AQUIND Limited

AQUIND INTERCONNECTOR

Environmental Statement – Volume 3 – Appendix 21.3 Geophysical Survey Report

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EXECUTIVE SUMMARY

WSP has commissioned Wessex Archaeology on behalf of Aquind Ltd to undertake a detailed gradiometer survey to further investigate the potential for archaeological remains along the route of the proposed Aquind Interconnector in Hampshire / Winchester. The scheme development comprises a subsea and underground High Voltage Direct Current (HVDC) power cable transmission link between Normandy in France and the south coast of England. The onshore section comprises a 20km cable route, which would link to a new HDVC converter station, proposed adjacent to the existing National Grid substation in Lovedean, in rural Hampshire. The work is pre-construction and not subject to Construction (Design and Management) Regulations (CDM 2015).

This document sets out the aims of the geophysical survey, along with the methods and standards that were employed as well as the results and discussion. The primary aim of the archaeological survey is to identify and record potential archaeological remains through the production and interpretation of geophysical data and to inform the development of subsequent phases of the archaeological evaluation strategy.

The work will investigate the potential set out in the Preliminary Environmental Information Report (PEIR), produced in February 2019 with the results of the investigation feeding into the forthcoming Environmental Statement, which is required in relation to an application for Development Consent (DCO). The PEIR noted that the Site has potential for archaeological remains of all periods from the prehistoric onwards, the significance of which would depend on the nature, extent, and date of the remains.

The geophysical survey comprised a gradiometer survey totalling an area of 96.5 hectares. The survey area was defined following a scoping exercise (WSP Jan 2019). This was informed by the PEIR and considered those areas of proposed impact, including temporary works and access with topsoil removal, which would be suitable for geophysical survey (i.e. greenfield land). The survey encompasses the proposed Converter Station area, greenfield sections of the Onshore Cable Route, Joint Bays (JBs) and Horizontal Directional Drilling (HDD) areas. The scoping rationale was approved by the relevant statutory consultees and the agreed approach was presented in a separate WSI, which set out the aims, scope and methodology, reporting and archival requirements, along with the role of WSP in managing and assuring the work on behalf of the client.

Across the proposed geophysical survey area, the gradiometer survey has produced limited results. Anomalies thought to be of archaeological origin have been identified in Section 1 (close to the footprint of the proposed Converter Station) in the form of possible enclosure ditches (possibly prehistoric / Romano-British in date). A number of possible pits have also been identified across route Sections 1 – 2, which could be prehistoric in date but could also be of a geological origin. In route Sections 4, 5 and 7 no clear anomalies of archaeological origin have been identified, with the majority of anomalies relating to modern disturbance (e.g. drainage features/ services).

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1. INTRODUCTION

1.1. PROJECT BACKGROUND

1.1.1.1. Wessex Archaeology was commissioned by WSP UK Ltd, on behalf of Aquind Ltd, to carry out a Geophysical Survey between Horndean and Portsmouth, Hampshire (land between NGR 467350 113800 to the north and NGR 467970 098925 to the south) (**Figure 1**).

1.1.1.2. This report has been prepared to support of a Development Consent Order (DCO) Application for the Onshore Cable Route of the Aquind Interconnector, a subsea and underground High Voltage Direct Current (HVDC) power cable transmission link. This report will be submitted as an Appendix to the forthcoming Environmental Statement for Historic Environment.

1.1.1.3. A Preliminary Environmental Information Report (PEIR Chapter 20: Heritage and Archaeology provides the archaeological baseline and potential by each route section and supporting technical appendix 20.1, Heritage and Archaeological Historical Background provides a general thematic and historical overview, which included a collection of a broad range of sources within a 500 m assessment study area.

1.1.1.4. Following submission of the PEIR in February 2019, Geophysical Survey was proposed in order to determine the likely presence and nature of any subsurface features of archaeological interest, to inform the forthcoming Environmental Statement. The results would also inform any further site-based investigation that may be required, for example trial trench evaluation, with trenches located to possible archaeological anomalies identified by the geophysical survey.

1.1.1.5. Due to the nature and extent of the scheme, which includes up to 25 Joint Bays (JBs) and 6 Horizontal Directional Drilling (HDD) areas positioned along the route it was necessary to carry out the scoping exercise to determine which sites along the 20 km route would be suitable for geophysical survey. This was based on the extent of each JB/HDD site, their archaeological potential and whether they are indeed greenfield (including a review of available geotechnical data), and whether or not alluvium is present as this would hinder the survey. The detailed methodology and results of this exercise is contained within the detailed report (Aquind Ltd, *Scoping of Joint Bay and Horizontal Directional Drilling locations for archaeological geophysical survey*, January 2018). This excluded the proposed Converter Station Area, where the requirement for geophysical survey was already known.

1.1.1.6. The proposed scope was approved by statutory consultees (Local Planning Authority Archaeological Officers) and the survey has been carried out in accordance with a Written Scheme of Investigation for archaeological geophysical survey (WSI) sent to LPA archaeological advisors for information.

1.2. SCOPE OF DOCUMENT

1.2.1.1. This report presents a brief description of the methodology followed by the detailed survey results and the archaeological interpretation of the geophysical data.

1.3. THE SITE

1.3.1.1. The Order Limits has been divided into 10 route Sections. Following the scoping exercise carried out, geophysical survey was carried out in Sections 1-7.

1.3.2. SECTION 1 - 4

1.3.2.1. The northern portion of the proposed survey comprises Sections 1 to 3, as well as the northern portion of Section 4.

1.3.2.2. Section 1 is located between Old Mill Lane to the west, Monarch's Way to the north-east, and Broadway Lane to the east, approximately 1.8 km north-east of Denmead, centred on NGR 467200 113645. An electricity substation is noted in the eastern portion of Section 1. The area comprises numerous arable fields.

1.3.2.3. Section 2 extends to the south of Section 1 in two linear portions, as well as a larger open area to the south. The area is located over land to the east of Edneys Lane approximately 1 km east-north-east of Denmead, centred on NGR 466720 112600. This area comprises three large arable fields as well as several small pasture fields.

1.3.2.4. Section 3 is located over land to the north and south of the B2150, immediately to the east of the residential properties of Denmead, centred on NGR 466675 111185. This area comprises numerous pasture fields between Anmore Road to the north, the B2150 in the centre and further pasture land to the south.

1.3.3. SECTION 4 – 7

1.3.3.1. The southern portion of the survey comprises Sections 5 to 7, as well as the southern portion of Section 4. These sections are located over green spaces located within and around the town of Drayton.

1.3.3.2. The southern portion of Section 4 is located to the south of the B2177, centred on NGR 467030 106395. Open pasture land is noted to the south of Section 4.

1.3.3.3. Section 5 comprises two parcels of land toward the north-east of Drayton. The first is located to the south of the B2177, centred on NGR 467910 106235; the second is centred on NGR 467795 105980 between Farlington Avenue and Grant Road. The areas are surrounded by residential properties as well as green spaces and pasture land.

1.3.3.4. Section 7 is located to the south-east of Drayton, east of Eastern road and north of the A27 centred on NGR 467795 104700. This comprises an area of sports pitches.

1.4. TOPOGRAPHY

1.4.1. SECTION 1 - 4

1.4.1.1. The northern portion of Section 4 is located immediately south of Section 3 and comprises two small pasture fields to the south of the B1250, centred on NGR 466845 110856.

1.4.1.2. These areas are on largely undulating land, ranging from 92 m above Ordnance Datum (aOD) at the northern edge of Section 1, to approximately 36 m aOD at the southern edge of Section 3.

1.4.2. SECTION 4 – 7

1.4.2.1. These areas are located on a broadly south facing slope, falling from 72 m aOD at the northern edge of the southern portion of Section 4 to approximately 4 m aOD at the southern edge of Section 7.

1.5. GEOLOGY

1.5.1. SECTION 1 - 4

1.5.1.1. The solid geology comprises Chalk of the Tarrant Member for Sections 1 and 2. Sections 3 and 4 are likely to comprise Clay, Silt, and Sand of the Lambeth Group throughout the northern parcels of land, and London Formation throughout the south. Overlying superficial geological deposits of Head – clay, silt, sand, and gravel are noted throughout the landscape. These extend through all portions of the survey area (Sections 1 – 4) and are particularly prominent throughout Section 3 (BGS 2019).

1.5.1.2. The soils underlying the site are likely to consist of typical paleo-argillic brown earths of the 581d (Carstens) association in Sections 1 and 2. Throughout Sections 3 and 4, the soils are likely to consist of pelo-stagnogley soils of the 712c (Windsor) association (SSEW SE Sheet 6 1983). Soils derived from such geological parent material have been shown to produce magnetic contrasts acceptable for the detection of archaeological remains through magnetometer survey.

1.5.2. SECTION 4 – 7

1.5.2.1. The solid geology comprises Chalk of the Spetisbury Member throughout the southern portion of Section 4. Section 5 and 7 likely comprise undifferentiated Chalk of the Newhaven, Lewes Nodular, Seaford, Culver and Portsdown Formations. No overlying superficial geological deposits are recorded for the southern portion of Section 4, or the northern portion of Section 5. The southern portion of Section 5 is likely to contain deposits of Head – clay, silt, sand, and gravel. Section 7 is likely to contain River Terrace Deposits (BGS 2019).

1.5.2.2. The soils underlying the site are unrecorded due to the urban setting for the southern portion of Section 4, and Section 5. Soils underlying Section 7 are likely to consist of eutric pelo-alluvial gley soils of the 813f (Wallasea 1) association (SSEW SE Sheet 6 1983). Soils derived from such geological parent material have been shown to produce magnetic contrasts acceptable for the detection of archaeological remains through magnetometer survey.

2. ARCHAEOLOGICAL BACKGROUND

2.1. INTRODUCTION

2.1.1.1. The archaeological and historical background was assessed in a prior Historical Baseline (AQUIND Ltd 2018), which considered the recorded historic environment resource within a study area of the Proposed Development. The document used information from the Hampshire Historic Environment Record (HER) and the National Heritage List for England (NHLE). The following is a summary of the findings considered relevant to the archaeological geophysical survey based upon their likelihood to indicate subsurface remains within the survey boundary.

2.2. SUMMARY OF THE ARCHAEOLOGICAL RESOURCE

2.2.1.1. The following is separated in to Sections along the route of the Site. Refer to **Figures 1 – 2** for route Section divisions.

2.2.2. SECTION 1

2.2.2.1. A single Thames Pick (early Mesolithic adze) was recovered from a garden at Saltbox Barn, Denmead 15 m from the western edge of the Order Limits. In addition, flint flakes were recovered to the east of Sawyers hill, 290 m north-west.

2.2.2.2. During the archaeological assessment for the nearby Lovedean Substation (within Section 1), a Neolithic stone axe head was recovered in Anmore, 230 m south-east of the Order Limits.

2.2.2.3. During the construction of Lovedean Substation in Section 1, an archaeological strip map and record identified two isolated Bronze Age cremation pits each containing a Middle Bronze Age urn. In addition, a watching brief recorded a single ditch or pit to the northern end of the investigation that was found to contain Middle to Late Bronze Age, Late Prehistoric and Romano-British pottery.

2.2.2.4. Pottery broadly dated to the prehistoric period has been recovered 290 m east of the proposed Converter Station footprint (within the Order Limits). This was found during a watching brief at Lovedean Substation.

2.2.2.5. Romano-British pottery was found in an enclosure ditch at Prew's Hanger oil exploration site, 460 m north of the Order Limits. Further pottery from this period was found during a watching brief at Lovedean Substation.

2.2.2.6. During the medieval period this area is thought to have been a large forest and would later become part of the Royal Forest of Bere, a hunting ground established during the Norman period.

2.2.3. SECTION 2 - 7

2.2.3.1. During the late Mesolithic, rapidly changing sea levels had a significant impact not only on the whole terrestrial environment and coastal landscape, but also on the nature, presence and distribution of resources. The present coastal plain of Hampshire would have been far inland in the late Mesolithic, prior to marine regression.

2.2.3.2. Mesolithic flint wastes have been found on the north side of Grove Road, Drayton, 390 m to the west of the Order Limits (Section 7).

2.2.3.3. A prehistoric barrow, thought to be Neolithic in date, located on Portsdown Hill, 60 m to the west of the Order Limits (close to the southern portion of Section 4). This was found to contain 12 Saxon burials that had been inserted later than the monument's original construction.

2.2.3.4. Substantial Neolithic features were revealed during an earlier geophysical survey to the west of Waterlooville (west of Section 4). Subsequent excavations revealed late Neolithic or early Bronze Age pit containing flint and pottery fragments. Middle to Late Neolithic pottery sherds were recovered from the topsoil. A double-ditched Neolithic enclosure along with burnt flint and pottery were also identified.

2.2.3.5. Numerous findings pertaining to the Bronze Age are noted in the study area surrounding the development and Sections 2 to 7, predominantly noted surrounding the chalk ridge of Portsdown Hill, west of Purbrook and Waterlooville.

2.2.3.6. A Bronze Age boundary was identified by a line of post-holes bounded by an east – west gulley on Portsdown Hill, 70 m north of the Order Limits (Section 5). An oval Bronze Age barrow (Gob's barrow) located on Portsdown Hill 30 m to the north of the Order Limits was opened in 1926. The western part of the barrow contained a crouched inhumation burial of a young male accompanied by a flint dagger, beaker and jet bead; the eastern part contained cremations and a flint scraper. A further possible Bronze Age bowl barrow 400 m to the east of Gob's Barrow and 140 m to the north of the Order Limits is indicated on Ordnance Survey maps of 1930 and 1951.

2.2.3.7. During archaeological investigations west of Waterlooville following the geophysical survey, Bronze Age pits containing worked flints and pottery were also found. Some 940 m to the east of the site boundary, an early Bronze Age barbed, and tanged arrowhead was found in the vicinity of Kingscote Road, Cowplain (Section 2 and 3).

2.2.3.8. As with the Bronze Age, much of the activity dated to the Iron Age within the Cable Route study area appears focused on the chalk ridge of Portsdown Hill and the area to the north, west of Purbrook and Waterlooville. Within the middle/central part of the site boundary, evidence of a small Iron Age occupation site was revealed during an archaeological evaluation close to The George Inn, Portsdown. The occupation site consisted of a hearth, storage area and a domestic or manufacturing area. Finds consisted of weaving equipment, pottery fragments (quern stone) and animal bones, most of which were recovered from features cut into the chalk.

2.2.3.9. Archaeological investigations at Portsdown Hill, 460 m north-east of the Order Limits found a complex of Iron Age fields and boundary earthworks. Numerous pottery sherds and scraper/arrowheads were also recovered from plough soil on a footpath to the west of The Dell, 140 m to the west of the Order Limits (Section 4).

2.2.3.10. The Order Limits is intersected by a known Roman Road. Margary's projected route '421' would have linked the Roman settlements of Bitterne and Chichester. The road bisects the route of the proposed development just south of Purbrook and can be followed through Southbourne, Emsworth, and Warblington to Havant, following the approximate course of the modern A27 (Section 7). This could indicate the potential for substantial wider settlement activity associated with this period.

2.2.3.11. An archaeological evaluation carried out close to The George Inn in Portsdown found two Anglo-Saxon inhumation burials with associated artefacts and two parallel ditches. The second of the burials was noted to have a severed head and no evidence of a coffin or associated artefacts. The burials are thought to be located near the former Naval Telegraph on Portsdown Hill although the precise location of the site is not certain. It is thought to be approximately 80 m to the west of the Order Limits. A further 12 Saxon burials were removed from a prehistoric barrow on Portsdown Hill in the 19th century.

