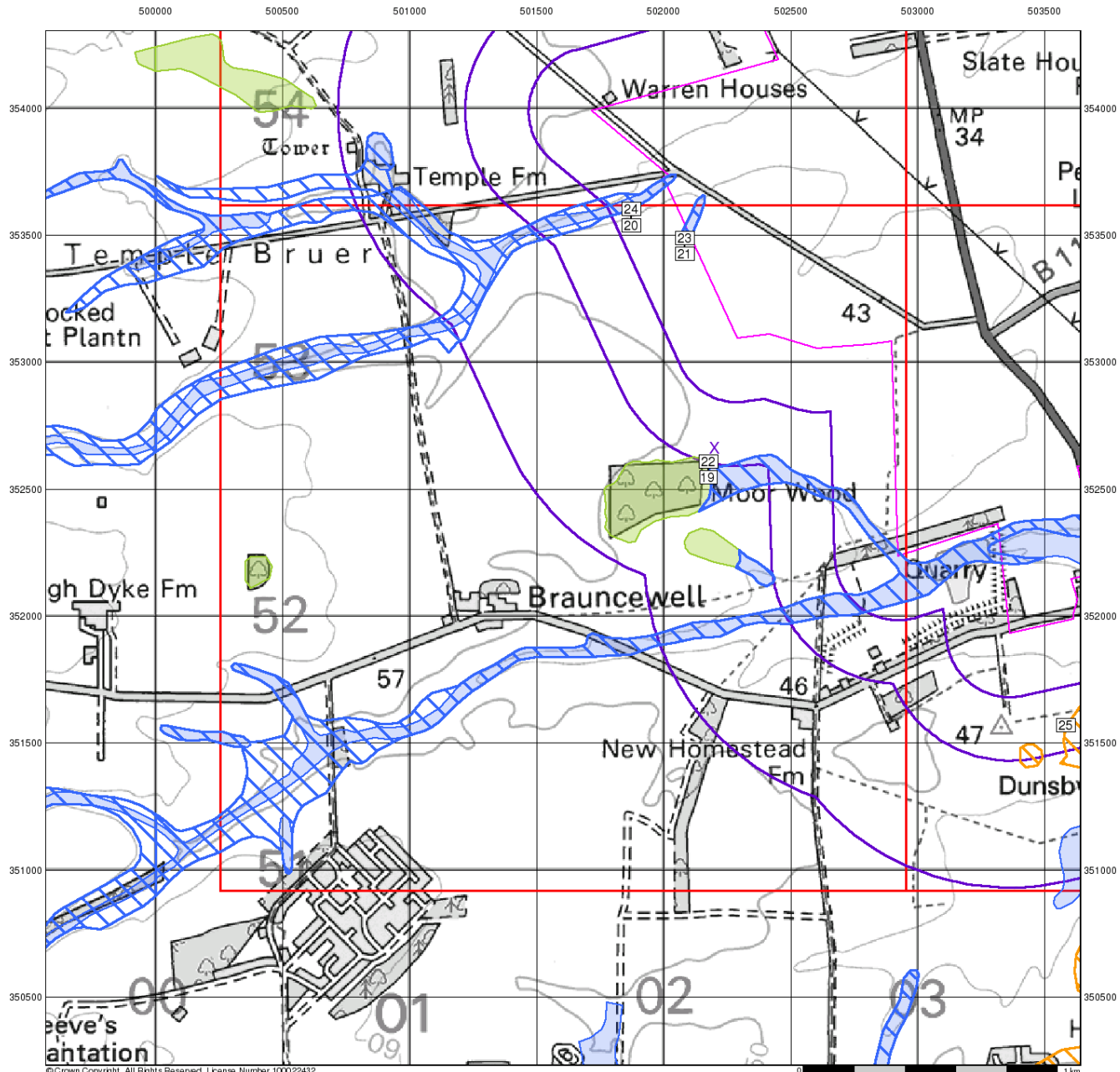
Order Number: 304263548_1_1
 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
 Search Buffer (m): 1000

Site Details

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Ground Stability Data (1:50,000)

General

- ◇ Specified Site
- Specified Buffer(s)
- X Bearing Reference Point
- Slice
- B Map ID

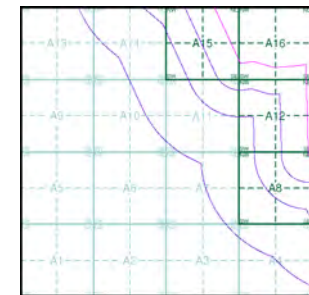
Potential for Running Sand Ground Stability Hazards

- High
- Low
- Moderate
- Very Low

Potential for Shrinking or Swelling Clay Ground Stability Hazards

- High
- Low
- Moderate
- Very Low

Mining and Ground Stability - Slice A



Order Details

Order Number: 304263548_1_1
 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
 Search Buffer (m): 1000

Site Details

All Areas New

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Historical Mapping Legends

Ordnance Survey County Series 1:10,560

	Gravel Pit		Sand Pit		Other Pits
	Quarry		Shingle		Orchard
	Osiers		Reeds		Marsh
	Mixed Wood		Deciduous		Brushwood
	Fir		Furze		Rough Pasture
	Arrow denotes flow of water		Trigonometrical Station		
	Site of Antiquities		Bench Mark		
	Pump, Guide Post, Signal Post		Well, Spring, Boundary Post		
	-285 Surface Level				
	Sketched Contour		Instrumental Contour		
	Main Roads		Minor Roads		
	Sunken Road		Raised Road		
	Road over Railway		Railway over River		
	Railway over Road		Level Crossing		
	Road over River or Canal		Road over Stream		
	Road over Stream				
	County Boundary (Geographical)				
	County & Civil Parish Boundary				
	Administrative County & Civil Parish Boundary				
	County Borough Boundary (England)				
	County Burgh Boundary (Scotland)				
	Rural District Boundary				
	Civil Parish Boundary				

Ordnance Survey Plan 1:10,000

	Chalk Pit, Clay Pit or Quarry		Gravel Pit
	Sand Pit		Disused Pit or Quarry
	Refuse or Slag Heap		Lake, Loch or Pond
	Dunes		Boulders
	Coniferous Trees		Non-Coniferous Trees
	Orchard		Scrub
	Coppice		
	Bracken		Heath
	Rough Grassland		
	Marsh		Reeds
	Saltings		
	Building		Glasshouse
	Sloping Masonry		Pylon
	Electricity Transmission Line		Pole
	Cutting		Embankment
	Standard Gauge Multiple Track		
	Standard Gauge Single Track		
	Siding, Tramway or Mineral Line		
	Narrow Gauge		
	Geographical County		
	Administrative County, County Borough or County of City		
	Municipal Borough, Urban or Rural District, Burgh or District Council		
	Borough, Burgh or County Constituency Shown only when not coincident with other boundaries		
	Civil Parish Shown alternately when coincidence of boundaries occurs		
	BP, BS Boundary Post or Stone		Pol Sta Police Station
	Ch Church		PO Post Office
	CH Club House		PC Public Convenience
	F E Sta Fire Engine Station		PH Public House
	FB Foot Bridge		SB Signal Box
	Fn Fountain		Spr Spring
	GP Guide Post		TCB Telephone Call Box
	MP Mile Post		TCP Telephone Call Post
	MS Mile Stone		W Well

1:10,000 Raster Mapping

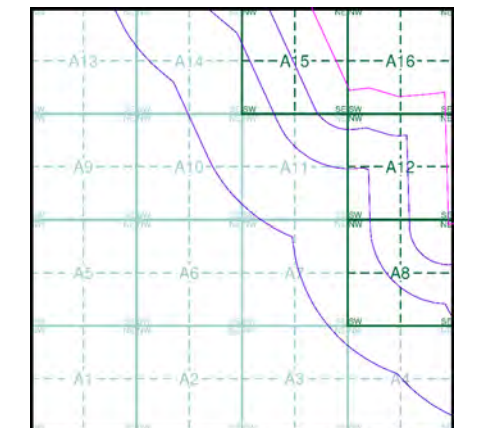
	Gravel Pit		Refuse tip or slag heap
	Rock		Rock (scattered)
	Boulders		Boulders (scattered)
	Shingle		Mud
	Sand		Sand Pit
	Slopes		Top of cliff
	General detail		Underground detail
	Overhead detail		Narrow gauge railway
	Multi-track railway		Single track railway
	County boundary (England only)		Civil, parish or community boundary
	District, Unitary, Metropolitan, London Borough boundary		Constituency boundary
	Area of wooded vegetation		Non-coniferous trees
	Non-coniferous trees (scattered)		Coniferous trees
	Coniferous trees (scattered)		Positioned tree
	Orchard		Coppice or Osiers
	Rough Grassland		Heath
	Scrub		Marsh, Salt Marsh or Reeds
	Water feature		Flow arrows
	MHW(S) Mean high water (springs)		MLW(S) Mean low water (springs)
	Telephone line (where shown)		Electricity transmission line (with poles)
	Bench mark (where shown)		Triangulation station
	Point feature (e.g. Guide Post or Mile Stone)		Pylon, flare stack or lighting tower
	Site of (antiquity)		Glasshouse
	General Building		Important Building



Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Lincolnshire	1:10,560	1887	2
Lincolnshire	1:10,560	1905 - 1906	3
Lincolnshire	1:10,560	1947 - 1950	4
Ordnance Survey Plan	1:10,000	1956	5
Ordnance Survey Plan	1:10,000	1985	6
10K Raster Mapping	1:10,000	2000	7
Street View	Variable		8

Historical Map - Slice A



Order Details

Order Number: 303381609_1_1
 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
 Search Buffer (m): 1000

Site Details

All Areas New



Tel: 0844 844 9952
 Fax: 0844 844 9951
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Lincolnshire

Published 1887

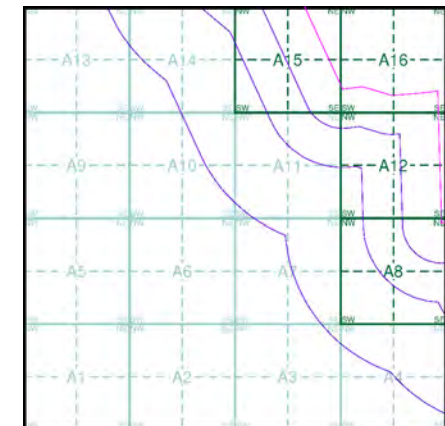
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

096NE 1887 1:10,560	097NW 1887 1:10,560
096SE 1887 1:10,560	097SW 1887 1:10,560

Historical Map - Slice A



Order Details

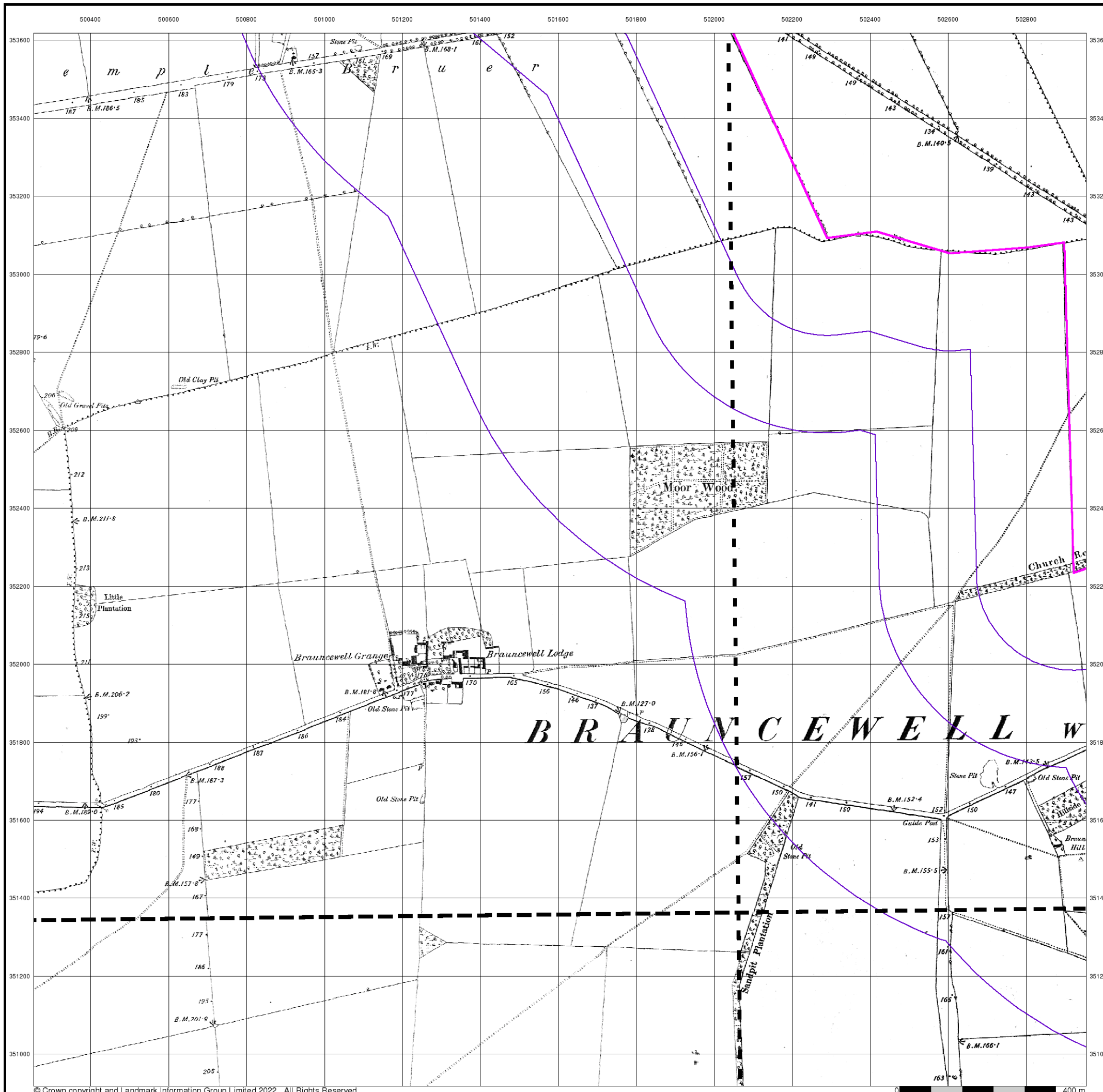
Order Number: 303381609_1_1
 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
 Search Buffer (m): 1000

Site Details

All Areas New



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Lincolnshire

Published 1905 - 1906

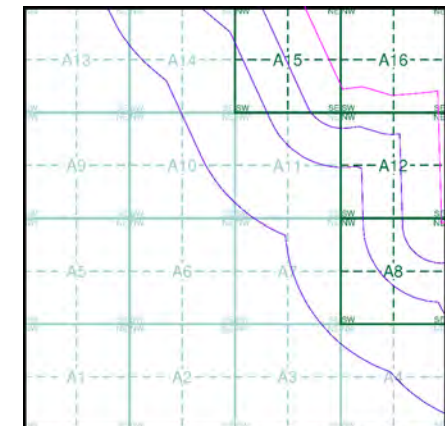
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The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

096NE 1905 1:10,560	097NW 1906 1:10,560
096SE 1905 1:10,560	097SW 1906 1:10,560

Historical Map - Slice A



Order Details

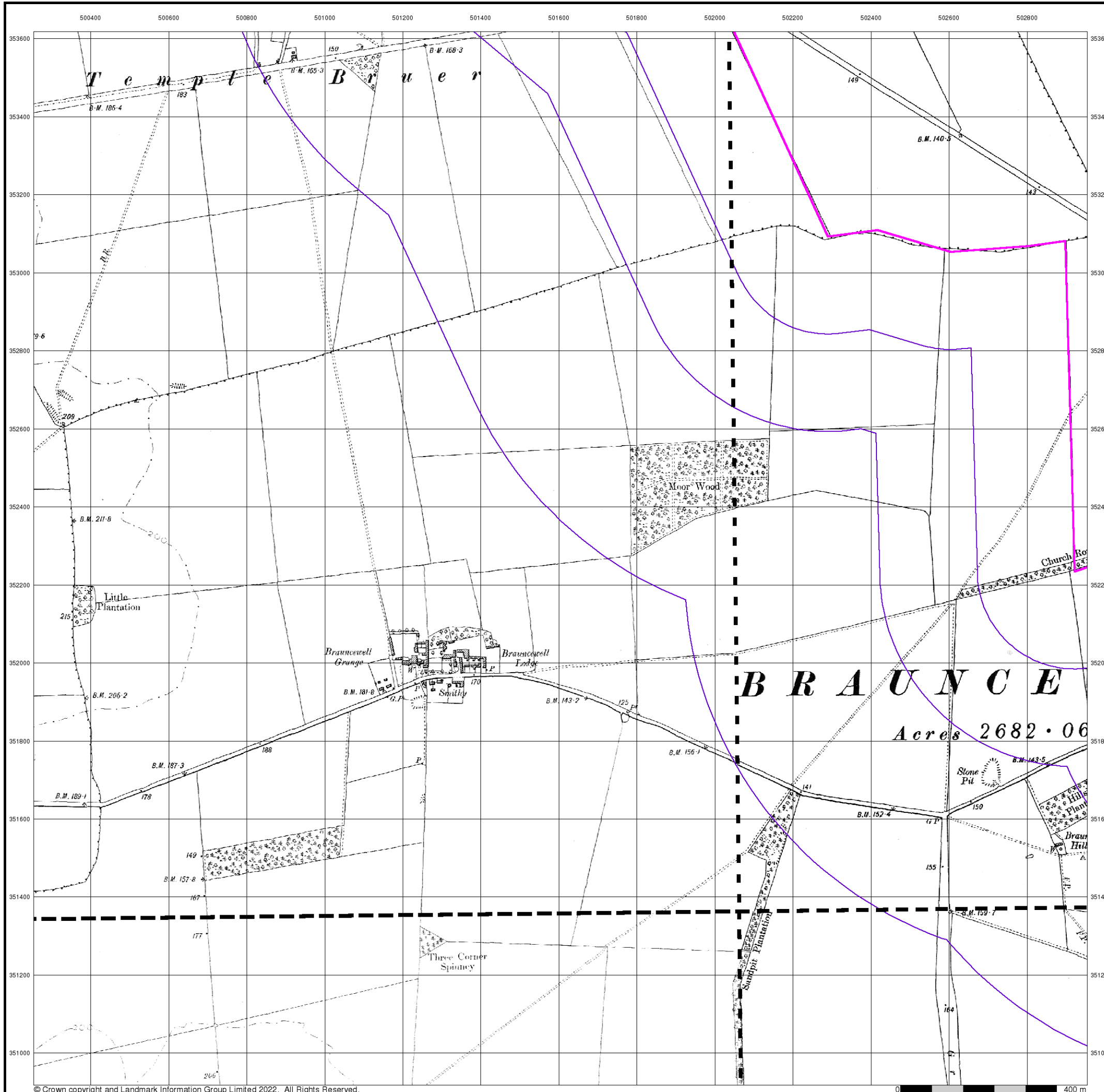
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 Customer Ref: P02130089
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 Site Area (Ha): 1774.17
 Search Buffer (m): 1000