3. METHODOLOGY

3.1. INTRODUCTION

3.1.1.1. The Geophysical Survey was undertaken by Wessex Archaeology's in-house geophysics team between 30 April and 25 May, 19 – 20 and 22 August 2019. Field conditions at the time of the survey were generally good and an overall coverage of 87.4 ha was achieved. Overgrowing vegetation and field boundaries, as well as interference from overhead electrical utilities lead to a small reduction in the area that could be surveyed. Several areas were deemed not suitable for survey in addition to areas that access could not be arranged. These included Section 1 Area A; Section 2 Area D; Section 3 H and K; and Section 4 A and B (See **Figure 1** and **2**).

3.1.1.2. The methods and standards employed throughout the geophysical survey conform to that set out in the Written Scheme of Investigation (WSI) (Wessex archaeology 2018), as well as to current best practice, and guidance outlined by the Chartered Institute for Archaeologists' (CIfA 2014) and European Archaeologiae Consilium (Schmidt et al. 2015).

3.2. AIMS AND OBJECTIVES

3.2.1.1. The aims (or purpose) of the geophysical survey, in compliance with the CIfA' Standards and guidance for archaeological geophysical survey (CIfA 2014a), are:

- To determine, as far as is reasonably possible, the nature of the detectable archaeological resource within a specified area using appropriate methods and practices; and
- To inform either the scope and nature of any further archaeological work that may be required; or the formation of a mitigation strategy (to offset the impact of the development on the archaeological resource); or a management strategy.

3.2.1.2. In order to achieve the above aims, the objectives of the geophysical survey are:

- To conduct a geophysical survey covering as much of the specified area as possible, allowing for on-site obstructions;
- To clarify the presence/absence of anomalies of archaeological potential; and
- Where possible, to determine the general nature of any anomalies of archaeological potential.

3.3. FIELDWORK METHODOLOGY

3.3.1.1. For cart-based gradiometer survey, the system uses a Leica Captivate RTK GNSS instrument, which receives corrections from a network of reference stations operated by the Ordnance Survey (OS) and Leica Geosystems. Both instruments allow positions to be determined with a precision of 0.02 m in real-time and therefore exceeds European Archaeologiae Consilium recommendations (Schmidt et al. 2015).

3.3.1.2. The detailed gradiometer survey was then undertaken using four Bartington Grad-01-1000L gradiometers spaced at 1 m intervals and mounted on a non-magnetic cart with an effective sensitivity of 0.03 nT. Data were collected at a rate of 10 hz, producing intervals of 0.15 m along transects spaced 4 m apart.

3.3.1.3. For handheld gradiometer survey, individual survey grid nodes were established at 30 m x 30 m intervals using a Leica Viva RTK GNSS instrument, which is precise to approximately 0.02 m and therefore exceeds European Archaeologiae Consilium recommendations (Schmidt et al. 2015).

3.3.1.4. The detailed gradiometer survey was then conducted using a Bartington Grad601-2 fluxgate gradiometer instrument, which has a vertical separation of 1 m between sensors. Data were collected at 0.25 m intervals along transects spaced 1 m apart with an effective sensitivity of 0.03 nT). Data were collected in the zigzag method.

3.4. DATA PROCESSING

3.4.1.1. Data from the cart-based survey were subject to minimal data correction processes. These comprise a ‘Destripe’ function (±5 nT thresholds), applied to correct for any variation between the sensors, and an interpolation used to grid the data and discard overlaps where transects have been collected too close together.

3.4.1.2. Data from the handheld survey were subjected to minimal correction processes. These comprise a zero-mean traverse function (±5 nT thresholds) applied to correct for any variation between the two Bartington sensors used, and a de-step function to account for variations in traverse position due to varying ground cover and topography. These two steps were applied throughout the survey area, with no interpolation applied.

3.4.1.3. Further details of the geophysical and survey equipment, methods and processing are described in **Appendix 1**.

4. GEOPHYSICAL SURVEY RESULTS AND INTERPRETATION

4.1. INTRODUCTION

4.1.1.1. The detailed gradiometer survey has identified magnetic anomalies along the entire length of the surveyed area, some of which are considered to be archaeological or possibly archaeological in origin. Results are presented as a series of greyscale plots and archaeological interpretations at a scale of 1:2000 (**Figures 3** to **26**). The data are displayed at -2 nT (white) to +3 nT (black) for the greyscale image.

4.1.1.2. The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous/burnt or fired objects, and magnetic trends (**Figure 4**, **6**, **8**, **10**, **12**, **14**, **16**, **18**, **20**, **22, 24** and **26**). Full definitions of the interpretation terms used in this report are provided in Appendix 2.

4.1.1.3. Numerous ferrous anomalies are visible throughout the dataset. These are presumed to be modern in provenance and are not referred to, unless considered relevant to the archaeological interpretation.

4.1.1.4. It should be noted that small, weakly magnetised features may produce responses that are below the detection threshold of magnetometers. It may therefore be the case that more archaeological features may be present than have been identified through geophysical survey.

4.1.1.5. Gradiometer survey may not detect all services present on site. This report and accompanying illustrations should not be used as the sole source for service locations and appropriate equipment (e.g. CAT and Genny) should be used to confirm the location of buried services before any trenches are opened on site.

4.2. GRADIOMETER SURVEY RESULTS AND INTERPRETATION

4.2.1.1. The Geophysical Survey has identified several anomalies that are thought to be associated with archaeological remains. These are predominantly located throughout Section 1 and 2 consisting of weak linear anomalies and possible pit alignments (**Figures 3** – **14**). Further anomalies have been identified that are of a possible archaeological origin in Section 3, including a known former field boundary as well as linear trends that could be associated with earlier unrecorded boundary features (**Figures 15** – **18**). The remaining anomalies identified by the survey are predominantly associated with modern features, such as agricultural activity, modern services, and ferrous objects and disturbance. Natural features including a likely paleochannel traversing Section 1 and 2, and localised variation in the underlying deposits have also been identified. These are discussed in further detail below.

4.2.2. SECTION 1

Archaeology (probable)

4.2.2.1. Two areas of increased magnetic response are noted that are interpreted as archaeological in origin. The first in Area 1N (**1000**) is located on the southern boundary and the second in Area 1Q (**1001**) (**Figure 12**). These have been identified in the location of two "Old Chalk Pits" noted on historical OS mapping (1868). The exact date of such features cannot be determined by the geophysical survey results or available documentary evidence.

4.2.2.2. Toward the north of Section 1 (Area 1B), a network of positive linear anomalies has been identified at **1002** – **1005** (**Figure 6**). These cover an 85 x 55 m area and are indicative of ditch features likely forming a network of enclosures. The north and east sides of the network are formed by the anomalies at **1002** and **1003**. At **1002**, the 1.9 m wide anomaly is aligned east – west for 41 m with a turn to the south for 6 m at the eastern end. After a gap of 6m two slightly curved anomalies continue south for 44 m (including a second 7 m gap) (**1003**). It is possible that this fragmented ditch then turns west, although the anomaly becomes too weak to apply a confident interpretation.

4.2.2.3. The anomaly at **1004** extends west from **1003** for 45 m, before turning south for 16 m. The anomaly at **1005** extends 68 m north-west from the point of this turn. Both anomalies are 2 m wide, however the 3 m gap between them makes it difficult to state whether they once formed part of the same ditch.

4.2.2.4. All of these anomalies together appear to form a small network of broadly recti-linear enclosures that are between 25 and 40 m across. It is likely these anomalies indicate past settlement activity, although it is not possible to speculate on a specific date range from the geophysical survey results alone.

Possible archaeology

4.2.2.5. Within the southern enclosure, a positive semi-circular anomaly has been identified at **1006** (**Figure 6**). The anomaly measures 6.7 m in diameter and is 1 m wide. This anomaly may indicate the remains of a ring ditch, potentially associated with a round barrow or round house. A highly magnetic dipolar response has been identified on the north-west side of the anomaly that could indicate burnt or fired material, or possibly ferritic deposits. It is not clear whether this anomaly is associated with the nearby enclosures (**1002** – **1005**).

4.2.2.6. In north of Area 1B, a very weakly positive penannular anomaly is noted at **1007** (**Figure 6**). The anomaly measures 6.5 m in diameter and is 1 m wide, with a 3.5 m gap in the southern side. This could indicate a second ring ditch feature, such as a round barrow; however, the weak nature of this anomaly means more confident interpretation of this anomaly is not possible. To the east of **1007** a fragmented weakly positive linear anomaly is noted on a curving north to south alignment at **1008**. The anomaly is 1 m wide and could be up to 80 m in length. It is possible this anomaly indicates a further ditch feature; however, it could equally relate to agricultural activity or natural variation in the underlying soils or superficial geology.

4.2.2.7. To the south of the network of enclosures in Area 1B, a weakly positive area of magnetic enhancement has been identified at **1009**. The anomaly protrudes from the southern boundary, extending 21 m north and 9.7 m east – west. A weakly negative 'halo' response is discernible surrounding the anomaly. It is possible this anomaly indicates an area of extraction activity and so is interpreted as possible archaeology. A weakly negative response surrounding the positive anomaly is characteristic of redeposited natural deposits surrounding an area of extraction. However, it could equally represent natural variation in the underlying superficial deposits or bedrock.

4.2.2.8. To the east of the network of enclosures at **1001** – **1005**, several smaller recti-linear anomalies have been identified at **1010** in Area 1D. The anomalies protrude from the western boundary of Area 1D on a broadly north-west to south-east orientation. The anomalies are weakly positive and are approximately 1 m wide. Due to their weak magnitude, it is not possible to confidently interpret their providence from the geophysical survey results alone. However, it is possible they form settlement activity or land division associated with the anomalies noted in Area 1B.

4.2.2.9. In the north-east of Area 1D, a weakly positive linear anomaly has been identified at **1011** (**Figure 6**). The anomaly protrudes from the eastern boundary for 27 m and is 1 m wide. This anomaly indicates an underlying ditch feature that could be evidence of an earlier unrecorded land division. However, it could equally relate to more modern agricultural activity.

4.2.2.10. Throughout Section 1, numerous positive discrete anomalies have been identified (**Figure 4**). It is possible all these anomalies indicate wider settlement activity such as refuse pits or extraction activity (See **1012** in Area 1R; **1013** in Area 1O; **1014** in Area 1Q). However, many of these are equally likely to be natural in origin and could be evidence of localised variation in the magnetic susceptibility of the underlying geological deposits or natural pitting in the bedrock.

4.2.2.11. Numerous further pit-like features have been detected through the dataset in Section 1. Starting in the west, anomalies at **1015**, **1016** and **1017** (Area 1J) are on a north-east to south-west alignment and are broadly the same size (5 m diameter) (**Figure 14**). It is possible these anomalies indicate a pit alignment. **1018** is also noted to the north in Area 1J and **1019** in Area 1K to the north-east (**Figure 12**). Similar anomalies are also noted across Area 1R (**1020** – **1022**) (**Figure 10**). Weaker anomalies of this type are also noted in Area 1C – 1I (**1023** – **1030**) and 1N – 1P (**1031** – **1032**). These anomalies could be evidence of wider earlier settlement activity.

4.2.2.12. To the west of Section 1 Area 1R, the anomaly at **1033** is large and weakly positive, covering an area of 31 m east – west and 12.5 m north – south (**Figure 10**). A notable negative 'halo' is noted to the north and south of the response also that could indicate redeposited natural material. This anomaly is similar to the anomaly at **1009** and could indicate earlier extraction activity. However, this anomaly could also be natural in origin.

4.2.2.13. Anomalies identified to the north in Area 1C are also tentatively ascribed an archaeological origin (**1034** and **1035** – **Figure 8**). The anomaly at **1034** bares some similarities to the anomaly at **1033** but does not have the same negative 'halo' and is less consistent in its shape. The anomalies at **1035** could indicate pit-like features in the underlying deposits. However, these anomalies are amorphous and while they could also be evidence of extraction activity, they could also be the result of localised variation in the underlying deposits.

4.2.2.14. A further positive linear anomaly is noted in Area 1J at **1036** (**Figure 14**). The anomaly measures 37 m long by 1 m wide and could indicate an underlying ditch feature. The anomaly does not conform to the modern pattern of land division and so could indicate an earlier phase of activity. However, due to the limited detectability of the anomaly a more confident interpretation is not possible.

Historic agricultural

4.2.2.15. Throughout Section 1, broadly spaced (5 – 6 m) parallel linear trends are noted on a predominantly north – south alignment (**Figure 4**). These are mostly noted in Area 1F, 1G, 1J, 1K, 1L, 1O, and 1Q. It is thought these trends are likely to be evidence of ridge and furrow cultivation and could date to the medieval or post-medieval period.

4.2.2.16. Several areas of increased magnetic response are noted in Section 1. Firstly, throughout the western portion of Area 1B, a notably increased magnetic response is noted. This corresponds to a former pattern of land division noted on aerial imagery and likely indicates variable land management strategies.

Increased magnetic response

4.2.2.17. A prominent area of increased magnetic response has been identified on the east side of Area 1H (**1037**) (**Figure 8**). This corresponds to a former trackway visible on aerial photography surrounding the electrical substation located immediately to the east of the survey area. It cannot be ruled out that the response is associated with peripheral activity during the construction of the substation. A former chalk pit is noted to the east (under the location of the substation) on historical mapping (1868). While an archaeological origin cannot be entirely ruled out as a result, this type of response is more typical of surface or shallow deposits than of infilling.

4.2.2.18. To the south of Area 1G, a small area of increased magnetic response corresponds to a cropmark on aerial imagery (**1038**) (**Figure 6**). The origin of this anomaly is not clear from the survey results alone. While an archaeological origin cannot be ruled out (e.g. a former pit), the weak and variable magnitude of the response is more typical of a localised variation in the underlying deposits. It is therefore considered more likely to be natural in origin.

4.2.2.19. The central portion of Area 1Q (**Figure 12**) is also dominated by an increased magnetic response. This response corresponds to the route of a probable paleochannel and is likely to be associated natural variation. It is possible archaeological deposits are contained within this response, although nothing more conclusive can be identified from the survey results except the course of the channel.

Natural

4.2.2.20. Anomalies thought to indicate natural features in the underlying deposits have been identified across a large portion of the southern areas of Section 1 (1K – 1M, 1P and 1R) (**Figure 4**). These responses are weakly positive and follow (starting from the north) a broadly north-east to south-west orientation, before turning to a north to south orientation in the south-east corner of Area 1J. These responses continue to the south in Section 2 (Area 1A and 1B). The responses are located in a notable depression in the landscape and it is thought these responses indicate the course of another paleochannel. Archaeological artefacts and deposits pertaining to prehistoric periods such as the Palaeolithic, Mesolithic and Neolithic are found in such features. However, it is not possible to determine the presence or otherwise of such deposits from the geophysical survey results. Further anomalies that are thought to be natural in origin have been identified by the survey in the north of Area 1B. These responses are caused by localised variation in the magnetic susceptibility of the underlying deposits.

Modern

4.2.2.21. A number of highly magnetic responses have been identified. These are predominantly modern in origin. In Area 1R at **1039** a dipolar linear response has been detected on a north – south alignment (**Figure 10**). Two further responses are noted in the north-east of the same area on a north-west to south-east alignment at **1040**. More responses of this type are noted at the eastern boundary of Area 1K and 1N on a north – south alignment at **1041**, as well as in the south-east corner of Area 1N on a broadly east – west alignment at **1042** (**Figure 12**). These responses are evidence of modern services, such as a pipes or cables.

4.2.2.22. At **1043** in Area 1B, **1044** in Area 1F and 1L, and **1045** in Area 1J, highly magnetic responses have been identified (**Figure 6**). These are caused by modern extant pylons. Four more responses that are evidence of former pylons are also noted (**1046** – **1048**). These correspond to pylons noted on mapping dating to 1962 that have subsequently been removed.

4.2.2.23. Numerous trends have been identified throughout Section 1. These trends are typically thought to be modern in origin, and likely pertain to agricultural activity, such as ploughing or tyre ruts. In Area 1E, a single weakly dipolar trend is evidence of a temporary fence.

4.2.3. SECTION 2

Archaeology (probable) and Possible Archaeology

4.2.3.1. Throughout Section 2 numerous discrete positive anomalies have been identified (**2001** – **2006**) (**Figure 16**). These are 3 - 5 m in diameter and are interpreted as archaeological in origin as they are on a broadly north-east to south-west orientation and likely indicate pit-alignments. It is not possible to determine an exact date for such features from the geophysical survey results alone. However, features of this type can typically date to the Bronze Age. Several anomalies surrounding the alignments are also noted that could be further evidence of archaeological pits (**2007** – **2009**).

Historic agricultural

4.2.3.2. Weakly positive parallel linear anomalies have been identified on various alignments throughout Area 2A (**Figure 16**). These are thought to be evidence of historical cultivation such as ridge and furrow.

Natural

4.2.3.3. As previously mentioned, the anomalies identified in Section 1 that indicate a paleochannel continue clearly through Area 2A and 2B in Section 2. These continue as weakly positive, sinuous anomalies on a north – south alignment to the south of Area 2B where they appear to begin turning to the south-west.

4.2.4. SECTION 3

Possible archaeology

4.2.4.1. A weakly positive, curvilinear anomaly has been identified at **3000** traversing from the southern boundary of Area 3A (**Figure 18**), curving broadly towards the north-east before appearing to turn east throughout Area 3B. The anomaly is fragmented but appears to be 146 m long and 1 m wide. The anomaly does not correspond to any known former field boundaries noted on available historical mapping and so could indicate an earlier feature. However, the anomaly is weak in magnitude and so a natural or modern agricultural origin cannot be ruled out.

4.2.4.2. Toward the north of Section 3 at **3001**, a strong, positive response has been identified on the boundary of Area 3A (**Figure 18**). The full extent of the anomaly is not clear due to its position on the edge of the survey area. It is possible such a response could indicate a pit feature in the underlying deposits and therefore could be an indication of former extraction activity. However, a natural or agricultural origin cannot be ruled out.

4.2.4.3. Numerous weakly positive, 1 m diameter, discrete anomalies have been identified throughout Section 3. These anomalies, as with those in other sections, are interpreted as possible archaeology. They could indicate pits in the underlying deposits and so could in turn indicate previous extraction activity or refuse pits. However, it is equally possible the anomalies are the result of natural pits in the bedrock.

Historic agricultural

4.2.4.4. Closely spaced, parallel linear anomalies are noted throughout Section 3 (See Area 3C, 3F, 3G and 3J). These generally correspond to the modern ploughing regime noted across the Site and in aerial imagery. In Area 3F at **3002**, these anomalies are much broader spaced (9 m) and do not correspond to the pattern of land division noted on historical mapping (**Figure 20**). It is therefore possible these anomalies could indicate earlier cultivation methods, such as ridge and furrow.

4.2.4.5. Traversing the central portion of Area 3C, a weakly positive anomaly has been identified on a north-north-west to south-south-east alignment at **3003** (**Figure 20**). The anomaly traverses the entire survey area for 130 m and is 1 m wide. This anomaly corresponds to a former field boundary identified on historical OS mapping (1868 - 1888).

Increased magnetic response

4.2.4.6. An area of increased magnetic response is noted in Area 3E at **3004** (**Figure 20**). This response corresponds to a former pond noted on historical mapping (1888 – 1913) and indicates infilling of variable material. It is possible such a feature could indicate earlier extraction activity. However, this is not possible to determine from the geophysical survey results alone.

4.2.4.7. To the west of **3003** throughout the south-east of Area 3D a notably increased magnetic response has been identified. The anomaly appears to cover an area of 155 m north – south and approximately 40 m east – west. The anomaly corresponds to an area of crop marking on aerial imagery and is not thought to be archaeological in origin as it appears to respect the modern land division and is not visible in Area 3C or 3E to the east. It is likely this is the result of modern agricultural practises or deposits.

Natural

4.2.4.8. Numerous areas of large-scale variable magnetic enhancement have been identified throughout Section 3. These are largely interpreted as natural in origin. Such responses are typically an indication of localised variation in the magnetic susceptibility of the underlying geological deposits.

4.2.5. SECTION 4

Modern

4.2.5.1. A highly magnetic dipolar linear anomaly is noted at the western end of Section 4 Area 4C (**4000**) on a north-east to south-west alignment (**Figure 22**). This indicates a modern service such as a pipe or cable. On an east to west alignment a further dipolar trend has been identified. This may indicate a second modern service in this area, although due to the largely increased magnetic response across the area, this is uncertain.

4.2.6. SECTION 5

Modern

4.2.6.1. Three highly magnetic positive linear anomalies with associated negative responses have been identified traversing Section 5 Area 5B. The first is noted to the east on a north to south alignment (**5000**), with two further anomalies on a north-east to south-west alignment (**5001** and **5002**) (**Figure 24**). These responses indicate underground services, such as pipes or cables.

4.2.6.2. A large area of increased magnetic response is noted in Area 5B at **5003**. The area is 30 m east – west by 28.6 m north – south. An exact origin for this anomaly is not clear. The anomaly corresponds to a cropmark noted on aerial imagery, and while an archaeological origin cannot be ruled out, it likely indicates an area of infilling or landscaping to level the area for use of the area as a recreational ground.

4.2.6.3. Several ferritic responses are noted in this area. These are the result of the current land use as a play area containing metallic goalposts.

4.2.7. SECTION 7

Modern

4.2.7.1. Section 7 consists of a single area that is currently in use as a recreational sports ground (**Figure 26**). The area is dominated by highly magnetic dipolar linear responses. These are variably interpreted as evidence of underground drainage systems and modern services. Where parallel or 'herringbone' linear anomalies are noted (see **7000**, **7001**, **7002**), these have been interpreted as evidence of drainage and likely indicate metallic pipes. Where individual highly magnetic dipolar linear anomalies are noted (see **7003**, **7004**, **7005**), these are interpreted as underground services and could indicate pipes or cables.

5. DISCUSSION

5.1.1.1. The detailed gradiometer survey has detected anomalies thought to be of archaeological origin in Sections 1 and 2.

5.1.1.2. Firstly, a clear network of interconnected recti-linear anomalies that are thought to indicate former boundary features or enclosures has been noted in Section 1. Several anomalies in the vicinity have been interpreted as possible ring-ditches. Such features can indicate settlement or funerary activity although further investigation would be required to confirm this.

5.1.1.3. Several strong, positive anomalies indicating pit-like features have been identified. These have been interpreted as archaeological in origin in Section 2 and are noted on a north-east to south-west alignment. Based on their alignment, these anomalies are likely to be anthropogenic rather than natural. Similar anomalies are also noted in Section 1 with less coherence to their position. However, the features appear to have a similar diameter to those identified in Section 2 (~3 - 5 m). Further investigation would be required to confirm the origin of these anomalies.

5.1.1.4. The remaining anomalies thought to be archaeological in origin pertain to former extraction activity noted on historical Ordnance Survey mapping throughout Section 1. Where anomalies of this type are identified and a known feature can be interpreted an archaeological origin is ascribed as the feature is known to be anthropogenic. However, the exact date of the feature cannot be determined fully from the geophysical survey results alone. It is possible such features predate the mapping they are identified on, the earliest available being 1861 – 1888.

5.1.1.5. Numerous positive anomalies thought to indicate pit-like features in the underlying deposits have been identified throughout the dataset. These anomalies are likely to indicate natural variations in the magnetic susceptibility of the underlying deposits or natural pits. However, an archaeological origin cannot be ruled out as such features can be evidence of wider settlement activity, such as refuse or extraction pits.

5.1.1.6. A single anomaly associated with a former field boundary has been identified in Section 3. The anomaly corresponds to the historical pattern of land division and is noted on historical mapping. While the feature likely pre-dates the mapping it is first noted on, an exact origin cannot be determined for this feature. It is possible the feature dates to an earlier period, such as the medieval period.

5.1.1.7. Weakly magnetised parallel linear anomalies have been identified throughout the dataset. These are typically between 6 and 8 m apart and are likely evidence of historical cultivation activity. Features of this type can date to the medieval period.

5.1.1.8. A weakly positive alignment of sinuous anomalies has been identified traversing a significant portion of Section 1 and 2. This is thought to be evidence of a paleochannel. While this feature is likely to be natural in origin, such features have been known to contain archaeological artefacts and deposits.

5.1.1.9. The remaining anomalies identified are thought to be modern in origin pertaining to agricultural activity such as ploughing and tyre tracks as well as several modern services.

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Schmidt, A, Linford, P, Linford, N, David, A, Gaffney, C, Sarris, A and Fassbinder, J. 2015 *Guidelines for the use of geophysics in archaeology: questions to ask and points to consider.* EAC Guidelines 2, Belgium: European Archaeological Council.

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WSP UK Ltd 2019 *Scoping of Joint Bay and Horizontal Directional Drilling locations for archaeological geophysical survey*

5.1.3. CARTOGRAPHIC AND DOCUMENTARY SOURCES

Ordnance Survey 1983 *Soil Survey of England and Wales Sheet 6, Soils of South-East England.* Southampton.

5.1.4. ONLINE RESOURCES

British Geological Survey Geology of Britain Viewer (accessed May & June 2019) http://mapapps.bgs.ac.uk/geologyofbritain/home.html

Magic Maps (accessed May & June 2019) https://magic.defra.gov.uk/MagicMap.aspx

Old Maps (accessed May & June 2019) https://www.old-maps.co.uk

Appendix 1 – Survey Equipment and Data Processing

SURVEY METHODS AND EQUIPMENT

CART SURVEY

The magnetic data for this project will be acquired using a non-magnetic cart fitted with 4x Bartington Grad-01-1000L magnetic gradiometers. The instrument has four sensor assemblies fixed horizontally 1 m apart allowing four traverses to be recorded simultaneously. Each sensor contains two fluxgate magnetometers arranged vertically with a 1m separation and measures the difference between the vertical components of the total magnetic field within each sensor array. This arrangement of magnetometers suppresses any diurnal or low frequency effects.

The gradiometers have an effective resolution of 0.03 nT over a ±100 nT range, and measurements from each sensor are logged at intervals of 0.25 m. All of the data are then relayed to a Leica Viva CS35 tablet, running the MLgrad601 program, which is used to record the survey data from the array of Grad601 probes at a rate of 10 Hz. The program also receives measurements from a GPS system, which is fixed to the cart at a measured distance from the sensors, providing real time locational data for each data point.

The cart-based system relies upon accurate GPS location data which is collected using a Leica Viva system with rover and base station. This receives corrections from a network of reference stations operated by the Ordnance Survey and Leica Geosystems, allowing positions to be determined with a precision of 0.02m in real-time and therefore exceed the level of accuracy recommended by European Archaeologiae Consilium recommendations (Schmidt et al. 2015) for geophysical surveys.

Data may be collected with a higher sample density where complex archaeological anomalies are encountered, to aid the detection and characterisation of small and ephemeral features. Data may be collected at up to 0.125 m intervals along traverses spaced up to 0.25m apart.

POST-PROCESSING

The magnetic data collected during the detail survey are downloaded from the Bartington cart system for processing and analysis using both commercial and in-house software. This software allows for both the data and the images to be processed in order to enhance the results for analysis; however, it should be noted that minimal data processing is conducted so as not to distort the anomalies.

The cart-based system generally requires a lesser amount of post-processing than the handheld Bartington Grad 601-2 fluxgate gradiometer instrument. This is largely because mounting the gradiometers on the cart reduces the occurrence of operator error; caused by inconsistent walking speeds and deviation in traverse position due to varying ground cover and topography.

Typical data and image processing steps may include:

- GPS Destripe – Determines the median of each transect and then subtracts that value from each datapoint in the transect. May be used to remove the striping effect seen within a survey caused by directional effects, drift, etc.
- GPS Base Interpolation – Sets the X & Y interval of the interpolated data and the track radius (area around each datapoint that is included in the interpolated result).
- Discard Overlaps - Intended to eliminate a track(s) that have been collected too close to one another. Without this, the results of the interpolation process can be distorted as it tries to accommodate very close points with potentially differing values.

Typical displays of the data used during processing and analysis:

- XY Plot – Presents the data as a trace or graph line for each traverse. Each traverse is displaced down the image to produce a stacked profile effect. This type of image is useful as it shows the full range of individual anomalies.
- Greyscale – Presents the data in plan view using a greyscale to indicate the relative strength of the signal at each measurement point. These plots can be produced in colour to highlight certain features but generally greyscale plots are used during analysis of the data.

HANDHELD SURVEY

The magnetic data for this project was acquired using a Bartington 601-2 dual magnetic gradiometer system. This instrument has two sensor assemblies fixed horizontally 1 m apart allowing two traverses to be recorded simultaneously. Each sensor contains two fluxgate magnetometers arranged vertically with a 1 m separation and measures the difference between the vertical components of the total magnetic field within each sensor array. This arrangement of magnetometers suppresses any diurnal or low frequency effects.

The gradiometers have an effective resolution of 0.03 nT over a ±100 nT range, and measurements from each sensor are logged at intervals of 0.25 m. All of the data are stored on an integrated data logger for subsequent post-processing and analysis.

Wessex Archaeology undertakes two types of magnetic surveys: scanning and detail. Both types depend upon the establishment of an accurate 20 m or 30 m site grid, which is achieved using a Leica Viva RTK GNSS instrument and then extended using tapes. The Leica Viva system receives corrections from a network of reference stations operated by the Ordnance Survey and Leica Geosystems, allowing positions to be determined with a precision of 0.02 m in real-time and therefore exceed the level of accuracy recommended by European Archaeologiae Consilium (Schmidt et al. 2015) for geophysical surveys.

Scanning surveys consist of recording data at 0.25 m intervals along transects spaced 10 m apart, acquiring a minimum of 80 data points per transect. Due to the relatively coarse transect interval, scanning surveys should only be expected to detect extended regions of archaeological anomalies, when there is a greater likelihood of distinguishing such responses from the background magnetic field.

The detailed surveys consist of 20 m x 20 m or 30 m x 30 m grids, and data are collected at 0.25 m intervals along traverses spaced 1m apart. These strategies give 1600 or 3600 measurements per 20 m or 30 m grid respectively and are the recommended methodologies for archaeological surveys of this type (Schmidt et al. 2015).

Data may be collected with a higher sample density where complex archaeological anomalies are encountered, to aid the detection and characterisation of small and ephemeral features. Data may be collected at up to 0.125 m intervals along traverses spaced up to 0.25 m apart, resulting in a maximum of 28800 readings per 30 m grid, exceeding that recommended by European Archaeologiae Consilium recommendations (Schmidt et al. 2015) for characterisation surveys.