Site Details

All Areas New



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Lincolnshire

Published 1947 - 1950

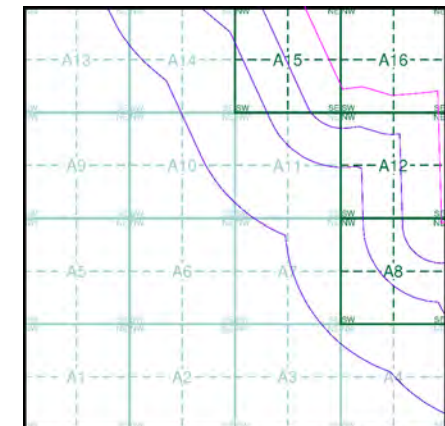
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

096NE 1947 1:10,560	097NW 1950 1:10,560
096SE 1947 1:10,560	097SW 1950 1:10,560

Historical Map - Slice A



Order Details

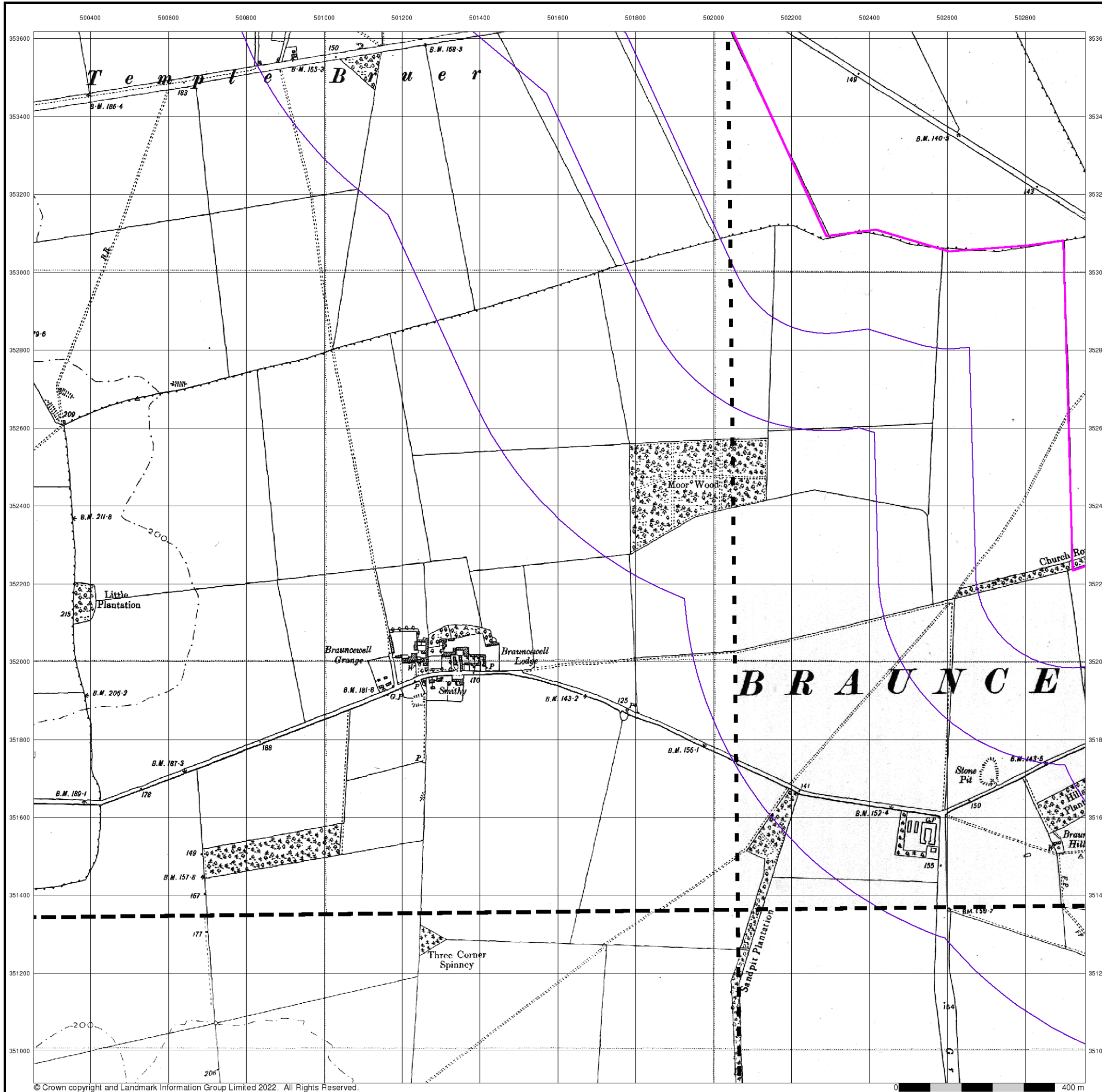
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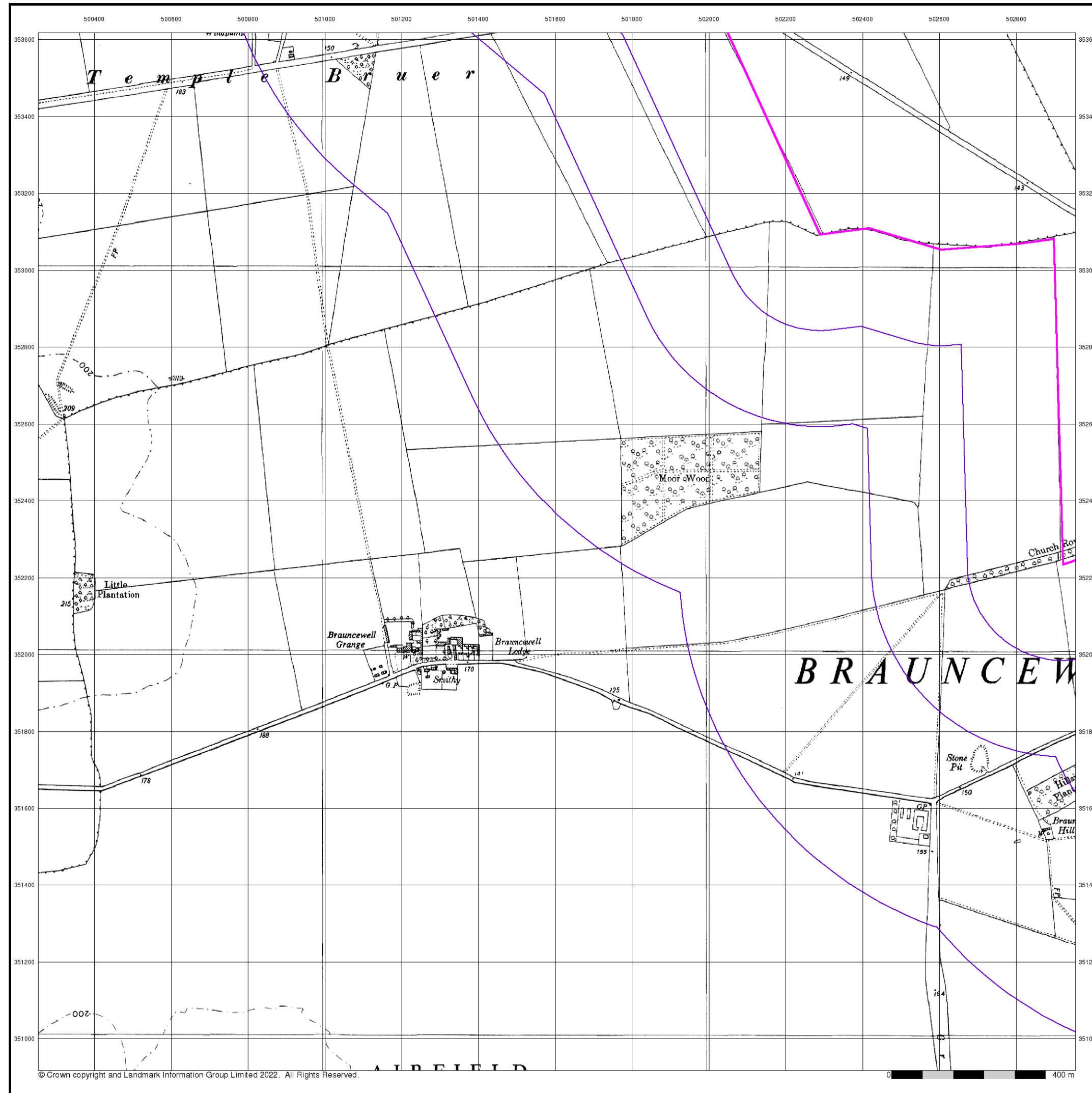
Site Details

All Areas New



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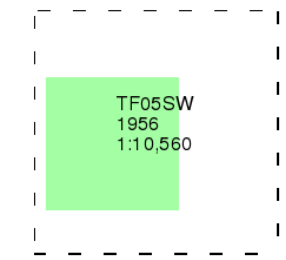




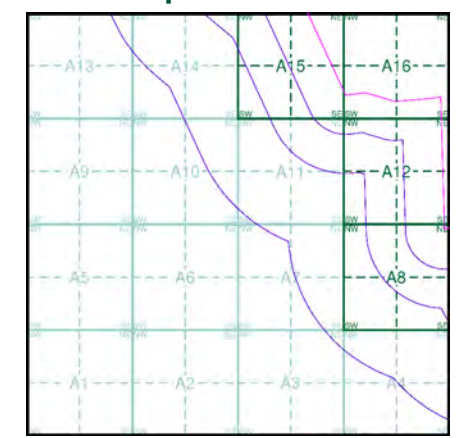
Ordnance Survey Plan
Published 1956
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

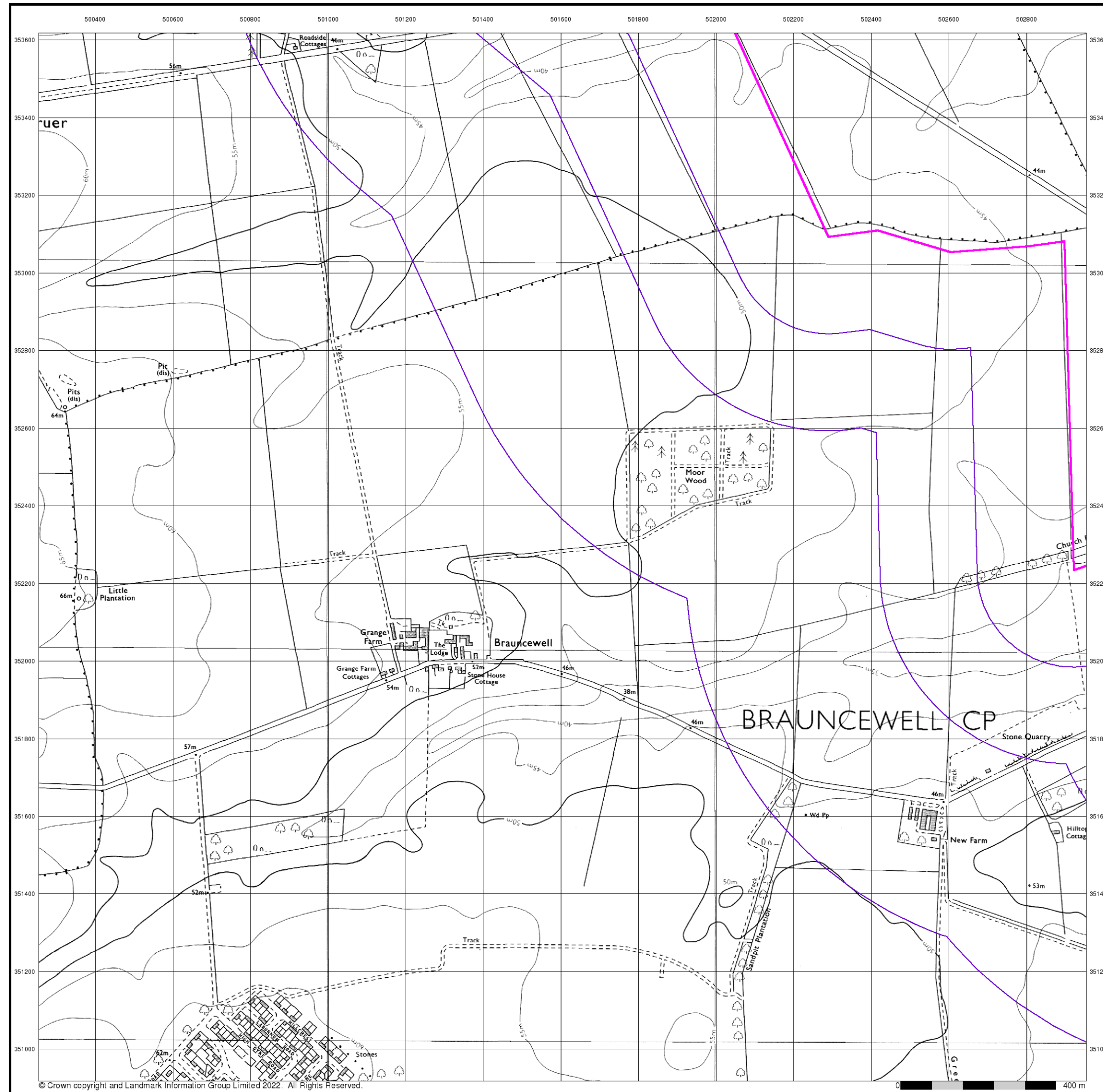
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 Search Buffer (m): 1000

Site Details

All Areas New



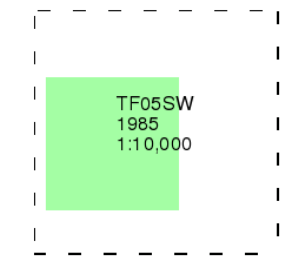
Tel: 0844 844 9952
 Fax: 0844 844 9951
 Web: www.envirocheck.co.uk



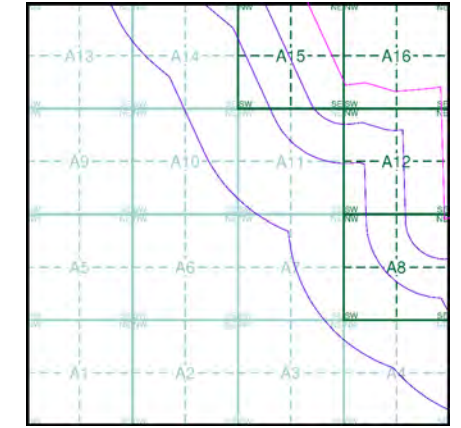
Ordnance Survey Plan
Published 1985
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

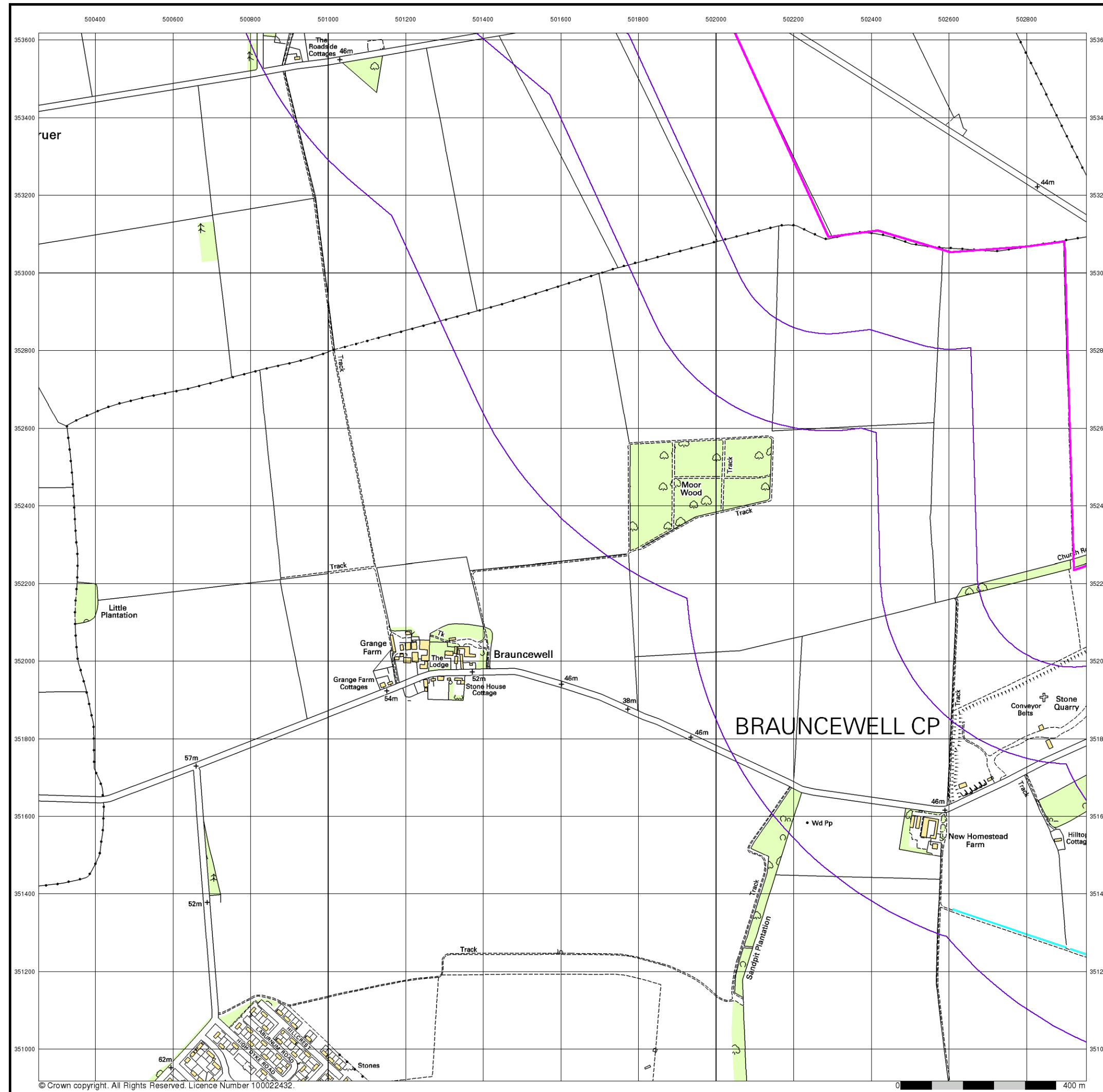
Order Number: 303381609_1_1
 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
 Search Buffer (m): 1000