POST-PROCESSING

The magnetic data collected during the detail survey are downloaded from the Bartington system for processing and analysis using both commercial and in-house software. This software allows for both the data and the images to be processed in order to enhance the results for analysis; however, it should be noted that minimal data processing is conducted so as not to distort the anomalies.

As the scanning data are not as closely distributed as with detailed survey, they are georeferenced using the GPS information and interpolated to highlight similar anomalies in adjacent transects. Directional trends may be removed before interpolation to produce more easily understood images.

Typical data and image processing steps may include:

- Destripe – Applying a zero mean traverse in order to remove differences caused by directional effects inherent in the magnetometer;
- Destagger – Shifting each traverse longitudinally by a number of readings. This corrects for operator errors and is used to enhance linear features;
- Despike – Filtering isolated data points that exceed the mean by a specified amount to reduce the appearance of dominant anomalous readings (generally only used for earth resistance data)

Typical displays of the data used during processing and analysis:

- Greyscale – Presents the data in plan view using a greyscale to indicate the relative strength of the signal at each measurement point. These plots can be produced in colour to highlight certain features but generally greyscale plots are used during analysis of the data.
- XY Plot – Presents the data as a trace or graph line for each traverse. Each traverse is displaced down the image to produce a stacked profile effect. This type of image is useful as it shows the full range of individual anomalies. XY plots can be made available upon request.

Appendix 2 – Geophysical Interpretation

The interpretation methodology used by Wessex Archaeology separates the anomalies into four main categories: archaeological, modern, agricultural and uncertain origin/geological.

The archaeological category is used for features when the form, nature and pattern of the anomaly are indicative of archaeological material. Further sources of information such as aerial photographs may also have been incorporated in providing the final interpretation. This category is further sub-divided into three groups, implying a decreasing level of confidence:

- Archaeology – used when there is a clear geophysical response and anthropogenic pattern.
- Possible archaeology – used for features which give a response, but which form no discernible pattern or trend.

The modern category is used for anomalies that are presumed to be relatively modern in date:

- Ferrous – used for responses caused by ferrous material. These anomalies are likely to be of modern origin.
- Modern service – used for responses considered relating to cables and pipes; most are composed of ferrous/ceramic material although services made from non-magnetic material can sometimes be observed.

The agricultural category is used for the following:

- Former field boundaries – used for ditch sections that correspond to the position of boundaries marked on earlier mapping.
- Ridge and furrow – used for broad and diffuse linear anomalies that are considered to indicate areas of former ridge and furrow.
- Ploughing – used for well-defined narrow linear responses, usually aligned parallel to existing field boundaries.
- Drainage – used to define the course of ceramic field drains that are visible in the data as a series of repeating bipolar (black and white) responses.

The uncertain origin/geological category is used for features when the form, nature and pattern of the anomaly are not sufficient to warrant a classification as an archaeological feature. This category is further sub-divided into:

- Increased magnetic response – used for areas dominated by indistinct anomalies which may have some archaeological potential.
- Trend – used for low amplitude or indistinct linear anomalies.
- Superficial geology – used for diffuse edged spreads considered to relate to shallow geological deposits. They can be distinguished as areas of positive, negative or broad bipolar (positive and negative) anomalies.

Appendix 3 – OASIS Form

PROJECT DETAILS:

Project name		AQUIND Interconnector			
Type of project		Detailed gradiometer survey (Field evaluation)			
Project description		A network of recti-linear anomalies that likely indicate former boundary features or enclosures has been noted in Section 1. Several anomalies have tentatively been interpreted as archaeological surrounding these features that could indicate ring-ditches. Anomalies indicating pit features on a north-east to south-west alignment have also been identified in Section 2. Based on their alignment, these are interpreted as anthropogenic. The remaining anomalies thought to be archaeological in origin pertain to former extraction activity noted on historical OS mapping throughout Section 1. A single anomaly associated with a former field boundary has been identified in Section 3 in addition to weakly magnetised parallel linear trends that are likely to be evidence of historical cultivation activity. A weakly positive alignment of sinuous anomalies has been identified traversing a significant portion of Section 1 and 2. This is thought to be evidence of a former paleochannel. The remaining anomalies identified are thought to be modern in origin pertaining to agricultural activity such as ploughing and tyre tracks as well as several modern services.			
Project dates		**Start:** 25-04-2019		**End:** 24-05-2019	
Previous work		Not known.			
Future work		Not known.			
Project Code:	218590	**HER event no.**	N/A	**OASIS form ID:**	wessexar1-353916
		NMR no.	N/A		
		SM no.	N/A		
Planning Application Ref.					
Site Status		None			
Land use		Cultivated Lane 3 – Operations to a depth of more than 0.25 m			
Monument type			**Period**		

PROJECT LOCATION:

County	Hampshire	**District**	Portsmouth	**Parish**	Portsmouth
Study Area	75 ha	**Height OD**	36 – 92 m aOD	**NGR**	

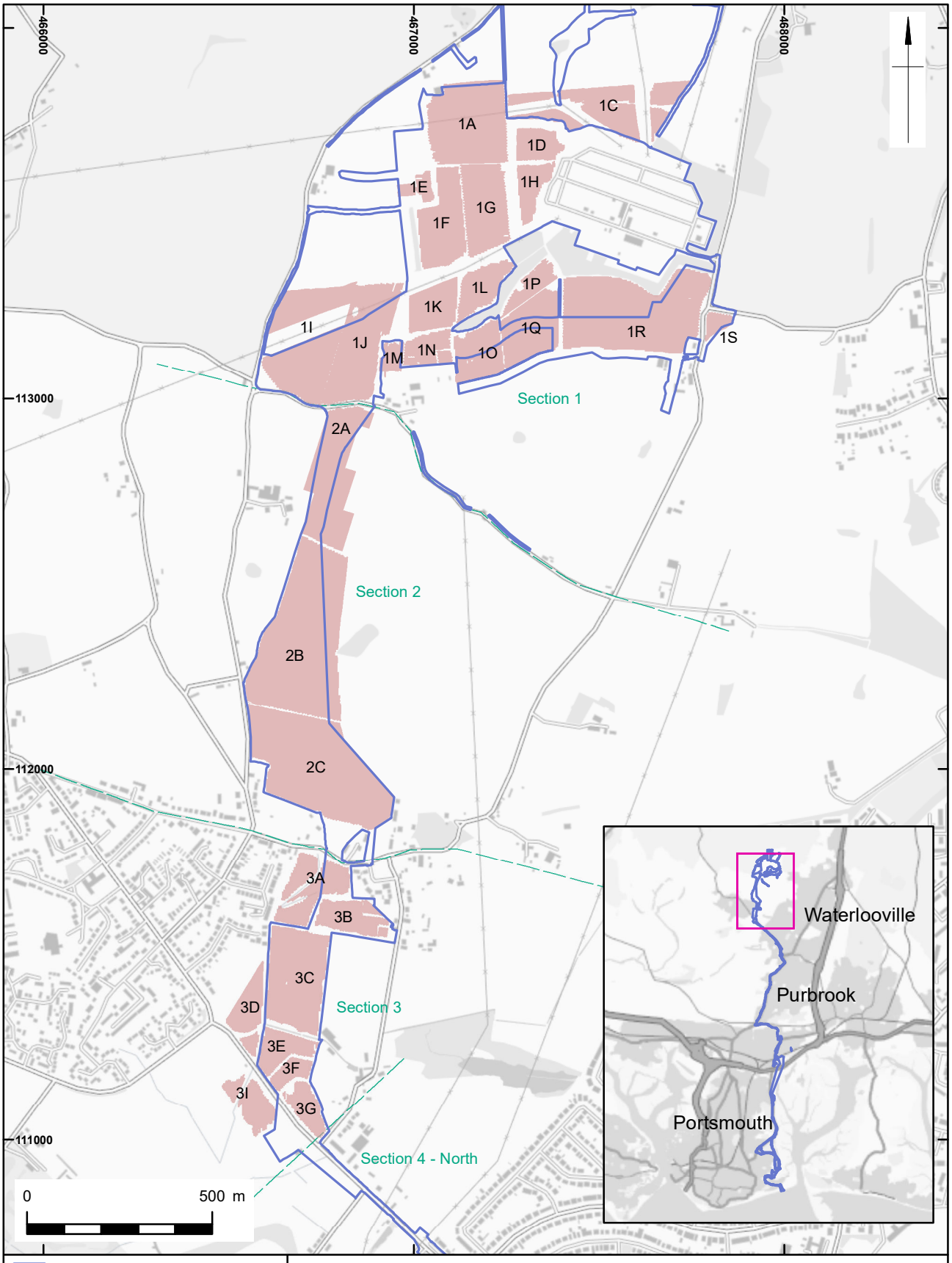
PROJECT CREATORS:

Name of Organisation	Wessex Archaeology		
Project brief originator	WSP Environmental	**Project design originator**	Wessex Archaeology
Project Manager	Tom Richardson	**Project Supervisor**	Chris Hirst

Sponsor or funding body	WSP Environmental	**Type of Sponsor**	

PROJECT ARCHIVE AND BIBLIOGRAPHY:

Physical archive	N/A	**Digital Archive**	Geophysics, survey and report	**Paper Archive**	N/A
Report title	AQUIND Interconnector Detailed Gradiometer Survey Report			**Date**	2019
Author	Wessex Archaeology	**Description**	Unpublished report	**Report ref.**	218590.05



Order Limits

Detailed survey extents

Section boundary

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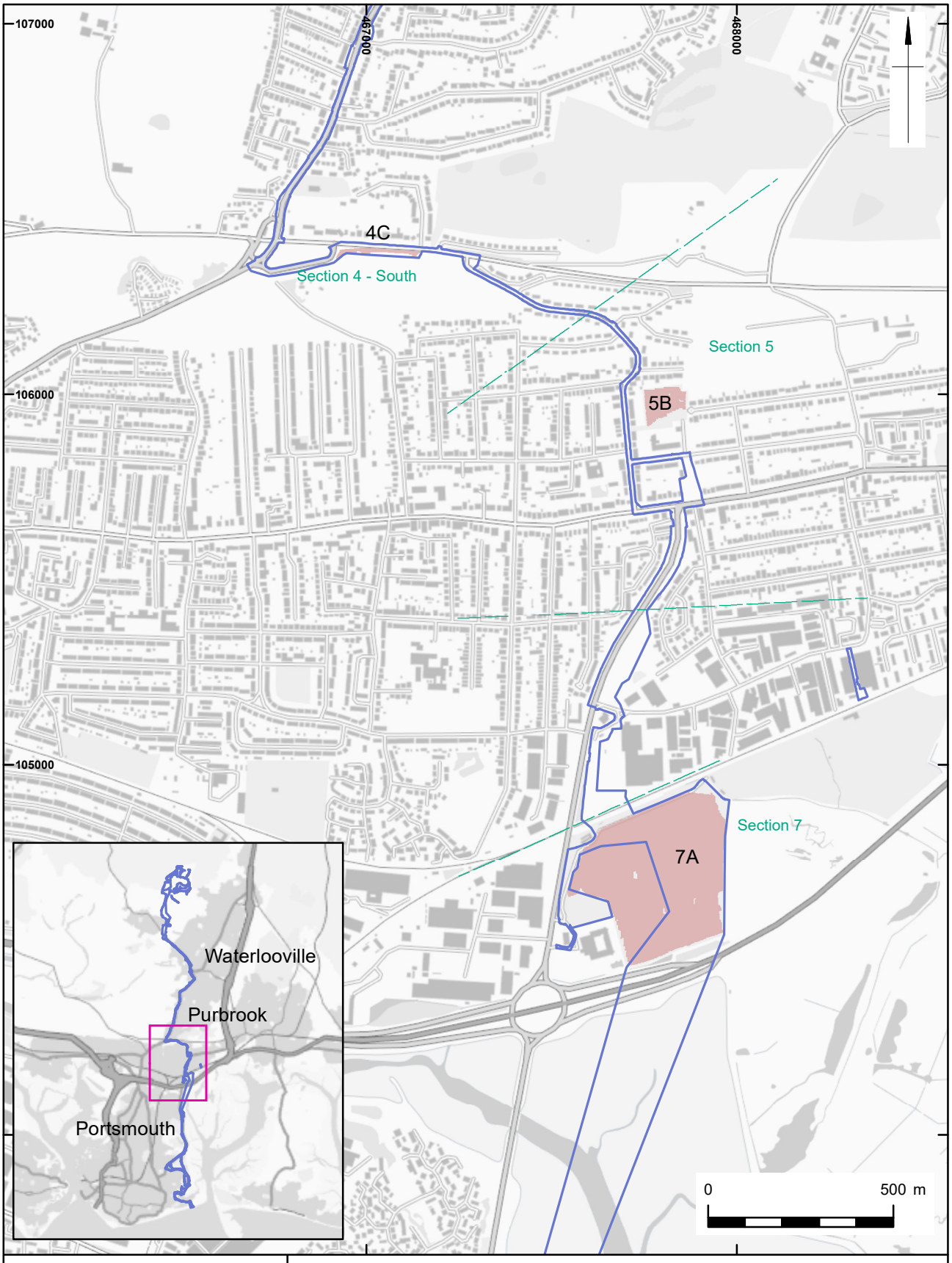
Site location and survey location (Section 1 - 3)

Figure 1



Order Limits

Detailed survey extents

Section boundary

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Site location and survey location (Section 4 - 7) Figure 2

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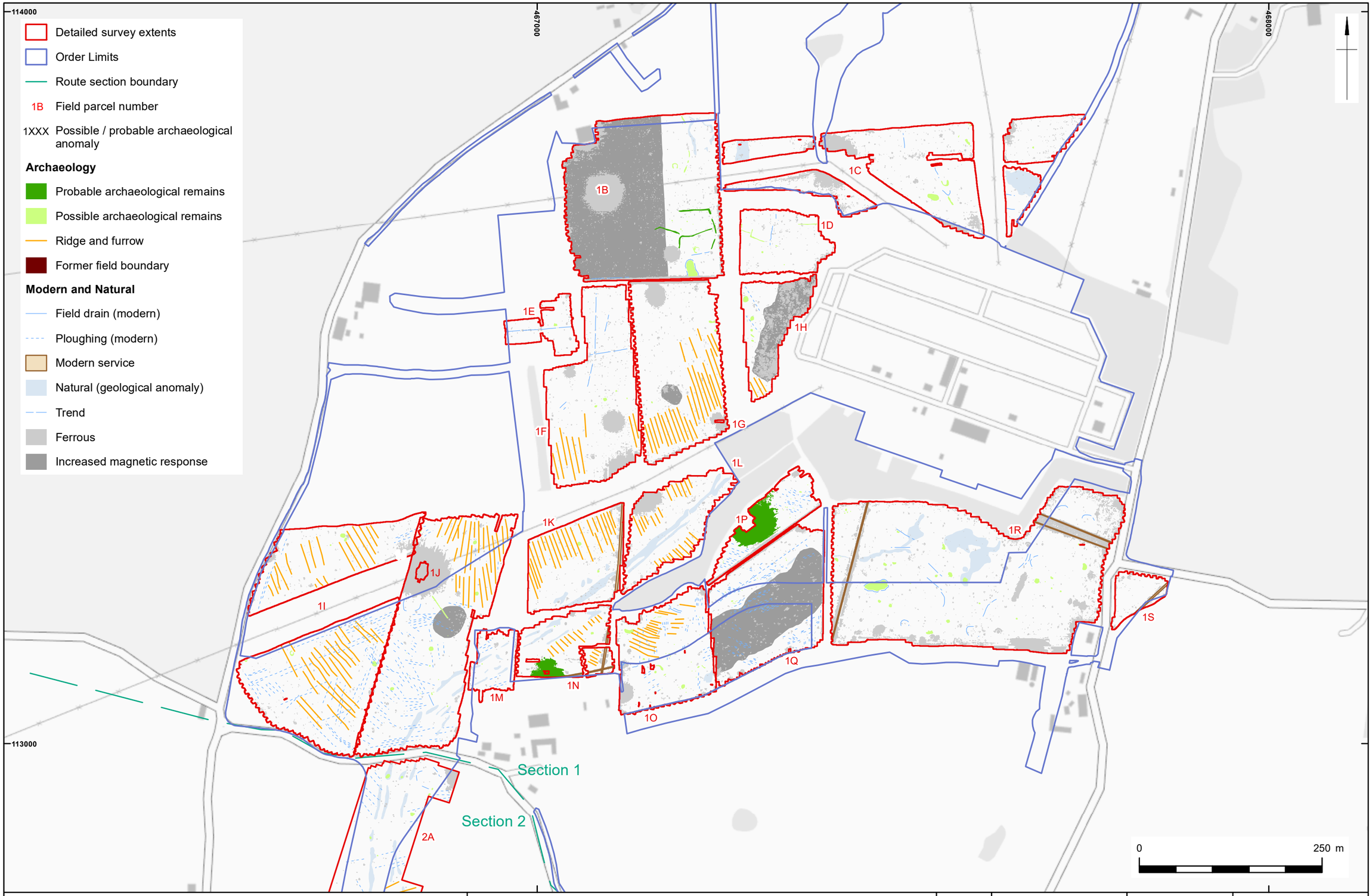
Detailed gradiometer survey results: overall greyscale plot (Section 1)