Site Details

All Areas New



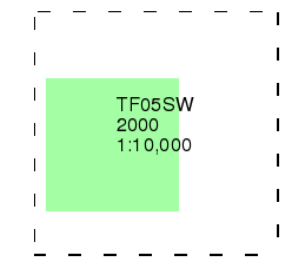
Tel: 0844 844 9952
 Fax: 0844 844 9951
 Web: www.envirocheck.co.uk



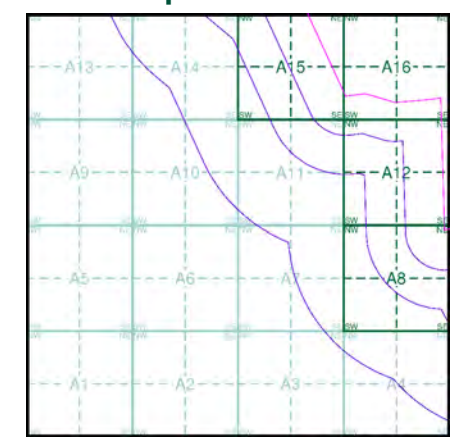
10k Raster Mapping
Published 2000
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey's 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

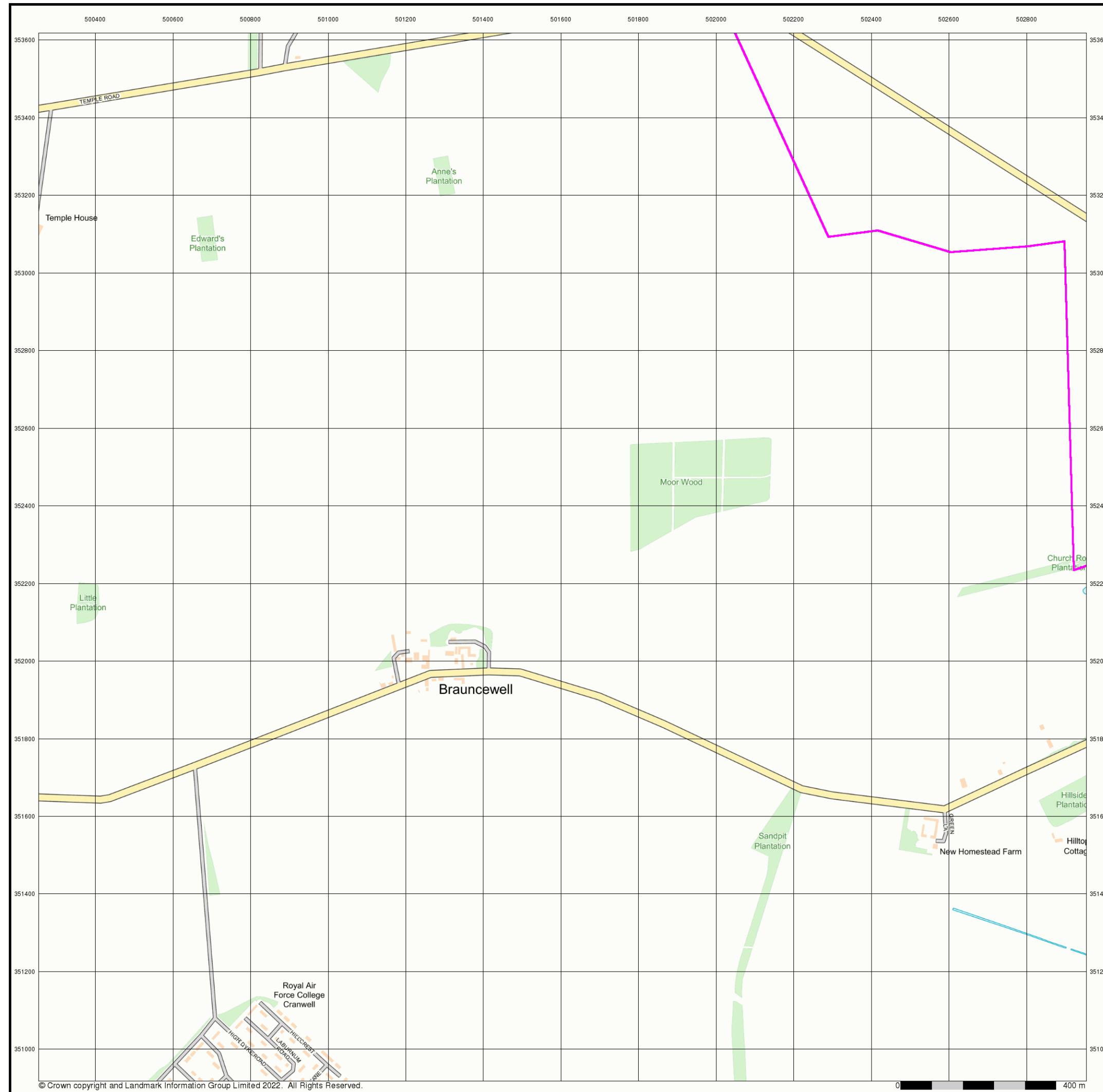
Order Number: 303381609_1_1
 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
 Search Buffer (m): 1000

Site Details

All Areas New



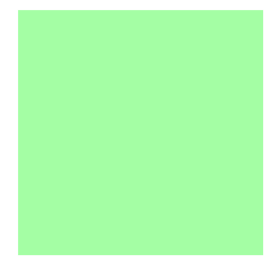
Tel: 0844 844 9952
 Fax: 0844 844 9951
 Web: www.envirocheck.co.uk



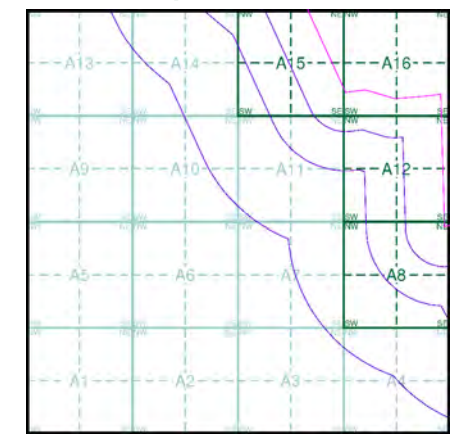
Street View
Published 2022
Source map scale - 1:10,000

Street View is a street-level map for the whole of Great Britain produced by the Ordnance Survey. These maps are provided at a nominal scale of 1:10,000

Map Name(s) and Date(s)



Street View Map - Slice A



Order Details

Order Number: 303381609_1_1
 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
 Search Buffer (m): 1000

Site Details

All Areas New



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Historical Mapping Legends

Ordnance Survey County Series and Ordnance Survey Plan 1:2,500

Quarry **Gravel Pit** **Sand Pit**
Clay Pit **Shingle** **Refuse Heap**
Sloping Masonry **Flat Rock**
Marsh **Reeds** **Osiers**
Rough Pasture **Furze** **Wood**
Mixed Wood **Brushwood** **Orchard**
Fir **Ford** **Stepping Stones**
Ferry **Waterfall** **Lock**
Trig. Station **Altitude at Trig. Station**
B.M. 325.9 **Bench Mark** **Surface Level**
Arrow denotes flow of water **Antiquities (site of)**
Cutting **Embankment**
Railway crossing Road **Level Crossing** **Road crossing Railway**
Railway crossing River or Canal **Road over single stream** **Road over River or Canal**
County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
County Borough Boundary (England)
Co. Boro. Bdy.
County Burgh Boundary (Scotland)
Co. Burgh Bdy.
BP BS Boundary Post or Stone **P.C.B** Police Call Box
B.R. Bridle Road **P** Pump
E.P Electricity Pylon **S.P** Signal Post
F.B. Foot Bridge **SL** Sluice
F.P. Foot Path **Sp.** Spring
G.P Guide Post or Board **T.C.B** Telephone Call Box
M.S Mile Stone **Tr.** Trough
M.P M.R Mooring Post or Ring **W** Well

Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250

Inactive Quarry, Chalk Pit or Clay Pit **Active Quarry, Chalk Pit or Clay Pit**
Rock **Boulders**
Cliff **Slopes** **Top**
Roofed Building **Glazed Roof Building**
Sloping Masonry **Archway**
Non-Coniferous Tree (surveyed) **Coniferous Tree (surveyed)**
Non-Coniferous Trees (not surveyed) **Coniferous Trees (not surveyed)**
Orchard Tree **Scrub** **Bracken**
Coppice, Osier **Reeds** **Marsh, Saltings**
Rough Grassland **Heath** **Culvert**
Direction of water flow **Bench Mark** **Antiquity (site of)**
Cave Entrance **Triangulation Station** **Electricity Pylon**
Electricity Transmission Line
County Boundary (Geographical)
County & Civil Parish Boundary
Civil Parish Boundary
Admin. County or County Bor. Boundary
London Borough Boundary
Symbol marking point where boundary mereing changes
BH Beer House **P** Pillar, Pole or Post
BP, BS Boundary Post or Stone **PO** Post Office
Cn, C Capstan, Crane **PC** Public Convenience
Chy Chimney **PH** Public House
D Fn Drinking Fountain **Pp** Pump
EI P Electricity Pillar or Post **SB, S Br** Signal Box or Bridge
FAP Fire Alarm Pillar **SP, SL** Signal Post or Light
FB Foot Bridge **Spr** Spring
GP Guide Post **Tk** Tank or Track
H Hydrant or Hydraulic **TCB** Telephone Call Box
LC Level Crossing **TCP** Telephone Call Post
MH Manhole **Tr** Trough
MP Mile Post or Mooring Post **Wr Pt, Wr T** Water Point, Water Tap
MS Mile Stone **W** Well
NTL Normal Tidal Limit **Wd Pp** Wind Pump

Large-Scale National Grid Data 1:2,500 and 1:1,250

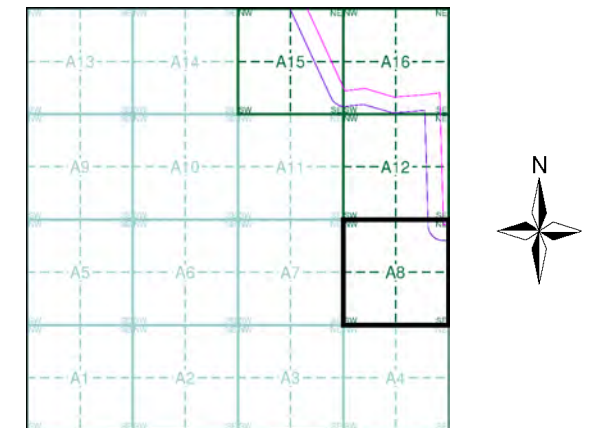
Cliff **Slopes** **Top**
Rock **Rock (scattered)**
Boulders **Boulders (scattered)**
Positioned Boulder **Scree**
Non-Coniferous Tree (surveyed) **Coniferous Tree (surveyed)**
Non-Coniferous Trees (not surveyed) **Coniferous Trees (not surveyed)**
Orchard Tree **Scrub** **Bracken**
Coppice, Osier **Reeds** **Marsh, Saltings**
Rough Grassland **Heath** **Culvert**
Direction of water flow **Triangulation Station** **Antiquity (site of)**
Electricity Transmission Line **Electricity Pylon**
B.M. 231.60m Bench Mark **Buildings with Building Seed**
Roofed Building **Glazed Roof Building**
Civil parish/community boundary
District boundary
County boundary
Boundary post/stone
Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)
Bks Barracks **P** Pillar, Pole or Post
Bty Battery **PO** Post Office
Cemy Cemetery **PC** Public Convenience
Chy Chimney **Pp** Pump
Cis Cistern **Ppg Sta** Pumping Station
Dismtd Rly Dismantled Railway **PW** Place of Worship
EI Gen Sta Electricity Generating Station **Sewage Ppg Sta** Sewage Pumping Station
EI P Electricity Pole, Pillar **SB, S Br** Signal Box or Bridge
EI Sub Sta Electricity Sub Station **SP, SL** Signal Post or Light
FB Filter Bed **Spr** Spring
Fn / D Fn Fountain / Drinking Ftn. **Tk** Tank or Track
Gas Gov Gas Valve Compound **Tr** Trough
GVC Gas Governor **Wd Pp** Wind Pump
GP Guide Post **Wr Pt, Wr T** Water Point, Water Tap
MH Manhole **Wks** Works (building or area)
MP, MS Mile Post or Mile Stone **W** Well



Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Lincolnshire	1:2,500	1888	2
Lincolnshire	1:2,500	1905	3
Ordnance Survey Plan	1:2,500	1979 - 1980	4
Large-Scale National Grid Data	1:2,500	1994	5

Historical Map - Segment A8



Order Details

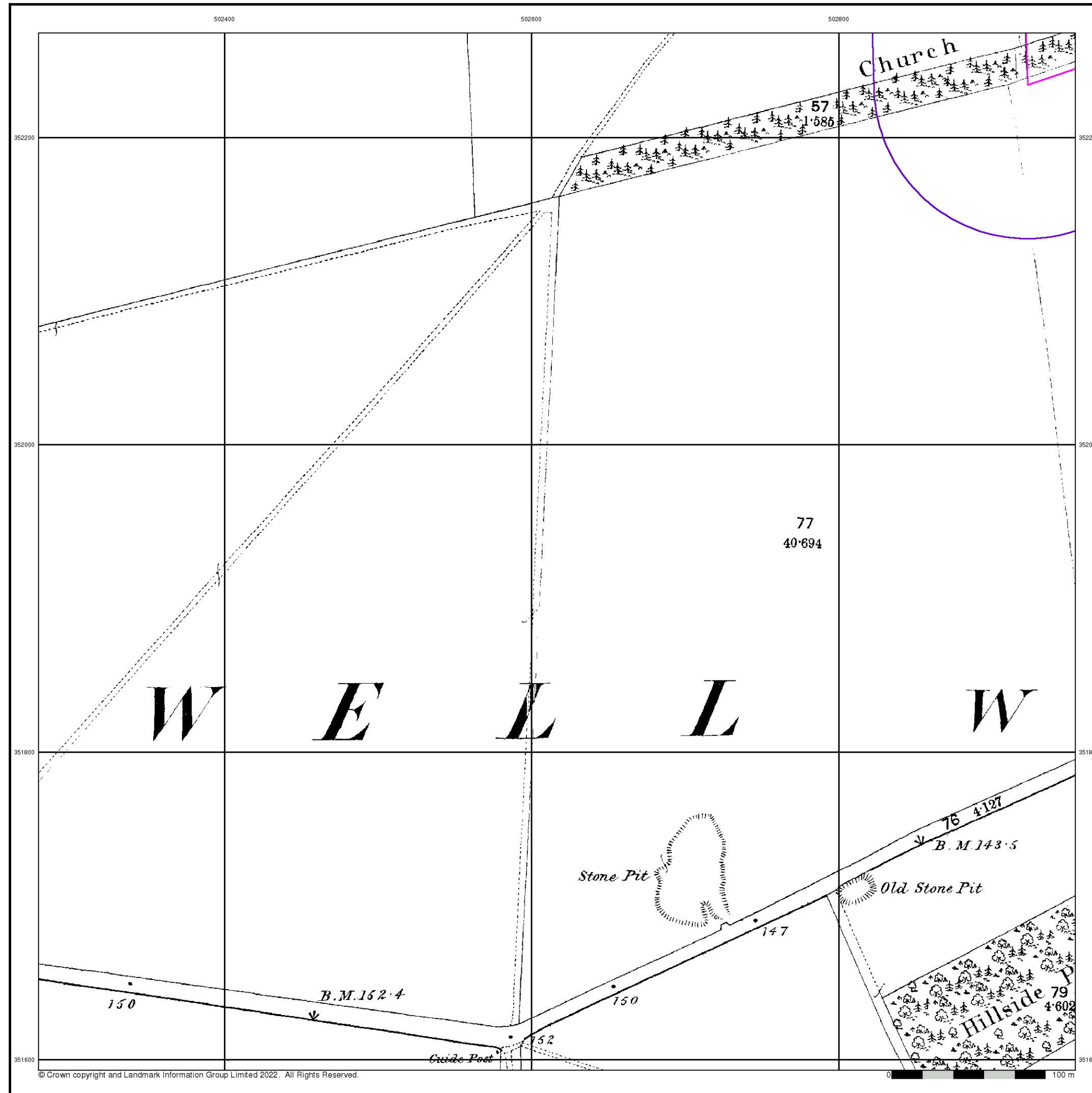
Order Number: 303381609_1_1
 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
 Search Buffer (m): 100