Figure 3



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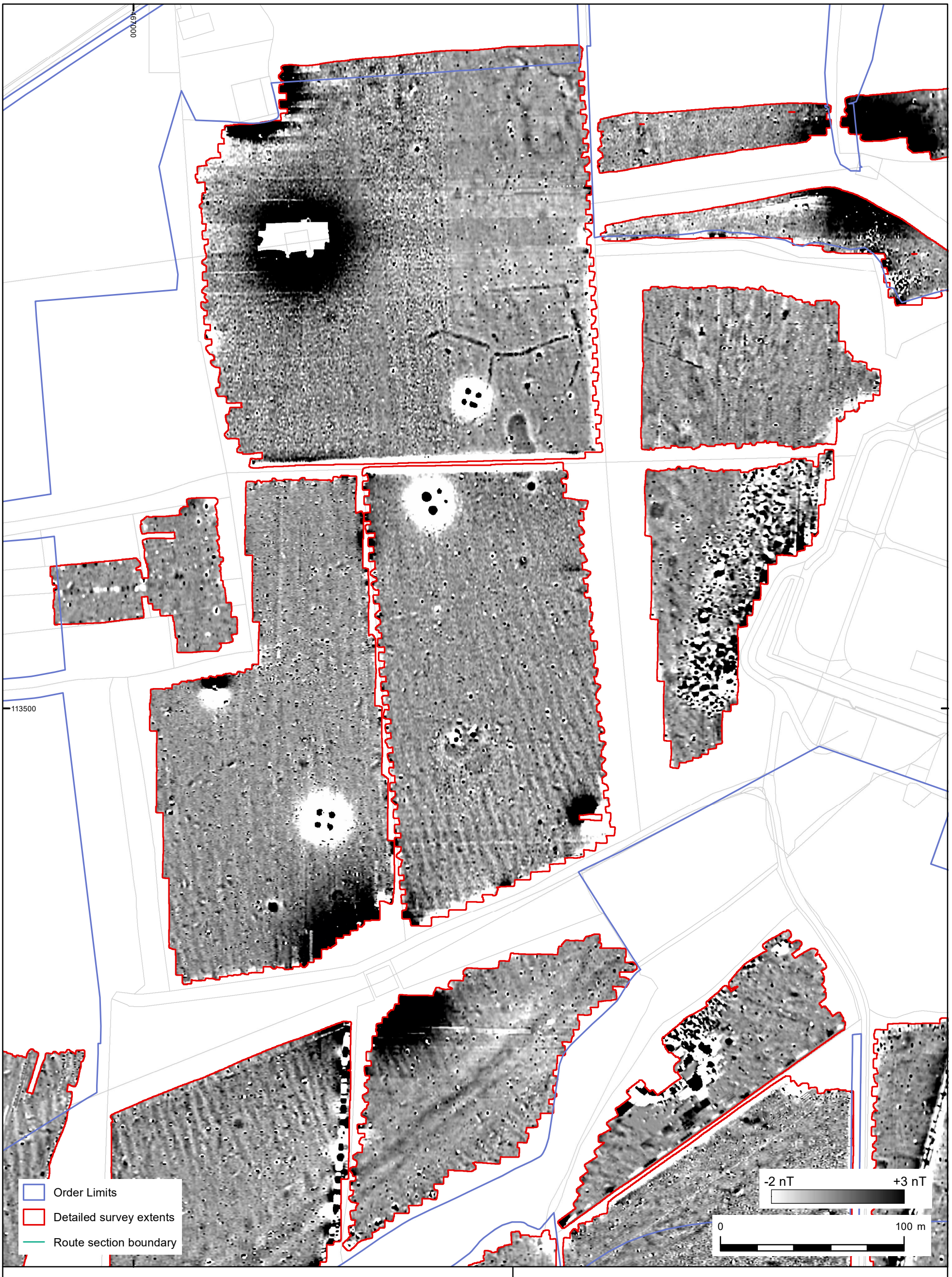
Detailed gradiometer survey results: overall interpretation (Section 1)

Figure 4



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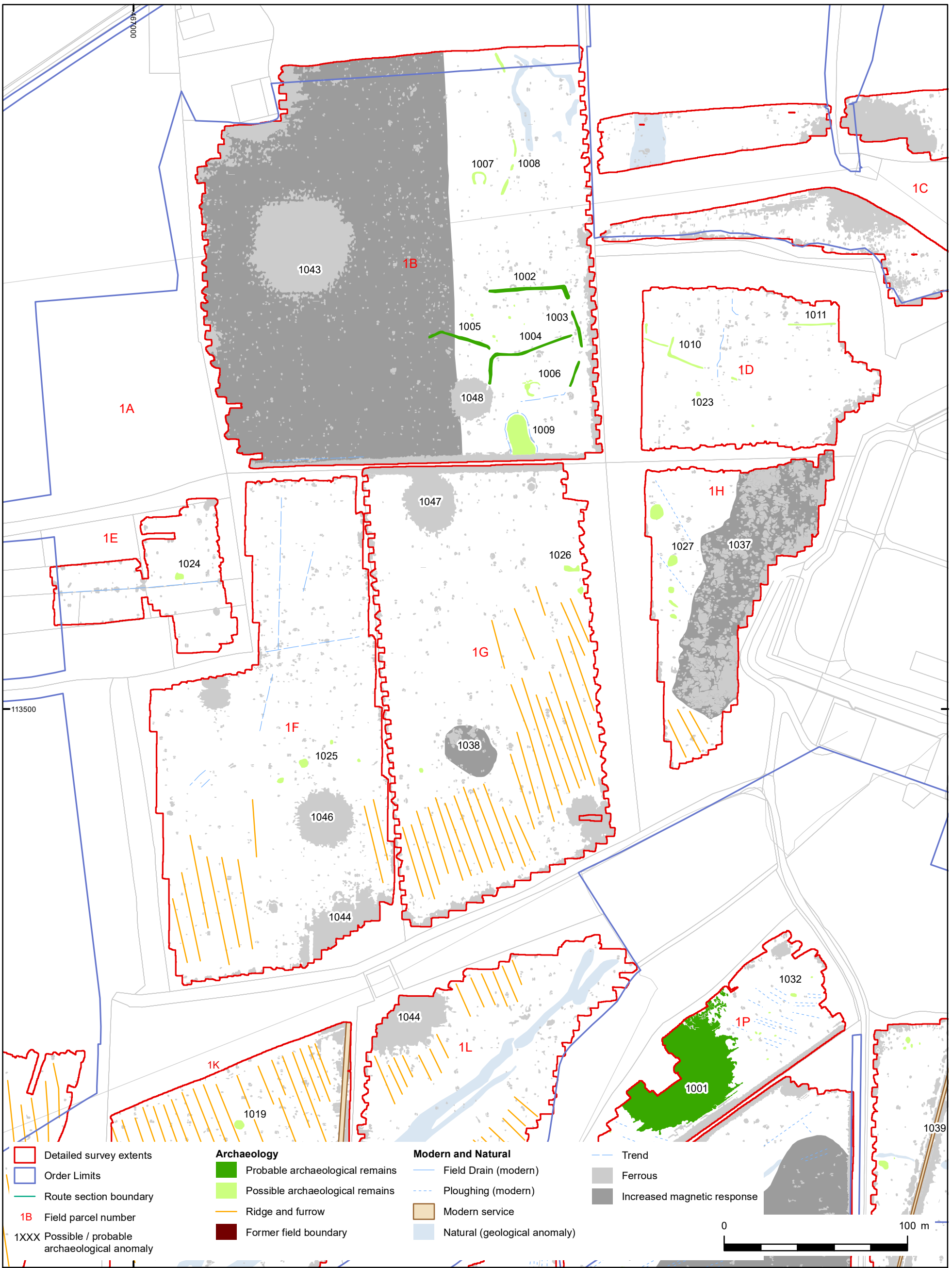
Detailed gradiometer survey results: greyscale plot (Area 1A – 1H)

Figure 5



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Detailed gradiometer survey results: interpretation (Area 1A – 1H)

Figure 6

467500

113500

Order Limits

Detailed survey extents

Route section boundary

-2 nT +3 nT

0 100 m

Date:	07/06/2019	Revision Number:	2
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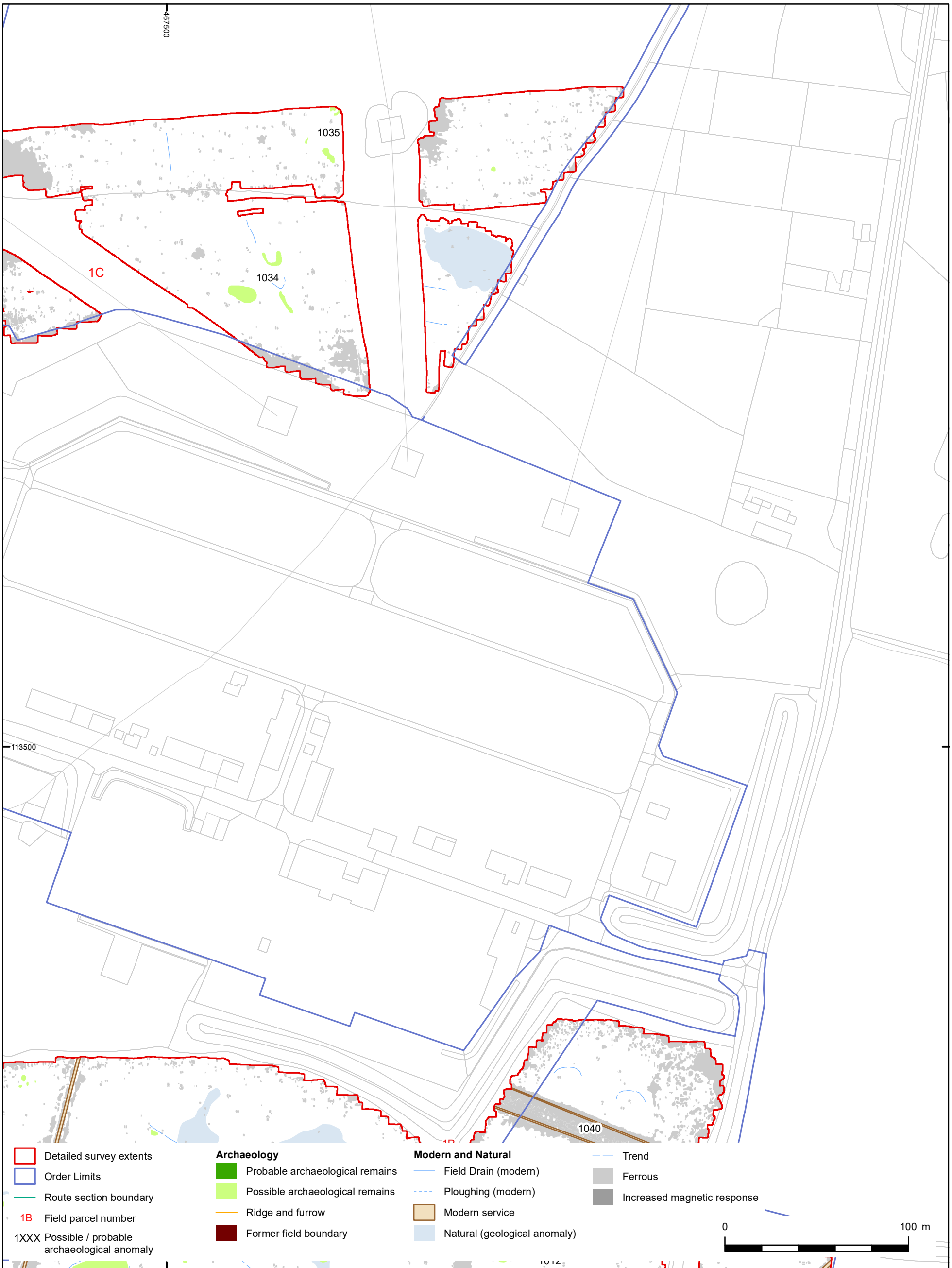
Detailed gradiometer survey results: greyscale plot (Area 1C)

Figure 7



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Detailed gradiometer survey results: greyscale plot (Area 1C)