Site Details

All Areas New



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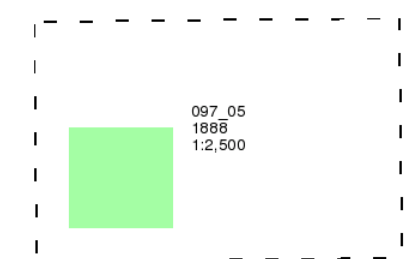
Lincolnshire

Published 1888

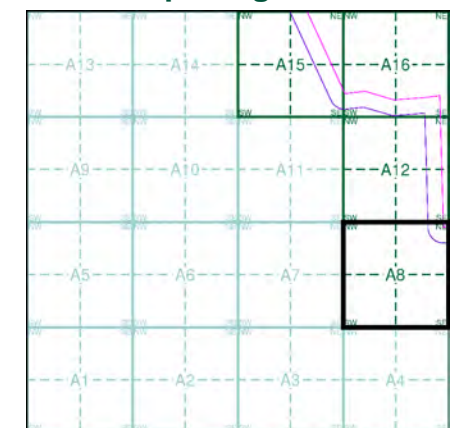
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A8



Order Details

Order Number: 303381609_1_1
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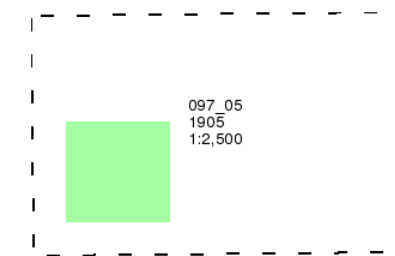
Lincolnshire

Published 1905

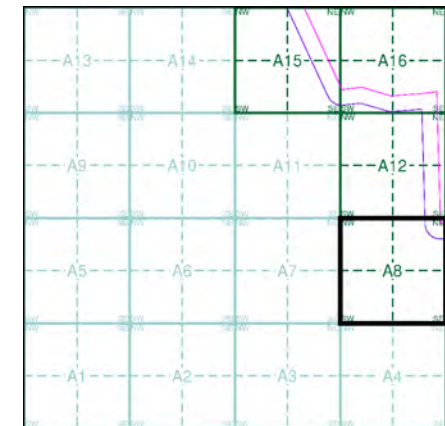
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A8



Order Details

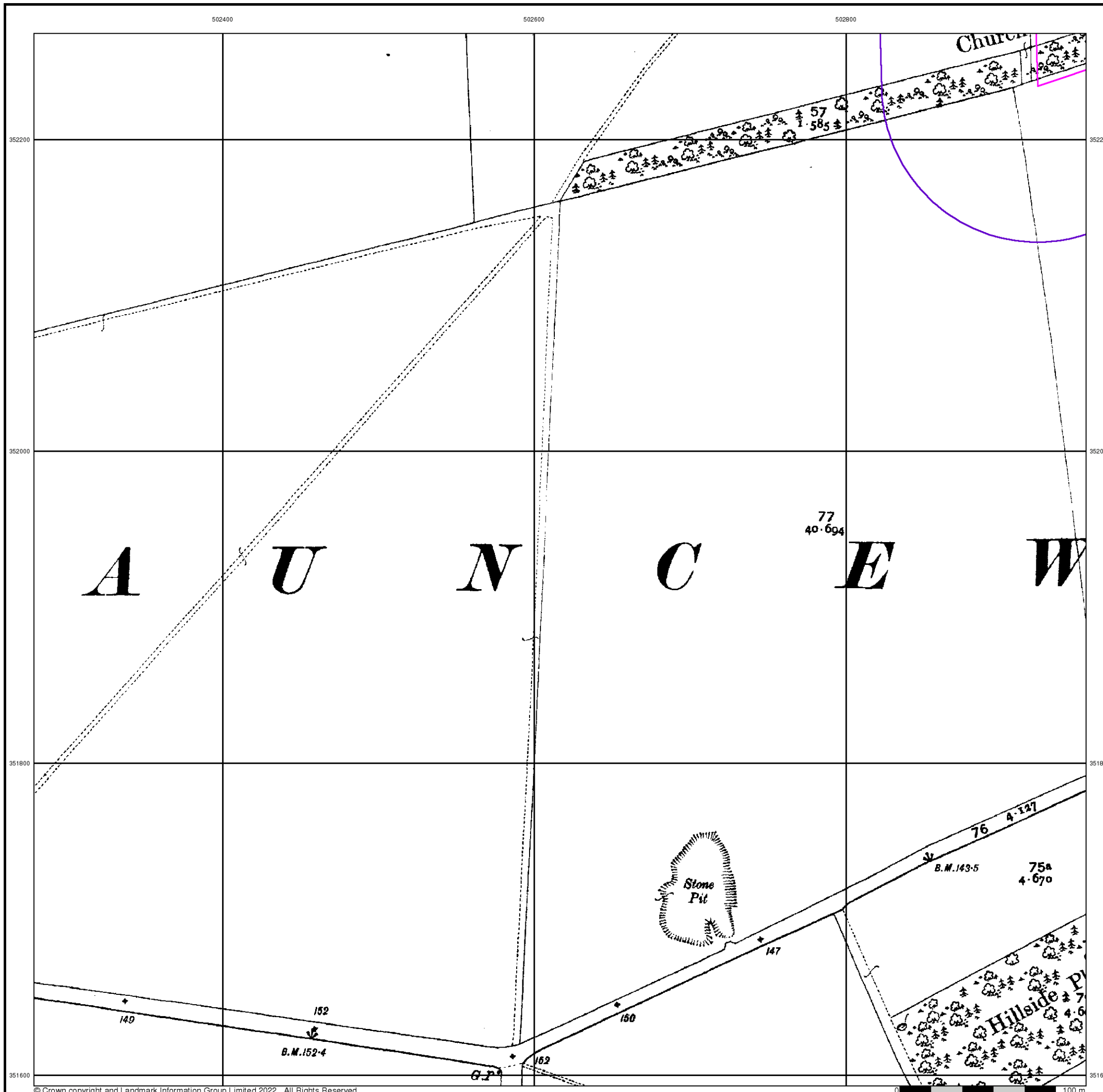
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Customer Ref: P02130089
National Grid Reference: 502200, 352660
Slice: A
Site Area (Ha): 1774.17
Search Buffer (m): 100

Site Details

All Areas New



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Ordnance Survey Plan

Published 1979 - 1980

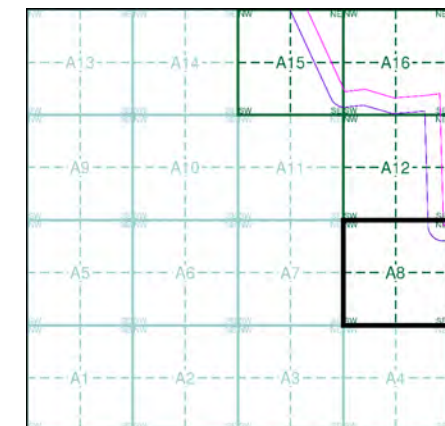
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

TF0252	1979	1:2,500
TF0251	1980	1:2,500

Historical Map - Segment A8



Order Details

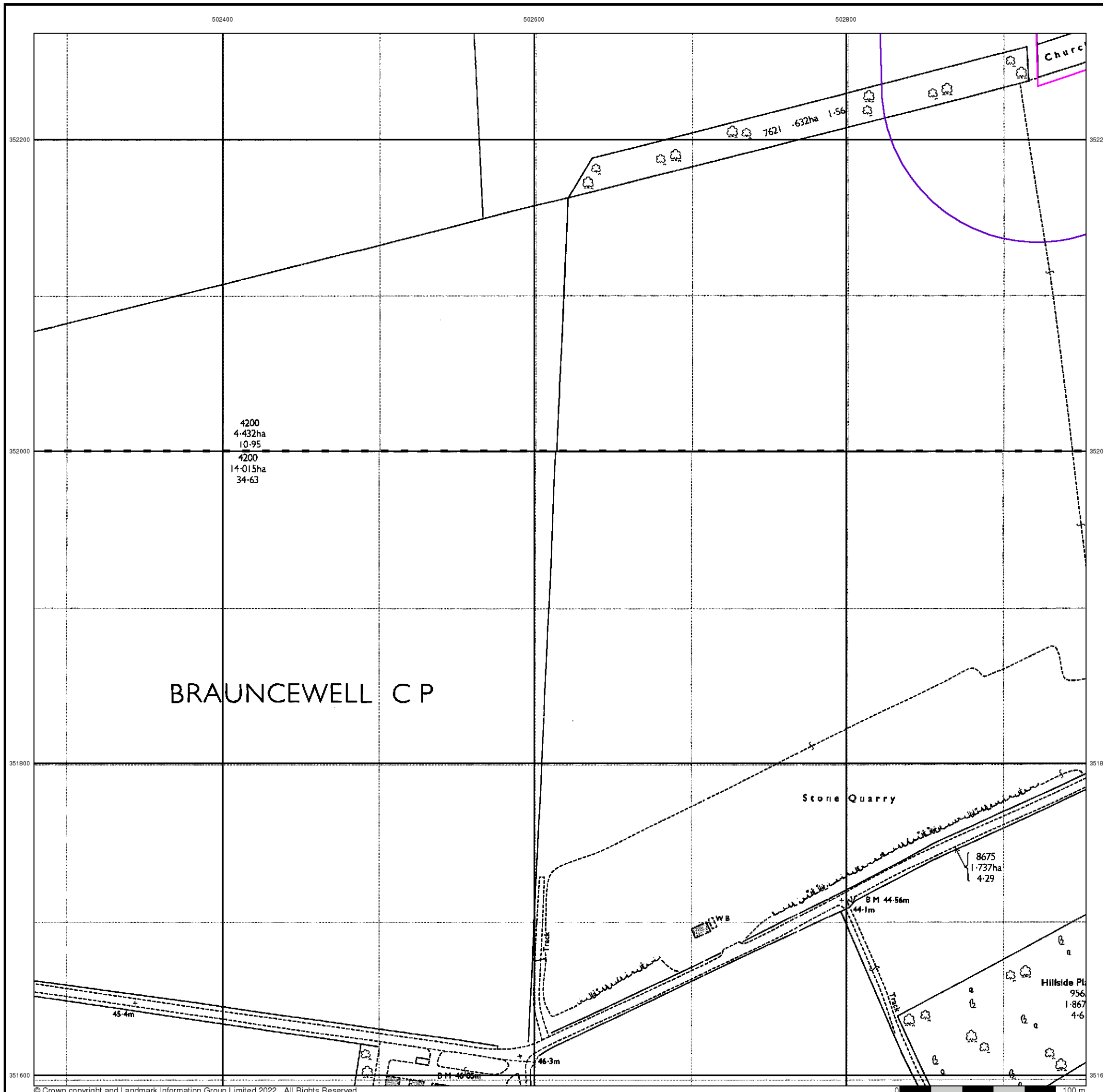
Order Number: 303381609_1_1
 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
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 Search Buffer (m): 100

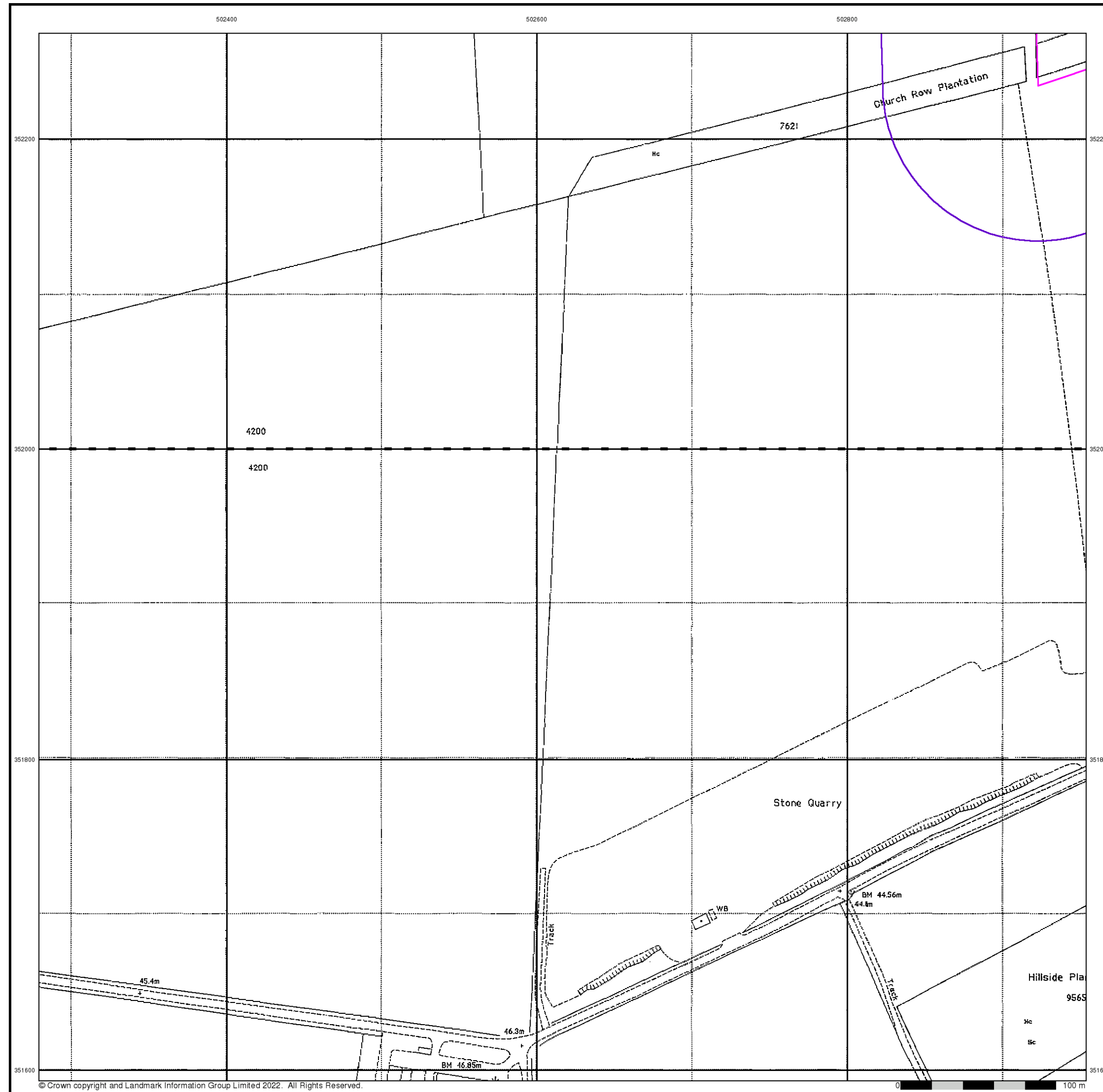
Site Details

All Areas New



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Large-Scale National Grid Data

Published 1994

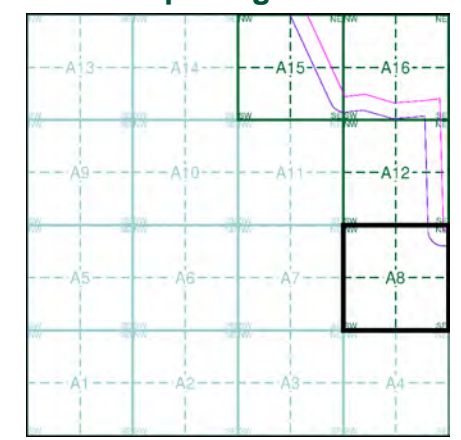
Source map scale - 1:2,500

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

TF0252	1994	1:2,500
TF0251	1994	1:2,500

Historical Map - Segment A8



Order Details

Order Number: 303381609_1_1
 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
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Historical Mapping Legends

Ordnance Survey County Series and Ordnance Survey Plan 1:2,500

Quarry **Gravel Pit** **Sand Pit**
Clay Pit **Shingle** **Refuse Heap**
Sloping Masonry **Flat Rock**
Marsh **Reeds** **Osiers**
Rough Pasture **Furze** **Wood**
Mixed Wood **Brushwood** **Orchard**
Fir **Ford** **Stepping Stones**
Ferry **Waterfall** **Lock**
Trig. Station **Altitude at Trig. Station**
B.M. 325.9 **Bench Mark** **Surface Level**
Arrow denotes flow of water **Antiquities (site of)**
Cutting **Embankment**
Railway crossing Road **Level Crossing** **Road crossing Railway**
Railway crossing River or Canal **Road over single stream** **Road over River or Canal**
County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
County Borough Boundary (England)
Co. Boro. Bdy.
County Burgh Boundary (Scotland)
Co. Burgh Bdy.
BP, BS Boundary Post or Stone **P.C.B** Police Call Box
B.R. Bridle Road **P** Pump
E.P Electricity Pylon **S.P** Signal Post
F.B. Foot Bridge **SL** Sluice
F.P. Foot Path **Sp.** Spring
G.P Guide Post or Board **T.C.B** Telephone Call Box
M.S Mile Stone **Tr.** Trough
M.P M.R Mooring Post or Ring **W** Well

Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250

Inactive Quarry, Chalk Pit or Clay Pit **Active Quarry, Chalk Pit or Clay Pit**
Rock **Boulders**
Cliff **Slopes** **Top**
Roofed Building **Glazed Roof Building**
Sloping Masonry **Archway**
Non-Coniferous Tree (surveyed) **Coniferous Tree (surveyed)**
Non-Coniferous Trees (not surveyed) **Coniferous Trees (not surveyed)**
Orchard Tree **Scrub** **Bracken**
Coppice, Osier **Reeds** **Marsh, Saltings**
Rough Grassland **Heath** **Culvert**
Direction of water flow **Bench Mark** **Antiquity (site of)**
Cave Entrance **Triangulation Station** **Electricity Pylon**
Electricity Transmission Line
County Boundary (Geographical)
County & Civil Parish Boundary
Civil Parish Boundary
Admin. County or County Bor. Boundary
London Borough Boundary
Symbol marking point where boundary mereing changes
BH Beer House **P** Pillar, Pole or Post
BP, BS Boundary Post or Stone **PO** Post Office
Cn, C Capstan, Crane **PC** Public Convenience
Chy Chimney **PH** Public House
D Fn Drinking Fountain **Pp** Pump
EI P Electricity Pillar or Post **SB, S Br** Signal Box or Bridge
FAP Fire Alarm Pillar **SP, SL** Signal Post or Light
FB Foot Bridge **Spr** Spring
GP Guide Post **Tk** Tank or Track
H Hydrant or Hydraulic **TCB** Telephone Call Box
LC Level Crossing **TCP** Telephone Call Post
MH Manhole **Tr** Trough
MP Mile Post or Mooring Post **Wr Pt, Wr T** Water Point, Water Tap
MS Mile Stone **W** Well
NTL Normal Tidal Limit **Wd Pp** Wind Pump

Large-Scale National Grid Data 1:2,500 and 1:1,250

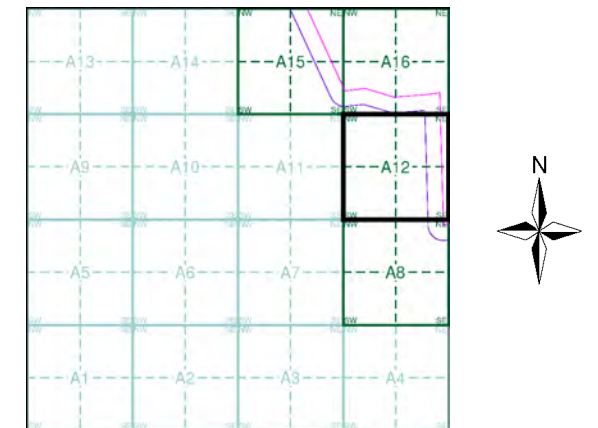
Cliff **Slopes** **Top**
Rock **Rock (scattered)**
Boulders **Boulders (scattered)**
Positioned Boulder **Scree**
Non-Coniferous Tree (surveyed) **Coniferous Tree (surveyed)**
Non-Coniferous Trees (not surveyed) **Coniferous Trees (not surveyed)**
Orchard Tree **Scrub** **Bracken**
Coppice, Osier **Reeds** **Marsh, Saltings**
Rough Grassland **Heath** **Culvert**
Direction of water flow **Triangulation Station** **Antiquity (site of)**
Electricity Transmission Line **Electricity Pylon**
B.M. 231.60m Bench Mark **Buildings with Building Seed**
Roofed Building **Glazed Roof Building**
Civil parish/community boundary
District boundary
County boundary
Boundary post/stone
Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)
Bks Barracks **P** Pillar, Pole or Post
Bty Battery **PO** Post Office
Cemy Cemetery **PC** Public Convenience
Chy Chimney **Pp** Pump
Cis Cistern **Ppg Sta** Pumping Station
Dismtd Rly Dismantled Railway **PW** Place of Worship
EI Gen Sta Electricity Generating Station **Sewage Ppg Sta** Sewage Pumping Station
EI P Electricity Pole, Pillar **SB, S Br** Signal Box or Bridge
EI Sub Sta Electricity Sub Station **SP, SL** Signal Post or Light
FB Filter Bed **Spr** Spring
Fn / D Fn Fountain / Drinking Ftn. **Tk** Tank or Track
Gas Gov Gas Valve Compound **Tr** Trough
GVC Gas Governor **Wd Pp** Wind Pump
GP Guide Post **Wr Pt, Wr T** Water Point, Water Tap
MH Manhole **Wks** Works (building or area)
MP, MS Mile Post or Mile Stone **W** Well



Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Lincolnshire	1:2,500	1888	2
Lincolnshire	1:2,500	1905	3
Ordnance Survey Plan	1:2,500	1979	4
Large-Scale National Grid Data	1:2,500	1994	5

Historical Map - Segment A12



Order Details

Order Number: 303381609_1_1
 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
 Search Buffer (m): 100

Site Details

All Areas New



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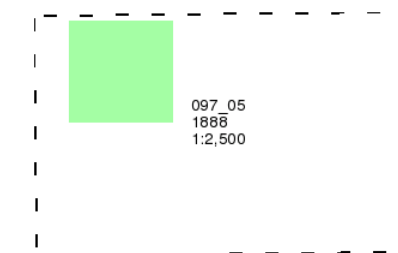
Lincolnshire

Published 1888

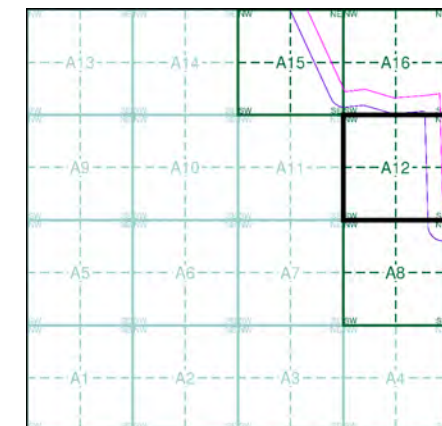
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A12



Order Details

Order Number: 303381609_1_1
Customer Ref: P02130089
National Grid Reference: 502200, 352660
Slice: A
Site Area (Ha): 1774.17
Search Buffer (m): 100

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All Areas New



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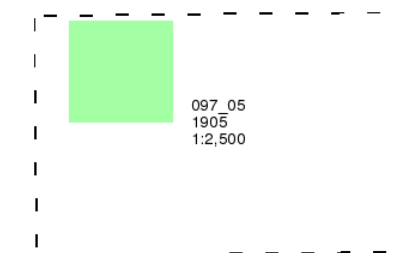
Lincolnshire

Published 1905

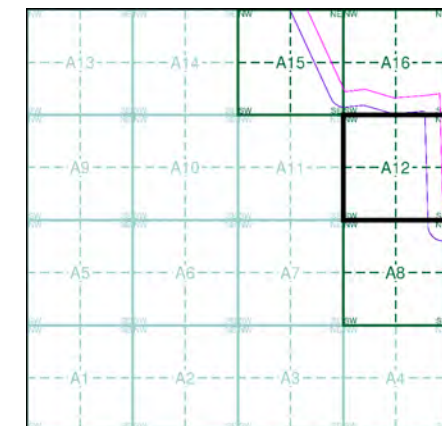
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A12



Order Details

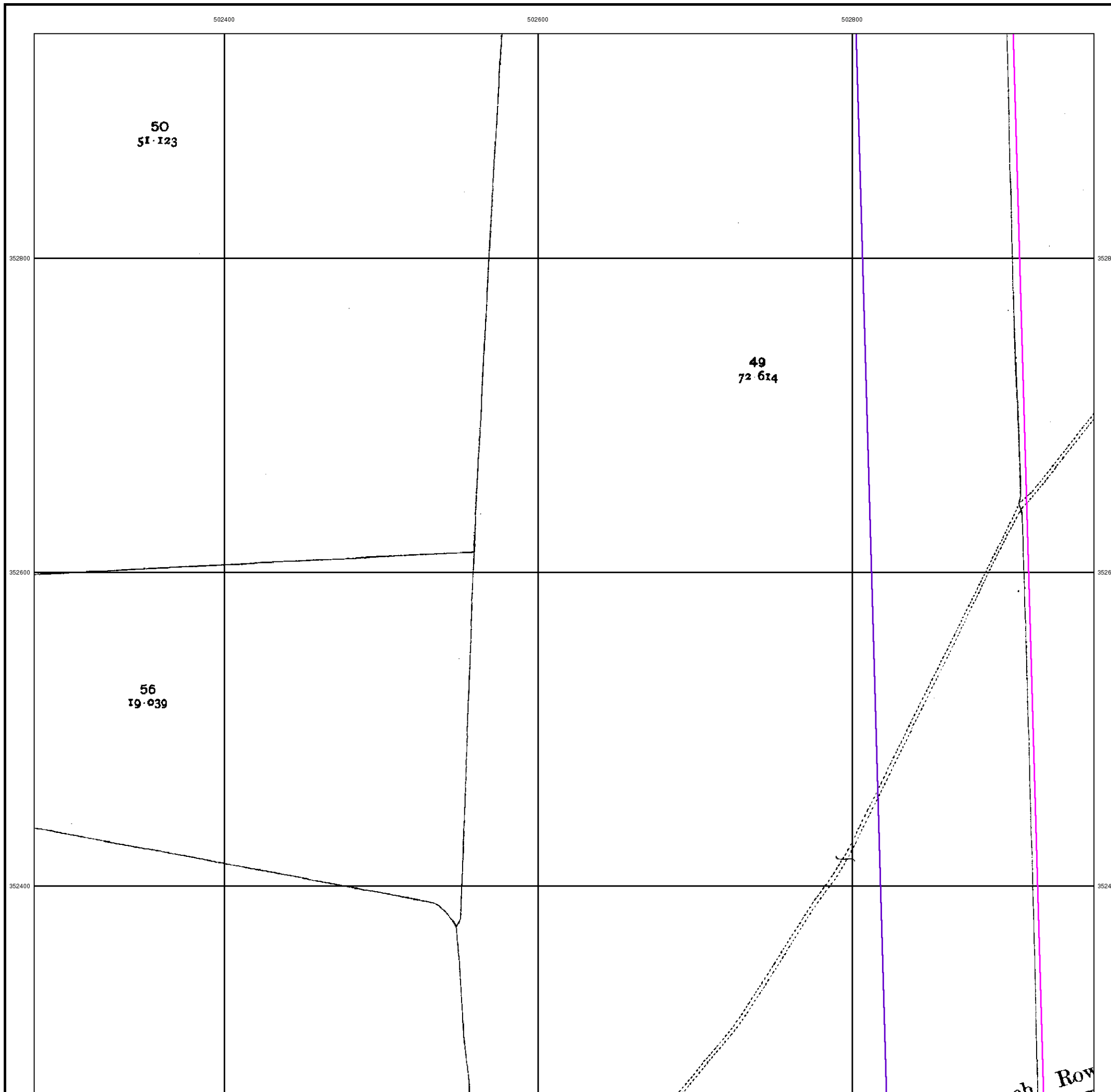
Order Number: 303381609_1_1
Customer Ref: P02130089
National Grid Reference: 502200, 352660
Slice: A
Site Area (Ha): 1774.17
Search Buffer (m): 100

Site Details

All Areas New



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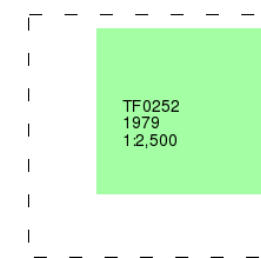
Ordnance Survey Plan

Published 1979

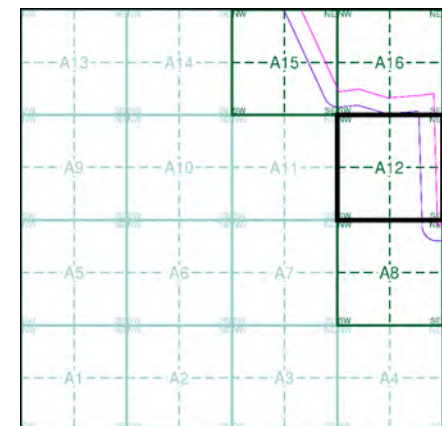
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A12



Order Details

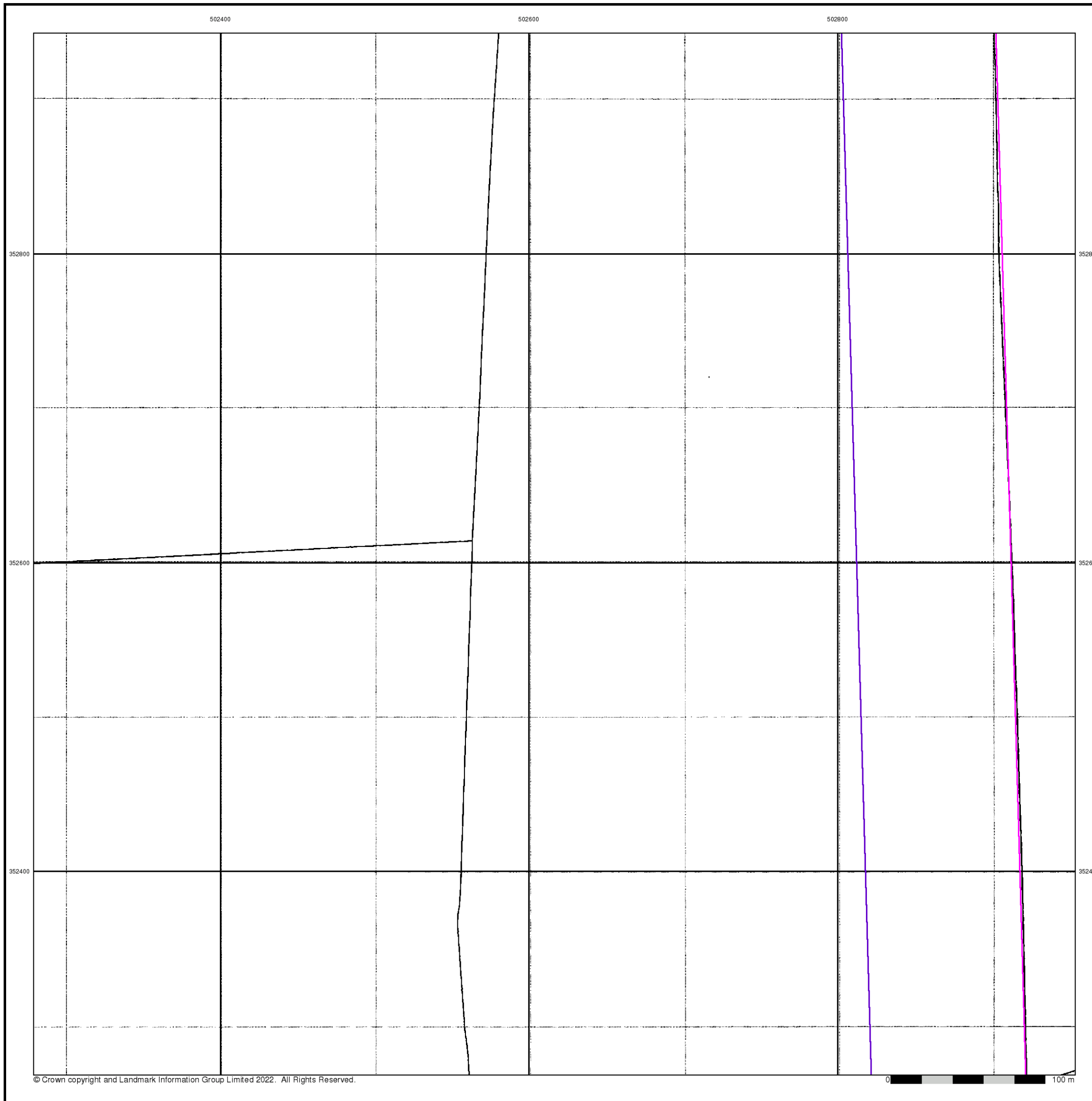
Order Number: 303381609_1_1
Customer Ref: P02130089
National Grid Reference: 502200, 352660
Slice: A
Site Area (Ha): 1774.17
Search Buffer (m): 100

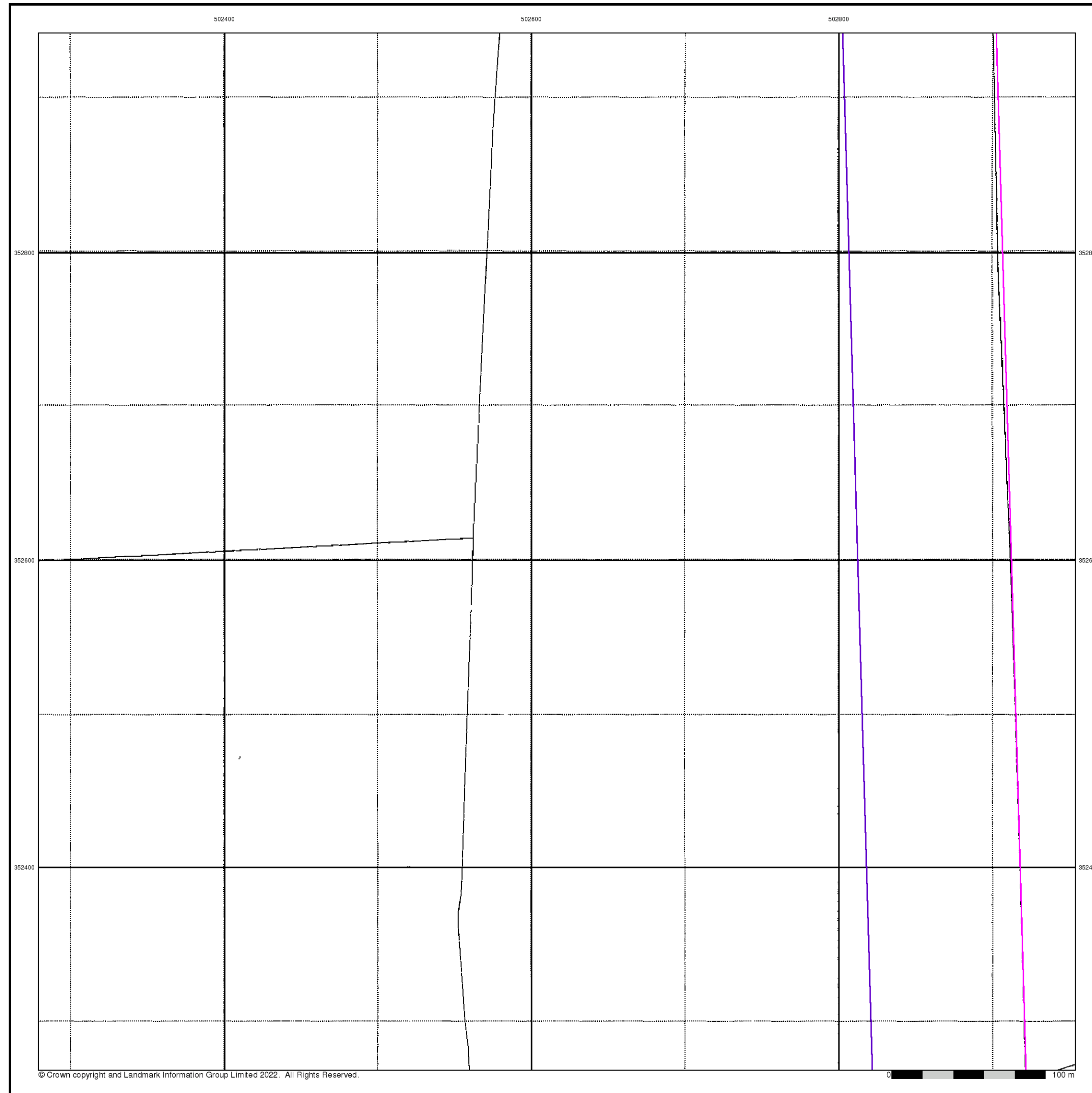
Site Details

All Areas New



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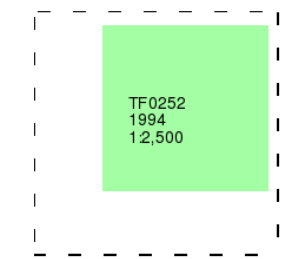
Large-Scale National Grid Data