Figure 8

467500

113500

113000

Order Limits

Detailed survey extents

Route section boundary

-2 nT +3 nT

0 100 m

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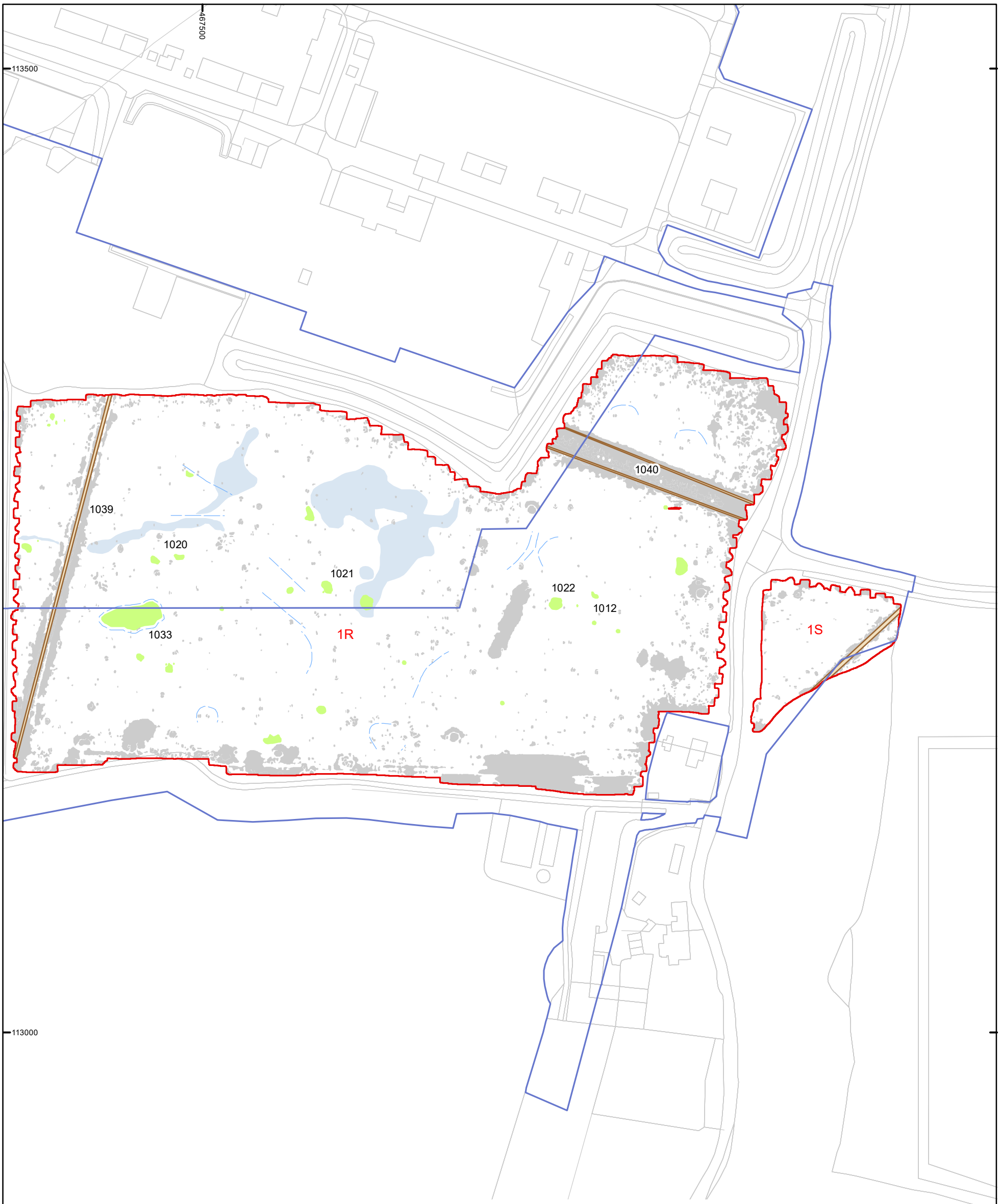
Detailed gradiometer survey results: greyscale plot (Area 1R and 1S)

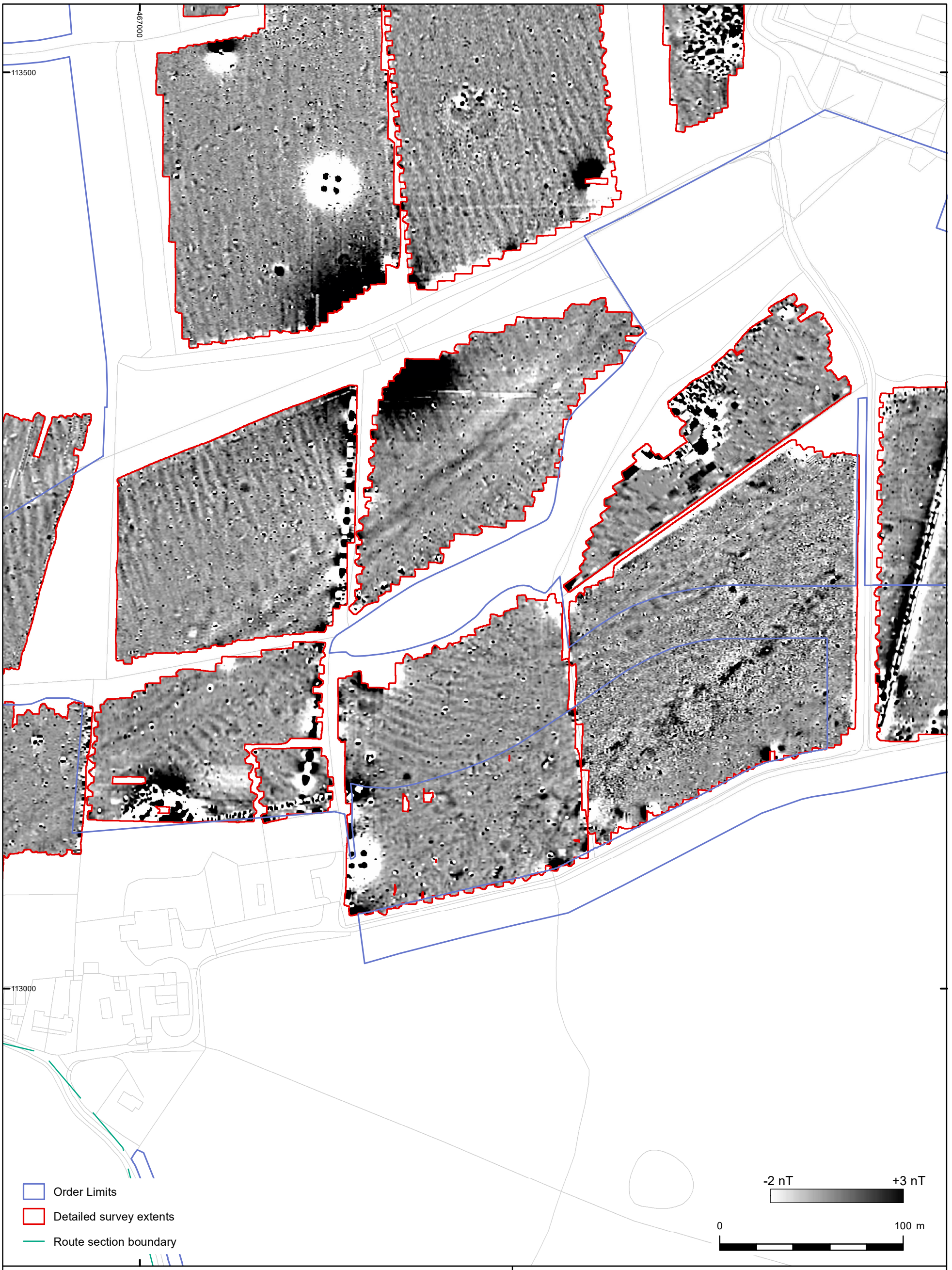
Figure 9



Date:	05/07/2019	Revision Number:	2
Scale:	1:2000 at A3	Illustrator:	IA
Path:	S:\PROJECTS\218590\GIS\FigsMXD\2019_06_07\218590_Figs_Interp.mxd		

Detailed gradiometer survey results: interpretation (Area 1R and 1S)

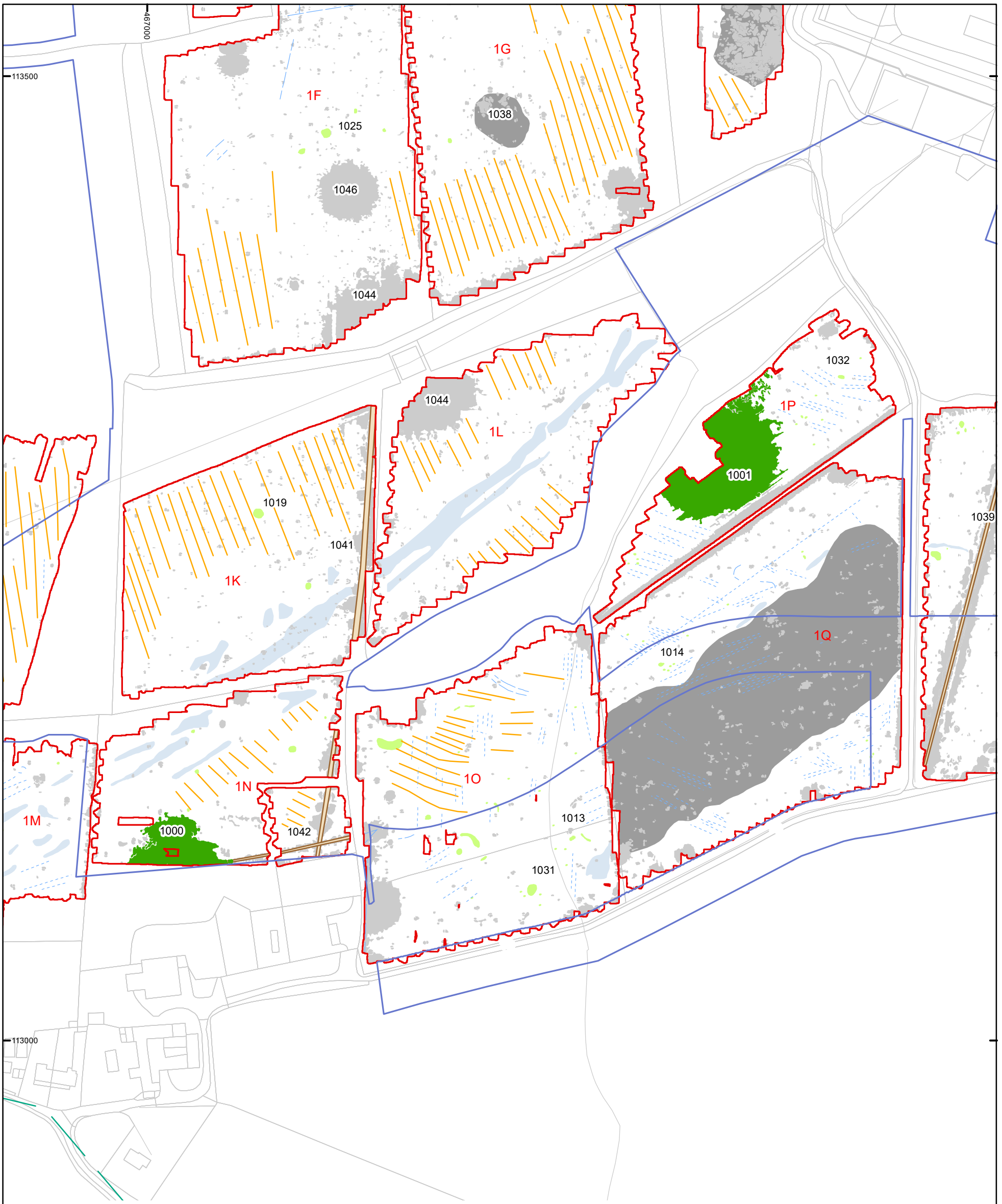
Figure 10



Date:	07/06/2019	Revision Number:	2
Scale:	1:2000 at A3	Illustrator:	IA
Path:	S:\PROJECTS\218590\GIS\FigsMXD\2019_06_07\218590_Figs_Greyscale.mxd		

Detailed gradiometer survey results: greyscale plot (Area 1K – 1Q)

Figure 11



Date:	05/07/2019	Revision Number:	2
Scale:	1:2000 at A3	Illustrator:	IA
Path:	S:\PROJECTS\218590\GIS\FigsMXD\2019_06_07\218590_Figs_Interp.mxd		

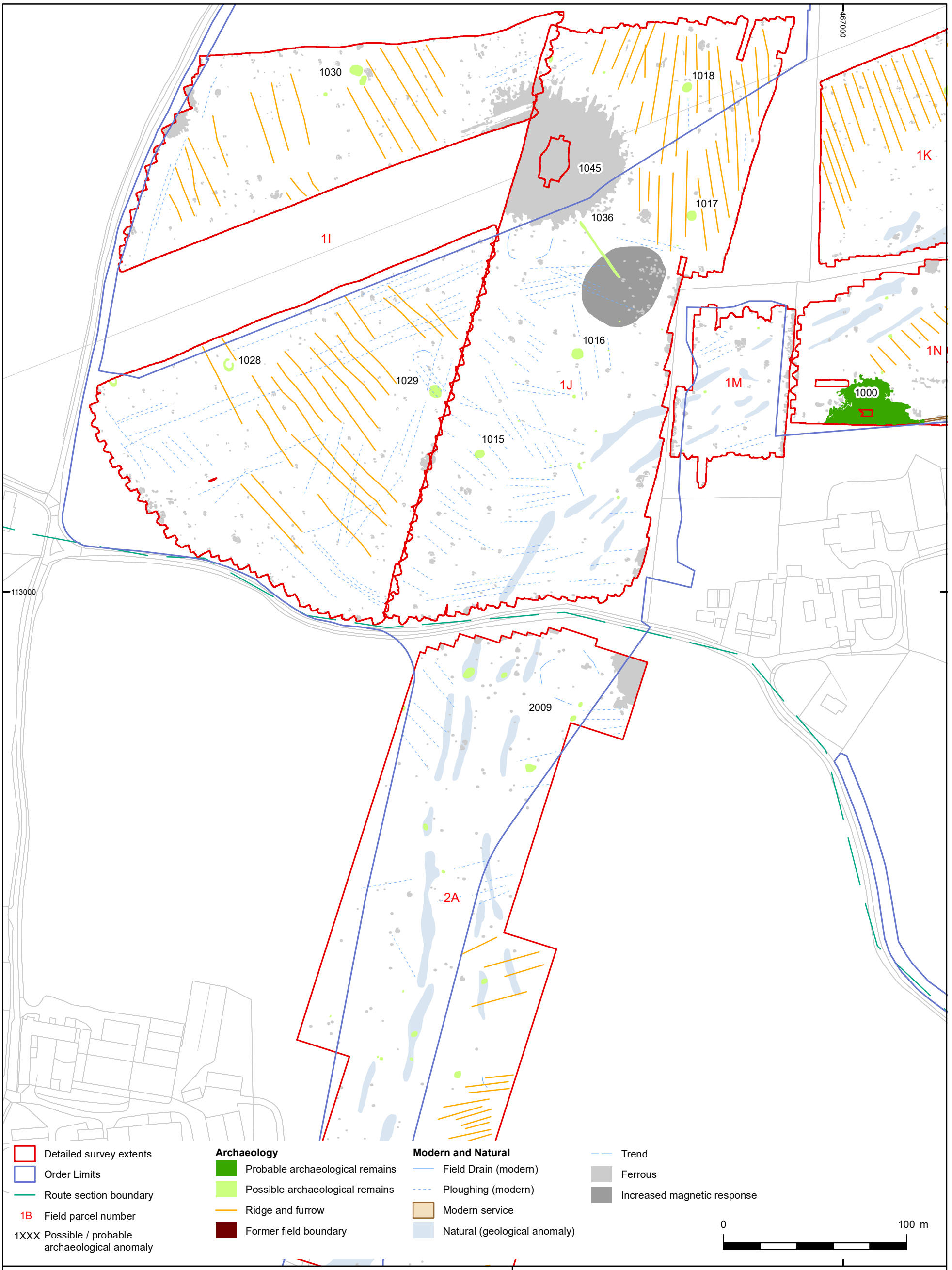
Detailed gradiometer survey results: interpretation (Area 1K – 1Q)

Figure 12

Date:	07/06/2019	Revision Number:	2
Scale:	1:2000 at A3	Illustrator:	IA
Path:	S:\PROJECTS\218590\GIS\FigsMXD\2019_06_07\218590_Figs_Greyscale.mxd		

Detailed gradiometer survey results: greyscale plot (Area 1J – 2A)