Published 1994

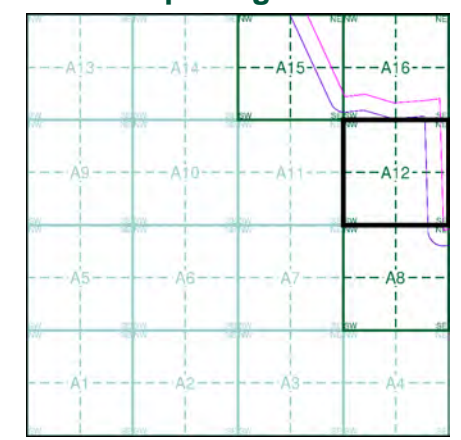
Source map scale - 1:2,500

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A12



Order Details

Order Number: 303381609_1_1
 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
 Search Buffer (m): 100

Site Details

All Areas New



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Historical Mapping Legends

Ordnance Survey County Series and Ordnance Survey Plan 1:2,500

Quarry **Gravel Pit** **Sand Pit**
Clay Pit **Shingle** **Refuse Heap**
Sloping Masonry **Flat Rock**
Marsh **Reeds** **Osiers**
Rough Pasture **Furze** **Wood**
Mixed Wood **Brushwood** **Orchard**
Fir **Ford** **Stepping Stones**
Ferry **Waterfall** **Lock**
Trig. Station **Altitude at Trig. Station**
B.M. 325.9 **Bench Mark** **Surface Level**
Arrow denotes flow of water **Antiquities (site of)**
Cutting **Embankment**
Railway crossing Road **Level Crossing** **Road crossing Railway**
Railway crossing River or Canal **Road over single stream** **Road over River or Canal**
County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
County Borough Boundary (England)
Co. Boro. Bdy.
County Burgh Boundary (Scotland)
Co. Burgh Bdy.
BP, BS Boundary Post or Stone **P.C.B** Police Call Box
B.R. Bridle Road **P** Pump
E.P Electricity Pylon **S.P** Signal Post
F.B. Foot Bridge **SL** Sluice
F.P. Foot Path **Sp.** Spring
G.P Guide Post or Board **T.C.B** Telephone Call Box
M.S Mile Stone **Tr.** Trough
M.P M.R Mooring Post or Ring **W** Well

Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250

Inactive Quarry, Chalk Pit or Clay Pit **Active Quarry, Chalk Pit or Clay Pit**
Rock **Boulders**
Cliff **Slopes** **Top**
Roofed Building **Glazed Roof Building**
Sloping Masonry **Archway**
Non-Coniferous Tree (surveyed) **Coniferous Tree (surveyed)**
Non-Coniferous Trees (not surveyed) **Coniferous Trees (not surveyed)**
Orchard Tree **Scrub** **Bracken**
Coppice, Osier **Reeds** **Marsh, Saltings**
Rough Grassland **Heath** **Culvert**
Direction of water flow **Bench Mark** **Antiquity (site of)**
Cave Entrance **Triangulation Station** **Electricity Pylon**
Electricity Transmission Line
County Boundary (Geographical)
County & Civil Parish Boundary
Civil Parish Boundary
Admin. County or County Bor. Boundary
London Borough Boundary
Symbol marking point where boundary mereing changes
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BP, BS Boundary Post or Stone **PO** Post Office
Cn, C Capstan, Crane **PC** Public Convenience
Chy Chimney **PH** Public House
D Fn Drinking Fountain **Pp** Pump
EI P Electricity Pillar or Post **SB, S Br** Signal Box or Bridge
FAP Fire Alarm Pillar **SP, SL** Signal Post or Light
FB Foot Bridge **Spr** Spring
GP Guide Post **Tk** Tank or Track
H Hydrant or Hydraulic **TCB** Telephone Call Box
LC Level Crossing **TCP** Telephone Call Post
MH Manhole **Tr** Trough
MP Mile Post or Mooring Post **Wr Pt, Wr T** Water Point, Water Tap
MS Mile Stone **W** Well
NTL Normal Tidal Limit **Wd Pp** Wind Pump

Large-Scale National Grid Data 1:2,500 and 1:1,250

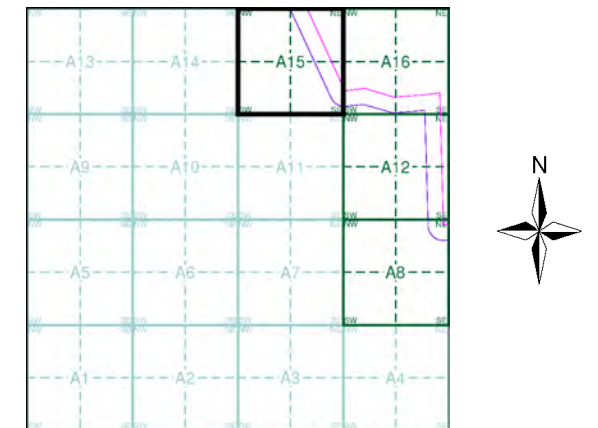
Cliff **Slopes** **Top**
Rock **Rock (scattered)**
Boulders **Boulders (scattered)**
Positioned Boulder **Scree**
Non-Coniferous Tree (surveyed) **Coniferous Tree (surveyed)**
Non-Coniferous Trees (not surveyed) **Coniferous Trees (not surveyed)**
Orchard Tree **Scrub** **Bracken**
Coppice, Osier **Reeds** **Marsh, Saltings**
Rough Grassland **Heath** **Culvert**
Direction of water flow **Triangulation Station** **Antiquity (site of)**
Electricity Transmission Line **Electricity Pylon**
B.M. 231.60m Bench Mark **Buildings with Building Seed**
Roofed Building **Glazed Roof Building**
Civil parish/community boundary
District boundary
County boundary
Boundary post/stone
Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)
Bks Barracks **P** Pillar, Pole or Post
Bty Battery **PO** Post Office
Cemy Cemetery **PC** Public Convenience
Chy Chimney **Pp** Pump
Cis Cistern **Ppg Sta** Pumping Station
Dismtd Rly Dismantled Railway **PW** Place of Worship
EI Gen Sta Electricity Generating Station **Sewage Ppg Sta** Sewage Pumping Station
EI P Electricity Pole, Pillar **SB, S Br** Signal Box or Bridge
EI Sub Sta Electricity Sub Station **SP, SL** Signal Post or Light
FB Filter Bed **Spr** Spring
Fn / D Fn Fountain / Drinking Ftn. **Tk** Tank or Track
Gas Gov Gas Valve Compound **Tr** Trough
GVC Gas Governor **Wd Pp** Wind Pump
GP Guide Post **Wr Pt, Wr T** Water Point, Water Tap
MH Manhole **Wks** Works (building or area)
MP, MS Mile Post or Mile Stone **W** Well



Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Lincolnshire	1:2,500	1887 - 1888	2
Lincolnshire	1:2,500	1905	3
Ordnance Survey Plan	1:2,500	1979 - 1980	4
Additional SIMs	1:2,500	1980	5
Large-Scale National Grid Data	1:2,500	1994	6

Historical Map - Segment A15



Order Details

Order Number: 303381609_1_1
 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
 Search Buffer (m): 100

Site Details

All Areas New



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Lincolnshire

Published 1887 - 1888

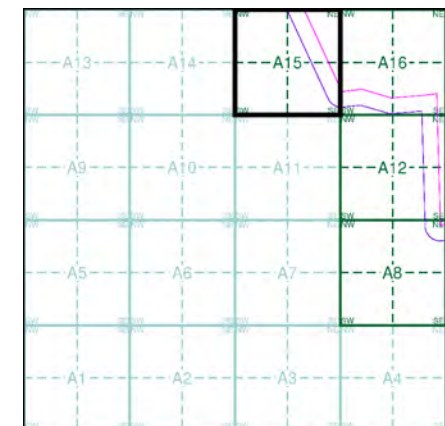
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

096_04 1887 1:2,500	097_01 1888 1:2,500
096_08 1887 1:2,500	097_05 1888 1:2,500

Historical Map - Segment A15



Order Details

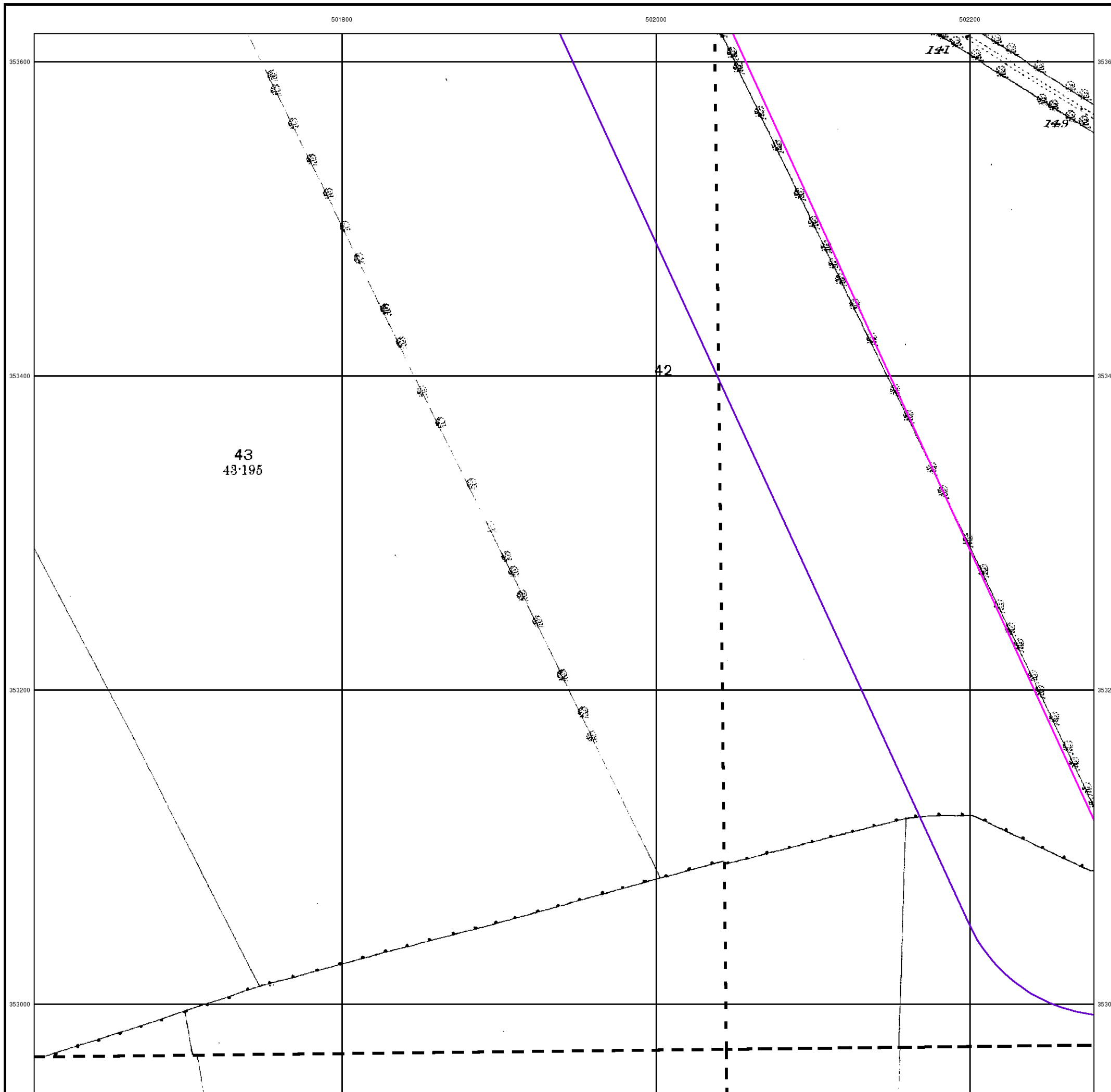
Order Number: 303381609_1_1
 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
 Search Buffer (m): 100

Site Details

All Areas New



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Lincolnshire

Published 1905

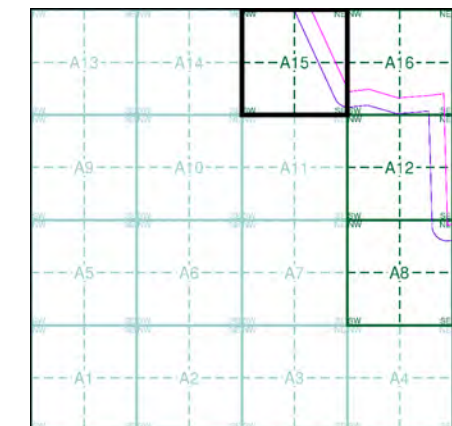
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

096_04 1905 1:2,500	097_01 1905 1:2,500
096_08 1905 1:2,500	097_05 1905 1:2,500

Historical Map - Segment A15



Order Details

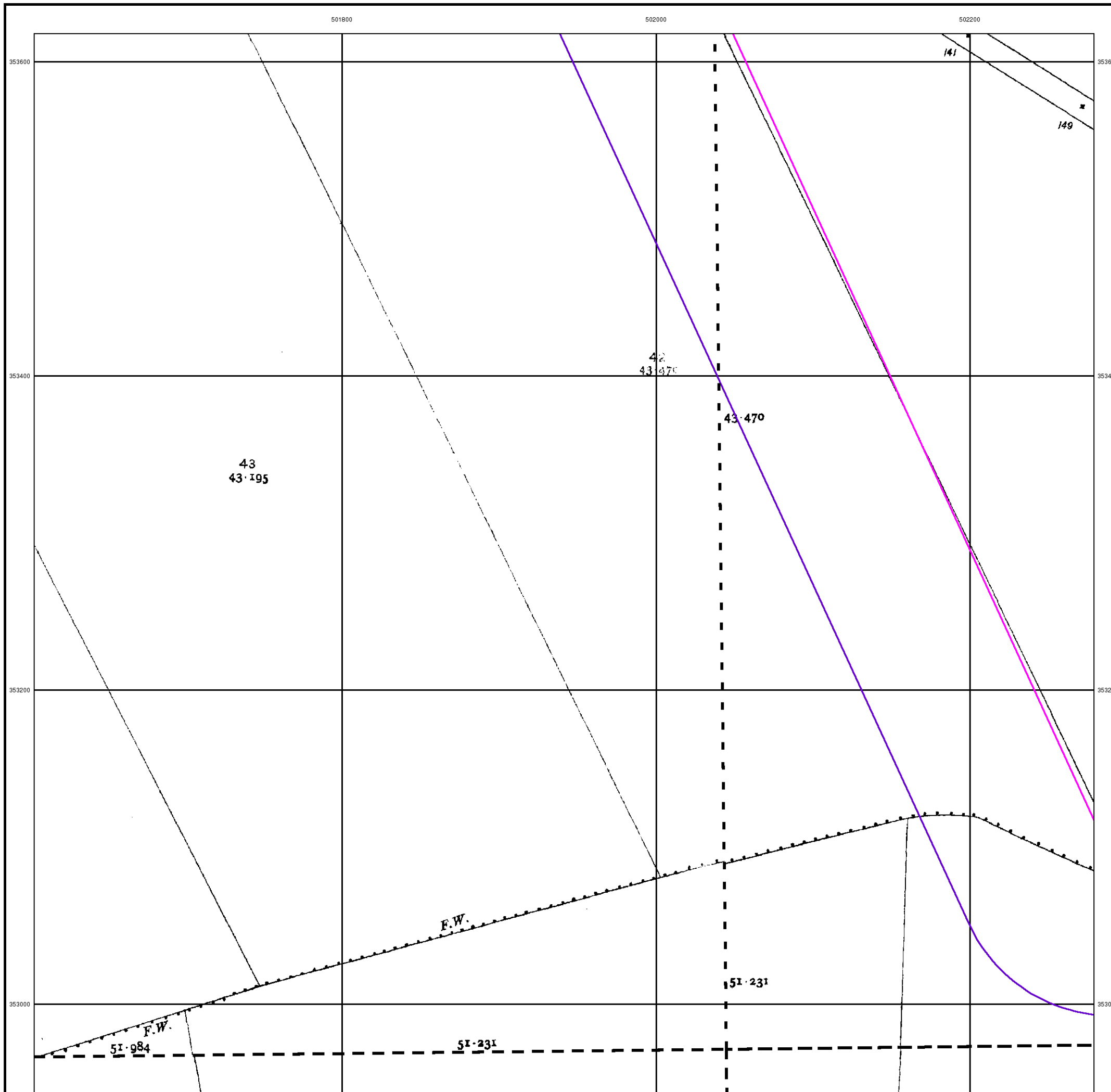
Order Number: 303381609_1_1
 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
 Search Buffer (m): 100

Site Details

All Areas New



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Ordnance Survey Plan

Published 1979 - 1980

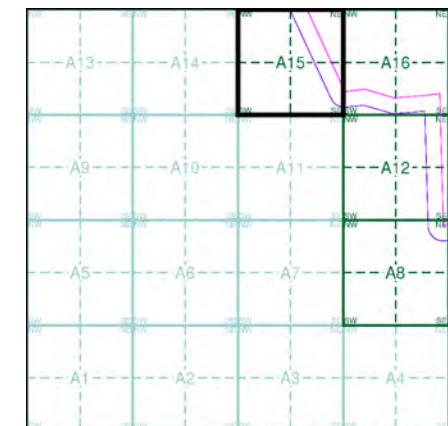
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

TF0153 1979 12,500	TF0253 1979 12,500
TF0152 1980 12,500	TF0252 1979 12,500

Historical Map - Segment A15



Order Details

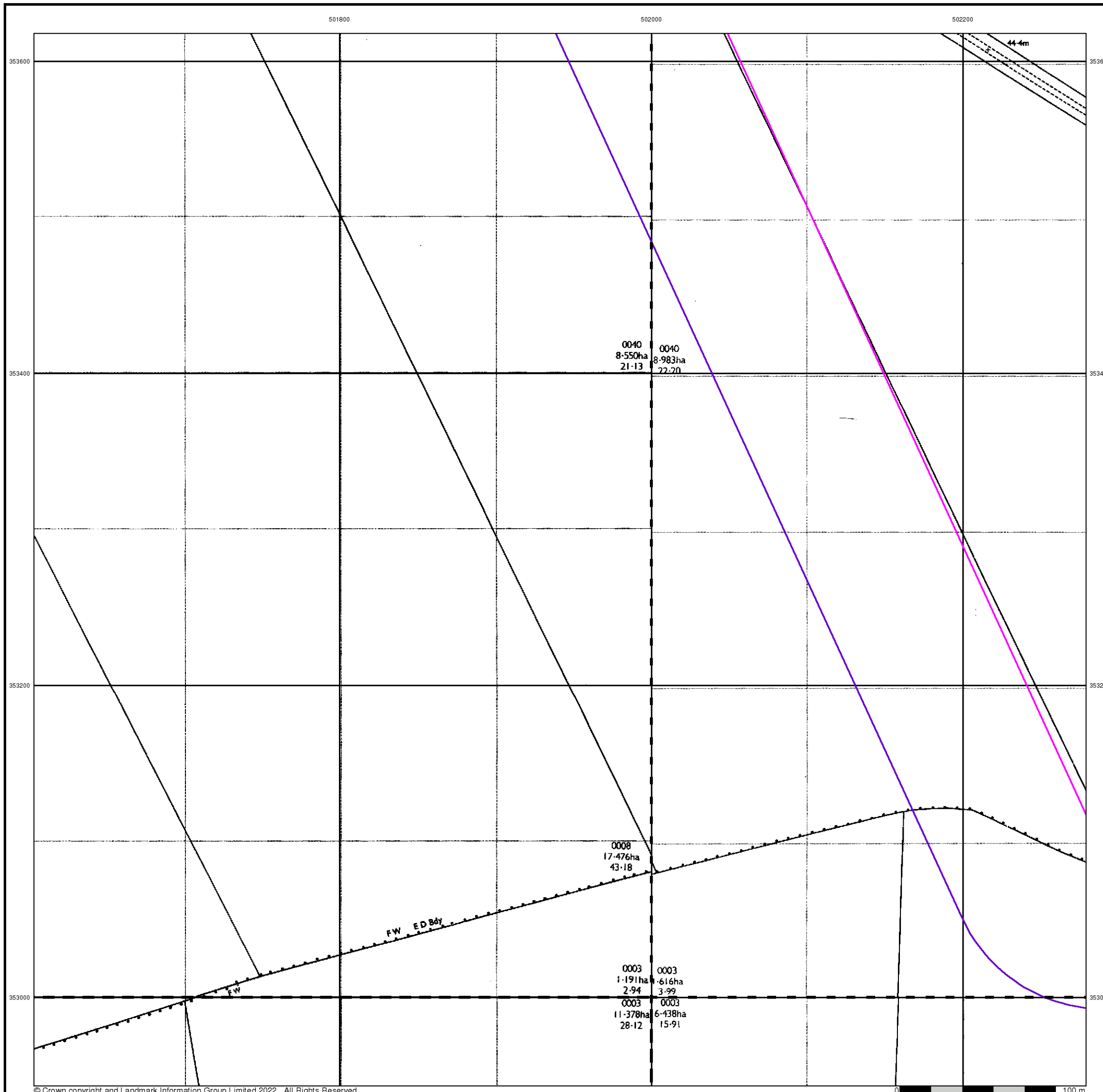
Order Number: 303381609_1_1
 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
 Search Buffer (m): 100

Site Details

All Areas New



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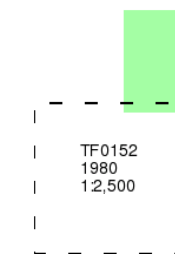
Additional SIMs

Published 1980

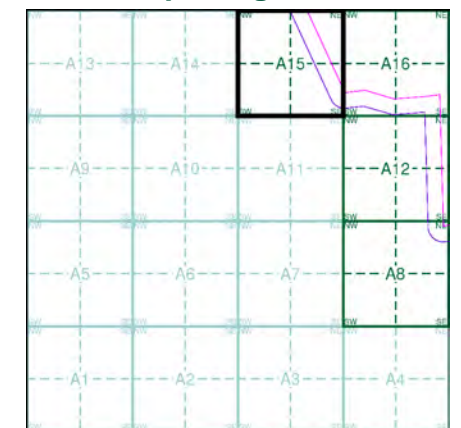
Source map scale - 1:2,500

The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A15



Order Details

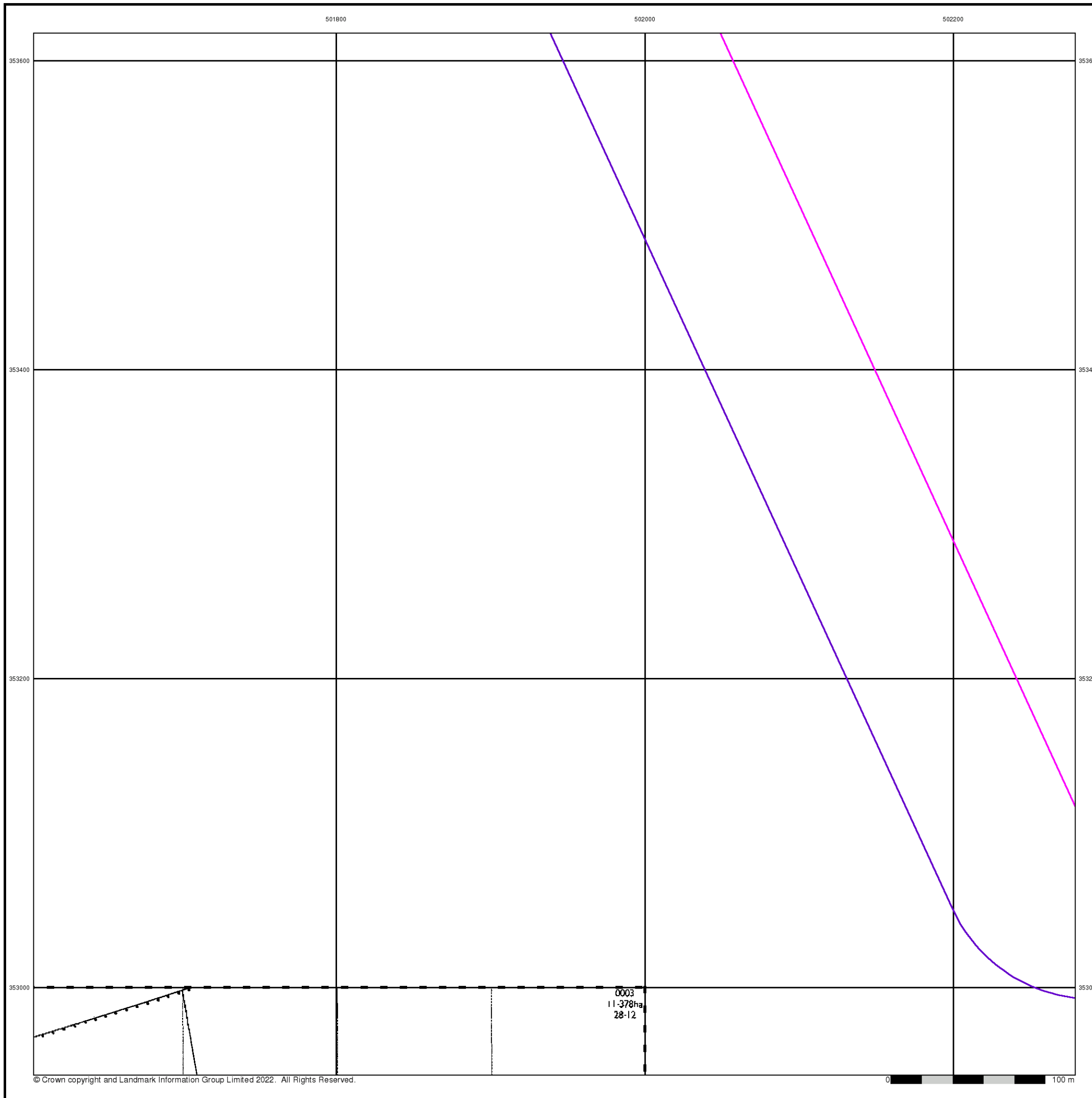
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National Grid Reference:	502200, 352660
Slice:	A
Site Area (Ha):	1774.17
Search Buffer (m):	100

Site Details

All Areas New



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Web:	www.envirocheck.co.uk





Large-Scale National Grid Data

Published 1994

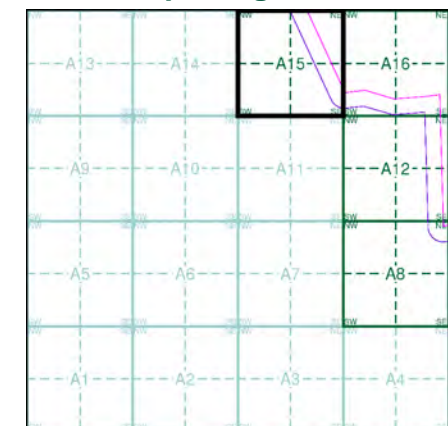
Source map scale - 1:2,500

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

TF0153 1994 1:2,500	TF0253 1994 1:2,500
TF0152 1994 1:2,500	TF0252 1994 1:2,500

Historical Map - Segment A15



Order Details

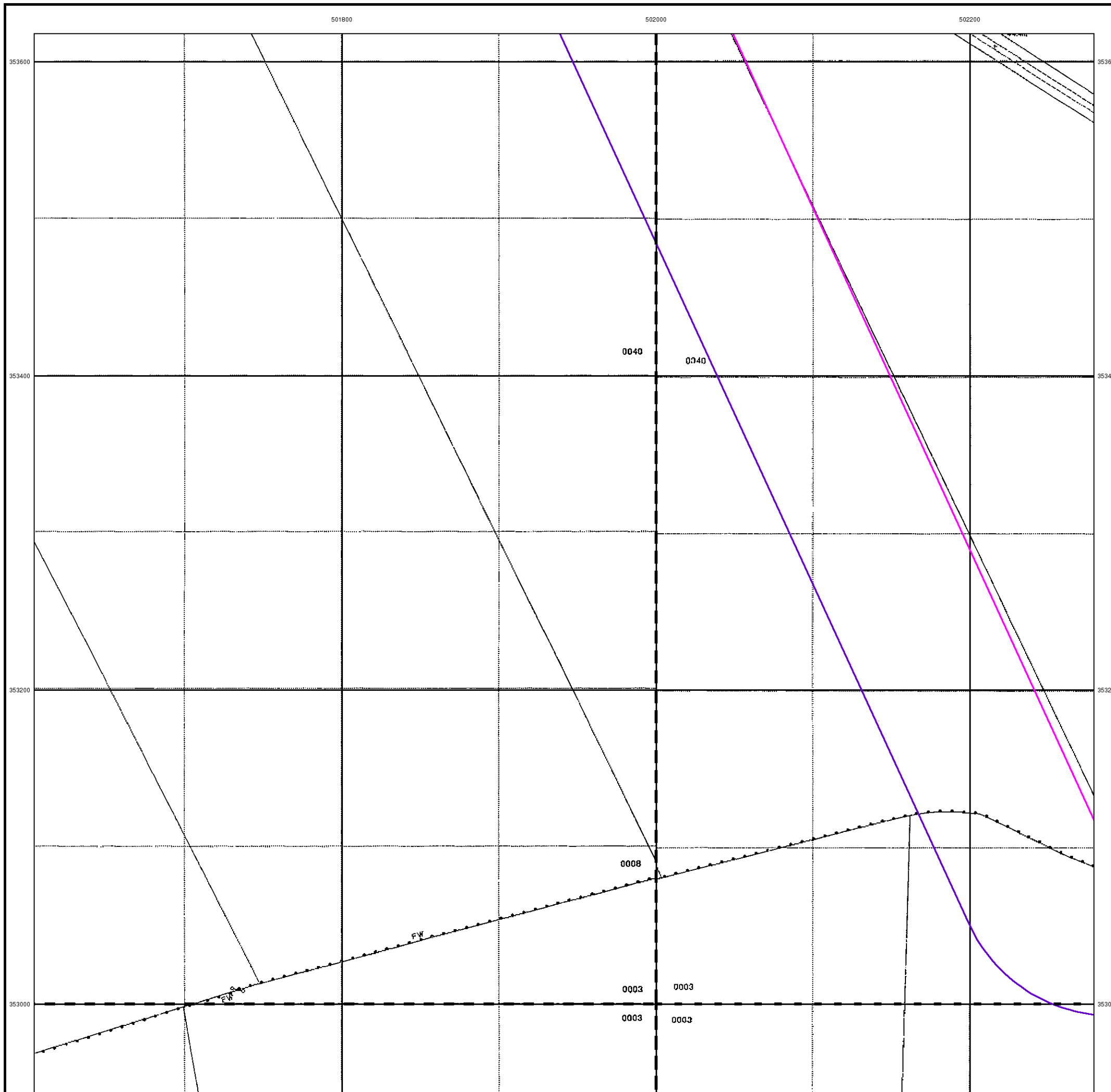
Order Number: 303381609_1_1
 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
 Search Buffer (m): 100

Site Details

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Historical Mapping Legends

Ordnance Survey County Series and Ordnance Survey Plan 1:2,500

Quarry **Gravel Pit** **Sand Pit**
Clay Pit **Shingle** **Refuse Heap**
Sloping Masonry **Flat Rock**
Marsh **Reeds** **Osiers**
Rough Pasture **Furze** **Wood**
Mixed Wood **Brushwood** **Orchard**
Fir **Ford** **Stepping Stones**
Ferry **Waterfall** **Lock**
Trig. Station **Altitude at Trig. Station**
B.M. 325.9 **Bench Mark** **Surface Level**
Arrow denotes flow of water **Antiquities (site of)**
Cutting **Embankment**
Railway crossing Road **Level Crossing** **Road crossing Railway**
Railway crossing River or Canal **Road over single stream** **Road over River or Canal**
County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
County Borough Boundary (England)
Co. Boro. Bdy.
County Burgh Boundary (Scotland)
Boundary Post or Stone **Police Call Box**
B.R. **Bridle Road** **P** **Pump**
E.P. **Electricity Pylon** **S.P.** **Signal Post**
F.B. **Foot Bridge** **Sl.** **Sluice**
F.P. **Foot Path** **Sp.** **Spring**
G.P. **Guide Post or Board** **T.C.B.** **Telephone Call Box**
M.S. **Mile Stone** **Tr.** **Trough**
M.P. M.R. **Mooring Post or Ring** **W** **Well**

Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250

Inactive Quarry, Chalk Pit or Clay Pit **Active Quarry, Chalk Pit or Clay Pit**
Rock **Boulders**
Cliff **Slopes** **Top**
Roofed Building **Glazed Roof Building**
Sloping Masonry **Archway**
Non-Coniferous Tree (surveyed) **Coniferous Tree (surveyed)**
Non-Coniferous Trees (not surveyed) **Coniferous Trees (not surveyed)**
Orchard Tree **Scrub** **Bracken**
Coppice, Osier **Reeds** **Marsh, Saltings**
Rough Grassland **Heath** **Culvert**
Direction of water flow **Bench Mark** **Antiquity (site of)**
Cave Entrance **Triangulation Station** **Electricity Pylon**
Electricity Transmission Line
County Boundary (Geographical)
County & Civil Parish Boundary
Civil Parish Boundary
Admin. County or County Bor. Boundary
London Borough Boundary
Symbol marking point where boundary mereing changes
BH **Beer House** **P** **Pillar, Pole or Post**
BP, BS **Boundary Post or Stone** **PO** **Post Office**
Cn, C **Capstan, Crane** **PC** **Public Convenience**
Chy **Chimney** **PH** **Public House**
D Fn **Drinking Fountain** **Pp** **Pump**
EI P **Electricity Pillar or Post** **SB, S Br** **Signal Box or Bridge**
FAP **Fire Alarm Pillar** **SP, SL** **Signal Post or Light**
FB **Foot Bridge** **Spr** **Spring**
GP **Guide Post** **Tk** **Tank or Track**
H **Hydrant or Hydraulic** **TCB** **Telephone Call Box**
LC **Level Crossing** **TCP** **Telephone Call Post**
MH **Manhole** **Tr** **Trough**
MP **Mile Post or Mooring Post** **Wr Pt, Wr T** **Water Point, Water Tap**
MS **Mile Stone** **W** **Well**
NTL **Normal Tidal Limit** **Wd Pp** **Wind Pump**