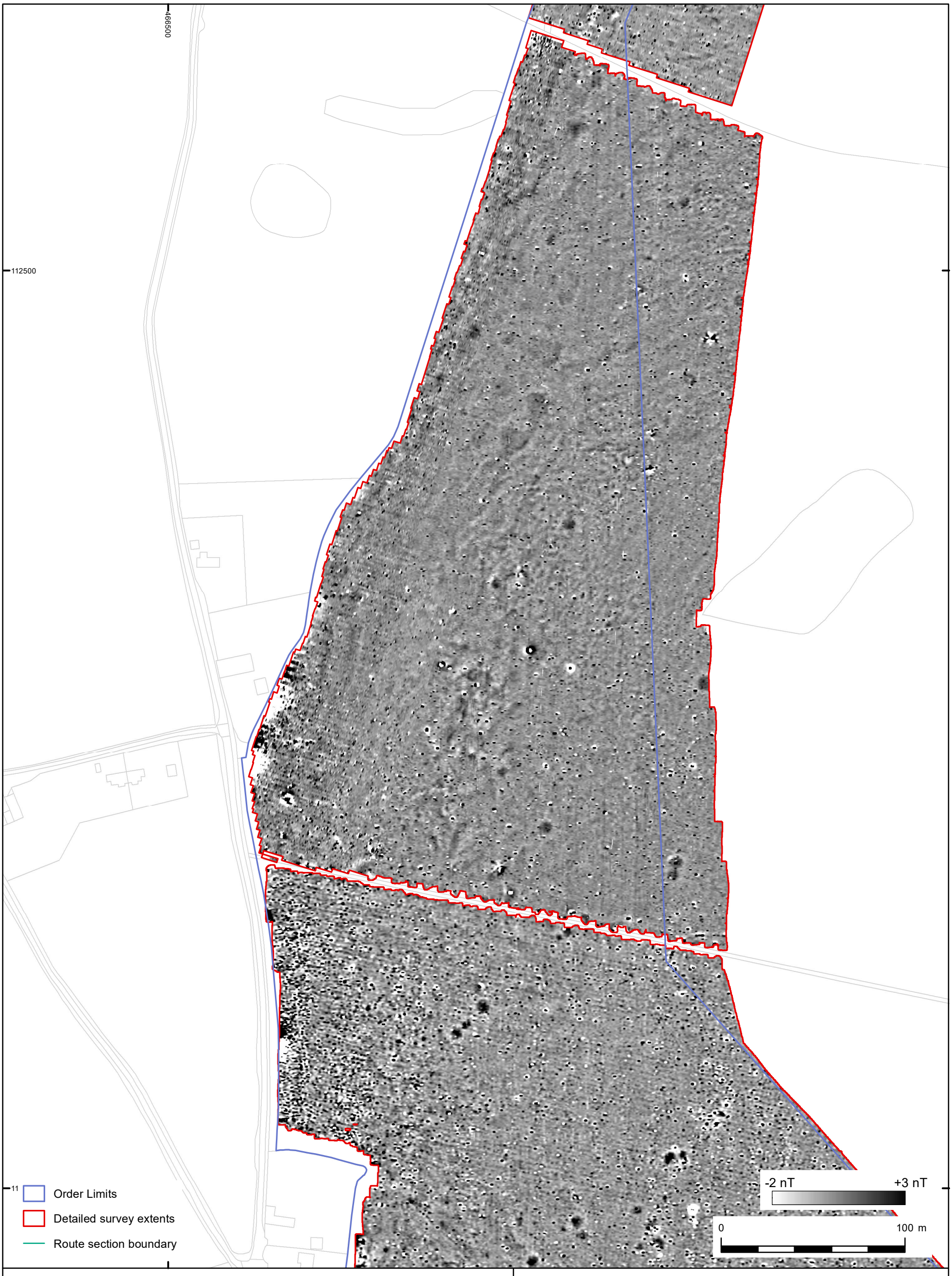
Figure 13



Date:	05/07/2019	Revision Number:	2
Scale:	1:2000 at A3	Illustrator:	IA
Path:	S:\PROJECTS\218590\GIS\FigsMXD\2019_06_07\218590_Figs_Interp.mxd		

Detailed gradiometer survey results: interpretation (Area 1J – 2A)

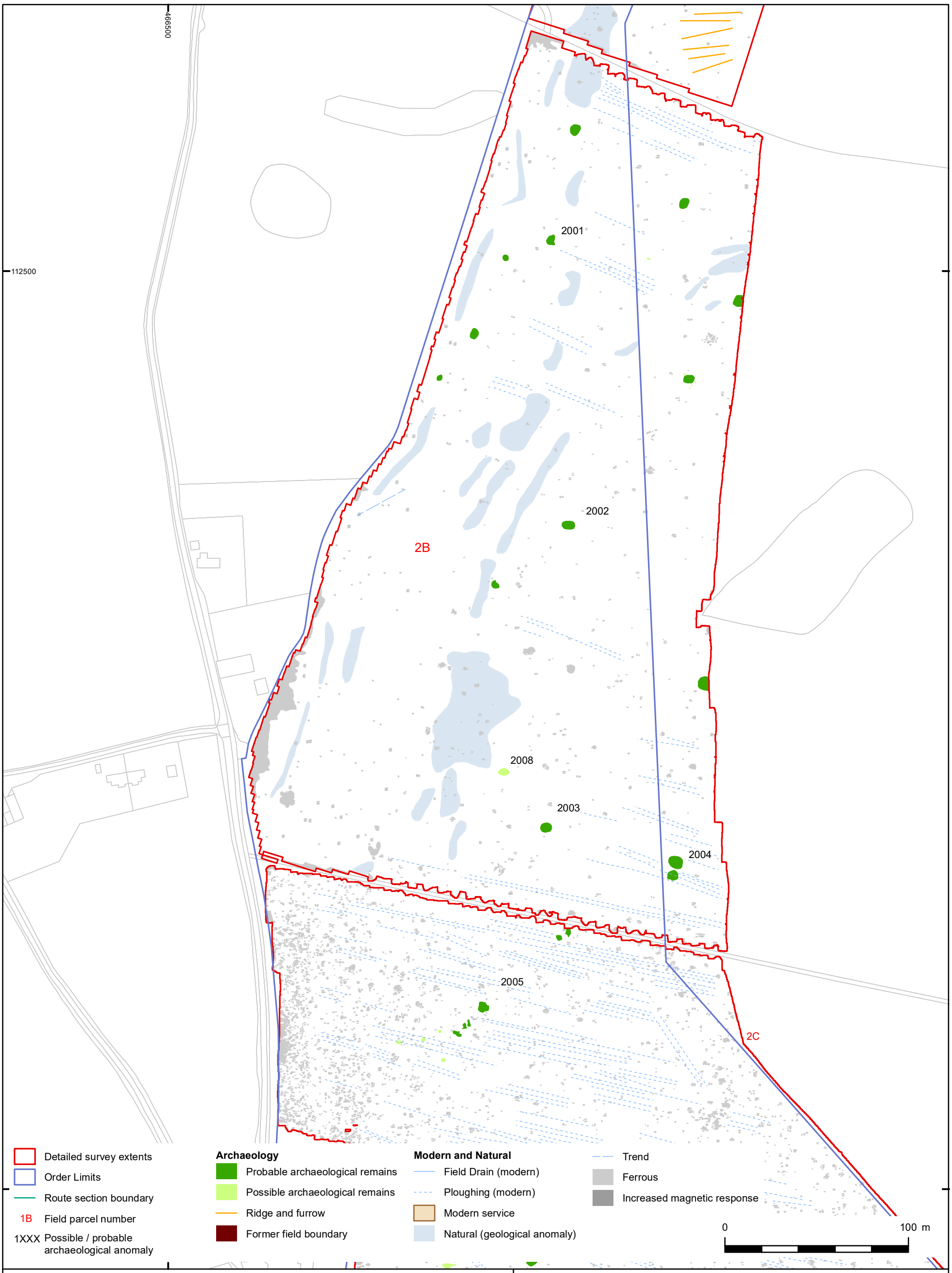
Figure 14



Date:	07/06/2019	Revision Number:	2
Scale:	1:2000 at A3	Illustrator:	IA
Path:	S:\PROJECTS\218590\GIS\FigsMXD\2019_06_07\218590_Figs_Greyscale.mxd		

Detailed gradiometer survey results: greyscale plot (Area 2B – 2C)

Figure 15



Date:	05/07/2019	Revision Number:	2
Scale:	1:2000 at A3	Illustrator:	IA
Path:	S:\PROJECTS\218590\GIS\FigsMXD\2019_06_07\218590_Figs_Interp.mxd		

Detailed gradiometer survey results: interpretation (Area 2B – 2C)

Figure 16

466500

112000

Order Limits

Detailed survey extents

Route section boundary

-2 nT

+3 nT

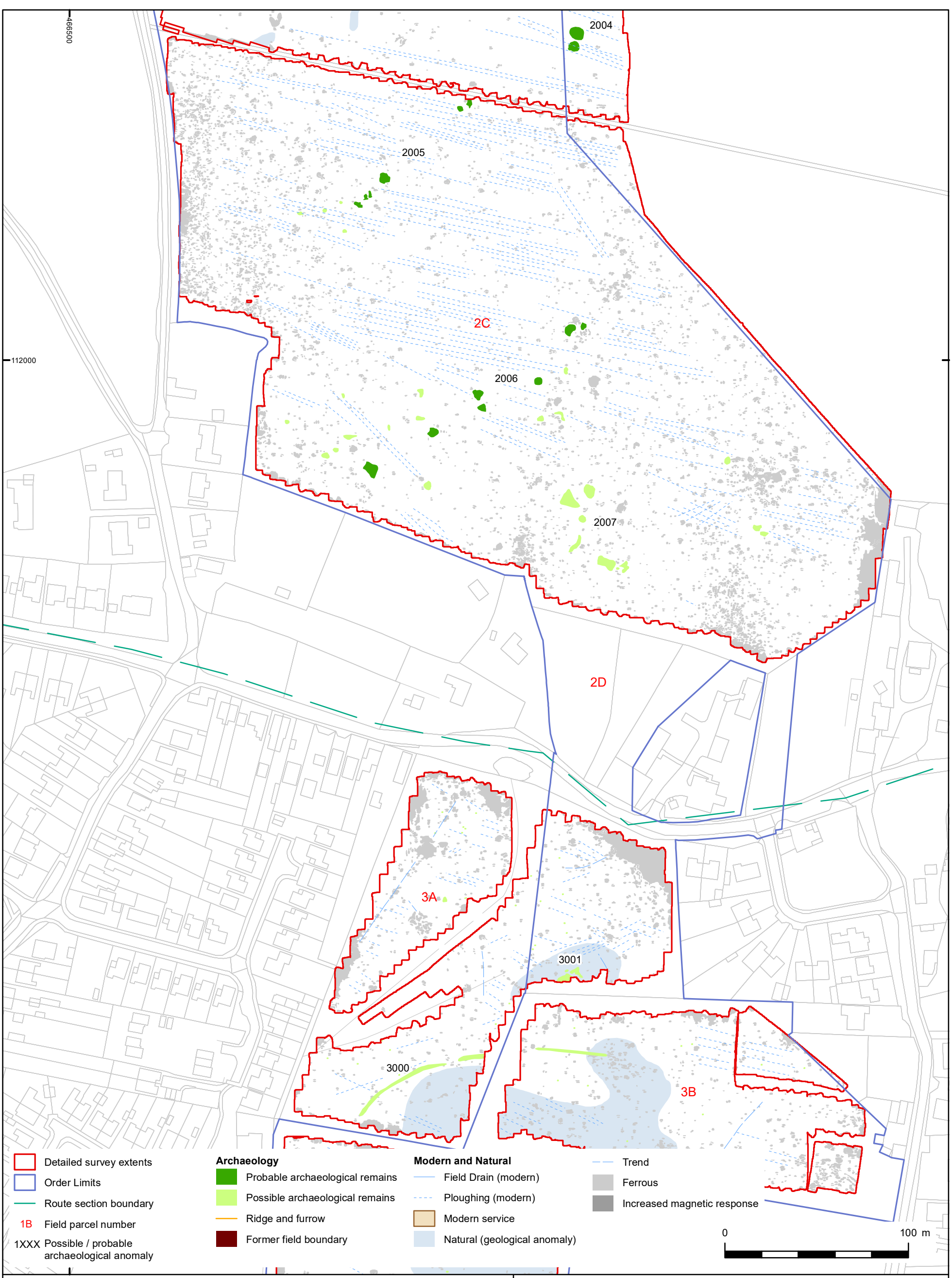
0

100 m

Date:	07/06/2019	Revision Number:	2
Scale:	1:2000 at A3	Illustrator:	IA
Path:	S:\PROJECTS\218590\GIS\FigsMXD\2019_06_07\218590_Figs_Greyscale.mxd		

Detailed gradiometer survey results: greyscale plot (Area 2C – 3B)

Figure 17



Date:	05/07/2019	Revision Number:	2
Scale:	1:2000 at A3	Illustrator:	IA
Path:	S:\PROJECTS\218590\GIS\FigsMXD\2019_06_07\218590_Figs_Interp.mxd		

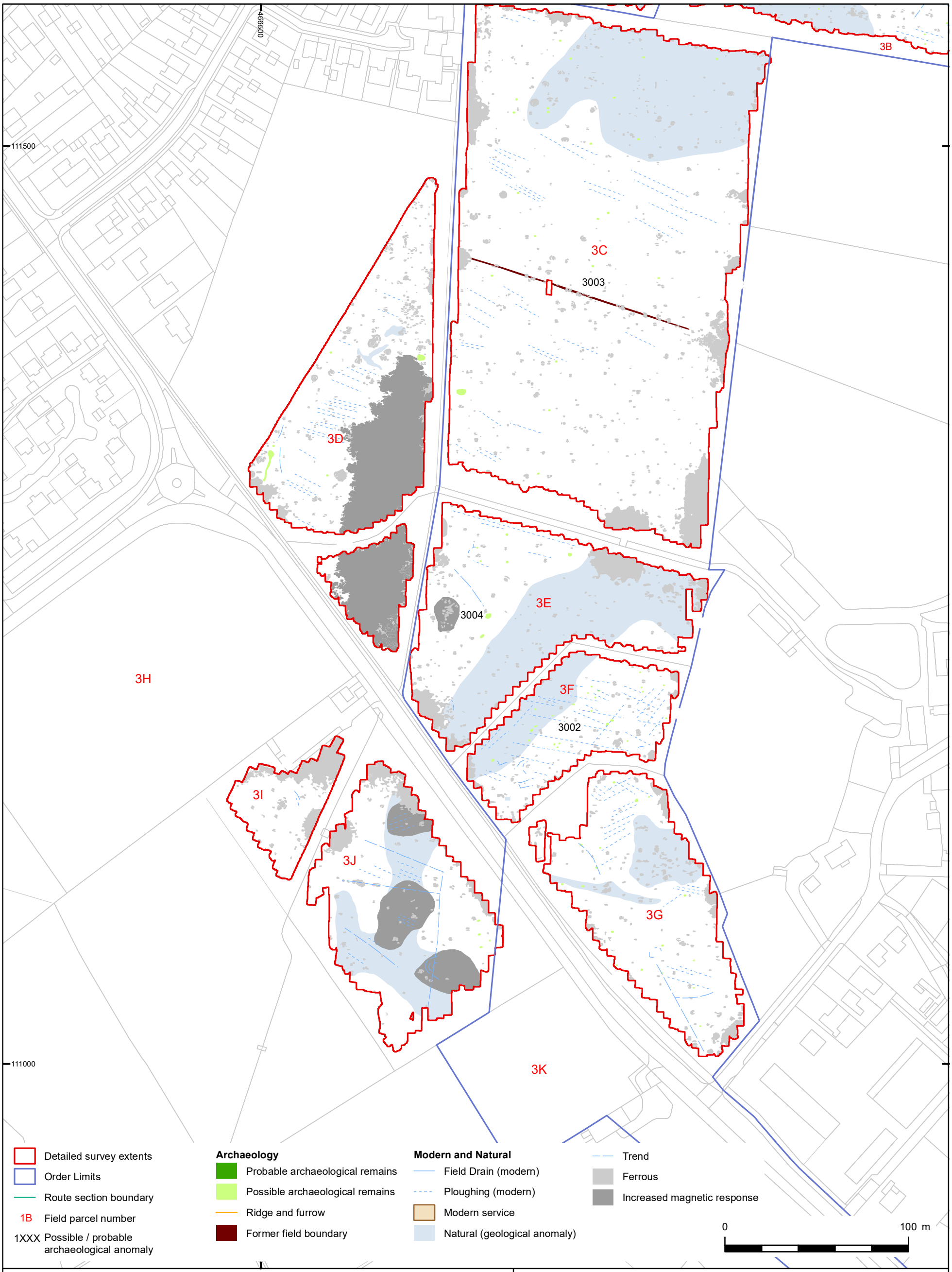
Detailed gradiometer survey results: interpretation (Area 2C – 3B)