Large-Scale National Grid Data 1:2,500 and 1:1,250

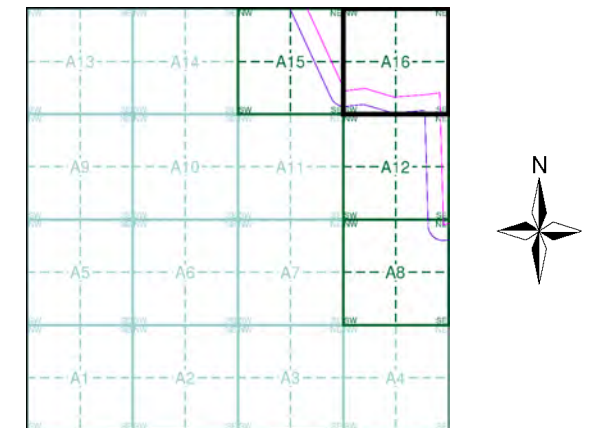
Cliff **Slopes** **Top**
Rock **Rock (scattered)**
Boulders **Boulders (scattered)**
Positioned Boulder **Scree**
Non-Coniferous Tree (surveyed) **Coniferous Tree (surveyed)**
Non-Coniferous Trees (not surveyed) **Coniferous Trees (not surveyed)**
Orchard Tree **Scrub** **Bracken**
Coppice, Osier **Reeds** **Marsh, Saltings**
Rough Grassland **Heath** **Culvert**
Direction of water flow **Triangulation Station** **Antiquity (site of)**
Electricity Transmission Line **Electricity Pylon**
B.M. 231.60m **Bench Mark** **Buildings with Building Seed**
Roofed Building **Glazed Roof Building**
Civil parish/community boundary
District boundary
County boundary
Boundary post/stone
Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)
Bks **Barracks** **P** **Pillar, Pole or Post**
Bty **Battery** **PO** **Post Office**
Cemy **Cemetery** **PC** **Public Convenience**
Chy **Chimney** **Pp** **Pump**
Cis **Cistern** **Ppg Sta** **Pumping Station**
Dismtd Rly **Dismantled Railway** **PW** **Place of Worship**
EI Gen Sta **Electricity Generating Station** **Sewage Ppg Sta** **Sewage Pumping Station**
EI P **Electricity Pole, Pillar** **SB, S Br** **Signal Box or Bridge**
EI Sub Sta **Electricity Sub Station** **SP, SL** **Signal Post or Light**
FB **Filter Bed** **Spr** **Spring**
Fn / D Fn **Fountain / Drinking Ftn.** **Tk** **Tank or Track**
Gas Gov **Gas Valve Compound** **Tr** **Trough**
GVC **Gas Governor** **Wd Pp** **Wind Pump**
GP **Guide Post** **Wr Pt, Wr T** **Water Point, Water Tap**
MH **Manhole** **Wks** **Works (building or area)**
MP, MS **Mile Post or Mile Stone** **W** **Well**



Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Lincolnshire	1:2,500	1888	2
Lincolnshire	1:2,500	1905	3
Ordnance Survey Plan	1:2,500	1979	4
Large-Scale National Grid Data	1:2,500	1994	5

Historical Map - Segment A16



Order Details

Order Number: 303381609_1_1
Customer Ref: P02130089
National Grid Reference: 502200, 352660
Slice: A
Site Area (Ha): 1774.17
Search Buffer (m): 100

Site Details

All Areas New



Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



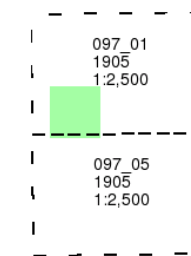
Lincolnshire

Published 1905

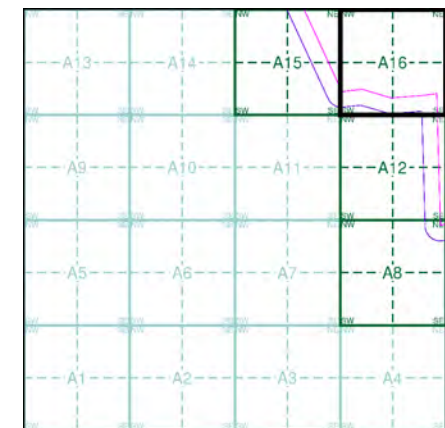
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A16



Order Details

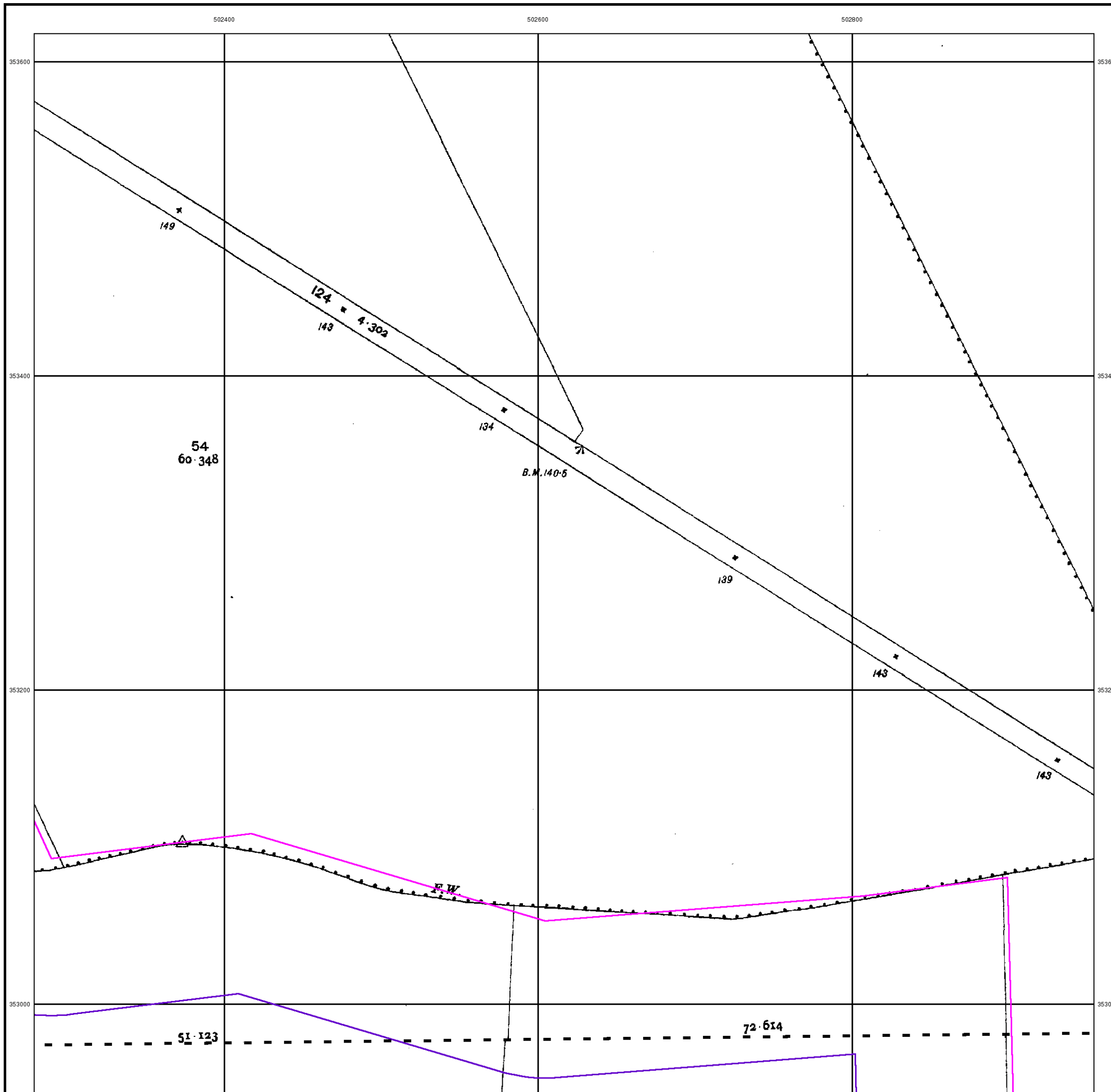
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Customer Ref: P02130089
National Grid Reference: 502200, 352660
Slice: A
Site Area (Ha): 1774.17
Search Buffer (m): 100

Site Details

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Ordnance Survey Plan

Published 1979

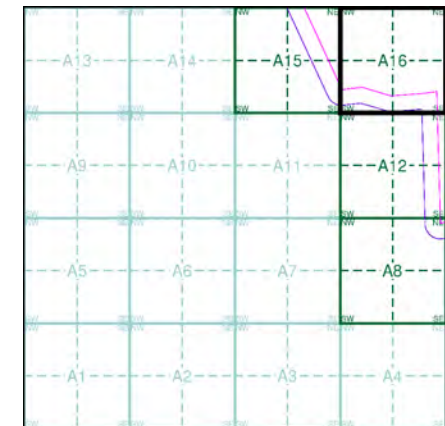
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

TF0253	1979	1:2,500
TF0252	1979	1:2,500

Historical Map - Segment A16



Order Details

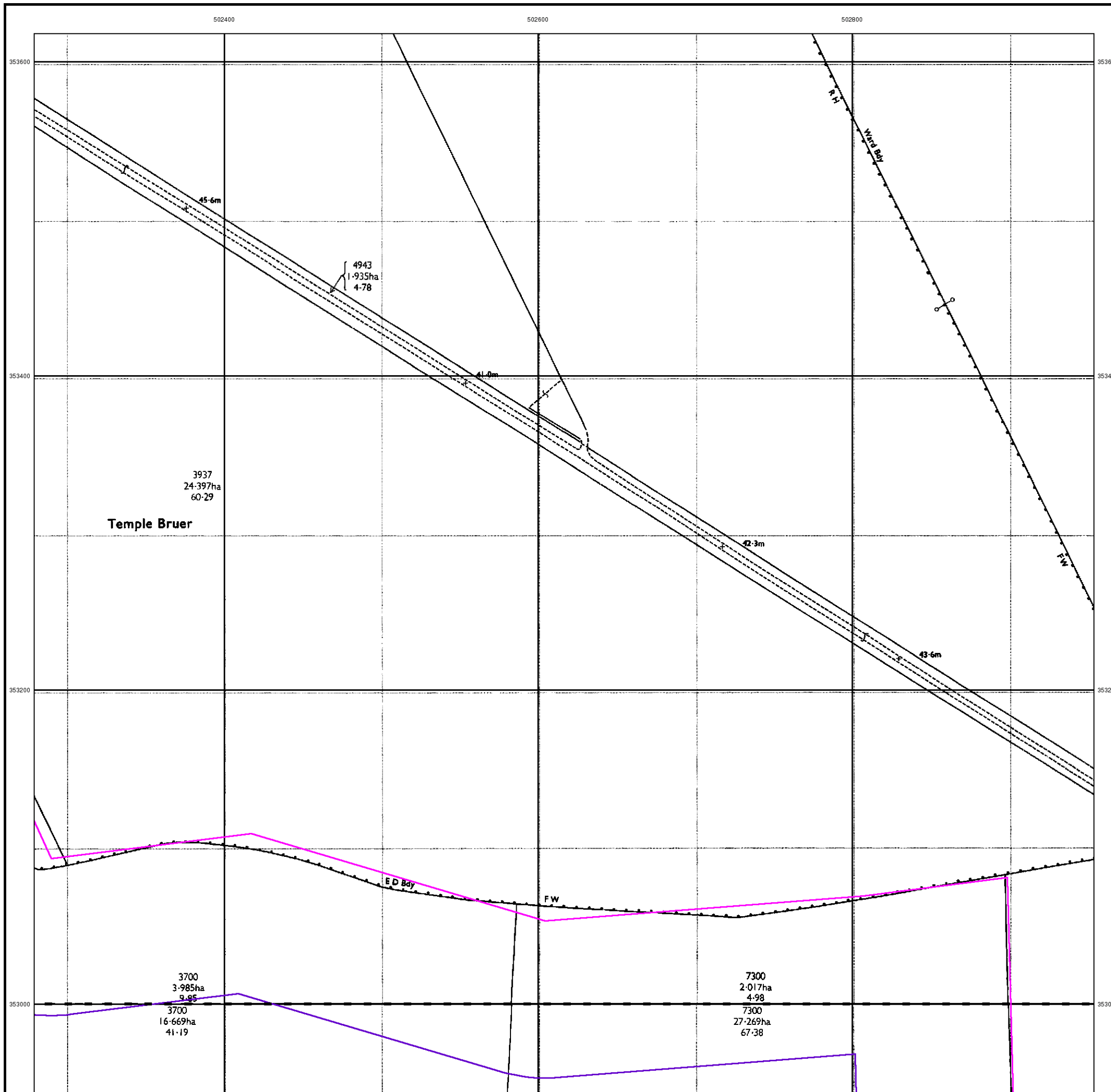
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 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
 Search Buffer (m): 100

Site Details

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Large-Scale National Grid Data

Published 1994

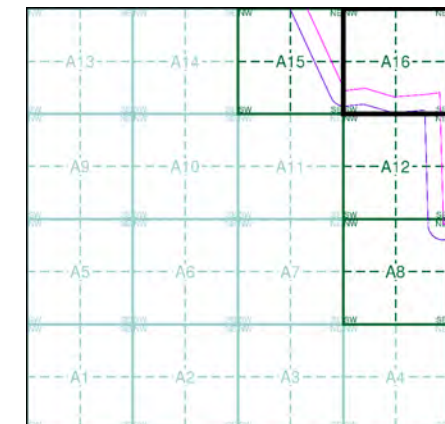
Source map scale - 1:2,500

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

TF0253	1994	1:2,500
TF0252	1994	1:2,500

Historical Map - Segment A16



Order Details

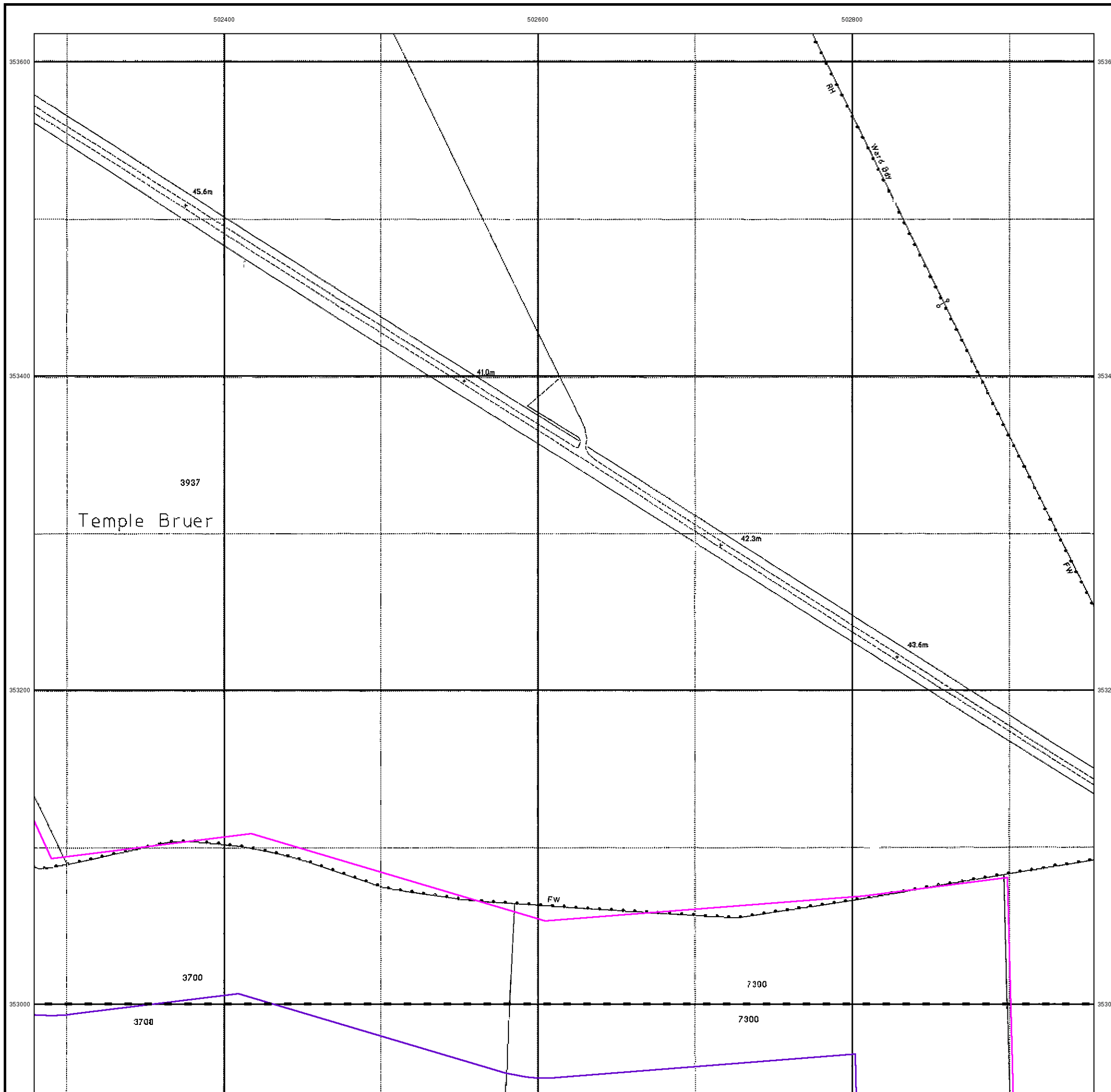
Order Number: 303381609_1_1
 Customer Ref: P02130089
 National Grid Reference: 502200, 352660
 Slice: A
 Site Area (Ha): 1774.17
 Search Buffer (m): 100

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