Figure 18

Date:	07/06/2019	Revision Number:	2
Scale:	1:2000 at A3	Illustrator:	IA
Path:	S:\PROJECTS\218590\GIS\FigsMXD\2019_06_07\218590_Figs_Greyscale.mxd		

Detailed gradiometer survey results: greyscale plot (Area 3C – 4B)

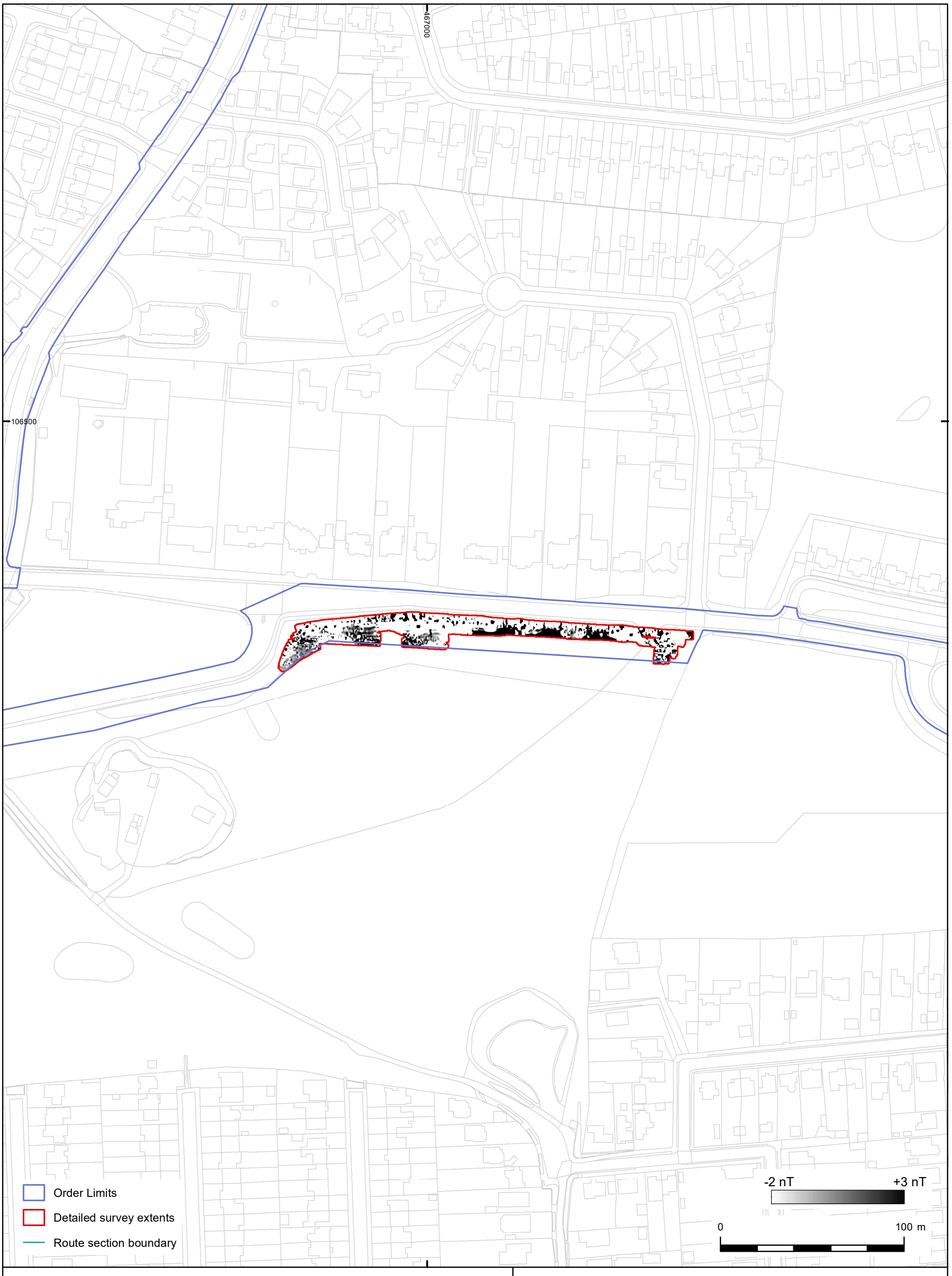
Figure 19



Date:	05/07/2019	Revision Number:	2
Scale:	1:2000 at A3	Illustrator:	IA
Path:	S:\PROJECTS\218590\GIS\FigsMXD\2019_06_07\218590_Figs_Interp.mxd		

Detailed gradiometer survey results: interpretation (Area 3C – 4B)

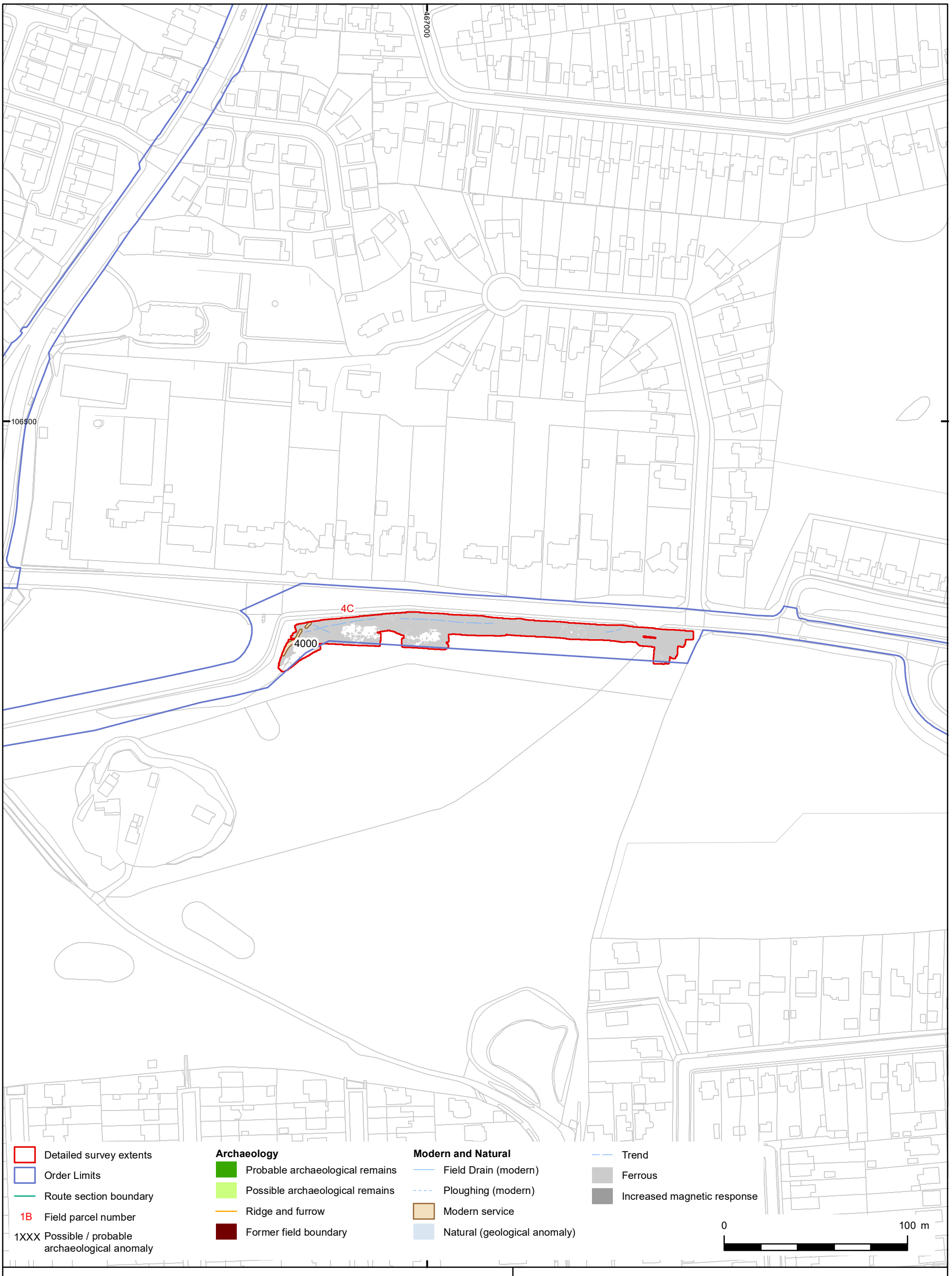
Figure 20



Date:	07/06/2019	Revision Number:	2
Scale:	1:2000 at A3	Illustrator:	IA
Path:	S:\PROJECTS\218590\GIS\FigsMXD\2019_06_07\218590_Figs_Greyscale.mxd		

Detailed gradiometer survey results: greyscale plot (Area 4C)

Figure 21



Date:	05/07/2019	Revision Number:	2
Scale:	1:2000 at A3	Illustrator:	IA
Path:	S:\PROJECTS\218590\GIS\FigsMXD\2019_06_07\218590_Figs_Interp.mxd		

Detailed gradiometer survey results: interpretation (Area 4C)

Figure 22

468000

106000

Order Limits

Detailed survey extents

Route section boundary

-2 nT +3 nT

0 100 m

Date:	07/06/2019	Revision Number:	2
Scale:	1:2000 at A3	Illustrator:	IA
Path:	S:\PROJECTS\218590\GIS\FigsMXD\2019_06_07\218590_Figs_Greyscale.mxd		

Detailed gradiometer survey results: greyscale plot (Area 5B)

Figure 23

Date:	05/07/2019	Revision Number:	2
Scale:	1:2000 at A3	Illustrator:	IA
Path:	S:\PROJECTS\218590\GIS\FigsMXD\2019_06_07\218590_Figs_Interp.mxd		

Detailed gradiometer survey results: interpretation (Area 5B)

Figure 24

105000

468000

104500

Order Limits

Detailed survey extents

Route section boundary

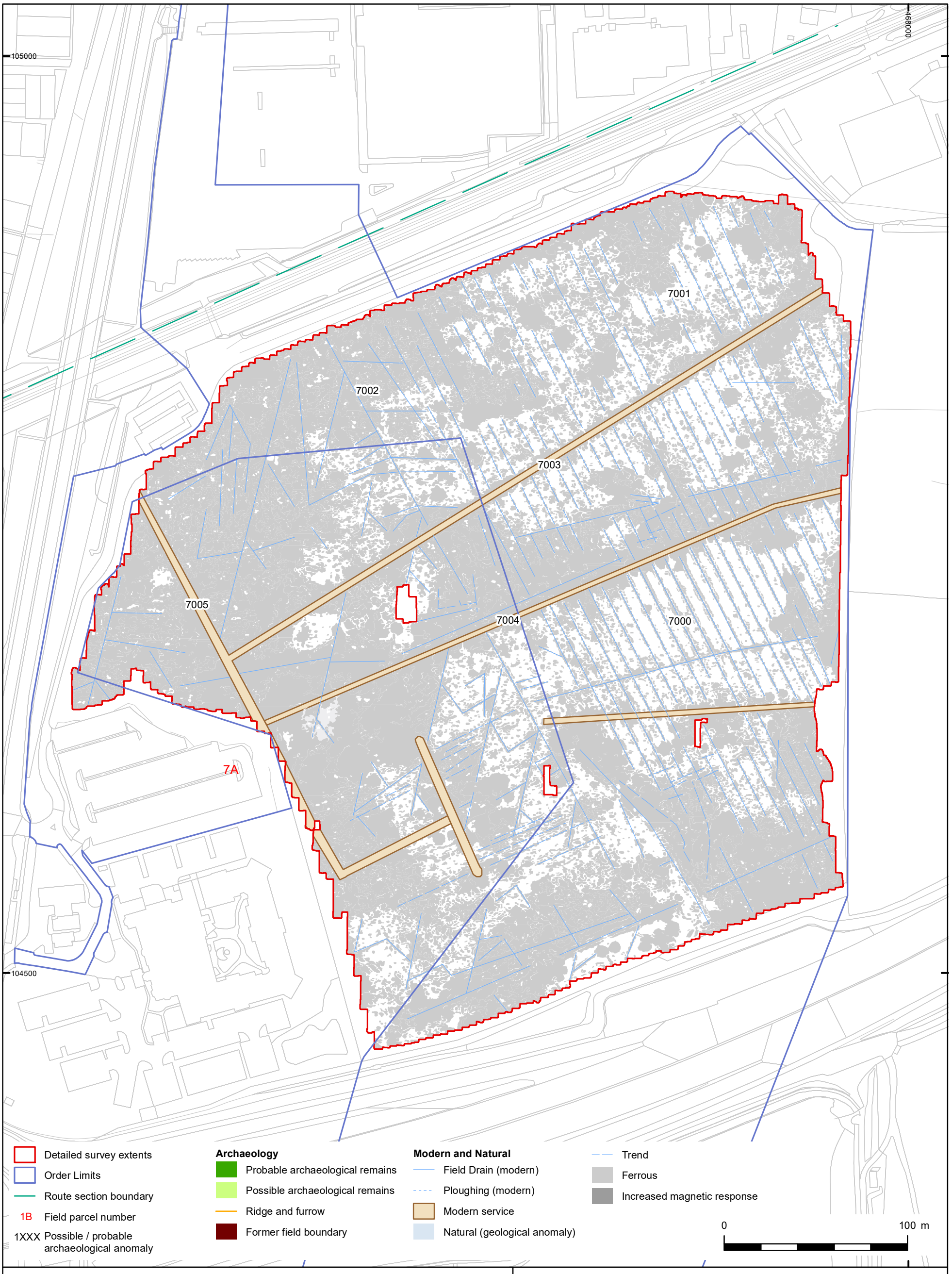
-2 nT +3 nT

0 100 m

Date:	07/06/2019	Revision Number:	2
Scale:	1:2000 at A3	Illustrator:	IA
Path:	S:\PROJECTS\218590\GIS\FigsMXD\2019_06_07\218590_Figs_Greyscale.mxd		

Detailed gradiometer survey results: greyscale plot (Area 7A)

Figure 25



Date:	05/07/2019	Revision Number:	2
Scale:	1:2000 at A3	Illustrator:	IA
Path:	S:\PROJECTS\218590\GIS\FigsMXD\2019_06_07\218590_Figs_Interp.mxd		

Detailed gradiometer survey results: interpretation (Area 7A)

Figure 26

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